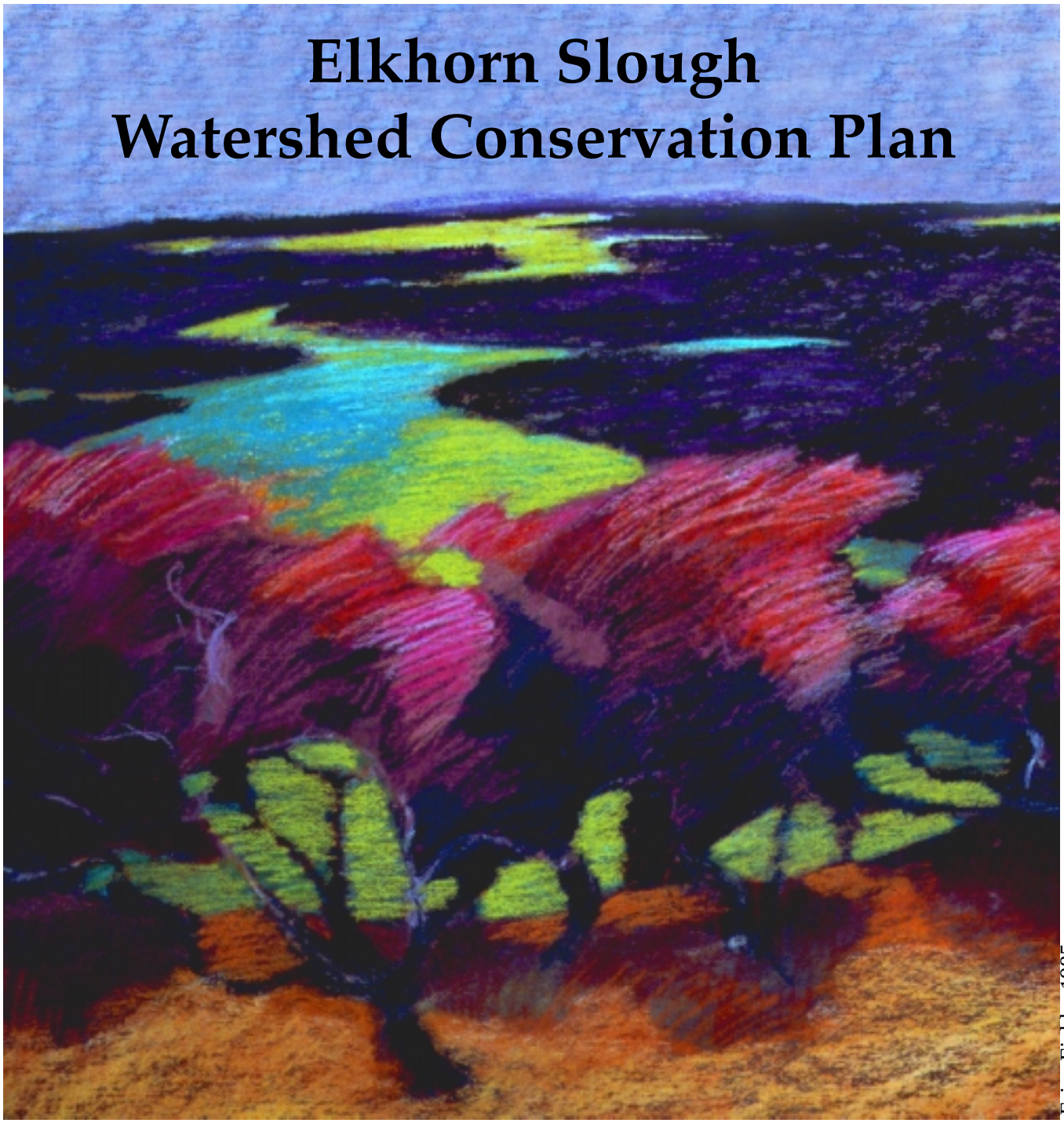
Elkhorn Slough Watershed Conservation Plan



Erica Fielder 1985

The Elkhorn Slough Foundation
The Nature Conservancy

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Elkhorn Slough Watershed Conservation Plan

Prepared for:

Elkhorn Slough Foundation and
The Nature Conservancy

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Prepared by:
Tom Scharffenberger
Scharffenberger Land Planning & Design

In conjunction with:
Mark Silberstein, Elkhorn Slough Foundation
Robin Cox, Chris Kelly and Lynn Lozier, The Nature Conservancy
Karyn Gear, California State Coastal Conservancy

GIS by:
Brian Cohen, GreenInfo Network

Project Funding by:
The David and Lucile Packard Foundation

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Preface

This document outlines an approach to the conservation of critical natural resources in the Elkhorn Slough Watershed. It represents the work and critical thinking of many individuals and organizations, but is by no means the last word. We offer this as a tool to further the goals of preserving the remarkable biological diversity of the Elkhorn watershed in concert with sustaining the existing economic and social activities here.

All proposed or implied transactions presented are based on the understanding that these can only move forward with the cooperation and support of willing landowners and other partners. We support and respect the rights of property owners and rely on collaboration with the community to shape the future of the slough.

The persistence of rich coastal environments like Elkhorn Slough depends on an informed public and on agencies and community organizations clearly focused on priorities for conservation. This plan gives us this focus. We invite you to join us in its implementation.

Chris Kelly, Lynn Lozier, Robin Cox	The Nature Conservancy
Mark Silberstein	Elkhorn Slough Foundation
Karyn Gear	California State Coastal Conservancy

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Carol	Baudler	The Nature Conservancy
Kris	Beall	Elkhorn Slough Foundation
Jonathan	Berkey	Resource Conservation District
Jane	Caffrey	Elkhorn Slough National Estuarine Research Reserve
Frank	Capurro	Elkhorn Slough Foundation
Sue	Chan	University of California, Berkeley
Becky	Christensen	Elkhorn Slough National Estuarine Research Reserve
Diane	Cooley	Elkhorn Slough Foundation
Sherwood	Darrington	Monterey County Agricultural & Historic Land Conservancy
Jean	Driscoll	Packard Foundation
Lynn	Dwyer	Sustainable Conservation
Nancy	Giberson	Santa Cruz County Office of Education (ESF)
Scott	Hennessy	Monterey County Planning Commission, Watershed Institute
Deborah	Hilyard	California Department of Fish & Game
Rick	Hyman	California Coastal Commission
Candy	Ingram	Monterey County LAFCO (ESF)
Rob	Johnson	Monterey County Water Resources Agency
Paul	Kephart	Rana Creek Ranch
Cory	Leong	The Nature Conservancy
Henry	Little	The Nature Conservancy
Steven	Maki	Monterey County Planning Department
Chris	Malzone	USGS
Michael	Mantell	California Environmental Trust
Steve	McCormick	The Nature Conservancy
Charlie	McNeish	Pajaro Valley Water Management Agency
Ed	Mercurio	Hartnell College
Daniel	Mountjoy	Natural Resources Conservation Service
John	Oliver	Moss Landing Marine Laboratories
Larry	Orman	Green Info Network
Terry	Palmisano	California Department of Fish & Game
Kenton	Parker	Elkhorn Slough National Estuarine Research Reserve
John	Piini	Piini Realty
Dawn	Reis	San Jose State University
Don	Roberson	Monterey Peninsula Audubon
Martha	Schauss	CDF&G
Jeanne	Sedgwick	Packard Foundation
Woody	Simmons	Pacific Meridian
Wil	Smith	Elkhorn Slough Foundation
Sean	Smith	The Nature Conservancy
Robert	Stephens	Elkhorn Native Plant Nursery
Jack	Taylor	Elkhorn Slough Foundation
Emily	Tibbott	The Nature Conservancy
Tilly	Tillson	The Nature Conservancy
Mark	Valentine	Packard Foundation
Jim	Van Houten	Santa Cruz County LAFCO (ESF)
Chris	Zachariadas	Rural Development Center

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Project Summary

Elkhorn Slough is an ecological gem located on the edge of Monterey Bay. It supports one of California's most threatened ecosystems, the coastal estuary. Its surrounding landscape of working farms and undeveloped ridges and hills are highly scenic and remarkably intact, considering their close proximity to the metropolitan Bay Area.

Although not pristine, Elkhorn Slough is a biologically rich wetland system, providing habitat for numerous resident and migratory birds. A great diversity of rare plants and animals are found in its natural communities. Elkhorn Slough serves as an important fish nursery and source of nutrients for Monterey Bay. The State of California has designated Elkhorn Slough an ecological preserve, and the National Oceanic and Atmospheric Administration has included its tidal waters as part of the Monterey Bay National Marine Sanctuary, and established a National Estuarine Research Reserve on its shores. Surrounding Elkhorn Slough is a series of ridges covered with the rare maritime chaparral community, and associated coast live oak woodlands.

This study identified critical resources within the Elkhorn Slough watershed that are of highest priority for protection:

- Coastal marsh
- Riparian forest and freshwater wetlands
- Maritime chaparral and associated oak woodlands and grasslands
- Highly productive cultivated farmlands
- Scenic viewsheds surrounding Elkhorn Slough and Carneros Creek

Elkhorn Slough is threatened by many factors, most of them related to human activities immediately surrounding the Slough. The most significant threats are:

- Sedimentation and contamination of marshes, largely due to uncontrolled runoff from steep cultivated fields;
- Destruction and fragmentation of maritime chaparral habitat associated with residential development;
- Severe depletion of groundwater resources and accompanying seawater intrusion due to excessive pumping of wells for irrigation; and
- Loss of marsh habitat by tidal erosion and conversion as a consequence of human manipulation of the marsh hydrology.

This Conservation Plan, sponsored by The David and Lucile Packard Foundation, was developed to identify and address threats, and to maintain the long-term viability of Elkhorn Slough and its related upland communities as a significant coastal system. The Plan's vision is to preserve an intact and interconnected network of natural communities, including over 4,000 acres of coastal marsh within Elkhorn and Moro Cojo Sloughs, the freshwater wetlands of McClusky Slough, a restored riparian forest in the lower Carneros Creek floodplain and a series of upland ridges with unfragmented maritime chaparral in the Elkhorn Highlands. The Plan envisions these natural communities surrounded by productive, habitat-compatible farmland, scenic vistas and

residences. As a whole this landscape comprises 22,500 acres, or approximately one half of the total watershed.

To make this vision a reality, the Plan calls for immediate action on a number of fronts:

- Raise the visibility of Elkhorn Slough on regional and state-wide levels to secure political support for funding programs recommended in the Plan
- Continue to build the capacity of local organizations to implement the Plan
- Acquire fee or conservation easements on key habitat-rich parcels and surrounding agricultural lands
- Restore and enhance natural habitats where suitable, and re-establish ecological linkages
- Provide ongoing incentives and assistance to farmers to improve management practices so that they are compatible with biological resources
- Provide outreach to local citizens regarding conservation issues, and encourage local involvement in the County Planning Process
- Educate and mobilize decision makers and landowners to better understand and manage resource lands

To be successful, the Plan will require a sustained public and private effort to secure funding for recommended programs. On a local level, the Plan calls for ongoing support to the Elkhorn Slough Foundation (ESF) and other partners to implement the Plan. The Plan also calls for increased support for the land trust function of ESF in acquiring and managing conservation lands and easements throughout the Elkhorn Slough watershed.

Resource protection, particularly on the few remaining large blocks of connected natural habitat lands, is a key element of the Plan. Recommended fee and easement acquisitions include marsh and buffer portions of properties in western Moro Cojo Slough, a crescent of linked Elkhorn Highland properties between The Nature Conservancy Blohm Ranch and the Elkhorn Slough Foundation's Long Valley properties, and bluff portions of properties north and west of Elkhorn Slough. The plan calls for protection of McClusky Slough, as well as surrounding highly productive farmlands in Springfield Terrace. Priority restoration projects include Moro Cojo Slough marshlands, Porter marsh, and critical linkages in the Elkhorn Highlands that were once maritime chaparral.

Abatement of major stresses are also a key element of the Plan. The Plan recommends continuation of programs, such as the Natural Resource Conservation Service (NRCS) Elkhorn Slough Watershed Project, to help farmers implement management practices that will substantially reduce sedimentation in adjacent marshlands. It further recommends that conservation organizations play a supportive role in solving the groundwater overdraft problem, while ensuring that natural habitat protection is a key part of any solution. It also recommends outreach to the local community on conservation issues, and how local citizens can become involved in the County's planning decisions that affect Slough resources.

Figure 1 - Regional Context Map

This is a pivotal time for protecting Elkhorn Slough. There are a number of well-established conservation programs and committed organizations already involved. And there are a number of encouraging developments, such as the recent purchases of Long Valley and Catellus properties, and the positive response of local farmers to soil conservation practices promoted by NRCS and the local Resource Conservation District. Uncertain markets and recent restrictions on the use of methyl bromide may reduce the economic viability of strawberry cultivation in more marginal farms east of Elkhorn Slough, and hasten their conversion to other uses. Some of these lands, therefore, may be available for purchase to protect maritime chaparral habitat. Finally, there are significant opportunities to obtain conservation funding from public and private sources.

Planning Purpose and Process

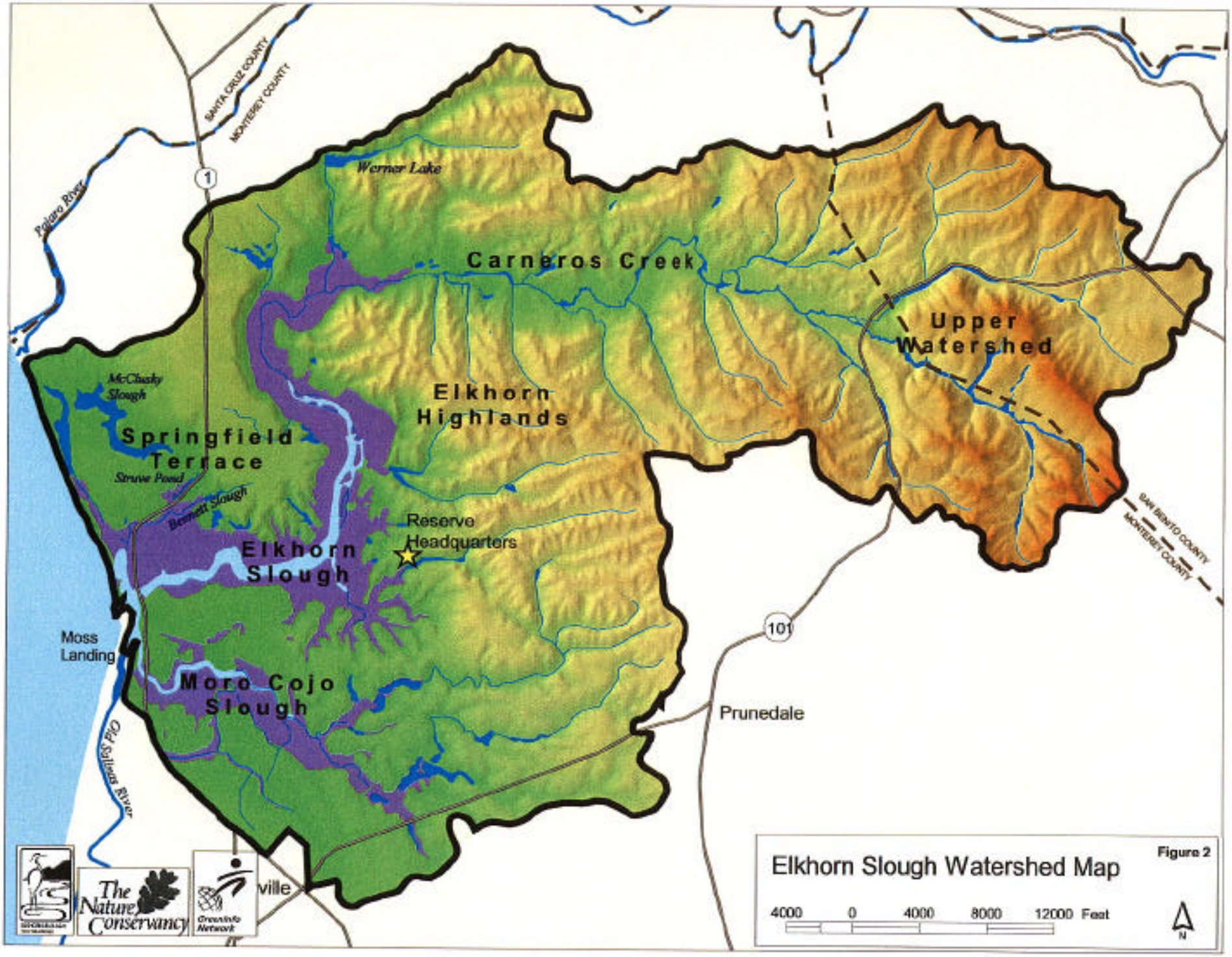
The overall goal of this project was to develop a Conservation Plan which will guide future conservation activities by both public and private organizations. The project was funded by a grant of The David and Lucile Packard Foundation, as part of their "Conserving California Landscapes" program.

The Plan identified critical resources, the most significant threats (stresses and sources of stress) to these resources, and strategies to protect these resources over time. Land use and resource layers were mapped on ARCView GIS. To ensure we were working with the best and most current information regarding Elkhorn Slough and its conservation needs, three workshops were conducted at the Elkhorn Slough National Estuarine Research Reserve (ESNERR) offices. In addition, one-on-one interviews were held with experts to solicit added guidance. The planning process is summarized in Figure 3, "Planning Process Flow Chart."

Setting and Project Area

Elkhorn Slough is located one hundred miles south of San Francisco, in the curve of Monterey Bay. At its mouth is Moss Landing Harbor. The entire Elkhorn Slough watershed contains 45,000± acres, some of which extend east beyond Highway 101 into San Benito County. Although the project took into consideration the entire watershed, its primary focus is on the western half of this watershed, where biological resources characteristic of the Elkhorn Slough and unique to its marine-influenced ecology are concentrated. This area is roughly bounded on the east by San Miguel Canyon Road.

The project area includes the marshes of both Elkhorn and Moro Cojo Sloughs, the freshwater wetlands of McClusky Slough, the rich farmlands of Springfield Terrace, the lower floodplains of Carneros Creek, and a series of high ridges east of Elkhorn Slough described here as "Elkhorn Highlands." Just beyond the project area are three small cities: Watsonville and Pajaro to the north, and Castroville to the south. Within the project area are two small communities, Las Lomas and portions of Prunedale.


Elkhorn Slough Watershed Map
Figure 2
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Carneros Creek
Upper Watershed
Elkhorn Highlands
Springfield Terrace
Elkhorn Slough
Moro Cojo Slough
Reserve Headquarters
Werner Lake
McCluskey Slough
Struve Pond
Bennett Slough
Pajaro River
Old Salinas River
Moss Landing
Prunedale
SANTA CRUZ COUNTY
MONTEREY COUNTY
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ELKHORN SLOUGH PLANNING PROCESS

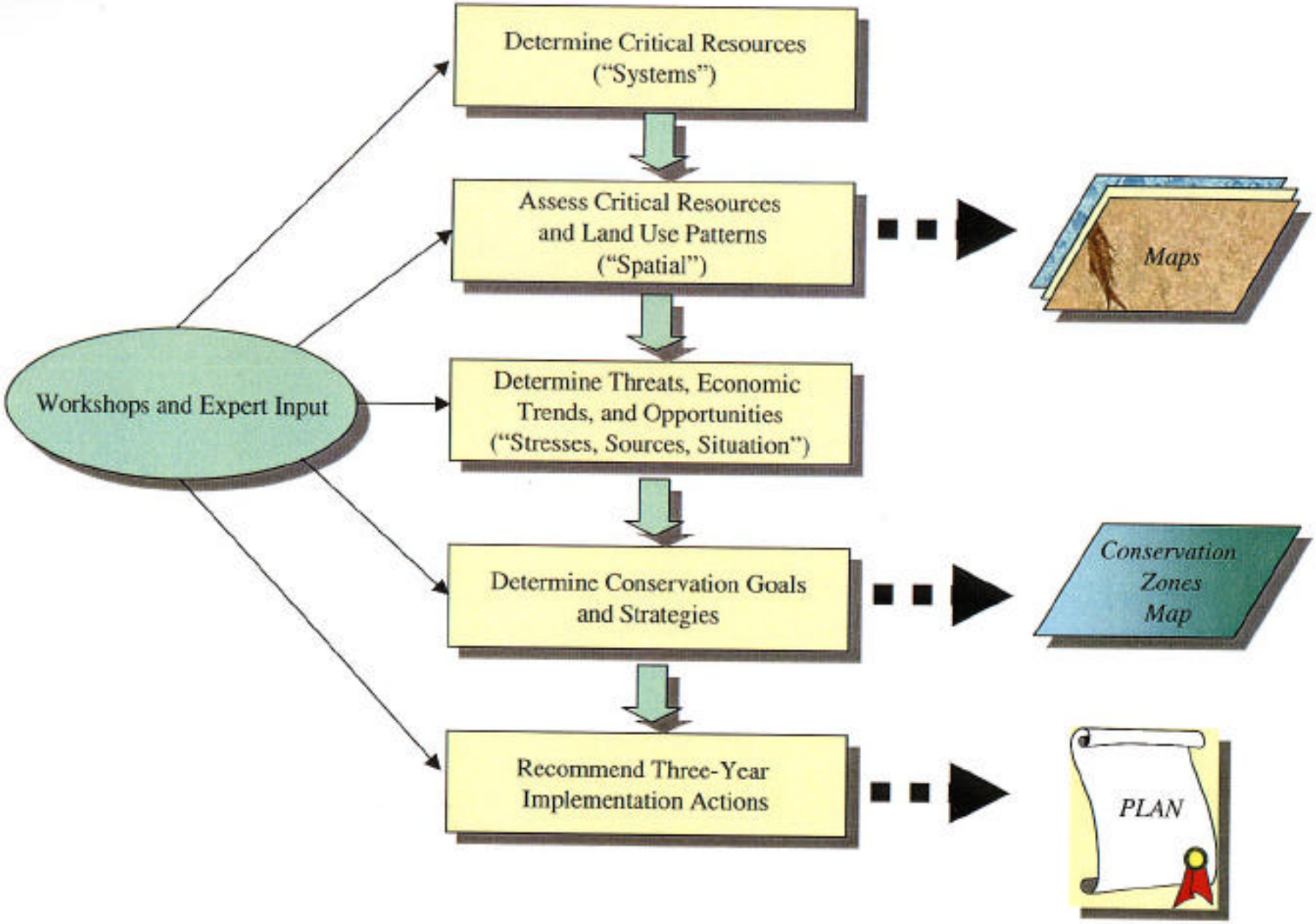

Figure 3

Critical Resources

The project identified "critical resources," or conservation targets, throughout the Elkhorn Slough project area. A primary focus is on the unique biological and agricultural resources of the Elkhorn Slough watershed, as described below. Where biological and agricultural resources conflicted, biological resources were favored. Scenic resources, so pervasive in the Elkhorn Slough watershed, are generally presumed to be covered through the selection of critical biological and agricultural resources. Biological resources are summarized in Appendix A, "Critical Biological Resources," and shown on Figure 4, "Biological Resources Map." Agriculture resources are shown on Figure 5.

Wetland Habitats

Elkhorn Slough is an estuary of great habitat diversity and species richness. Its marshes represent a particularly valuable resource as California has lost more than 75% of it coastal marshes. At 4,182± acres, the combined marshes of Elkhorn and Moro Cojo Slough are the largest between San Francisco and Morro Bays.

Its natural communities include tidal canals, mudflats, salt and brackish marshes of Elkhorn and Moro Cojo Sloughs. In its upper reaches are freshwater wetlands, the remnant riparian forests and floodplain of Carneros Creek and numerous seasonal streams. McClusky Slough is a freshwater wetland system that drains into Elkhorn Slough at Moss Landing Harbor.

More than half of California's threatened and endangered animals are associated with wetlands. Sensitive species in Elkhorn Slough include the Santa Cruz Long-toed Salamander (SCLTS), California Tiger Salamander, the California Red-legged Frog, the Southwest Pond Turtle and the California Brackishwater Snail. The first four of these are dependent on freshwater wetland and pond habitats. McClusky Slough is one of the largest of nine habitats where the federally endangered SCLTS is found. The CA Brackishwater Snail is found in both Elkhorn and Moro Cojo Slough marshes and tidal channels.

Elkhorn Slough's marsh's provide important feeding and roosting habitat for a large variety of migrant and resident birds. Along the shores of the marsh are two heron rookeries, a small breeding population of Snowy Plovers, and nesting pairs of Golden Eagles, White-tailed Kites and many other species of raptors. It also serves as an important fish nursery, and functions as a sponge and filter for sediment and pollution from surrounding upland farms and residential uses. This function is particularly significant, as the mouth of Elkhorn Slough opens into one of the deepest and most productive oceanic resources along the California coast, the Monterey Submarine Canyon.

Upland Habitats

The surrounding uplands are no less diverse. Sheltering the estuary from the ocean is a series of largely intact sand dunes, most of which have been protected in public ownership. To the east of the estuary is a series of parallel ridges, known as Elkhorn Highlands, which have dense coast live oak woodlands on north-facing slopes and maritime chaparral on south-facing slopes. Maritime

chaparral is a community that is rare in California, and in Elkhorn Highlands it has a unique assemblage of plants found no where else. Rare plant species include Hooker's Manzanita, Pajaro Manzanita, Monterey Ceanothus, Eastwood's Goldenbush, Gairdner's Yampah and Yadon's Piperia. Though some fragmentation has occurred due to farming and residential development, the northern and eastern-most hills in Elkhorn Highlands contain healthy expanses of maritime chaparral.

The Biological Resources Map shows critical natural communities which are a priority for protection in the Conservation Plan. These communities include coastal marsh, freshwater wetlands, riparian forests and maritime chaparral. Though coast live oak woodlands are a relatively common community in California, those associated with maritime chaparral have been considered as a priority for protection, as the two communities are often found intermixed in an ecological mosaic. The Biological Resources Map also shows documented occurrences of rare animal and plant species.

Agriculture

The farmlands surrounding the estuary are unique in California. The combination of deep, well-drained, sandy soils and a warm Mediterranean climate tempered by summer fog, allows for year-round production of crops like strawberries, cut flowers and artichokes. 10% of the watershed is planted in strawberries alone, and the watershed produces 10% of California's strawberries. The largest, most productive farms are concentrated in Springfield Terrace and Moro Cojo Slough areas. Smaller farms are scattered within the Carneros Creek and Elkhorn Highlands areas. Elkhorn Slough's farms are a vital component of the local and County economy, but they are also the major cause of sedimentation, a chief stress to marsh habitats. One of the challenges in Elkhorn Slough is to balance both agricultural and resource protection. Fortunately, protection strategies for the two are often complementary.

Scenic Viewsheds

Although much of the estuary is largely hidden from the public eye, the scenic panoramas of marshland, farm fields and forested uplands that unfold as one travels along Elkhorn Road, Hall/Tarpey Roads and Highway 1 are outstanding. Monterey County has designated three scenic routes in the area, including Highway 1, Highway 156 and portions of Elkhorn Road. The County has also made Elkhorn Slough an official "Scenic Waterway," as it is enjoyed by many in kayak and canoe. However, no protective land use regulations come with these designations. The Plan identifies additional scenic areas of concern, including the bluffs and bluff tops west of Elkhorn Slough, the hillsides east of Elkhorn Slough, the agricultural landscape along Carneros Creek, and Elkhorn Highland ridge tops.

Major Land Uses, County Regulations and Land Use Trends

A. Land Use

There are over 5,550 legal parcels in the Monterey County portion of the watershed, on which approximately 75-80% have residences. Despite the high number of parcels, over 75% of the total watershed is largely undeveloped, a combination of farms and preserve lands. Approximately 4,260 acres (roughly 10%) of the watershed have been protected through agency and non-profit acquisitions. Most of the protected lands lie within or adjacent to Elkhorn Slough

itself, with some in the Elkhorn Highlands and Moro Cojo areas.
Approximately 24% of the watershed is in cultivated agriculture. Relatively large family and corporate-owned farms with high-value crops are concentrated in the Springfield Terrace and Moro Cojo areas. Smaller farms, many operated by tenants, are found throughout the Carneros Creek valley, as well as in scattered patches throughout Elkhorn Highlands. Farms in the Elkhorn Highlands are often found in hillside areas with steep slopes (15-30+%).

Approximately 10% of the watershed consists of residential areas with lots under 5 acres in size. Most of these are clustered in the communities of Las Lomas, Prunedale, the southern portion of Aromas, and the Oak Hills subdivision along Highway 156. Five, ten and twenty acre lots are interspersed with larger agricultural parcels in the Elkhorn Highlands and Carneros Creek areas. Here the historic development pattern has been modest homes built in valley bottoms near existing roads. More recently, scattered development of larger, more expensive homes has occurred on south-facing hillsides and ridge tops.

B. Land Use Regulations

The majority of the Monterey portion of the watershed is within the Coastal Zone, and regulated by the Monterey County North County Land Use Plan (LUP). The LUP land use designations for the western portion of the project area (Springfield Highlands, Lower Moro Cojo and Elkhorn Slough areas) are either "Agricultural Preservation" or "Scenic and Natural Resource Recreation." Land use regulations are very restrictive here, and residential development is discouraged. On the other hand, regulations in Elkhorn Highlands and Carneros Creek zones are much less restrictive. Here, the land use designations, "Rural Density" and "Low Density," allow for residential development in all areas but wetlands, maritime chaparral and ridge tops. Densities range from 2.5 to 40 acres per unit. Appendix D provides a more detailed summary of land use regulations and jurisdictions which regulate land uses in the project area. Appendix E provides a table of significant land ownership patterns, conservation status, land use regulations and economic trends, by zone.

C. Economic and Regulatory Trends that will Influence Future Land Uses

Growth and immigration to coastal areas will increase pressure for development. Contributing factors include job growth in the Silicon Valley, desirability of the coastal climate, and overall population growth in the coastal counties. After several years of slow growth, the real estate market here is on the upswing, and land values are escalating. Undeveloped land in the Highlands area is now priced at $5,000 to 6,000 per acre. Recently a 200-acre Highlands farm near Las Lomas, called Triple M Ranch, was subdivided into 31 one-acre lots. A second proposal calls for a development surrounding the golf course near Los Lomas.

The uncertainty in the economics of strawberry production may phase out the smaller, more marginal farms in the Highlands. Highland farms are currently facing steep lease increases (as high as $1,000 per acre, as opposed to $300 per acre a few years ago) and volatile commodity prices. In addition, a recent restrictions on the use of methyl bromides, on which this cultivation relies, and a potential future ban, may further reduce the economic viability of hillside strawberry farming. If farmers abandon their farms, landlords who have become accustomed to high returns from strawberry leases may be tempted to sell their land for development. By contrast,

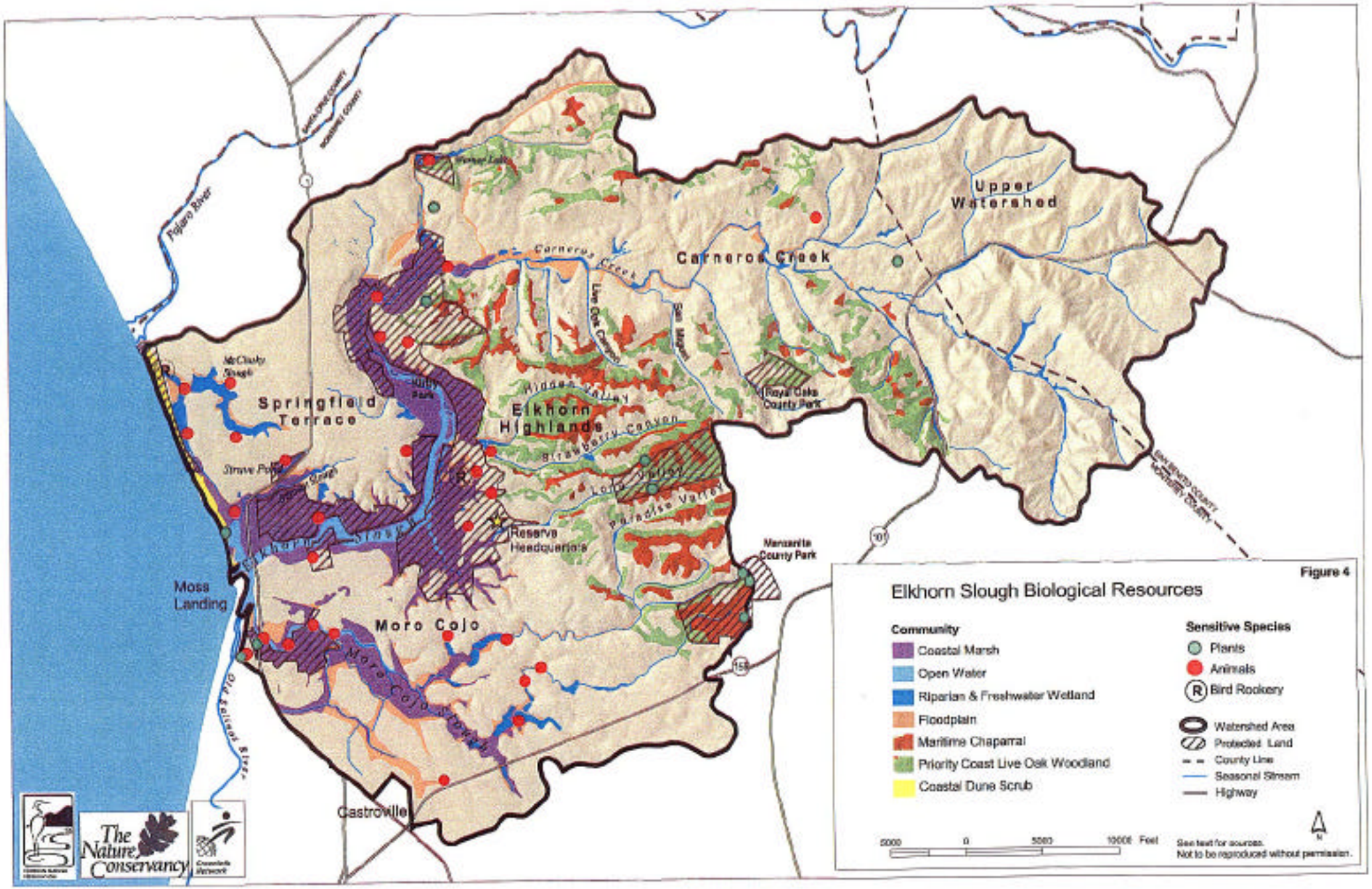
Figure 4
Elkhorn Slough Biological Resources
Community
Coastal Marsh
Open Water
Riparian & Freshwater Wetland
Floodplain
Maritime Chaparral
Priority Coast Live Oak Woodland
Coastal Dune Scrub
Sensitive Species
Plants
Animals
Bird Rookery
Watershed Area
Protected Land
County Line
Seasonal Stream
Highway
5000 0 5000 10000 Feet
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Upper Watershed
Carneros Creek
Springfield Terrace
Elkhorn Highlands
Moro Cojo
Moss Landing
Castroville
Reserve Headquarters
Manzanita County Park
Rancho Oaks County Park
Pajaro River
Old Salinas River
Elkhorn Slough
Moro Cojo Slough
Carneros Creek
Hidden Valley
Strawberry Canyon
Lone Valley
Paradise Valley
McCloskey Slough
Strawe Pond
Hoffman Park
Monterey County
Santa Cruz County
The Nature Conservancy

strawberry and other cultivation in Springfield Terrace is carried out by larger, corporate farmers on more level and more productive agricultural lands, and are less likely to be impacted by falling prices. Cultivated land in Springfield Terrace ranges from $15,000 to 20,000 acre, compared to only $6,000 per acre in Elkhorn Highlands.

Groundwater overdraft in the area is acute, and there appears to be no clear solutions on the horizon. Monterey County Water Resources Agency (MCWRA) has calculated the overdraft in Springfield Terrace to be 498%, and the Highlands area to be 96-137%. This overdraft has resulted in seawater intrusion in the aquifers, and the need for ever deeper wells. The Pajaro Valley Water Management Agency is committed to solving the problem by importing water, but this may prove infeasible due to recent voter initiatives restricting water fee increases and pipeline construction. Without imported water or large-scale retiring of fields, agriculture in many areas may no longer be viable, and may ultimately give way to residential development.

Monterey County's resource-protection regulations are strong, but enforcement is often weak**.** For example, the County has never exercised its authority to impose fines on landowners whose runoff from agricultural fields has accumulated on County roads. If the County imposed such fees, not only would County roads be free from soil runoff, but a major stress to Elkhorn Slough might be substantially reduced. Also, the County is uneven in its enforcement of ordinances which protect maritime chaparral and ridge top areas. Recent house construction on ridge tops and south-facing maritime chaparral hillsides conflicts with the County's scenic and resource protection ordinances, as well as its grading ordinances. County planners who review building permit applications are often unaware of the importance of maritime chaparral as a resource, or of the problems created when steep access driveways are constructed in fragile Highland soils.

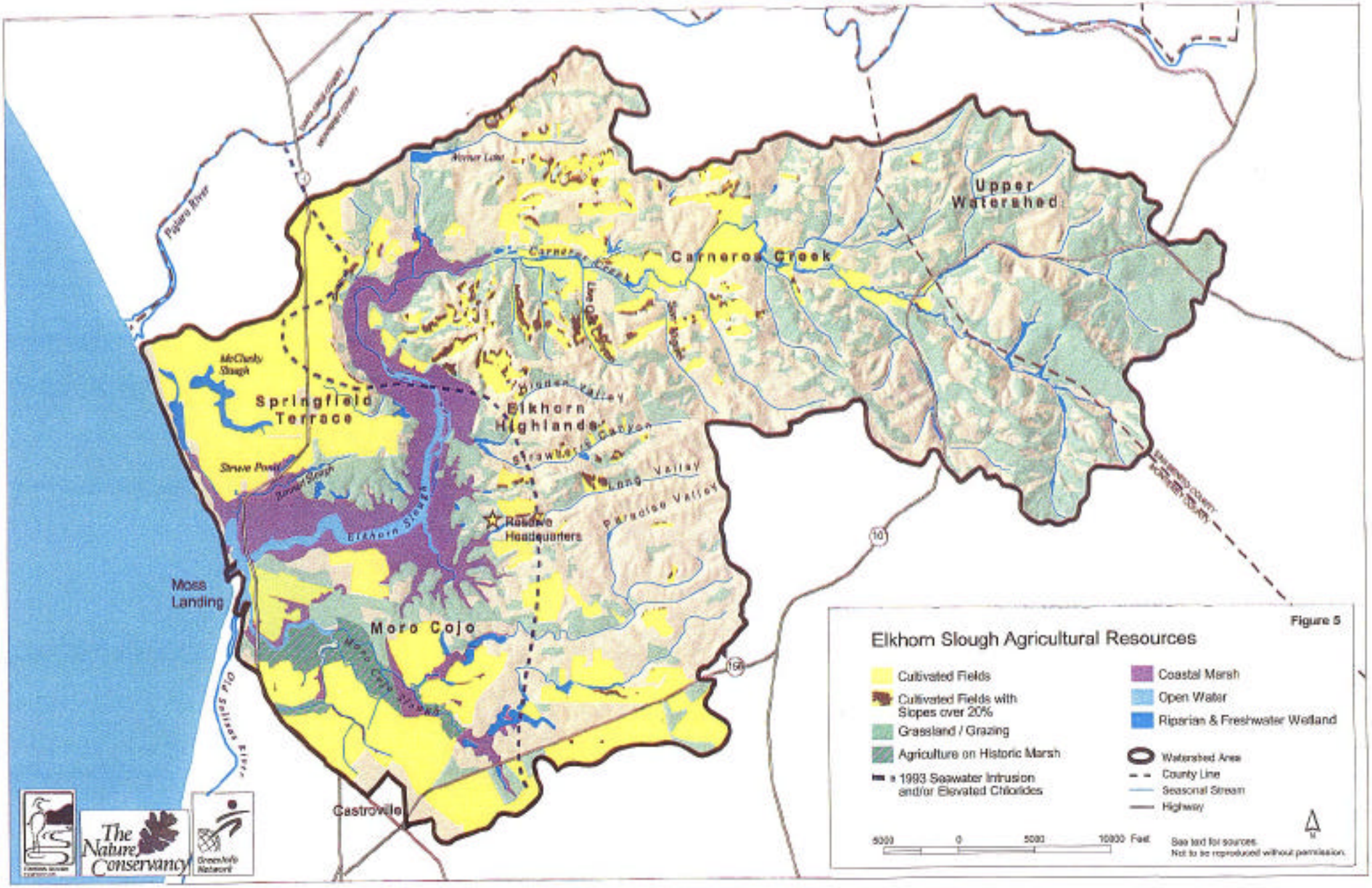
Major Stresses and Sources of Stress to Resources

This project employed The Nature Conservancy's customary "3S" methodology for devising site-specific conservation plans. It involves identification of a site's most critical **systems** (also called "conservation targets" or "critical resources"), the **stresses** to these systems, and the **sources** of these stresses. Appendix F provides a detailed list of Elkhorn Slough's stresses and the sources of these stresses.

The most serious threats to Elkhorn Slough resources include the following:

1) inappropriate agricultural activities,
2) residential development,
3) groundwater overdraft, and
4) manipulation of marsh hydrology.

Inappropriate Agricultural Activities: Sediment and associated chemical accumulation in wetlands due to uncontrolled runoff from cultivated fields and access roads is the cause of the most serious stress to the Elkhorn Slough ecosystem. Although residential uses contribute, the major source of this sedimentation is steep hillside farms, primarily in the Elkhorn Highlands, and to a lesser extent, the Carneros Creek sub-watershed. This problem particularly impacts freshwater wetlands and ponds in the upper reaches of the Elkhorn Slough, which harbor


Elkhorn Slough Agricultural Resources
Figure 5
Cultivated Fields
Cultivated Fields with Slopes over 20%
Grassland / Grazing
Agriculture on Historic Marsh
1993 Seawater Intrusion and/or Elevated Chlorides
Coastal Marsh
Open Water
Riparian & Freshwater Wetland
Watershed Area
County Line
Seasonal Stream
Highway
5000 0 5000 10000 Feet
See text for sources.
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Upper Watershed
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Elkhorn Slough
Long Valley
Paradise Valley
Reserve Headquarters
Hidden Valley
Strawberry Canyon
McCloskey Slough
Struve Pond
Tarwater Slough
Moro Cojo Slough
Porter Lake
Salinas River
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sensitive amphibians, as well as riparian habitats in lower Carneros Creek. Due to the high value of crops in the area, cultivated agriculture has often been pushed to the edge of wetland habitats, without any buffer.

In Moro Cojo and McClusky Sloughs, agricultural activities are not only a source of sedimentation, but they have more directly resulted in actual natural habitat destruction and conversion. Diking, ditching, filling, and soil compaction from grazing have turned much of Moro Cojo's wetlands into grasslands. Portions of McClusky Slough wetlands have been converted to agricultural production, though several of the surrounding landowners are currently working to buffer and restore wetland areas adjoining agricultural lands, and are discussing ways of increasing water retention and recharge in the McClusky system.

Residential development: Recent residential development on Elkhorn Highland ridges is destroying and fragmenting maritime chaparral and associated oak woodland habitats, as well as adjacent marsh habitats. Site development, especially the construction of steep access drives, is creating severe soil erosion and encouraging the spread of invasive pampas grass. Related stresses include predation on sensitive marsh animal species by pets and feral animals, nutrient loading in marsh habitats caused by runoff from lawns and corrals, and suppression of the natural fire regime, on which maritime chaparral depends for its long-term viability.

Groundwater overdraft: A severe overdraft of groundwater from agricultural wells has caused aquifers to retreat and seawater to intrude. Without feasible sources of imported water, and/or a willingness of landowners to voluntarily cut water use, the overdraft may eventually result in loss of productive farmlands, especially those in Springfield Terrace, and future conversion of farms to residential uses. Another result may be local de-watering of freshwater habitats, such as McClusky Slough, and the freshwater 'fingers' in Elkhorn Slough.

Manipulations of marsh hydrology: The opening of Elkhorn Slough at Moss Landing Harbor in 1947 has subjected this once protected estuary to the full force of Monterey Bay's tides. This daily tidal scour is slowly eroding the site's most extensive marsh habitats: Salicornia (pickleweed) beds. At the current rate of erosion, it is possible that most of the Salicornia beds will be converted to mud flat habitats in 50 to 100 years. However, current research is inconclusive regarding how fast this process is actually taking place, and whether there are other factors, such as a possible subsidence of Elkhorn Slough after the Loma Prieta earthquake, which will have an even greater impact on the long-term composition of Elkhorn Slough's marsh habitats. Other hydrological manipulations include the construction of channels, levies and tide gates (although some tide gates have been successfully used to restore the freshwater fringes of Elkhorn Slough). Finally, inadequately-sized culverts beneath Route 1 has caused peak floodwaters of the Pajaro River to back up into the Elkhorn Slough. Contaminants from the Pajaro River may have been responsible for the failure of a breeding colony of Caspian Terns in Elkhorn Slough in 1995.

Conservation Opportunities and Partnerships

Opportunities for protecting critical biological, agricultural and scenic resources in Elkhorn Slough include both ongoing and potential conservation programs. Recently, several new conservation organizations have become involved in protecting Elkhorn Slough, and potential opportunities exist for collaborations between the various agencies and non-profit conservation organizations. There are also new funding sources, which are summarized in Appendix F. Appendix H provides a list of key conservation organizations and agencies.

Ongoing Programs for Permanent Protection of Significant Resource Lands - Public and Private Partnerships

As mentioned earlier, the majority of Elkhorn Slough marsh has already been protected, and is either owned by The Nature Conservancy (TNC) or the CA Department of Fish and Game. In addition, the Elkhorn Slough Foundation (ESF), in partnership with the Coastal Conservancy, has recently purchased an important wetland parcel in the lower Moro Cojo Slough, and has begun negotiations with several other landowners in the area.

Since the integrity of wetlands is so dependent on management of surrounding uplands, Elkhorn Slough conservation efforts have begun to focus on protecting upland resources. Several years ago, TNC, with funds from the Coastal Conservancy, purchased Azevedo and Blohm Ranches. On each of these properties, natural habitats are being restored, along with appropriate agricultural buffers. The Monterey County Agricultural and Historic Land Conservancy (MCAHLC) will eventually take sole ownership to the agricultural portion of Azevedo Ranch (it now co-owns this with TNC). TNC and the CA Wildlife Conservation Board (WCB) secured easements on portions of Porter Ranch, which has oak woodland habitat as well as the rare Santa Cruz Tarplant. These lands are managed by ESF. Finally, the ESF and the Big Sur Land Trust, with a grant from the Packard Foundation, recently purchased Long Valley, one of the largest unfragmented stands of maritime chaparral and associated coast live oak woodlands. So far, conservation purchases by non-profit and agency or foundation partners have resulted in protection of over 4,260 acres, which represent just under 10% of the project area.

Today there are increasing opportunities for ESF and other private non-profit and agency partners to raise funds for ongoing and new conservation programs. So far, these organizations have been relatively successful in obtaining funding, even though Elkhorn Slough has remained a relatively"hidden" resource relative to its famous County neighbors, Big Sur and the Monterey Peninsula. In the future, a marketing program geared to raising the visibility of Elkhorn Slough on local, regional and state-wide levels will help provide the political support necessary to secure funding of its many conservation programs.

Implementation of Best Management Practices - Existing NRCS and RCD Programs

In 1995 a team consisting of the Monterey County Resource Conservation District (RCD) and the local office of the National Resources Conservation Service (NRCS) started the "Elkhorn Slough Watershed Project." The goal of the program is to reduce sedimentation and chemical transport into Elkhorn Slough by 50% over an eight year period. To accomplish this, the project's goal is to implement "Best Management Practices", as specified by NRCS-designed

agricultural management plans, on 120 targeted farms. These farms are located in all areas of the Elkhorn Slough watershed where erosion problems are most acute. Typical plans call for construction of proper drainage along access roads, and creation of vegetated buffer strips and sediment basin at the base of fields. So far, the NRCS/RCD team has helped 60 of the 120 farms implement Best Farm Practices, and the team is optimistic that they will reach out to the others before the program's funding is exhausted.

To provide an incentive to local farmers to implement the NRCS/RCD plans, Sustainable Conservation, a non-profit from San Francisco, recently helped establish a permit streamlining, "one-stop-shopping" application process. The permit streamlining program allows farmers to comply with all permits required for erosion control and natural habitat improvements by working through a single agency, (in this case, the NRCS), in return for implementing NRCS agricultural management plans.

Proposed Farmer training program - Rural Development Center and NRCS

A non-profit farmer-advocacy group called the Rural Development Center (RDC), is involved in providing Best Management Practices assistance to mostly Hispanic farmers in the Salinas Valley . The RDC, in partnership with a national group called Association for Community Based Education, has proposed a farmer training facility for the Elkhorn Highlands, based on an existing facility in the Salinas Valley. The purposes of the proposed facility are 1) to train existing farmers in sustainable techniques on hillside farms in order to carry out the NRCS/RCD program objectives of reducing sediment and chemicals entering the Elkhorn Slough, 2) to provide a place to stage on-going outreach for farmers and to integrate the work of local agricultural organizations and 3) to promote research and education of sustainable agriculture. The project is designed to carry out the work of the NRCS/RCD Elkhorn Slough Watershed Project by various groups once the USDA portion of the funding expires. Currently the RDC is negotiating to purchase Triple M Ranch, the Highlands property that was recently approved for residential development. Placement of conservation easements on this property will protect the agricultural and natural values of the land and preclude future development.

Potential Role in Resolving Groundwater Overdraft Problem - MCAHLC, ESF, RCD, NRCS, California Association of Family Farmers, (CAFF) and Sustainable Conservation Partnerships

As the groundwater problem becomes more acute, there is an opportunity for conservation organizations to act as a catalyst in helping restore aquifers while protecting agriculture and natural habitat lands. Marginal portions of farms might be purchased, natural habitat restored and buffers provided, and the underlying water rights transferred to more productive, resource-compatible farming areas. In addition, groups such as Sustainable Conservation or MCAHLC might assist agencies and stakeholders to initiate a sustainable groundwater plan. Other proposed conservation programs include creating a water credit program for farmers willing to temporarily retire farming and flood portions of McClusky Slough and other areas of Springfield Terrace to increase water recharge.

Potential Role in Encouraging Involvement by Local Citizens in the Monterey County Planning Process.

Several organizations, such as the Elkhorn Slough National Estuarine Research Reserve and the RCD, have initiated outreach to local citizens regarding conservation issues within the watershed. There is an opportunity to expand this outreach to inform local citizens of how they can become involved in the Monterey County's planning process, and provide their input in the County's review of activities that may affect the local environment. Potential vehicles for this involvement include the North County Advisory Committee, the Ad Hoc North Monterey County Water Issues Advisory Committee and the Elkhorn Slough National Estuarine Research Reserve Advisory Committee, as well as the potential to form a new local citizens group which can review County land use proposals in the watershed.

Conservation Zones, Goals and Strategies

Future conservation efforts are organized conceptually using five conservation zones. Each of these zones has one or more critical biological resources, which together form an interlinked system that is the ecological focus of the Plan. Surrounding these are significant agricultural and scenic open space lands.

Figure 5 shows the boundaries of the Conservation Zones. Appendix I shows the same Conservation Zones Map with underlying critical resources. Together the five conservation zones comprise 22,500" acres, which is 50% of the project area.

The Conservation Zones Map represents the most intact remaining critical resources in the project area. If protected, these will provide sufficient natural habitat to sustain the Elkhorn Slough as a high quality ecosystem into the future. Areas left white on the map are either already highly fragmented, or, if they include resources, are too isolated to provide viable habitat for target resources. Nonetheless, some of these areas impose stresses to the ecosystem, and are therefore addressed by specific conservation strategies.

Desired conservation goals common to all zones include:

1) Critical resources and ecological linkages are protected
2) Major stresses are eliminated or substantially reduced
3) Biological function is restored and enhanced, and long-term agricultural viability is secured
4) Major stakeholders understand importance of, and are committed to, properly managing Elkhorn Slough's resources

For each zone, and within the project area as a whole, the Plan identifies strategies which address the most significant threats mentioned earlier:

- inappropriate agricultural activities
- residential development
- groundwater overdraft
- manipulation of marsh hydrology.

The strategies are largely derived from the input by workshop participants. Each strategy was evaluated for its effectiveness in abating stresses, its cost effectiveness, and most importantly, its feasibility, or likelihood for success.

The following is a description of each zone, its critical biological resources, conservation goals, stresses and sources of stress, and strategies to achieve conservation goals.

Elkhorn Slough Zone - includes salt, and brackish and freshwater marshes and ponds of Elkhorn Slough, as well as freshwater marshes and ponds in the upper reaches of Elkhorn Slough.

Conservation goals include:

- Protect remaining privately-held marshes and adjacent freshwater wetlands and ponds
- Improve water quality through reduction of runoff from surrounding farmlands
- Abate erosion of marshes due to tidal scouring
- Maintain a balance between freshwater and saltwater marshes.

Major stresses and their sources include:

- Loss of habitat, habitat quality and species diversity due to sediment accumulation, pollution and turbidity from uncontrolled agricultural runoff
- Loss of marsh habitat due to tidal scour

Strategies include:

- Purchase remaining unprotected marsh parcels, and provide suitable buffers between cultivated fields and wetlands
- Restore areas suitable for habitat restoration
- Provide on-going farm assistance and outreach to ensure 50% reduction in sedimentation into Elkhorn Slough
- Integrate results of water quality monitoring with agricultural assistance programs in order to measure relative success of programs
- Identify and implement actions and policies that:
  - reduce tidal scouring
  - increase freshwater marsh where possible
  - prevent future breach of floodwaters from Pajaro River into Elkhorn Slough
- Provide outreach programs that inform local decision makers, real estate brokers, buyers, farmers and landowners about Elkhorn Slough's critical resources and ways of implementing resource-compatible land use management

Moro Cojo Slough Zone - includes the marshes of Moro Cojo Slough and surrounding farmlands.

Conservation goals include:

- Protect marshes and adjacent freshwater wetlands and ponds
- Restore lands suitable for natural habitat
- Protect productive agricultural lands surrounding marshes

Major stresses and their sources include:

- Loss and conversion of habitats due to diking, ditching and grazing
- Decline of sensitive amphibian species due to sedimentation and contamination from uncontrolled agricultural runoff
- Future conversion of agricultural lands to development

Strategies include:

- Acquire key lands to protect and restore marsh habitat; and, where possible, utilize land swaps to secure further protection of natural habitat lands
- Acquire fee or easements on viable farmlands, especially those surrounding wetlands through fee or conservation easement purchase
- Provide adequate wetland buffers
- Restore natural habitat where suitable

Springfield Terrace Zone - includes the McClusky Slough freshwater wetland system, surrounding agricultural lands, and two upper drainages of McClusky Slough that could be restored as upland habitat for rare amphibians.

Conservation goals include:

- Protect and restore McClusky Slough marsh habitat
- Recover sensitive amphibian populations to sustainable levels
- Restore groundwater aquifers
- Protect productive agricultural lands
- Protect scenic bluffs.

Stresses and sources of stress include:

- Habitat loss and modification of McClusky Slough wetlands from adjacent cultivation
- Long-term decline in agricultural viability due to overdraft and seawater contamination of aquifers, leading to conversion to development
- Degradation of bluff drainages due to uncontrolled storm water runoff from cultivation in or at the edge of bluffs, and potential stress due to future residential development

Strategies include:

- Work with landowners, Pajaro Valley Water Management Agency (PVWMA), and other stakeholders to develop a groundwater plan for Springfield Terrace which: 1) provides incentives to restore and maintain groundwater at appropriate levels, 2) protects natural habitats and 3) improves water quality
- Acquire conservation easements on farms with high natural habitat value
- Encourage participation in the Williamson Act and the Agricultural Securities Zone Act programs
- Protect bluffs through purchase of fee or conservation easements
- Purchase cultivated fields on bluffs and restore
- Provide proper stormwater retention from cultivated fields before runoff reaches bluff and McClusky Slough drainages

Elkhorn Highland Zone - The Highlands offer one of the few areas of intact upland habitats surrounding Elkhorn Slough. The northern and eastern portion of this zone includes large blocks of connected and unfragmented maritime chaparral, associated oak woodlands, grazing lands and cultivated fields. The southern portions are fragmented by low density residential development.

Conservation goals include:

- Protect large connected blocks of maritime chaparral and associated oak woodlands
- Reduce erosion and runoff on cultivated fields
- Protect grazing lands and cultivated fields on more gentle slopes
- Restore steep cultivated slopes to natural habitat
- Control invasive weeds
- Future residential development is sited to avoid natural habitat areas and ridgetops.

Stresses and sources of stress include:

- Habitat fragmentation and degradation due to residential development, long-term fire suppression and invasive weeds
- Loss of topsoil and agricultural viability due to farming on steep slopes
- Drop in aquifer levels due to overdraft of groundwater
- Degradation of viewsheds due to residential development on eastern hillsides and ridge-tops, agricultural erosion and invasive weeds

Different strategies are recommended for the northern and southern portions of the zone.
Northern-portion strategies include:

- Purchase fee or conservation easements to protect relatively large, connected parcels with intact natural habitats
- Use conservation easements to retire the most erosion-prone portions of cultivated fields and, where appropriate, create appropriate buffers between agricultural fields and the edge of habitats and seasonal streams
- Wherever cultivated fields are taken out of production, immediately control weeds, establish a cover crop and/or restore natural habitat
- Provide incentives to hillside farmers to utilize sustainable methods of cultivation

Southern-portion strategies include:

- Develop outreach and incentive programs that help landowners in primarily residential areas manage maritime chaparral areas wisely

Strategies for all areas in the Elkhorn Highlands Zone include:

- Educate local residents and landowners to promote effective monitoring of County enforcement of land use regulations designed to steer development away from maritime chaparral and ridge-tops
- Establish and implement a plan to eradicate and control invasive weeds
- Work with landowners to develop and implement management plans for intermittent streams

Carneros Creek Zone - includes Porter Marsh and Porter Ranch, the 100 year floodplain of Carneros Creek with remnant riparian forest. The riparian forest serves as a major filter and collector for sediment and pesticides that erode from surrounding hillside farms.

Conservation goals include:

- Protect and restore the Carneros Creek riparian corridor
- Protect viable agriculture on more gentle slopes
- Protect scenic viewsheds of Hall and Tarpey Roads
- Locate new residential development away from scenic viewsheds, viable agricultural lands and natural habitat areas
- Retain runoff from fields to restore wildlife and enhance water recharge and quality

Stresses and sources of stress include:

- Loss of riparian habitat due to channelization and conversion to agriculture
- Flooding of farmlands due to siltation and loss of riparian habitat
- Loss of natural habitat and species diversity due to sediment accumulation and turbidity from uncontrolled agricultural runoff
- Potential loss of viable agriculture and scenic viewsheds from development
- Changes in hydrologic regime in Porter marsh

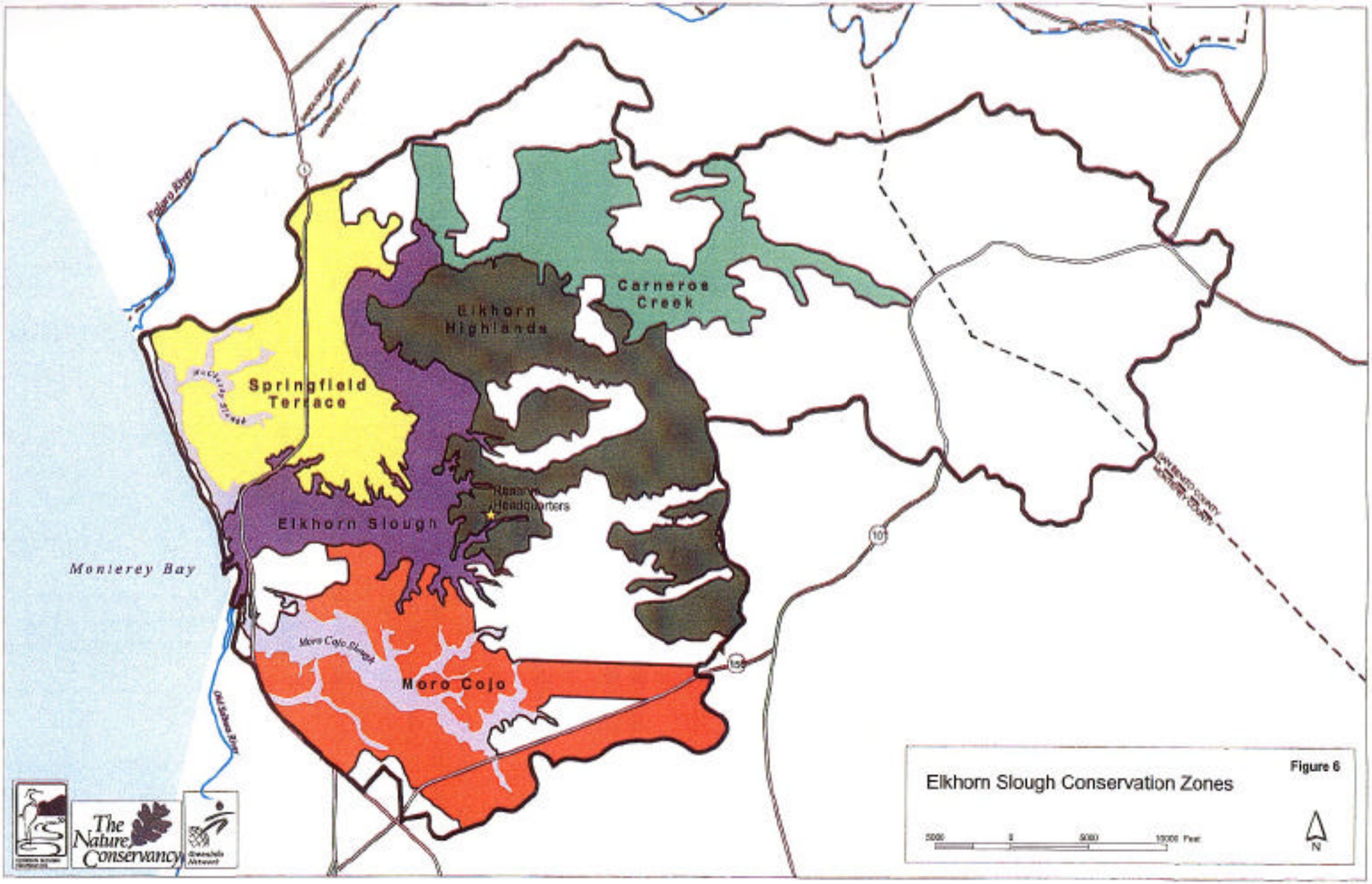
Strategies include:

- Support the ongoing Carneros Creek CRMP carried out by the NRCS, RCD and local Carneros Creek Association; implement recommendations
- Protect viable farmlands and viewsheds by purchasing fee or conservation easements, with priority to lands along Carneros Creek
- Restore riparian corridor along Carneros Creek
- Provide adequate vegetated buffer strips between agriculture and natural habitat areas
- Monitor County enforcement of existing land use controls that are designed to steer improvement away from maritime chaparral and ridge-top viewsheds
- Restore and enhance Porter Marsh

Areas Outside Conservation Zones

Strategies include:

- Work with San Benito County to enact regulations which prevent uncontrolled runoff from new development
- Work with Granite Rock Company and San Benito County to ensure that dams which hold mining overburden deposited in Muertos Canyon will not pose a future threat to the Elkhorn Slough due to dam failure
- Work with local residents to develop intermittent stream management plans for Live Oak, Strawberry, Paradise, Hidden and Long Creeks.


Carneros Creek
Elkhorn Highlands
Springfield Terrace
Elkhorn Slough
Reserve Headquarters
Monterey Bay
Moro Cojo Slough
Moro Cojo
Pajaro River
Old Salinas River
101
156
Elkhorn Slough Conservation Zones
Figure 6
5000
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5000
10000 Feet
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The Nature Conservancy

Three Year Implementation Plan and Budget

Of the strategies listed above, some are specific to conservation zones, while others are common to many. They all fall within the following broad categories:

1) Raise the visibility of Elkhorn Slough watershed on regional and state-wide levels in order to secure political support for funding programs recommended in the Plan
2) Continue to build the capacity of local organizations to implement the Plan
3) Acquire fee or conservation easements on key habitat-rich parcels and surrounding agricultural lands
4) Restore and enhance natural habitats where suitable, and re-establish ecological linkages
5) Provide ongoing incentives and assistance to farmers to improve management practices that are compatible with biological resources
6) Educate community on conservation issues and encourage their involvement in the County Planning Process
7) Educate and mobilize decision makers and landowners to better understand and manage resource lands

Because it is unlikely that future funding for conservation programs in the Elkhorn Slough watershed will be sufficient to meet all goals at once, the Plan recommends first steps or actions that are key in meeting long-term conservation goals. Also provided are organizations that would likely be involved in the implementation, as well as projected costs. Appendix K, at the end of this report, provides a table summary of these recommended actions.

Implementation Category 1: Raise the visibility of Elkhorn Slough on regional and state-wide levels in order to secure political support for funding programs recommended in the Plan

Action 1: **Develop and implement a marketing plan for the Elkhorn Slough and its programs**

Discussion: The purpose of this will be to increase regional and state-wide awareness of the Elkhorn Slough and its natural resources, in order to promote and gain funding for its long-term protection. ESF will develop a marketing plan which might include 1) a media package, 2) an information package for state legislators, 3) a slogan or message for Elkhorn Slough and 4) signs that announce when one is entering the Elkhorn Slough watershed.

Projected Costs:	Develop marketing plan, media and legislators package:	$ 80,000
	Create 10 watershed signs	20,000
	Total:	$100,000

Implementation Category 2: Continue to build the capacity of local organizations to implement the Plan

Action 1: **Provide further support to ESF as needed to coordinate existing and proposed conservation programs, as well as to acquire and manage Elkhorn Slough conservation lands.**

Discussion: The Plan recommends ongoing support of ESF as a coordinating partner in the promotion and implementation of conservation actions in the Elkhorn Sough watershed. The plan also calls for increased support for the land trust function of ESF in acquiring and managing conservation lands and easements throughout the Elkhorn Slough watershed.

Since its establishment in 1982, the ESF has played an important role in promoting the conservation of natural resources in Elkhorn Slough and Monterey Bay. ESF and TNC have been strong partners in the coordination of land management and restoration on hundreds of acres of Slough watershed lands. ESF as been a committed partner working with diverse agencies, organizations and individuals to focus on the broad management issues facing Elkhorn Slough watershed.

With a scientific grounding and knowledge of ecological function, a track record in successful conservation, experience in conservation land management and ability to foster cooperative approaches to problem solving with diverse groups, ESF is poised to expand its responsibilities as a land trust and in implementing this conservation plan.

There are three recommended roles for ESF: 1) to serve as a catalyst in the coordination and implementation of this conservation plan with local agency and non-profit partners, 2) to acquire, with appropriate partners, key conservation properties and 3) to manage the existing conservation holdings of TNC and ESF, along with new acquisitions and easements.

To acquire lands identified in this Plan, ESF will require funding for a full-time project manager, and funding for contract legal assistance on specific acquisition projects.

ESF, with support from the Packard Foundation and TNC, is building capacity to take on responsibilities for TNC properties and the recently acquired Long Valley and Moro Cojo Slough lands. ESF has established a stewardship endowment to ensure a revenue stream for long-term care and protection of these conservation lands. TNC has an endowment established for lands which is transferable when ESF takes title to TNC lands. Augmenting these combined resources into an endowment sufficient to protect and manage the all of the Slough's conservation lands is a critical need of ESF.

Projected Costs: Land Acquisition:

Project Manager, $65,000/year over 3 years:	$ 195,000
Legal Costs related to Land Acquisition, 3 years:	150,000
Land Management/Endowment:	
Endowment needs for long-term management of conservation lands:	
Fund raising to date: $340,000	
TNC existing endowments: 560,000	
Total existing sources: 900,000	
Projected annual management costs: 150,000	
Total endowment needed to sustain annual management costs: $3 million	
Endowment shortfall:	2,100,000
Total costs::	$ 2,445,000

Action 2: **Provide ongoing support as needed to allow MCAHLC, NRCS, RCD, RDC and other partners to implement the Plan's agricultural conservation actions.**

Discussion: MCAHLC needs on-going support to partner with ESF in the purchase of fee and conservation easements and to assume management responsibility for lands that have an agricultural component. The NRCS, RCD, RDC and other partners also need on-going support to continue to provide assistance to farmers who desire to change to Best Management Practices, and to provide outreach programs such as RCD's current CRMP program in the lower Carneros Creek watershed (see Implementation Category 4, below)

Projected Costs: Amount to be determined by agricultural partners

Action 3: **Provide on-going support to RCD to work with local residents to develop intermittent stream management plans for seasonal streams**

Discussion: RCD has been working with local residents and farmers to create a "Coordinated Resource Management Program" (ACRMP") in the lower Carneros Creek watershed. Some of the objectives/actions of this program include 1) prevention of erosion and sedimentation by promoting BMPs, 2) prevention of flooding by increasing on-site detention of flood waters, 3) restoring water quality by preventing agricultural chemicals from reaching marshes and 4) improving water quantity by increasing water recharge. The purpose of this is to secure funding as necessary which will allow the RCD to develop CRMP's with local residents in the following intermittent stream areas: Strawberry, Hidden, Long Valley, Live Oak and Paradise Creeks. In addition, RCD should be funded to develop a CRMP for the upper Carneros Creek watershed (similar to its existing CRMP in the lower watershed).

Projected Costs: To be determined by the RCD

Implementation Category 3: Acquire fee or conservation easements on key habitat-rich parcels and surrounding agricultural lands (note - these are the highest priorities for acquisition in the first three years, though other opportunities may arise which may equally meet conservation objectives)

Action 1: **Acquire wetland portions and buffers on three parcels in Moro Cojo Slough**

Discussion: ESF, in partnership with the Coastal Conservancy, MCAHLC and/or other partners, will continue to acquire marsh-portions of parcels in Moro Cojo Slough, with priority on parcels located between the Catellus property and the railroad. This includes 280 acres of marshlands and buffers. Where possible, use fee or conservation easements acquisition to secure buffers on surrounding agricultural lands.

Projected Costs: 300" acres of marsh and buffer @ $3,5000/acre = $1,050,000
(assumes fee acquisition of wetland portions of farms, and conservation easements over a variable buffer strip averaging 50 feet in width)

Action 2: **Acquire conservation easements on key parcels in Elkhorn Highlands ”northern crescent” where maritime chaparral habitat is most intact**

Discussion: To permanently protect the watershed’s best stand of connected maritime chaparral, ESF and/or its conservation partners will purchase fee or conservation easements on habitat-rich parcels in the Elkhorn Highland’s ”northern crescent.” Highest priorities would go to parcels that have connections to corridors of intact maritime chaparral habitat and/or that have portions of the property where incompatible land uses must be retired. In some instances, it may be possible or desirable to purchase just the natural habitat portion of the property, or to allow some limited, envelope-restricted development to subsidize this protection. The northern crescent also includes 15-20 smaller parcels, ranging from 5 to 20 acres in size, where landowner outreach and monitoring strategies will be more appropriate for long-term protection (see below). Figure 7 illustrates how a hypothetical Highland farm may be protected through a carefully crafted conservation easement.

Projected Costs: 1,400" acres @ $3000/acre = $4,200,000
(assumes conservation easements purchased on all portions of Properties)

Action 3: **Complete acquisition of Elkhorn Slough marshlands**

Discussion: Although the majority of Elkhorn Slough marshlands are protected, several parcels remain in private ownership. In most cases, these parcels include surrounding upland portions, which can remain in private ownership with appropriate agricultural buffers.

Projected Costs: 300" acres @ $3,000 per acre = $900,000

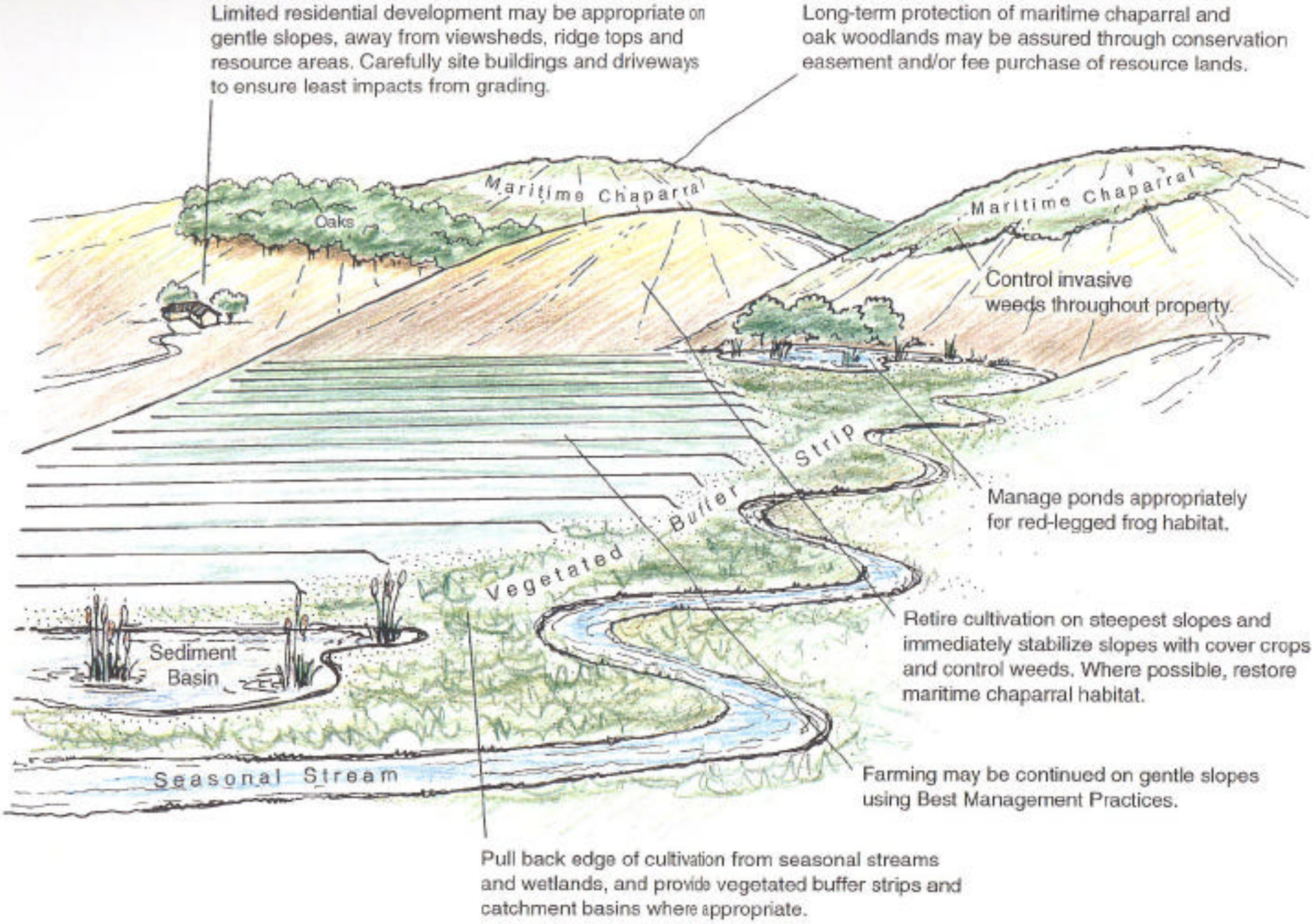


Figure 7: Conservation Easement on a Hypothetical Elkhorn Highlands Farm

Action 4: **Acquire conservation easements on bluff and bluff top portions of four properties north and west of Elkhorn Slough**

Discussion: These actions will 1) protect bluffs and their drainages from further erosion, 2) retire existing cultivation within bluffs, 3) prevent sediment and agricultural chemicals from entering the Elkhorn Slough and 4) protect scenic viewsheds.

Projected Costs: 500" acres @ 5,000/acre = $2,500,000

Action 5: **Acquire conservation easements to secure buffers on four agricultural properties on the southern edge of Elkhorn Slough**

Discussion: ESF and MCAHLC will acquire a vegetated buffer between cultivated fields and the wetland edge, and prevent sediment and agricultural chemicals from entering Elkhorn Slough.

Projected Costs: 20" acres @ $5,000/acre = $100,000
(assumes conservation easements purchased on only a 50-foot wide buffer strip)

Implementation Category 4: Provide ongoing incentives for farmers to improve management practices so they are compatible with biological resources

Action 1: Sustain and integrate agricultural assistance and monitoring programs

Discussion: These actions are designed to reduce one of the Elkhorn Slough's greatest stresses, sedimentation and contamination from agricultural runoff. It is important to both continue support for programs which help improve agricultural practices, and to make sure such programs are carefully integrated and coordinated. Programs include 1) the NRCS Elkhorn Slough Watershed Project (120 targeted farms, goal of 50% reduction in sediments entering Elkhorn Slough, funding expires in two years), 2) RCD's CRMP projects, 3) Azevedo and Blohm Ranch demonstration projects, 3) ESNERR and MCWRA Elkhorn Slough Monitoring Program, 4) Watershed Institute's habitat restoration programs, 5) Sustainable Conservation's Permit Streamlining Program, 6) Rural Development Center (RDC)'s farmer training programs, both existing and proposed, and 7) (proposed) NRCS/RCD proposed farmer accreditation and model lease programs.

While each of these programs have met with considerable success, there is much to be gained by ensuring better integration among the partners and the programs, and incorporating specific habitat protection and conservation goals where appropriate. To that end, develop a coordinated, multi-purpose outreach program which is reflected in an MOU that:

- Builds on the NRCS Elkhorn Slough Watershed Project and RCD CRMP Programs
- Serves as a model for an integrated watershed-wide approach that will influence future NRCS and other agency priorities
- Integrates assistance programs with new biodiversity and other agency biological conservation programs as proposed in this Plan
- Integrates water quality monitoring programs with field assistance programs to measure success in reduction of sediments and pollutants in Elkhorn Slough
- Secure sustained funding for these integrated programs

Projected Costs: Agricultural partners to jointly determine amount required

Action 2: **Participate in forums that seek to solve the groundwater overdraft problem, and ensure that natural resource protection and restoration is an integral part of any solution.**

Discussion: ESF, in cooperation with its partners and the community, should participate in developing a solution to the groundwater overdraft problem. Three possible actions include 1) working with stakeholders to develop solutions that include creation of recharge areas with natural habitat value, 2) encouraging implementation of land management practices that conserve water and reduce runoff and 3) acquiring interests in properties that can provide recharge areas, reduction of groundwater pumping and improvement of natural habitats.

Projected Costs: Costs to be covered by support for new ESF project manager (described above in Category 2, Action 1)

Implementation Category 5: Educate community on conservation issues and encourage their involvement in the County Planning Process

Action 1: **Provide workshops and information exchange for local residents interested in reviewing County land use decisions that affect Elkhorn Slough watershed's resources**

Discussion: The Conservation Plan should serve as a blue-print for County land use decisions which affect the Elkhorn Slough's resources. While the County has relatively strong environmental protection regulations in place to protect Elkhorn Slough, these are not always enforced. To increase adherence to County policies, it would be useful to provide education and outreach to the local community on conservation issues and the County's planning process. In particular, opportunities exist for local citizens and the agricultural community to work with the North County Advisory Committee and the Ad-Hoc North Monterey County Water Issues Advisory Committee to incorporate conservation and natural habitat concerns into their review process, and to assist the County in its upcoming North County General Plan update.

A further recommendation is to provide the County with pre-planning studies in areas where resources are at stake. In particular, this would be useful in protecting areas where relatively small undeveloped parcels cover maritime chaparral corridors in the Elkhorn Highlands, and where it is impractical to purchase multiple conservation easements. Creation of a "green build-out" plan would show the County where development of existing lots could occur that is both sensitive to ridge tops and maritime chaparral, and consistent with County ordinances, while respecting landowner's rights to use their land.

Projected Costs:	Build local neighborhood involvement in land use decisions by providing education/outreach to local community on conservation issues and involvement in County planning process:	$ 50,000
	Review regulations and develop a green build-out plan for critical corridors:	50,000
	Total Costs:	$ 100,000

Implementation Category 6: Restore and enhance natural habitats where suitable, and re-establish ecological linkages

Action 1: Restore marsh habitat in Moro Cojo Slough

Discussion: The Moro Cojo Slough Management and Enhancement Plan calls for restoration of seasonal freshwater habitats, and agricultural buffers. To carry out the recommendations in that plan, the Watershed Institute will work closely with landowners to develop appropriate buffers both to protect remaining cultivated fields from tidal flows and flooding, and to protect wetlands from agricultural runoff.

Projected Costs: 280" acres X $1000/acre for drill seeding = $280,000

Action 2: Develop and Implement Invasive Weed Eradication Plan

Discussion: The spread of pampas grass has recently become a serious problem, particularly in the Elkhorn Highlands area. It has covered large areas of fallow fields and is a particular threat to maritime chaparral habitat, where it establishes itself in any disturbed areas, even small animal trails. ESF and ESNERR will jointly develop an Invasive Weed Eradication Plan which may include 1) eradication and prevention measures both on public and private lands, 2) public outreach workshops and 3) research of potential measures Monterey County can take to ensure weed control on fallow lands.

Projected Costs: (plan only) $ 25,000

Action 3: Restore Two Key Elkhorn Highland Properties

Discussion: Many of the Highland properties which will be protected by fee or conservation easement purchase will require restoration to protect maritime chaparral and reduce further erosion and weed invasion. Lands taken out of production on steeper slopes, or lands that are already fallow, will require immediate erosion stabilization and weed control, and, where appropriate, eventual restoration to maritime chaparral. Some ponds and wetlands may require mechanical removal of sediment, restoration of wetland vegetation, and protection from future erosion. For each protected property, ESF, in partnership with the Coastal Conservancy and Watershed Institute, will assess the restoration needs of each property and secure needed funding for that restoration. The 3 M Ranch could serve as priority demonstration restoration/weed control projects.

Projected Costs:	Restoration assessment:	$ 50,000
	Restoration/Weed Control:	
	650" acres @ $2,500/acre =	1,625,000
	Total costs:	$1,675,000

Action 4: **Restore Porter Marsh**

Discussion: As part of the negotiations in acquiring Porter Marsh, Monterey County required a restoration plan be implemented in the near future. The purpose of this would be to determine what costs would be involved, and to fund and carry out the project.

Projected Costs: To be determined

Implementation Category 7: Educate and mobilize decision makers and landowners to better understand and manage resource lands

Action 1: **Provide workshops fop decision makers, landowners and other stakeholders regarding importance of natural habitats throughout the Elkhorn Slough watershed**

Discussion: The purpose of these workshops, provided by ESF, ESNERR, NRCS, RCD, The California Associations of Family Farms, and the Farm Bureau, will be to build local awareness of and support for conservation programs throughout the Elkhorn Slough watershed (both in Monterey and San Benito Counties). Each will be geared to a specific audience. The measure of success for such workshops will be increased memberships, increased queries for involvement, offers to donate conservation easements, better County enforcement of ordinances and adoption of better land management practices.

Projected Costs: Conduct 15 workshops: $30,000

Total Costs of 3 Year Implementation Plan **$13,405,000+**

Appendices

Appendix A: Critical Biological Resources

COMMUNITY/SPECIES	STATUS	OCCURRENCE	HABITAT
Primary Communities			
Coastal Salt/ Coastal Brackish Marsh	**G3**		
Coastal and Valley Freshwater Marsh	**G2**		
Central Maritime Chaparral	**G2**		
Secondary Communities			
Coast Live Oak Woodland (Associated with Maritime Chaparral)	**G3**		
Central Coast Arroyo Willow Riparian Forest	**G3**		
Coastal Dune Scrub	**G2**		
Sensitive Plant Species			
Arctostaphylos hookeri ssp hookeri **Hooker's Manzanita**	**G3T2**	**K**	**Chaparral**
Arctostaphylos pajorensis **Pajaro Manzanita**	**G2 C2**	**K**	**Chaparral**
Ceanothus cuneatus var. rigidis **Monterey Ceanothus**	**C2**	**K**	**Chaparral**
Chorizanthe pungens var pungens **Monterey Spineflower**	**G2T2 FT**	**K**	**Coastal Dunes**
Ericameria fasciculata **Eastwood's Goldenbush**	**G2 C2**	**K**	**Maritime Chaparral**
Fritillaria liliacea **Fragrant Fritillary**	**G2**	**P**	**Grasslands**

COMMUNITY/SPECIES	STATUS	OCCURRENCE	HABITAT
Hemizonia parryi ssp congdonii **Congdon's Tarplant**	**G5T1**	**P**	**Grasslands**
Holocarpha macradenia **Santa Cruz Tarplant**	**G1 C1 CE**	**K**	**Coastal Terrace Prairie, Grasslands**
Lomatium parvifolium **Small-leaved Lomatium**		**P**	**?**
Perideridia gairdneri spp. gairdneri **Gairdner's Yampah**	**C2**	**K**	**Grasslands, Chap-arral**
Piperia yadonii **Yadon's Piperia**	**G1 C1**	**K**	**Maritime Chaparral**
Plagiobothrys diffusus **San Francisco Popcornflower**	**SE**	**K - Brigantein Property**	**Coastal Terrace Prairie, Grasslands**
Sensitive Animal Species - Documented			
California Brackishwater Snail	**G2G3S2S3 C2**	**K - Parson's and Moro Cojo Sloughs**	**Slough/Aquatic Habitats**
California Red-legged Frog	**G4T2T3S2S3 FT CSC**	**K**	**Freshwater Ponds, Willow Riparian, Chaparral**
California Tiger Salamander	**G2G3S2S3 C2 CSC**	**K**	**Freshwater Ponds and Wetlands, Brackish and Salt Marsh, Grasslands**
Santa Cruz Long-Toed Salamander	**G5T1S1 FE SE**	**K - McClusky, Bennett and Moro Cojo Sloughs, Struve Pond**	**Freshwater Ponds, Grasslands, Willow Riparian, Chapar-ral**
Southwestern Pond Turtle	**G4S3 C1 CSC**	**K**	**Freshwater Ponds**
Burrowing Owl	**G4T2S2**	**P**	**Grasslands**
California Clapper Rail	**G5T1S1 FE SE**	**P**	**Slough marshes**

COMMUNITY/SPECIES	STATUS	OCCURRENCE	HABITAT
Monarch Butterfly	**G5S3**	**K - Eucalyptus Grove near PG&E**	**Eucalyptus Groves**
Short-eared Owl	**G5S3**	**K**	**Brackish and Freshwater Marsh, Grasslands**
Tri-colored Blackbird	**G3S3**	**K - Werner Lake**	**Grasslands, Fresh-water Ponds, Brackish and Freshwater Marsh**

Legend:

Status:

First set of symbols - Heritage Designation

Second set of symbols - Federal Designation:
FE - Listed as Federally Endangered by the Federal Government
FT- Listed as Federally Threatened by the Federal Government
C1 - Category 1 candidate for Federal listing
C2 - Category 2 candidate for Federal listing

Third set of symbols - State of California Designation:
SE - Listed as Endangered by the State of California
ST - Listed as Threatened by the State of California
SCS - California Dept. Of Fish and Game Species of Special Concern

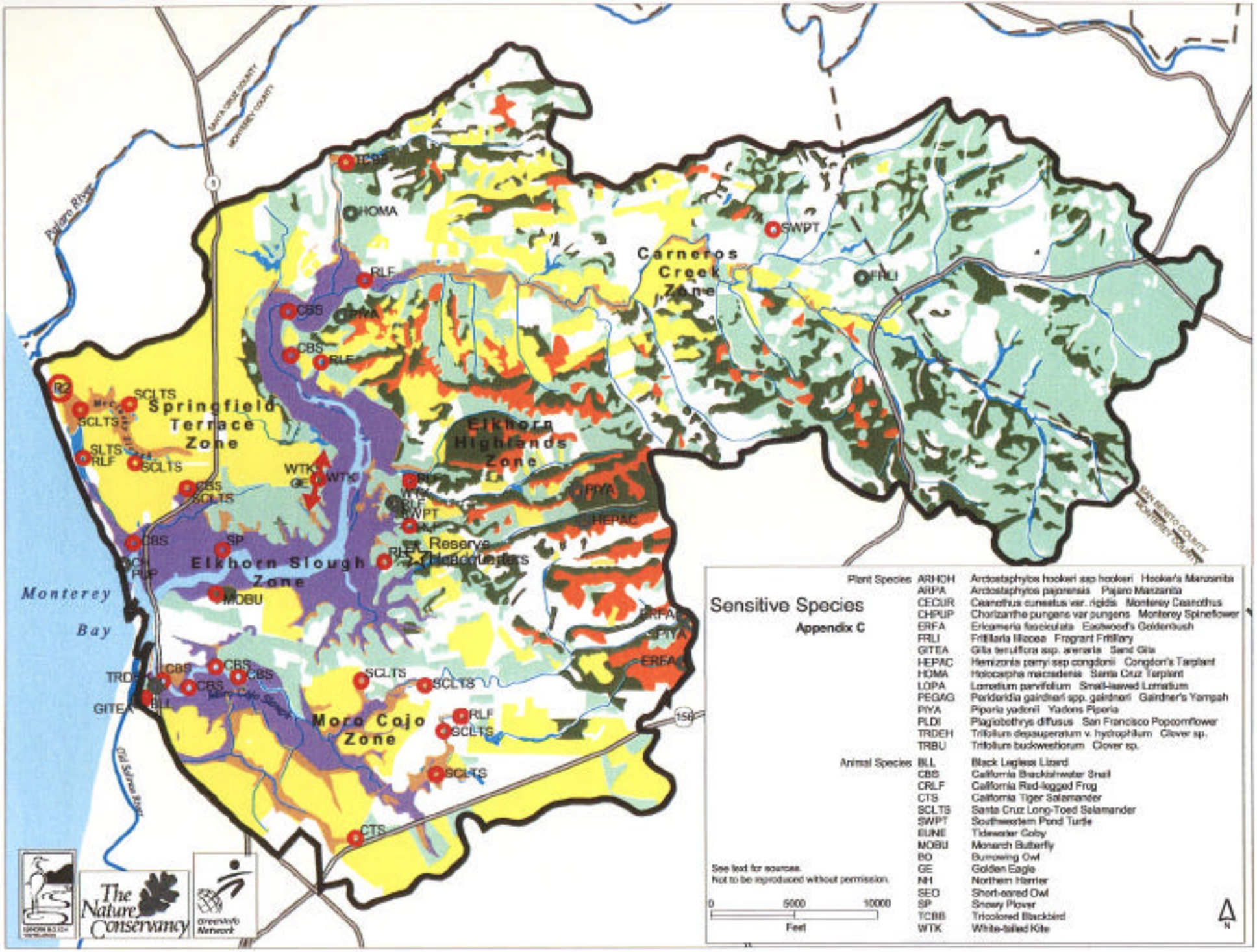
Occurrence:

K- Known Occurrence
P - Potential Occurrence

Appendix B: Distribution of Critical Resources in Elkhorn Slough

Critical Resource	Critical Resource Coverage, in acres	Critical Resource Protected Coverage, in acres
Coastal Marsh (including slough channels)	4,182	1,924
Inland Wetlands, Ponds and Riparian Forests	1,214	48
Maritime Chaparral	1,875	388
Priority Oak Woodlands (those associated with Maritime Chaparral)	3,636	502
Coastal Dune Scrub	135	73
Cultivated Fields	10,674	188
Total	21,716	3,123

Total watershed acreage = 44,500


Sensitive Species
Appendix C
Plant Species
ARHOH Arctostaphylos hookeri ssp hookeri Hooker's Manzanita
ARPA Arctostaphylos pajaronsis Pajaro Manzanita
CECUR Ceanothus cuneatus var. rigidus Monterey Ceanothus
CHPUP Chorizanthe pungens var pungens Monterey Spineflower
ERFA Ericameria fasciculata Eastwood's Goldenbush
FRLI Fritillaria liliacea Fragrant Fritillary
GITEA Gilia tenuiflora ssp. arenaria Sand Gilia
HEPAC Hemizonia parryi ssp congdonii Congdon's Tarplant
HOMA Holocarpha macradenia Santa Cruz Tarplant
LOPA Lomatium parvifolium Small-leaved Lomatium
PEGAG Perideridia gairdneri spp. gairdneri Gairdner's Yampah
PIYA Piperia yadonii Yadons Piperia
PLDI Plagiobothrys diffusus San Francisco Popcornflower
TRDEH Trifolium depauperatum v. hydrophilum Clover sp.
TRBU Trifolium buckwestiorum Clover sp.
Animal Species
BLL Black Legless Lizard
CBS California Brackishwater Snail
CRLF California Red-legged Frog
CTS California Tiger Salamander
SCLTS Santa Cruz Long-Toed Salamander
SWPT Southwestern Pond Turtle
EUNE Tidewater Goby
MOBU Monarch Butterfly
BO Burrowing Owl
GE Golden Eagle
NH Northern Harrier
SEO Short-eared Owl
SP Snowy Plover
TCBB Tricolored Blackbird
WTK White-tailed Kite
See text for sources.
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0 5000 10000
Feet
N
Monterey Bay
Pajaro River
Old Salinas River
Springfield Terrace Zone
Elkhorn Highlands Zone
Carneros Creek Zone
Elkhorn Slough Zone
Moro Cojo Zone
Reserve Headquarters
The Nature Conservancy
GreenInfo Network
SANTA CRUZ COUNTY
MONTEREY COUNTY
SAN BENITO COUNTY
MONTEREY COUNTY
1
156
R2
TCBB
HOMA
RLF
CBS
PIYA
SWPT
FRLI
SCLTS
SLTS
WTK
GE
SP
MOBU
HEPAC
ERFA
TRDE
GITEA
CTS

Appendix D: Land use Regulations, Jurisdictions and Development Trends

A All of the project area is within the Coastal Zone, and is regulated by the Monterey County North County Land Use Plan, adopted in June, 1982 (LUP", as well as the Monterey County Coastal Implementation Plan, Parts 1 and 2. The prime objective of the LUP is to protect coastal resources while maintaining coastal access and recreational opportunities. A secondary objective is to maintain the rural character of North County while clustering medium and high density residential development only in those areas where water, sewer and transportation services are available. The limited capacities of roads, highways, school and public wastewater treatment systems, and the fact that almost all uses rely on a very limited, overdrawn source of groundwater, affect potential growth in the area.

B. The LUP designates fifteen land use districts in the project area. Generally, in all districts a coastal development permit is required for the following: development on slopes exceeding 25%, on ridge lines, and within 100 feet of mapped or field identified environmentally- sensitive habitats, agricultural operation expansions into areas where 50% or more of the parcel has a slope of 10% or greater, conditional certificates of compliance and lot line adjustments. The most significant districts in the project area are:

1. **Agricultural Preserve and Agricultural Conservation**: most of Springfield Terrace and lower Moro Cojo Slough areas are included. Minimum lot size is 40 acres; residential development strong discouraged.

2. **Rural Density Residential:** 5-40 acres per unit: Most of Elkhorn Highlands is included. Agricultural expansion is discouraged.

3. **Wetlands and Coastal Strand**: No further divisions are allowed except under very special circumstances.

4. **Low Density Residential**: 2.5 to 10 acres maximum per unit: includes most of Elkhorn Highlands and Carneros Creek areas.

5. **Medium Density Residential**: 1-4 unite per acre maximum density-: includes Oak Knolls in Upper Moro Cojo, and town of Las Lomas.

6. **High Density**: 5-10 acres per unit maximum density: includes just two small areas flanking High School in central Moro Cojo area; one of these areas has been approved for a low cost housing project called CHISPA.

7. **Recreational:** includes three County parks (Kirby, Manzanita and Royal Oaks) and one golf course west of Elkhorn Road near the town of Las Lomas

8. **Industrial**: includes areas in lower Moro Cojo Slough north and south of Dolan Road

II. Jurisdictions

A. There are numerous Federal, State and local agencies which have regulatory roles in the Elkhorn Slough watershed. The agencies have the greatest effect on protecting critical resources are:

1. **US Army Corps of Engineers (COE)** - Regulates discharge of dredged and fill materials into navigable waters and adjacent wetlands of the U.S. Issues Section 404 permits for wetland alternations;

2. **US Fish and Wildlife Service (USFWS)** - Regulates, through permitting, the taking of Federally-listed wildlife species;

3. **California Department of Fish and Game (CDFG)** - Regulated activities affecting the bed and banks of stream courses, and issues Streambed Alternation Agreements. Also, has permit authority to take State-listed threatened and endangered wildlife and plant species, and regulates take of plant species which are both State and Federally-listed;

4. **California Coastal Commission (CCC)** - Regulates some development activity within the coastal zone, and hears appeals of selected coastal permit actions by Monterey County's implementation of the North County segment of the Local Coastal Program; and

5. **Monterey County** - Reviews and grants permits for proposed development and major land use changes.

Monterey County also permits well drilling and on-site sewage treatment plants through its Health Department. In conjunction with its Water Resources Agency, Monterey County has developed policies, programs and ordinances aimed at protecting groundwater as part of a Phase I Comprehensive Water Resource Management Plan; Phase II is in the works.

III. Development Trends, by Zone:

A. Springfield Terrace - not much residential development pressure due to land use restrictions mentioned above, and the high value of agricultural crops. Intensification of agricultural crops continues as agricultural leases have increased from $300/acre two years ago to $1,000/acre (similar lease increases in Moro Cojo and Central Highlands) New subdivision application in works for 64 estate lots adjacent to Pajaro Valley Golf Course, west of Las Lomas, and current build-out of Hoffman and Brood 19 single family homes near same golf course.

B. Elkhorn Slough - no development pressures in wetlands themselves, but high value of agricultural crops and expensive leases may increase pressure on farmers to farm right up to wetland and bluff edges to maximize profits.

C. Elkhorn Highlands and Carneros Creek - not much development activity in past years in western portion of Highlands, but increase in development in eastern portion of highlands, in form of infill of existing smaller parcels and parcel map subdivisions, many built with large estate-type residences. One new subdivision recently approved just east of Las Lomas is called Triple M Ranch: 31 lots clustered on 195 acres, adjacent to Carneros Creek flood plains.

D. Moro Cojo Slough - little new development surrounding western slough. Surrounding eastern slough, similar type of development to Elkhorn Highlands (infill of existing parcels, parcel map subdivisions). New high density low-cost housing development near high school on Castroville Boulevard called “CHISPA”

Outside Project Area:

E. San Benito County - Interspersed between large Ranches, mostly west of Highway 101, are numerous new residences on large lots, presumably created through Parcel Map subdivisions (four lots or less). New subdivisions may be kept in check due to the overall lack of water. Silverbridge, a 144-lot subdivision that is currently under construction, was able to purchase water rights from the Aromas Water District. However, this type of water transfer is unlikely to be allowed in the future.

Appendix E: Significant Land Ownership Patterns, Conservation Status, Land use Regulations and Economic Trends, By Zone

Zone	Land use, Ownership & Conservation Status	Land use Regulations	Development and Economic Trends
Elkhorn Slough	Large wetland parcels and surrounding uplands. Largely owned by agencies (CA DF&G) and non-profits (TNC and Monterey County Ag. Land Conservancy), some wetland and upland parcels still privately owned	Very restrictive - resource conservation zoning in wetlands	Short term: development unlikely; Long term: increasing pressures to develop unprotected hillsides and bluff tops surrounding Elkhorn Slough, especially if agriculture declines due to groundwater depletion
Elkhorn Highlands	Mix of small residential parcels (2, 5 and 10 acres) and small farms, mostly privately owned. Farms mostly leased. Protected parcels include: Long Valley (ESF) Blohm Ranch (TNC) and Azevedo Ranch (MCAHLC)	Rural and low density zoning. Prohibitions on development on ridge tops and maritime chaparral, but these are sometimes overcome through variance	Short term: development of existing parcels and parcel splits of larger lots, with continued pressure to develop desirable ridge top chaparral areas. Long term development of farm parcels likely as strawberry farming on marginal lands becomes less viable. Recent approval of 31-lot subdivision on Triple M Ranch east of Las Lomas may encourage other farms to convert to residential uses
Springfield Terrace	Large family and corporate-owned farm parcels; no secured conservation protection	Very Restrictive agricultural preservation zoning	High-value farm products will keep area in agriculture for short term; long-term uncertain due to groundwater overdraft and seawater intrusion
Moro Cojo	Large family and corporate farms; recent purchase of Catellus parcel by ESF and Coastal Conservancy	Very restrictive agricultural preservation zoning	High-value farm products will keep area in agriculture for short and long term; groundwater problem less acute than in Springfield Terrace
Carneros Creek	Mix of small farms and low-density residential	Rural and low density residential zoning; few resource protection regulations	Similar development scenarios to Elkhorn Highlands, but higher quality, less marginal farmlands here may slow conversion to residential

Appendix F: Stresses to Critical Resources within the Elkhorn Slough Watershed

Stress	Source of Stress	Affects on Critical Resources	Ranking of Stress
Soil erosion Sediment accumulation in wetlands/ riparian areas Increased suspended sediment and turbidity in aquatic habitats	Storm runoff from farm fields and roads	Loss of agricultural viability and risk of long-term conversion to residential development Loss of freshwater wetland and riparian habitats by burying, and loss of dependent animal species Reduction in species diversity in wetlands/aquatic systems Incremental impact on health of Monterey Bay	High Very High High High
Erosion of stream banks; increase in flooding in lowlands	Increased storm runoff and scour due to agriculture and residential development	Loss of riparian and aquatic diversity	Medium
Erosion of bluffs Creation of sediment fans over wetlands at base of bluffs	Existing farmland and potential future residential development on bluff tops	Degradation of undeveloped viewsheds from Elkhorn Slough to bluffs Conversion of marsh to uplands	High High
Migration of pesticides and nutrients into riparian/ aquatic habitats and groundwater	Storm runoff from farm fields and roads Pesticides in soils of pre-1980's cultivated fields Diversion of Pajaro River water and sediment into Elkhorn Slough	Contamination of aquatic systems including incremental impacts on Monterey Bay ecosystem Contamination of potable groundwater supplies Decline of aquatic diversity and direct impacts on breeding birds	Medium to High Medium Medium
Infiltration of nitrates into groundwater Nutrient loading in aquatic systems Coliform contamination	Agriculture Failed septic systems Animal wastes	Contamination of potable groundwater supplies Decline in aquatic diversity and degradation of fish nursery; incremental impacts on Monterey Bay ecosystem	Medium Medium Medium
Retreat of freshwater in aquifers resulting in seawater intrusion Seawater infiltration	Overdraft of wells Pumping from wells adjacent to marshes	Decline in agriculture Degradation of wetland habitats	High Medium

Stress	Source of Stress	Affects on Critical Resources	Ranking of Stress
Fragmentation and loss of maritime chaparral	Residential development	Decline of maritime chaparral habitat	Very High
Soil erosion	Runoff from roads and impervious surfaces	Decline of marsh and riparian habitats	High
Fire suppression			High
Contamination of local creeks and marshes	Domestic animals roaming beyond areas of human occupancy	Degradation of viewsheds	High
Spread of invasive weeds	Ground disturbance		High
Increase in farm costs	Conversion of agriculture to development	Decline of agricultural viability	Medium
Nuisance suits from adjacent landowners	Incompatible residential development adjacent to farmland	Loss of open space viewsheds	Low
Tidal scour Increase in salinity of some marsh habitats	Opening of Elkhorn Slough mouth for Moss Landing harbor	Los of Salicornia beds Decline in marsh habitat diversity	Unknown
De-watering of wetland areas	Draining and diking for flood control and grazing land	Conversion of coastal marsh habitat to less-diverse mud flat	High
Compaction, competition from range grasses	Over-grazing		Unknown
Contamination and sedimentation	Harbor and Industrial Development		Unknown
Competition to native marine species	Introduction of exotic marine species	Decline of native marine species	Medium
Predation on native amphibians	Improper pond management	Decline in populations of red-legged frogs, tiger and long-toed salamander and turtle populations	Medium
Competition with native vegetation by non-native plants, especially pampas grass	Farming and residential development; any type of ground disturbance Introduction of non-native plants	Decrease in health and species diversity of maritime chaparral and other natural communities	Very high

Appendix G: Potential Conservation Funding Sources:

Although there are many issues which need to be addressed in the Elkhorn Slough watershed, the ones which will most likely galvanize public support for conservation funding in the next decade are: 1) the decline of the local aquifer, which is the sole source of local drinking water, due to agricultural overdraft and contamination; 2) the loss of open space due to the conversion of agricultural lands to development and 3) an increased awareness on a local, regional and state-wide level of Elkhorn Slough as a unique ecological and recreational resource in an increasingly urbanized State.

Below is a list of public and private programs that have the best potential for protecting the Elkhorn Slough watershed's resources. Of these, the most promising sources of acquisition funds for Elkhorn Slough appear to be 1) TEA-21 program (acquisition, scenic easements, trail and facility development), 2) National Wetlands Reserve Program (acquisition, enhancement and restoration), 3) State Coastal Conservancy Grant Programs (planning, acquisition, restoration), 4) Wildlife Conservation Board Grants (acquisition, restoration), 5) County mitigation grants (acquisition) and 6) private foundation grants (various).

FEDERAL AGENCIES

1. **National Oceanographic and Atmosphere Agency** (NOAA)
   - A. Management funds available for National Marine Sanctuaries and Estuarine Reserves.
     Purpose/Priorities: Acquisition, research and educational grants to create and conserve marine sanctuaries and estuarine reserves
   - B. Coastal Nonpoint Source Pollution Control Program (NPSP)
     Purpose/Priorities:
     Contact: (202) 260-9133

2. **Environmental Protection Agency** (EPA)
   - A. Wetlands Protection Development Grants
     Purpose/Priorities: Planning, restoration, enhancement and management grants to improve wetland protection programs
     Who can apply: state, tribal, regional and local governments
     Contact: Suzanne Marr, US EPA (415) 744-1974
   - B. 205j Water Quality Planning Grants
     Purpose/Priorities: Funds for watershed management planning projects to reduce and prevent water pollution
     Who can apply: Local public agencies and special districts (water districts, Resource Conservation Districts, etc.)
   - C. 319h Water Quality NPS Grants
     Purpose/Priorities: Implementation of nonpoint source pollution management practices
   - D. Potential funds through penalty fees/ mitigation funds

3. **Natural Resource Conservation Service** (NRCS)
   - A. Wetlands Reserve Program (WRP)
     Purpose/Priorities: Acquisition (of conservation easements), enhancement and restoration of wetlands on private property where wetlands constitute 15% of the overall property, and wetlands have been degraded by agricultural activities
     Who can apply: Private landowners
     Notes: Funding limit for Acquisition of Easements: $2,000 per acre
     Contact: Daniel Mountjoy (831) 424-1036
   - B. EQIP and WHIP Programs - cost-share for restoration and enhancement activities on farmlands
   - C. Conservation Reserve Program (CRP) - offset payments for 10 year retirement of highly erodible agricultural lands
   - D. Farmland Protection Program (FPP) - purchase of agricultural easements on farmland subject to development

4. **United States Fish and Wildlife Service** (USF&WS)
   - A. National Wildlife Refuge Fund (Land and Water Conservation Funds)
     Purpose/Priorities: Protect land and water resources
   - B. National Coastal Wetland Conservation Grants
     Purpose/Priorities: Grants for acquisition, restoration and management of coastal lands or waterways
     Contact: Division of Federal Aid (503) 231-6128
   - C. Partners for Wildlife

Purpose/Priorities: Natural habitat restoration on private property
Who can apply: private landowners
Notes: Up to 50% cost-share program for design and implementation
Contact: Deborah Schlaffman (916) 979-2085

5. **National Fish and Wildlife Foundation**
   A. Various Grant Programs
   Purpose/Priorities: Grants for protection and restoration of sensitive fish and wildlife habitats, and plants species
   Notes: Requires matching 2 to 1 matching funds. Maximum $200,000 grants
   Contact: Eric Hammerling, (916) 484-1692

6. **North American Wetland Conservation Council**
   A. North American Wetland Conservation Grants
   Purpose/Priorities: Grants to carry out wetlands conservation projects, primarily for acquisition and restoration
   Who can apply: Individuals and organizations
   Contact: North American Wetlands Conservation Council (703) 358-1784

STATE OF CALIFORNIA AGENCIES

1. **Coastal Conservancy**
   A. Resource Enhancement Program Grants
   Purpose/Priorities: Planning, acquisition, restoration grants to enhance and restore coastal resources
   Who can apply: Public agencies and non-profits

2. **State Water Resources Control Board**
   A. 205j Water Quality Planning Grants (see EPA, above)
   B. 319h Water Quality NPS Grants
   C. Revolving funds for low interest loans for water system development, sometimes may be used for resource conservation (protection of vernal pools, etc.). Who can apply: Public agencies and non-profits.
   Notes: No voter approval needed. Priority given to target watersheds identified by the Regional Boards. 40% non-federal matching grant required. This is a potential source of funding for County's future fallow land bank program.
   Contact: Judy Bloom

3. **State Department of Parks and Recreation**
   A. Habitat Conservation Fund Grants
   Purpose/Priorities: Grants for acquisition and restoration of wildlife habitat and significant natural areas
   Who can apply: Local public agencies
   Contact: Odell King (916) 653-7423

4. **State Resources Agency**
   A. Coastal Resource Grants Program
   Contact: Chris Potter

5. **Wildlife Conservation Board**
   A. Riparian Habitat Conservation Program
   Purpose/Priorities: Grants to protect, restore, enhance riparian habitat along rivers and streams
   Who can apply: Local and State agencies, non-profits
   Contact: (916) 653-5656
   B. Public Access Projects
   Purpose/Priorities: Development of public access projects (including acquisition and improvements) that utilize fish and game resources throughout the state
   Who can apply: Agencies and special districts
   Contact: Wildlife Conservation Board

6. **State Department of Water Resources**
   A. Urban Streams Program
   Purpose/Priorities: Grants to assist communities in reducing damages from flooding, and to restore environmental and aesthetic values of streams

Who can apply: Local governments in partnership with Non-profits.

7. **State Department of Conservation**
   A. Agricultural Land Stewardship Program (ALSP) Grants
   Purpose/Priorities: Grants to acquire conservation easements to protect agricultural lands, and 10% funding for conservation improvements
   Who can apply: Local agencies and non-profits
   Notes: Easement may not limit agricultural practices in any way
   Contact: Charles Tyson, ALSP Coordinator (916) 324-0862

8. **State Department of Education**
   A. Environmental Education Grants
   Purpose/Priorities: Grants for environmental education programs
   Who can apply: Non-profits and schools
   Contact: Bill Andrews, Education Programs Consultant (916) 657-5374
   Note: Other agency environmental education grant programs offered through the National Fish and Wildlife Foundation and EPA

9. **State Department of Transportation (Caltrans) and Federal Transportation Agency**
   A. Environmental Enhancement and Mitigation Grants (EEMP)
   Purpose/Priorities: Grants to mitigate environmental impacts from transportation facilities, including acquisition and restoration of resource/habitat lands
   Who can apply: Agencies and Non-profits.
   Notes: Grants limited to $250,000
   Contact: Scott Clemons

10. **State line item funding by local legislator**

LOCAL/COUNTY AGENCIES

1. **Resource Conservation District of Monterey County**
   A. Watershed Management Programs
   Purpose/Priorities: Help landowners and communities improve and sustain the health of watersheds.
   Contact: Jonathan Berkey (831) 728-7709

2. **Transportation Agency of Monterey County (TAMC)**
   A. (Federal) Transportation Equity Act (TEA-21)
   Purpose/Priorities: Grants for acquisition, restoration and enhancement of coastal resources, public access improvements, etc.
   Who can apply: Public agencies (often in partnership with non-profits)
   Notes: TEA program funds require potentially significant up-front investments for environmental studies, lobbying, etc. Over a six year period, TAC will receive up to $4 million for projects. TEA-21 program funds may be used to purchase scenic easements related to transportation corridors, trail development, wildlife crossings and other transportation-related facilities.
   State Contact: Marsha Mason (916) 654-5275
   Website: www.dot.ca.gov/hq/TransEnhAct/
   Local Contact: Mary Orison (831) 755-8961

PRIVATE FOUNDATIONS

1. **The David and Lucile Packard Foundation**
   Program: Conserving California Landscapes, Central Coast Region
   Purpose/Priorities: Protect significant and threatened California resources. The program places priority on protection of scenic viewsheds, open space, recreational access, viable natural systems and agricultural lands. Funding provided for acquisition, policy, planning, capacity building and conservation loans
   Notes: Entire program has $175 million to be granted over five years. Typically, 50% matching funding required from other sources. In the Central Coast, the watersheds of Elkhorn and Watsonville Sloughs are among the listed priority areas
   Contact: Jeanne Sedgwick (650) 948-7658

2. **Hewlett Foundation**
   Purpose/Priorities: Funds available for various conservation projects, with particular interest in resolving

conflicts between development and open space. Planning, management, acquisition and pre-acquisition grants available
Notes: Conservation Program has approximately $9-12 million annually for western North American projects, of which $1-2 million is typically spent on California projects
Contact: Michael Fischer (650) 329-1070

3. **National Fish and Wildlife Foundation**
(see above, federal agencies)

Appendix H: Conservation Stakeholders:

Non-profits:

1. The Nature Conservancy (TNC) Chris Kelly, Robin Cox and Lynn Lozier
   Strengths - Began acquisition of key Elkhorn Slough parcels twenty years ago. Have considerable knowledge of Slough's biological resources, conservation needs and priorities for acquisition, management and restoration (on-the ground experience with Blohm and Azevedo Ranches). Extensive experience with real estate transactions on conservation lands.
   Potential roles: help establish conservation priorities within the Elkhorn Slough watershed, and assist local conservation organizations where needed in technical skills of acquiring key natural habitat lands, and managing and restoring natural habitat lands.

2. The Elkhorn Slough Foundation (ESF) Mark Silberstein
   Strengths - Skills in negotiating and acquiring conservation lands (Catellus parcel, Long Valley) and land management (Long Valley); considerable knowledge of biological resources, conservation needs and priorities, and ongoing research and research needs; strong working relationship with local conservation organization and agencies, especially ESNERR
   Potential roles: help establish conservation priorities in the Elkhorn Slough watershed; provide leading role in coordinating conservation activities in Elkhorn Slough and acquiring, managing, monitoring and restoring (mostly) natural habitat lands; serve as a local source for GIS and mapping efforts; provide outreach/workshops to various stakeholders and the public

3. Sustainable Conservation Ashley Boren, Laura Hattendorf, Lynn Dwyer
   Strengths - Skills in solving difficult conservation issues, often by finding economic incentives for appropriate conservation actions (example - permit streamlining program in Elkhorn Highlands provided farmers an incentive to implement Best Management Practices)
   Potential roles - work with Elkhorn Slough Foundation and other groups in assessing effectiveness of local farm assistance programs, and finding ways of continuing such programs;; work with NRCS and local farmers in finding economically feasible and less intensive alternatives to strawberry farming; help mediate/solve groundwater overdraft problem

4. The Monterey County Agriculture and Historic Land Conservancy Sherwood Darrington
   Strengths - Extensive land trust skills, including owning, managing and monitoring conservation lands; knowledge of local agricultural issues and players.
   Potential role - Hold and monitor conservation easements on predominantly agricultural lands; help solve groundwater/overdraft problem

5. Watershed Institute: Scott Hennessy
   Strengths: On-the-ground experience with restoration of Elkhorn Slough habitats. As a Monterey County planning commissioner, Scott is knowledgeable of both local and County-wide conservation issues and strategies
   Potential roles: Habitat restoration of marsh and upland areas, and development of a watershed-wide plan for removal of invasive weeds. Scott could be involved in diverse strategies, from developing a sustainable groundwater plan for Springfield Terrace to creating a private fallow land banking program to working on and promoting County awareness of the value of Elkhorn Slough watershed's resources to the local economy

Agencies

1. California Department of Fish and Game - ESNERR - Becky Christensen, ESNERR manager
   Strengths - Manages ESNERR lands, knowledgeable of marsh and upland biological habitats, land management and habitat restoration and enhancement.
   Potential roles: The ESNERR will continue to manage public lands, and coordinate research conducted on Elkhorn Slough issues, such as tidal scour. Has potential to develop a plan to control invasive weeds. ESNERR, with ESF, could provide workshops to local stakeholders. ESNERR, with ESF, could become a clearing house for Elkhorn Slough-related information and education.

2. California Department of Fish and Game - Central Coast Region - Deborah Hillyard
   Strengths - reviews major development plans and provides environmental review of development proposals, especially in regards to sensitive communities and species.
   Potential roles: Continue to provide information on sensitive communities and species,. help develop a plan to control invasive weeds, and review the County's upcoming North County LUP update

3. California State Coastal Conservancy (CC) - Karyn Gear
Strengths - over years CC has funded preparation of resource enhancement/management plans, and programs to acquire, manage and restore conservation lands in the Elkhorn Slough watershed. Like TNC, considerable real estate transaction skills and knowledgeable of conservation issues and priorities throughout the Elkhorn Slough watershed.
Potential roles: help establish conservation priorities, continue working as ESF partner in acquiring and eventually restoring marshlands in Moro Cojo Slough; assist ESF in future acquisitions of key Highlands and McClusky Slough properties; and RCD with creation of Carneros Creek Watershed Management Plan

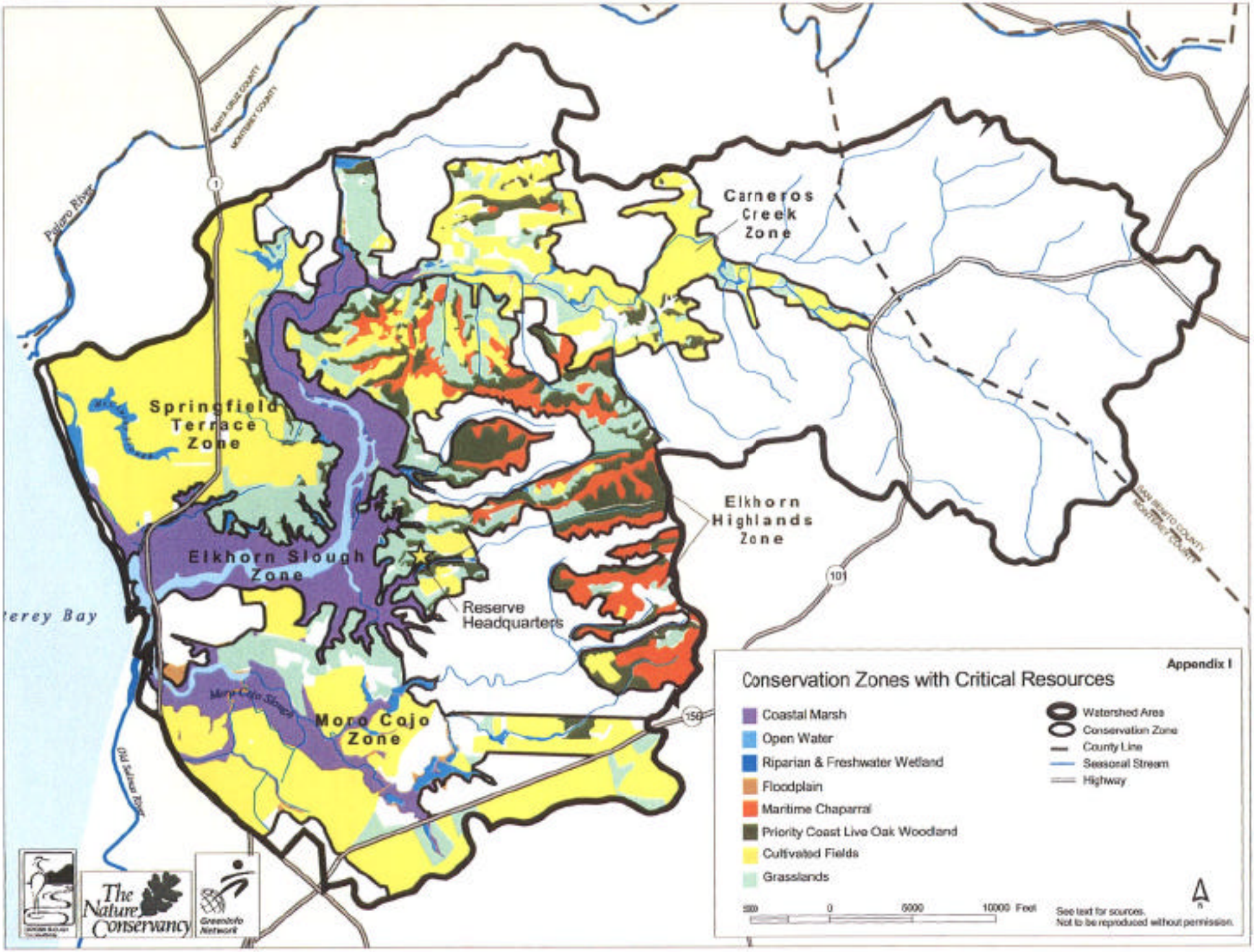
4. National Resources Conservation Service (NRCS) - Daniel Mountjoy
Strengths - NRCS assists farmers and provides funding for agricultural management plans on farms throughout the project area; assists local residential communities in preventing runoff. Good working relationship with farmers, good bridge between conservation organizations and farm organizations
Potential roles: Continue working on "Elkhorn Slough Watershed Project" to reduce runoff entering Elkhorn Slough by 50%; after program ends, continue to monitor and assist farmers

5. Resource Conservation District of Monterey County (RCD)- Jonathan Berkey
Strengths: Initiated and assists NRCS in ES Watershed Project; works with Carneros Creek landowners on conservation measures and flood control
Potential roles: continue work of NRCS when funding for ES Watershed Project runs out in three years; develop Carneros Creek Watershed Management Plan with local landowners

6. Monterey County Planning Department; - Steven Maki, Planner
Strengths: County has strong resource protection regulations in Elkhorn Slough watershed. Steven has strong commitment to Elkhorn Slough resource protection, understands conservation priorities and groundwater overdraft issue ; provides conservation perspective in MCWRA decisions
Potential role: with watchdog group at its side, begin to enforce existing regulations that have not yet been enforced, such as imposing fines on landowners whose runoff collects on County roads, and keeping development out of ridge tops and chaparral areas. Develop new regulations where needed to strengthen resource protections, especially as part of LUP update.

7. Coastal Commission - Rick Hyman
Strengths: understands and is committed to resource protection throughout Elkhorn Slough watershed; reviews appeals of County land use decisions in Coastal Zone
Potential roles: Rick Hyman has expressed interest in implementing more innovative land use techniques in the Coastal Zone, such as cluster development and in lieu fees/ off site mitigation

8. Monterey County Water Resources Agency (MCWRA) and Pajaro River Water District
Strengths - knowledgeable of groundwater overdraft issues
Potential roles - work with stakeholders to reverse aquifer depletion and seawater intrusion, especially in Springfield Terrace; will soon develop Pajaro River Project plans.


Appendix I
Conservation Zones with Critical Resources
Coastal Marsh
Open Water
Riparian & Freshwater Wetland
Floodplain
Maritime Chaparral
Priority Coast Live Oak Woodland
Cultivated Fields
Grasslands
Watershed Area
Conservation Zone
County Line
Seasonal Stream
Highway
0
5000
10000 Feet
See text for sources.
Not to be reproduced without permission.
Carneros Creek Zone
Springfield Terrace Zone
Elkhorn Highlands Zone
Elkhorn Slough Zone
Reserve Headquarters
Moro Cojo Zone
Pajaro River
Old Salinas River
erey Bay
SANTA CRUZ COUNTY
MONTEREY COUNTY
SAN BENITO COUNTY
MONTEREY COUNTY
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101
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The Nature Conservancy
Greenbelt Network

Implementation Category and Key Actions	Potential Conservation Partners Involved	Projected Costs	Potential Funding Sources
Raise the visibility of Elkhorn Slough to secure funding 1. Develop an identity and political marketing plan for Elkhorn Slough programs	ESF, TNC, CC and other Partners	100,000	Private foundations and local fund raising
Build capacity of local organizations to implement the Plan 1. Provide support to ESF to coordinate existing and proposed conservation programs, and to acquire and manage Elkhorn Slough conservation lands 2. Provide ongoing support to MCAHLC, NRCS, RCD, RDC and other partners to implement agricultural conservation programs 3. Provide on-going support to RCD to work with local residents to develop intermittent stream management plans for seasonal streams	ESF, TNC, and Coastal Conservancy MCAHLC, NRCS, RCD, RDC and other partners RCD	$2,445,000 To be determined by partners To be determined	Existing TNC management endowment, ESF fund raising, private foundation grants, State Water Resources Control Board Water Quality Revolving Funds
Acquire conservation lands 1. Purchase wetland portions and buffers in Moro Cojo Slough 2. Acquire conservation easements along Elkhorn Highlands "northern crescent," where maritime chaparral is most intact. 3. Complete acquisition of Elkhorn Slough marshlands 4. Acquire conservation easements on bluff and bluff top portions north and west of Elkhorn Slough 5. Acquire conservation easements to secure buffers on agricultural properties immediately south of Elkhorn Slough	ESF, Coastal Conservancy, USFWS ESF, Coastal Conservancy, TNC, MCAHLC ESF, Coastal Conservancy, TNC ESF, Coastal Conservancy ESF, Coastal Conservancy, MCAHLC	$1,050,000 $4,200,000 $900,000 $2,500,000 $100,000	Coastal Conservancy and USFWS Grants, WCB grants, private foundation grants TEA-21 grants, State Ag. Stewardship Program, FPP Program, State Water Resources Control Board Water Quality Revolving Funds

Implementation Category and Key Actions	Potential Conservation Partners Involved	Projected Costs	Potential Funding Sources
Provide ongoing incentives for farmers to improve management practices so they are more compatible with biological resources			
1. Sustain and integrate agricultural assistance and monitoring programs	NRCS, RCD, RDC, Sustainable Conservation, MCWRA, ESNERR, ESF	To be determined by agricultural partners	NRCS, private foundation grants
2. Participate in forums that seek to solve groundwater overdraft problem, and ensure natural resource protection is integral to solutions	ESF, Sustainable Conservation, MCAHLC	Included above	Costs covered by ESF project manager funding
Educate community on conservation issues and encourage involvement in County Planning Process			
1. Provide workshops and information exchange for local residents interested in reviewing County land use decisions which affect the Elkhorn Slough watershed's resources, and develop a "green build-out" plan	ESF and CA DF&G	$100,000	Private foundation grants
Restore and enhance habitats where suitable, and re-establish ecological linkages			
1. Restore marsh habitat in Moro Cojo Slough	ESF, , Watershed Institute, Coastal Conservancy, CA Dept. of Fish and Game, ESNERR	$280,000	CC and private foundation grants
2. Develop and Implement Invasive Weed Control Program		$25,000	CC and NOAA grants
3. Restore Key Elkhorn Highland Properties		$1,675,000	CC, NRCS, private foundation grants
4. Restore Porter Marsh		costs to be determined	Monterey County, CC grants

Implementation Category and Key Actions	Potential Conservation Partners Involved	Projected Costs	Potential Funding Sources
Educate and mobilize stakeholders to better understand and manage resource lands 1. Provide 15 workshops to decision makers, landowners and other stakeholders regarding importance of Elkhorn Slough watershed natural habitats	ESF, ESNERR, RCD, NRCS, RDC and other partners	$30,000	NOAA, CC and private foundation grants
Total Costs of all Implementation Actions for first three years:		**$13,405,000+**	

Appendix K: GIS Map Sources of Information:

All GIS Maps:

By GreenInfo Network, using ESRI ARCview and ARCinfo software

Figure 5, Elkhorn Slough Biological Resources and Appendix C: Sensitive Species:

Community types interpreted from aerial photography by Scharffenberger Land Planning & Design
Hydrology from USGS 200k DLG
Shaded relief from USGS 24k Digital Elevation Models
Flood areas from FEMA 1996
Protected lands derived from Monterey County Water Resources District
Species data from Natural Diversity Data Base Maps, Atlas of Breeding Birds of Monterey County, Moro Cojo Slough Management and Enhancement Plan, Elkhorn Slough Management and Enhancement Plan, Deborah Hillyard, Martha Schauss and Terry Palmasanto (CA Dept. of Fish and Game, Don Roberson and Dawn Reise.

Figure 6, Elkhorn Slough Agricultural Resources:

Cultivated Fields, Grasslands, Ponds and Wetland Areas interpreted by Scharffenberger Land Planning & Design
Cultivated Fields edited by Jonathan Berkey, Resource Conservation District of Monterey Co., and Daniel Mountjoy, USDA Natural Resources Conservation Service
Seawater Intrusion and Elevated Chloride Level data from Monterey County Water Resources Agency
Additional hydrology from USGS 100k DLG
Slope data and contours from USGS 24k Digital Elevation Models