THE MADRONA MARSH PRESERVE AND NATURE CENTER

MANAGEMENT PLAN

MARCH 2005

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CITY OF TORRANCE COMMUNITY SERVICES DEPARTMENT, RECREATION SERVICES DIVISION

Enriching the Community through People, Programs and Partnerships

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Madrona Marsh Preserve is a 44-acre remnant of land that was natural open space until recent times – circa the 1920's – when agriculture and oil recovery altered the property. The Preserve lies within an ancient, highly modified natural system – the El Segundo Dune complex. The last oil wells were removed in September, 2003. The Preserve is a complex "island" of natural habitat where 736 species of plants and animals have been documented. This is an amazing number of species considering the Preserve is surrounded by heavy urbanization, with residents to the north and east and businesses to the south and west.

Starting in the early 1970's, in partnership with the Friends of Madrona Marsh, the City of Torrance began the effort to set aside the property as a wildlife preserve. In the 1980's the property was deeded to the City, and the land was designated as the "Madrona Marsh Preserve."

The present state of the Madrona Marsh Preserve is a degraded wetlands/back-dune ecosystem. It is slowly recovering through the efforts of volunteers and Staff.

The purpose of this Management Plan is to provide the framework and guidelines for the management, restoration, and visitor-use of the Preserve and Nature Center. The intent is to ensure the long-term viability of the Preserve's natural resources while providing an optimal experience for visitors. Critical to the Plan's success is maintaining maximum species diversity through enhancing the habitat of both plants and animals.

This Management Plan includes information about the various habitats of the Preserve and their current state of degradation, plant and wildlife resources, management goals, objectives and measurable outcomes for the Preserve and Nature Center, and a projection of future staffing and capital needs that will be implemented as grant funding, fee-offset or other resources become available.

Implementation of this Plan will enable Staff and volunteers to proceed systematically in their efforts to properly manage the Madrona Marsh Preserve and Nature Center.

ACKNOWLEDGEMENTS

The insightful draft of former Preserve Naturalist Walt Wright is the foundation from which this Madrona Marsh Preserve and Nature Center Management Plan originated. Many people contributed to the development of this Management Plan, and in so doing they kept in mind a vision for the future. The comprehensive foresight and technical expertise needed to put forth this Management Plan for such a multifaceted natural area required extensive research, cooperation and support from many people – contributors, authors, consultants, scientists, volunteers, and Staff. These people gave freely of their time and knowledge over a period of many years and their contributions have been both helpful and appreciated.

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INTRODUCTION

Since 1985, the Madrona Marsh Preserve has been set aside by means of a settlement agreement between the City of Torrance and Torrance Investment Company (Appendix A). By virtue of the agreement, 42.5 acres were designated as a Preserve. Before the agreement, efforts were made and now continue to restore the land from its prior agriculture and oil recovery uses to that of a seasonal wetlands complex within an upland/back-dune habitat.

While reading this Plan, it is important to keep in mind that biologically, the Preserve is not a stand-alone unit. It is a critically important, sensitive and active ecosystem that is a part of the greater South Bay ecological complex. In fact, the Preserve is designated a "Significant Ecological Area" of Los Angeles County (Appendix B). Wild species using the Preserve also use City of Torrance parks, sumps and neighboring cities' suitable habitats such as Wilderness Park, Alondra Park, Harbor Park and the Palos Verdes Peninsula. An example of this is the migrant female Hooded Merganser (shown below) that arrived late in October 2003 and took up residence in the Maple/Sepulveda Sump - eating, resting and "hanging out" with a group of Mallards. In late December, she moved to Alondra Park for a few weeks. Visitors from Madrona Marsh Preserve went to Alondra Park to see the Merganser. Now that she is back at the Preserve, questions such as, "How long will she stay?" and, "Where will she go from here?" abound. No one can say. For now, she is here, using suitable habitat - the Preserve meets her basic needs - the same basic needs that humans have for suitable food, water, shelter and space.

The Merganser is one species among hundreds who find the Preserve an ideal habitat for seasonal use. In developing this Management Plan, consideration of wildlife and visitor needs for the Preserve and Nature Center brought up several additional questions the Plan seeks to address. For example, how do we create ideal Preserve conditions for plants, wildlife and visitors? How do we continue to enhance and develop a sound habitat for plants and wildlife, while also creating a place for visitors to enjoy passive recreation, the Preserve's ecology and aesthetics, and allow them to learn actively and passively about the natural history of this unique ecosystem?

The following Plan is fashioned, in part, to answer these and other questions. One such question is: How does the Preserve best fit within the City of Torrance General, Open Space and Recreational Plans, and the greater South Bay ecological complex?

The Plan is detailed and technical. The first four sections are dedicated to setting the stage – outlining information about the various habitats of the Preserve, their state of degradation and wildlife resources. The second section entitled "Special Status Species" is dedicated to listing and defining the status of the one hundred one Species of Special Concern (plants and animals) that use the Preserve. Many of these species are protected through State and Federal regulations. Sections five through seven outline management goals, objectives, and measurable outcomes for both the Preserve and Nature Center. Included in the Plan is how to meet these goals and objectives as well as goals to educate community volunteers and city staff about these valuable assets. The eighth section includes the summation and the next section outlines references used in the development of the Plan. The last section, a very large one, is the Appendixes. This

includes historical information, up-to-date species data, management recommendations and financial analyses tied to projects proposed. An understanding of the information housed in the Appendixes was critical in helping to develop the purpose of the Plan as well as in developing the goals, objectives and strategies recommended for managing the Preserve.

While many goals and objectives relating to the Preserve have been met and the Nature Center has been built, the formal guidelines set out in this document will be used to guide us beyond the present state of accomplishment.

PURPOSE

The following master document provides a detailed framework and guidelines for the restoration and human uses of the natural ecosystem at the Preserve as it fits into the greater South Bay ecological complex. The overall goal of the Plan is to provide guidelines that will benefit both the people who use it and the native plants and wildlife that live on or visit the Preserve. This Plan is intended to be an ongoing, dynamic part of the City of Torrance's natural-resource management of Madrona Marsh Preserve and Nature Center.

Another aim of this Plan is to ensure the long-term viability of the Preserve's natural systems - water, soils, vegetation and wildlife. The management of the physical and biological resources that make up the Preserve is critical and a basic component of habitat management for plants and wildlife. The key to maintaining and increasing plants and wildlife on the Preserve is maintaining and enhancing the natural habitats of the Preserve. Without increased and consistently planned management, the Preserve's natural resources will be lost. The Management Plan also addresses Preserve resource preservation and conservation needs, while taking into consideration that current and future visitors will enjoy the Preserve through the understanding of its ecology, passive recreation, educational opportunities, and by appreciation of its aesthetic beauty.

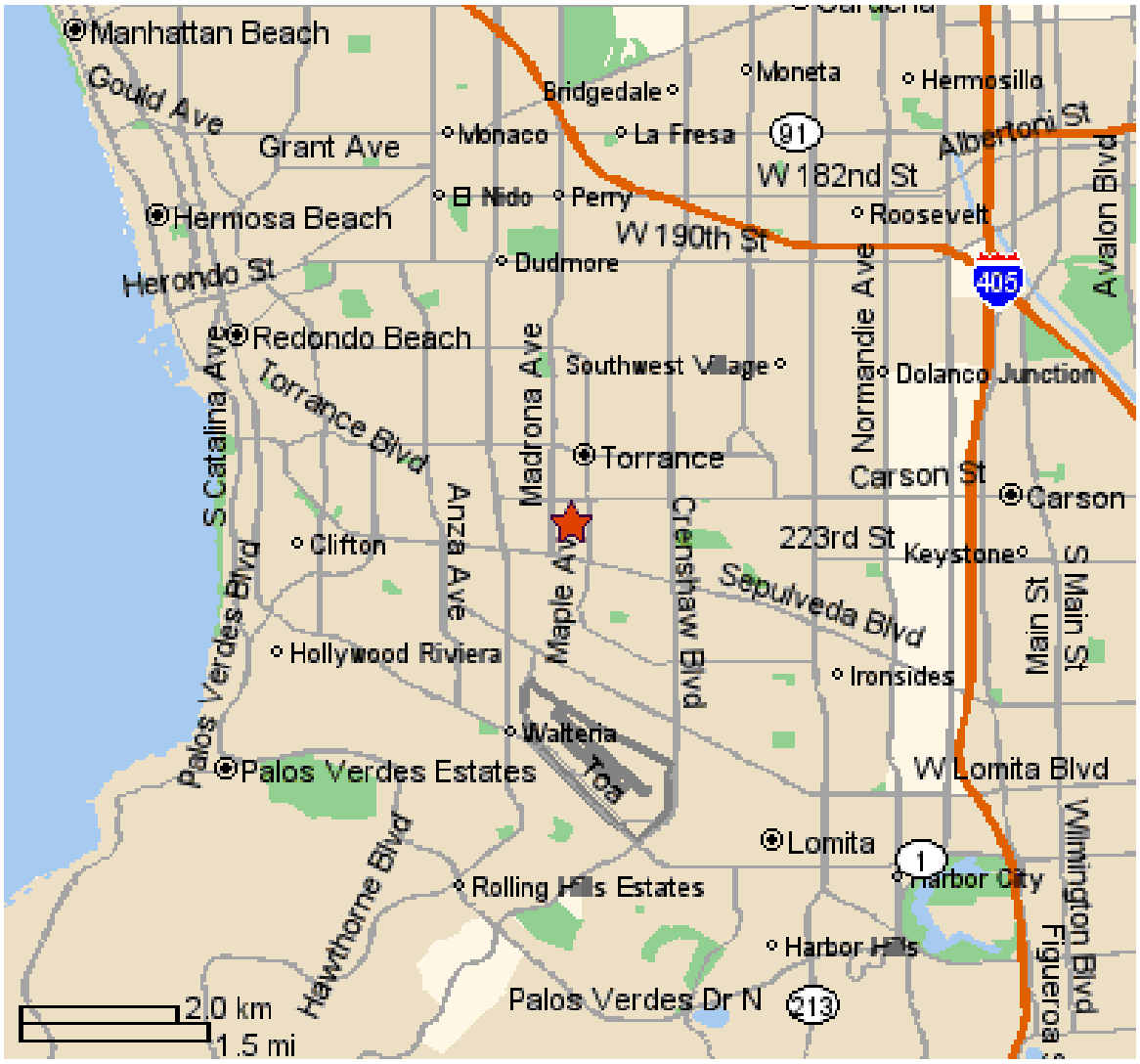
BACKGROUND

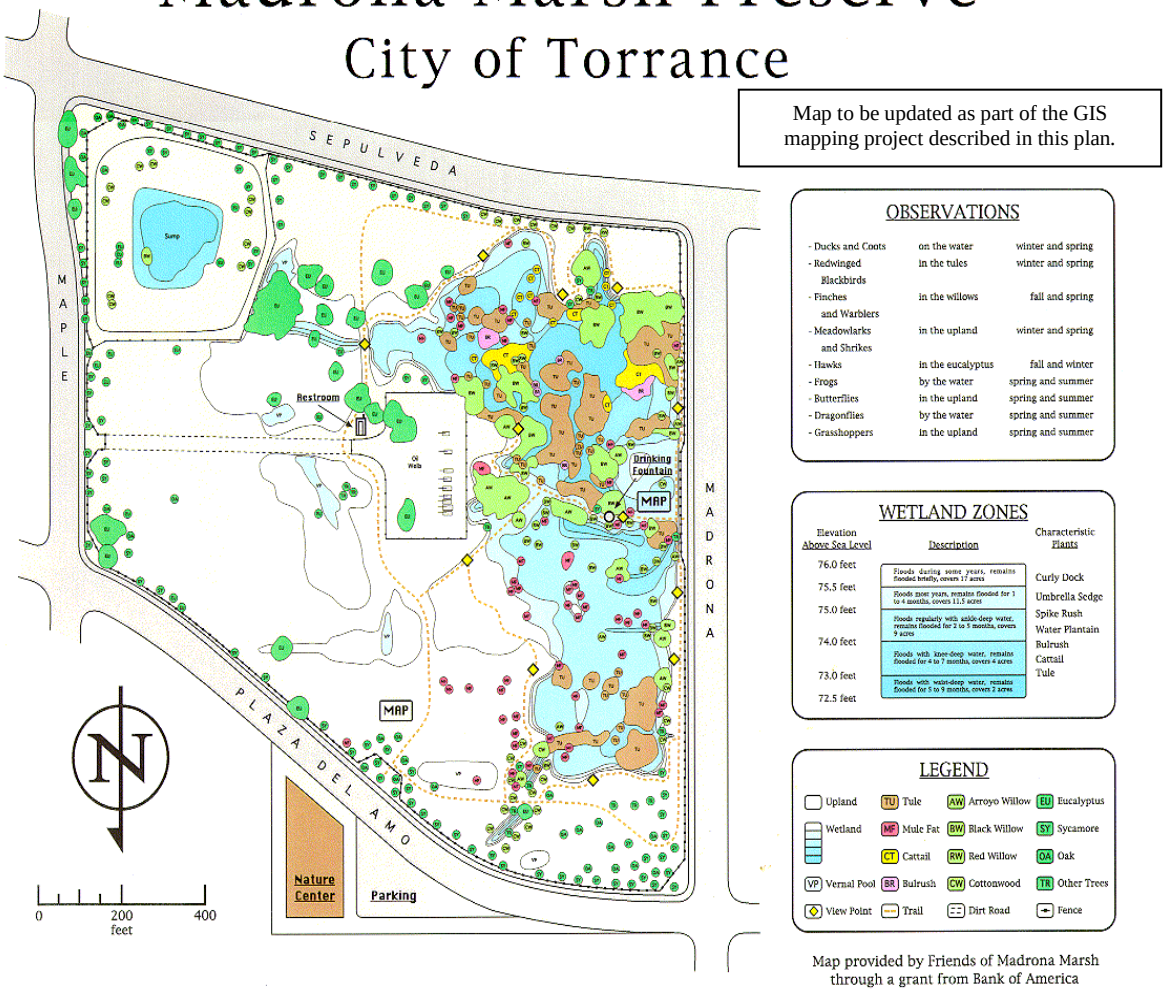
In 1985, the City of Torrance set aside the Madrona Marsh Preserve as an ecological reserve so that people then, today and in the future would have the opportunity to see and experience what the region was probably like in its natural state. Conserving this close-to-home area for hundreds of thousands of people, and providing related educational programs, hikes, literature, research, and art, demonstrates the City of Torrance's ongoing commitment to the protection of our natural resources.

The City of Torrance Community Service Department is dedicated to providing opportunities for visitors to experience and enjoy plants and wildlife in a natural setting at the Madrona Marsh Preserve. Additionally, the Department is dedicated to protecting and enhancing plant and wildlife habitat at the Madrona Marsh Preserve.

SETTING

South Bay Location of Madrona Marsh Preserve





*See Appendix W for a larger version of this map.

The Madrona Marsh Preserve is a remnant of the El Segundo Dunes, which was an extensive natural wetland and sand dune system that existed along the coastal plains, terraces and dunes of Southern California. The Preserve once was, but is no longer under the jurisdiction of the United States Army Corps of Engineers Section 404 (Appendix C).

The Preserve at one time was an active part of the ancient El Segundo Dune System. Now however, after years of local development, the Preserve is a remnant "island" of back-dune habitat with El Segundo Dune substrate, vernal pools and seasonal wetlands. The Preserve is impacted to a great extent by past uses for oil recovery, agriculture and to some degree, building development. These and other past uses created substantial debris and introduced a large number of non-native weeds.

The Preserve is situated in the heart of the City of Torrance, on land that was in oil production between 1924 and 2003.

Even with the impact of decades of oil production and adjacent high-density commercial and residential areas, the Preserve retains a high diversity of native and non-native plants. 255 species of plants have been observed and documented. About one-third of the area is lowland covered by a marsh-type vegetation complex of native perennial herbaceous species. The rest of the area is upland, dominated by non-native grasses and broadleaf annual plants. Historical research has documented that the native vegetation of the upland would have been dominated by an open stand of shrubs and perennial herbaceous plants.

The Preserve encompasses four habitat types that are determined by their topographic position, soil content and component vegetation. The lowland contains a vernal marsh surrounded by an alkaline margin. The upland is composed of a vegetated back-dune system containing vernal pools.

WILDLIFE HABITAT USE

An abundant variety of wildlife is found in the Preserve's habitats, especially considering its small geographic area and the surrounding intensively-urbanized landscape. Over 275 terrestrial vertebrate species (5 amphibian, 10 reptile, 247 bird, 13 terrestrial mammal) and 121 wetland/vernal pool invertebrates have been observed and documented at the Madrona Marsh Preserve. Although the terrestrial invertebrates, such as insects, have not been fully surveyed yet, this is a very important, large group of species. The scientific names of these animals are documented in Appendixes H – P.

The plant communities and aquatic habitats form the basis of the four wildlife habitats at Madrona Marsh Preserve. They provide the primary plant productivity upon which animals depend, along with nesting and denning sites, escape cover, resting sites, and protection from adverse weather. Most of the wildlife species at Madrona Marsh Preserve use several habitats; very few species restrict themselves to one. Most aquatic invertebrates are an exception to this rule.

Madrona Marsh Preserve is rich with areas of both complex and simpler sub-habitats. In general, the more complex plant communities with more vegetation layers and more plant species provide higher-value wildlife habitat than less complex vegetation communities. Communities that are more complex have more niches for wildlife and usually support more animal species than less complex communities do.

Although simple plant communities may support few wildlife species, they may provide habitat for great numbers of those few species. Bird species diversity in woodland habitats increases with increasing structural habitat diversity. Habitats with more canopy layers, greater foliage volume and greater total percent vegetative cover support greater bird diversity than habitats with fewer layers, less foliage volume and less vegetative cover (Beissenger and Osborne 1982). Mammal species' richness (a measure of diversity and abundance), especially for small mammals such as rodents, increases markedly with a
well-developed herbaceous vegetation layer (Dickman 1987). Increasing vegetation density in the 8-to-20 inch height range has been found to increase the number of mammal species in urban habitats (Dickman 1987).

Wildlife Habitat sections of the Plan focuses on plant, vertebrate and invertebrate species. The plant species provide habitat for vertebrates and invertebrates (wildlife). Native plant species attract native wildlife. Certain vertebrates may be used as "indicators" of the health of entire ecosystems. Of course, plants can also serve as an indicator species. Invertebrate species are of vital importance to the vertebrate wildlife and the ecosystems in which they live. Invertebrates play crucial roles in ecosystem functions, such as nutrient cycling, soil development, maintenance of soil fertility, dispersal of wood-decaying fungus spores and decomposition of dead organic matter. Invertebrates are also a crucial part of the food web in wildlife habitats and serve as major portions of the diet of vertebrate wildlife species.

HABITAT LOSS

Areas of wildlife habitat in the South Bay continue to be lost to human population pressure and associated development. Although there are active efforts by many individuals to preserve wildlife habitat in this area, development of remaining undeveloped open space threatens the existing local habitat network. Economic expansion and continued population increase in the area contribute to habitat loss. With the loss of habitat, including the loss of corridors, there is tremendous pressure on the remaining wildlife and habitat. This adds to the urgency of the continued effort to protect scarce urban habitats' such as the Madrona Marsh Preserve.

WILDLIFE CORRIDORS

Madrona Marsh Preserve is part of, and is vital to, maintaining local wildlife corridors. These habitat corridors (such as local parks, open spaces, gardens, sumps and parkways) are important in maintaining viable wildlife populations. Movement along corridors allows individual species and groups of species to move between suitable habitat patches that would otherwise cause their isolation. The corridors also provide for gene-flow between isolated populations, which helps prevent inbreeding and associated genetic problems for the wildlife. Movement routes additionally allow individuals to move from a habitat area used for one activity, such as feeding, to a habitat area used for breeding.

HABITAT DEGRADATION AND OTHER PROBLEMS

Degraded habitat contains significantly reduced (from historic levels) plant and wildlife diversity. Highly degraded areas may contain monocultures of species which can lead to widespread extinction. The Preserve includes areas of degraded habitat. Causes of this degradation are prior ranching, oil recovery, introduced plant and animal species (invasive exotics), enriched (polluted) urban runoff entering the wetlands, and refuse dumping. A considerable portion of the Preserve is dominated by introduced plant species. Introduced plant species (exotics) generally support fewer and different (e.g. exotic) animal species than native plants. Exotics are often aggressive invaders, expanding their numbers until they take over a site, dominating the vegetative community, and excluding existing native plant species. Exotic species can shade-out and choke-out native species, such as wildflowers, that are beneficial to present wildlife. Also, no natural predators/herbivores that were historically residents are at hand to keep these plant species in check.

Thus the control and removal of invasive exotic plants and the establishment of native plants promotes both the integrity of existing native plant communities and supports a more diverse native wildlife assemblage. Removal of exotic plants also aids in the decline of exotic insects that often are detrimental to the health of already-established native plant species.

Introduced animal species (exotics) can severely affect native plant and wildlife populations. They can directly kill native species, out-compete natives for nesting sites, or alter habitats so that native species are at a disadvantage and consequently suffer population declines. For example, introduced bullfrogs have been implicated in the severe decline of several species of native frogs in California and specifically our Pacific Tree frogs at Madrona Marsh Preserve. Other introduced wildlife such as European Starlings and Red Foxes tend to out-compete native species, often causing disruption in natural behavior. At times, these disruptions have caused extirpations (local extinction) on the Preserve. In the recent past, populations of Red Fox on the Preserve have eaten nearly all of the native lizards and toads. Over the past several years, because of stepped-up intervention, very few harmful species have been observed on the Preserve.

Free–roaming cats, domesticated rabbits, and occasionally, dogs are a major negative influence on Preserve habitats. Free-roaming dogs and cats disrupt plants and wildlife - chasing, injuring, and killing many small animals and damaging plants. Cats are very significant predators of songbirds and rodents, and probably depress native predator populations by severely reducing their natural food supply (Churcher and Lawton 1987, George 1974). Locally, cat populations do not decline with declining prey populations (like native wild predators) because these animals are provided food by sympathetic passers-by. This makes cats unnatural predators that are independent of, and not tied to, the natural ecosystem. Further, because domestic animals such as cats are not adapted to the Preserve's ecosystem, they typically end up as prey for animals such as owls and hawks.

Trash and pollutants in stormwater runoff that are carried into the Preserve by wind across and under (storm drains) at Madrona Avenue and Sepulveda Boulevard adversely affect the wetland habitat. For example, high nutrient loads in drainwater impact the wetland water quality, therefore they are regularly monitored by Staff and volunteers. High nutrient load in the water has ill effects on plant and wildlife. This enrichment causes stress to the plants and trees and causes excessive algal growth. The algal growth changes water chemistry (pH, CO_2 content, dissolved O_2, etc.) and is often accompanied by detrimental bacterial blooms.

Consequently, overgrowth of aquatic plants due to the presence of nutrient-rich water crowds the seasonal wetlands, reduces suitable habitat for native species of plant and wildlife and shortens the availability of water in the annual wetlands cycle.

MADRONA MARSH PRESERVE SPECIES WITH SPECIAL STATUS

Special Status Species are native species that have been accorded special legal or management protection because their continued existence is in question. There are several categories of protection at both the federal and state levels, depending on the magnitude of threat and knowledge of existing population sizes. Several plant and wildlife species are in decline locally and are considered "species of local significance". Local plant and wildlife biologists and naturalists who assisted in compiling the "species of local significance" list include Jeanne Bellamin from El Camino College, Dr. Connie Vadheim from Cal State University Dominguez Hills, Jess Morton of Palos Verdes/South Bay Audubon, David Moody of the Friends of Madrona Marsh and Bob Shanman of the Palos Verdes/South Bay Audubon Co-President.

Species of Concern are categorized as:

1. Federally Endangered – nearly extinct nationally
2. Under Federal Review – endangered listing under consideration
3. State Endangered – nearly extinct in California
4. State Threatened – a rare and declining species
5. State Protected – under legal protection (a legal penalty exists if the species is harmed - i.e., in the case of birds, the destruction of the bird, its nests or its eggs. All raptors and native breeding birds are on this list)
6. State Species of Special Concern – recognized as a severely declining species
7. Audubon Watchlist Birds – (Watchlist species are those facing population declines and/or threats such as habitat loss on their breeding and wintering grounds, or with limited geographic ranges. Watchlist species are categorized as red or yellow.)
8. Species of Local Concern (as declared by local wildlife biologists and naturalists) – species in decline in the South Bay
9. California Native Plant Society Watch List – species of limited distribution
10. California Native Plant Society Review List – species being considered for listing

More complete definitions of each of these categories can be found in Appendix D.1.

SPECIAL STATUS SPECIES KNOWN TO USE THE PRESERVE

One hundred one Special Status Species are known to reside in Preserve habitats, or temporarily stop there during migration. These species and their listing are illustrated on the following chart. A complete description of each species, their listing, and a documented account of how and when they use the Preserve can be found in Appendix D.

INVENTORY OF WILDLIFE RESOURCES

Because of the biological diversity of Madrona Marsh Preserve and the fact that it is one of the last remaining freshwater vernal wetlands in Los Angeles County, wildlife in this inventory includes a broader range of species than is traditionally considered in wildlife management. Traditionally, wildlife is limited to terrestrial vertebrates (amphibians, reptiles, birds, and mammals). The Preserve's inventory also includes terrestrial and aquatic invertebrates and vertebrates such as insects, macro-and-micro invertebrates and frogs.

Although, as mentioned earlier, this Plan focuses on plant and vertebrate species, the invertebrates are important for vertebrate wildlife and ecosystem functioning. Terrestrial invertebrates, exclusive of insects, are discussed only briefly due to the current lack of documented information about their occurrence at the Preserve. Invertebrates also form major portions of both aquatic and terrestrial food chains. Because of the numerous invertebrate species, greater knowledge and understanding of their habitat requirements and the roles they play in Preserve ecosystems is needed to gain a more complete understanding of all the biotic life in the Preserve.

HISTORICAL INVENTORIES

In order to make informed decisions on the management of Madrona Marsh Preserve, previous reports on the Marsh have been studied. Information in the summaries, species lists in the natural history reports, and local human-history documents, were used in the development of this Plan. Sections of previous reports used in this Plan can be found in Appendix E. Information about the Tongva/Gabrielino Tribes, their history/culture and a map of local settlement sites can be found in Appendix F. Research into the history of the area that is now Madrona Marsh Preserve should be continued in order to develop a more accurate picture of its past.

In September 2003, Kelt Oil Company deeded the property known as Drill site 10 to the City of Torrance. Kelt removed all operating material above and below ground. The southwestern portion was made into new palustrine habitat; the remainder was made into dune, alkali margin and riparian habitats. The term palustrine is used in the wetlands classification system by the U.S. Fish and Wildlife Service to refer to wetlands that are vegetated – dominated by trees, shrubs, herbaceous plants, moss or lichens. It refers to areas of limited extent that are not part of a major lake and that are filled with partially decomposed plant materials to a considerable depth. According to the U.S. Fish and Wildlife Service, "riparian areas are plant communities contiguous to and affected by surface and subsurface hydrologic features of perennial or intermittent lotic and lentic water bodies (rivers, streams, lakes, or drainage ways). Riparian areas have one or both of the following characteristics: 1) distinctively different vegetative species than adjacent areas, and 2) species similar to adjacent areas but exhibiting more vigorous or robust growth forms. Riparian areas are usually transitional between wetland and upland."

HABITATS AND THEIR ASSOCIATED WILDLIFE

A wide range of sub-habitats is found within the Preserve's network of habitats, from remnant El Segundo back-dune to vernal pools – and smaller structural units of each. The Chevron Corner (at the southwest corner of the Preserve), which is targeted for acquisition, is in this network. The range and number of habitats is impressive for this relatively small, intensely urbanized geographic area. There are five major and two minor habitats within the Madrona Marsh Preserve. The major habitats include Upland, Riparian, the upper (in geographic elevation) edges of which are Alkali Margin, Freshwater (Seasonal Marsh and Vernal Pools) and Coastal Canyon (in the Sump which is not considered part of the Preserve). The minor habitats include Unvegetated and Maintenance Area. Examples of each habitat type known to occur are briefly described. These descriptions are intended to give an overview of each of the habitats found in the system not an exhaustive analysis.

(The scientific names of plant and animal species mentioned throughout this text are presented in Appendixes G – P. Also included are all the plant and animal species known to have occurred and/or currently occur on the Preserve). (Habitats marked with an asterisk were derived from Classification of Wetlands and Deepwater Habitats of the United States, U.S. Fish and Wildlife Service)

TERRESTRIAL

Unvegetated

The only largely unvegetated terrestrial habitat within the Preserve is the Southwest corner.

This corner of the Preserve is the site of a previous gas station, now covered with fill. The soil type and condition is presently unknown. An easement at this site is owned by ExxonMobil and exists on a diagonal line running from southwest to southeast near the Southwestern corner of the Preserve. The easement consists of five pipelines that carry jet fuel. The Southwest corner is frequently used by Staff and visitors as a special-event gathering place and wetlands-viewing area.

This Southwest corner is also used by various wildlife such as ground foragers (i.e. pigeons, doves, House Finches, sparrows, phoebes, warblers and Starlings). Ducks use the area for preening and butterflies nectar on the site's flowers.

Upland (This portion of the Preserve is often referred to as back-dune and/or coastal prairie.)

The perimeter (the area that exists from the Alkali Margin outward to the various sidewalks) of the Preserve is remnant El Segundo back-dunes. Volunteers and Staff refer to this higher elevation area as upland habitat. It also includes the dunes and adjacent grasslands. Grasslands naturally occur in and adjacent to back-dunes creating upland habitat. The slightly undulating terrain is where sand has built up because of daily afternoon winds carrying this material. Low-growing native shrubs, native and non-native trees, and non-native weeds also inhabit this area. In the spring non-native weeds, which are mowed periodically, dominate the grassland. Most of the grass species present are non-native. Mowing is a technique used to reduce seed development and dispersal of weeds.

The Upland habitat is used by many wildlife species for foraging, resting and nesting. Sparrows, finches, doves, Jays, kingbirds, Killdeer and Mockingbirds all nest and forage in the dune habitat. Crows, herons, raptors, swallows, gold finches, phoebes and falcons also use the habitat for foraging. Valley Pocket Gophers, California Coastal King Snakes, Gopher Snakes, Spadefoot Toads, Western Toads, Pacific Tree Frogs, lizards and mice nest underground. Striped Skunks, Raccoons, Opossums and toads reside in areas of this habitat where there is less human disturbance. Numerous insects and spiders, earthworms, millipedes and Common Pill Bugs, many of which have not been inventoried, can be observed in the back-dune/upland habitat as well.

Coastal Canyon (similar to those at Walteria) (in the Sump only)

The physical nature of the Maple/Sepulveda Sump which is a locked facility and closed to the public except upon request of the Manager/Naturalist, is located in the southeast corner of the Preserve. It has very steep hillsides, sloping towards the water in the bottom, create a coastal canyon habitat. This habitat is similar to ancient Lake Walteria and the northeastern side of Palos Verdes. Like the Palos Verdes canyons and Lake Walteria, it is a remnant of the El Segundo dune system. The hillsides are composed of highly permeable El Segundo sand that allows water to penetrate at a rapid rate. The sump walls are warm and dry for much of the year. Drought-tolerant plant species thrive here, including Live Oak, Coyote Brush, Black Cottonwood, Buckwheat and California Sycamore. The dominant species of this habitat include non-native Eucalyptus, Wild Radish, Garland Chrysanthemum, Russian Thistle, Australian Saltbush, Fennel, and a variety of grasses.

The bottom of the Sump is wet (at variable depths) and consequently hosts wetland species such as Willow and California Tule. Because there is water year-round in the Sump, wildlife species move from the Preserve to the Sump as the Preserve dries. During the wet season there is considerable back and forth movement of birds and other animals.

Plant and wildlife species use the Sump as a canyon habitat. The Sump is preferred by some animal species like the Red-winged Blackbirds, because it is not often disturbed by human activities. Ravens have nested in the Sump for several years and are generally known to nest on cliffs in the Palos Verdes canyons. Red Foxes (occasionally), Opossums, Skunks, and Raccoons

live in the relatively undisturbed hillsides; while many insects use the plants for nectar. Birds such as warblers, finches, sparrows, doves, towhees and woodpeckers use the hillside habitat to forage and nest; Kingfishers, herons, egrets, raptors, Coots, a variety of ducks, blackbirds, and grosbeaks all use the lower, wetter, part of the Sump to nest, hunt and/or forage. Bullfrogs, Tree Frogs, introduced Mosquito Fish, snails and many macro-and-micro-invertebrates also live and thrive in this habitat. Killdeer occasionally nest on the pea-gravel road surface on the perimeter

Riparian (This habitat with adjacent damp-soil woodlands is broader in extent than the Seasonal Wetlands.)

Riparian habitat occurs in zones influenced by water (see definition under Historical Inventories, page 15). Plant species such as Black Cottonwood, Gooding's Black, Arroyo and Red Willows can be found in the Madrona Marsh Preserve riparian zone due to the increased amount of water available to these species. There is an elevated water table in the riparian zone, which also influences the plants growing in the zone (Brown 1985). Although a complete inventory of the riparian species of the Preserve has not been done, a large delimited area of riparian woodland is present. An example is found in the areas adjacent to the wetland, where the willows are predominant.

Riparian habitats are of particular importance as plant and wildlife habitat; they are often the key component determining diversity for surrounding ecosystems (Thomas 1979). Riparian habitats are generally more productive in plant and animal biomass than surrounding vegetation communities (Thomas 1979, Hoover and Wills 1987). In addition to providing a water source, they form an important movement corridor for many species (Thomas 1979). Riparian areas are used by birds, mammals, and amphibians for moving from habitat patch to habitat patch. They have been determined to be of critical importance to the survival of certain bird species in California, such as Bell's Vireo. Amphibians, in particular, use riparian areas for such movement. These movement corridors are important in maintaining gene flow between otherwise isolated populations and ultimately in helping to prevent local extinctions in these otherwise isolated habitat patches.

Riparian habitats are also important stopover areas for migrating birds. They provide resting and foraging sites, thus helping to maintain populations of birds that are only in the area for a small portion of their yearly cycle. The Preserve riparian area seasonally supports introduced fish and invertebrate populations, which are important food sources for predatory terrestrial wildlife. These predators include Great Blue Herons, egrets, Belted Kingfishers, Foxes, Skunks and Raccoons. These species have been observed foraging throughout the riparian area of the Preserve. An example of an introduced invertebrate that serves as a good food source is the Crayfish.

Maintenance Area (Minor Habitat)

The Maintenance Area is found in the center of the Preserve. Several sheds, light equipment, debris containers, and a woodpile characterize this area. Any expansion to this area should be kept to a minimum to prevent any harmful effects to the surrounding plants and wildlife. An unpaved road connects this area with an entrance gate on Maple Avenue and joins with

additional unpaved service perimeter roads and roads into the Preserve's interior. Visitors use these roads as trails.

The maintenance area of the Preserve provides low-value habitat for wildlife. It contains little vegetation and is subject to noise and disturbance from traffic and other human activities. Species found in these areas tolerate human activity and their presence is generally very common. Reptiles and amphibians are rarely found in this zone. Several mammal species occur, although birds are the most abundant terrestrial vertebrate wildlife group. Depending on the amount of vegetation available, and the time of year, species such as Crows, Starlings, Robins, Opossums, finches, sparrows, doves, Raccoons, Skunks, House Mice, Field Mice and many insects use this habitat.

FRESHWATER (Seasonal wetland)

Palustrine

Open Water

The wetland area in the Southwest portion of the Preserve ("South Bay"), several bays along Madrona Avenue and the Maple/Sepulveda Sump provide palustrine open-water habitat for diving waterfowl such as Ruddy Duck, Bufflehead, Hooded Merganser and Ring-necked Ducks. A new and enhanced open water pond was created in the Kelt Oil area in 2003 as part of ongoing habitat restoration efforts.

Emergent Wetland

Palustrine emergent wetland habitats are more commonly known as marshes. This habitat is found in much of the wetland area particularly in the southeast quadrant. Species found in this area include California Tule, Cattail and Umbrella Sedge. Black Willow and Mulefat form scrub-shrub wetland adjacent to the emergent wetland. This habitat is used by migratory dabbling ducks such as Mallard, Northern Pintail (a species in serious decline in California) , Gadwall, American Wigeon, Northern Shoveler, Blue-winged Teal, Cinnamon Teal and Green-winged Teal. Resident and migrating songbirds use the emergent wetland for bathing and drinking. The wetlands are also habitat for amphibians such as Pacific Tree Frog, American Bullfrog (an "exotic" pest) and Pacific Salamander. Other species feed in these areas, including Great Blue Herons, Egrets, Red-winged Blackbirds and Raccoons. These areas contain numerous species of aquatic invertebrates, Crayfish and frogs, and the larger invertebrates which serve as prey for many species. Red-tailed Hawks, Red-shouldered Hawks, Great Blue Herons, Egrets, Kingfishers and numerous songbird species have been observed using the emergent and scrub-shrub wetlands. Killdeer nest on small islands in the wetlands and gulls have been observed bathing in the shallower northernmost areas of wetlands.

Scrub-shrub Wetland

There are areas of scrub-shrub wetlands on Madrona Marsh Preserve. These areas are dominated by Willow and Mulefat and also contain Black Cottonwood, Fremont Cottonwood, Elderberry, Toad Rush, Spike Rush and Alkali Grass. In the dry season, species in these areas also include European grasses and weeds as well as Ragweed, Cocklebur, Sticktight, Nightshade, Smartweed and Annual Sunflower. Adjacent to this zone is an alkali margin dominated by alkali-tolerant

species such as Salt Grass and Seaside Heliotrope.

Scrub-shrub wetland contains several vegetation strata, which provide a more diverse habitat for wildlife than emergent wetlands. The tree and shrub layers offer nesting, perching and roosting sites for a variety of birds. Typical foraging birds in this habitat include Northern Flicker, American Robin, Spotted Towhee, flycatchers, Blue-Gray Gnatcatcher, Bushtit and Song Sparrow. Hummingbirds and Downey Woodpeckers nest here. These birds may be preyed upon by Cooper's and Sharp-shinned Hawks; also by foxes, raccoons and free-roaming cats.

Vernal Pools
During the wet season, shallow depressions that are separated from the wetlands fill with rainwater, creating pools that contain standing water for part of the year. Typically they dry up much earlier than the major bodies of water. Plants associated with these pools include Water Fern, Salt Grass, Spike Rush and Toad Rush.

During the wet season vernal pools are habitat for larger numbers of macro-and micro-invertebrate species. Theses species are food sources for migrating ducks, wading birds and shorebirds. Insect-eaters such as flycatchers and swallows also feed on the insects emerging as adults from the vernal pools. When these pools dry up, the remains of aquatic insects can be seen as an ashy residue. Fairy Shrimp are an important member of the vernal pool biota. Their numbers vary widely year-to-year.

LOCAL WILDLIFE CORRIDORS

Locally, numerous habitat corridors link together larger blocks of habitat. As mentioned earlier, Madrona Marsh Preserve is a vital part of the greater South Bay habitat complex. For example, species sighted on the Preserve are often spotted in local parks and habitat niches throughout the entire Dominguez watershed such as City of Torrance parks, City of Torrance sumps, Wilderness Park, Alondra Park, Harbor Park, the Gardena Willows, the open space of ExxonMobil, the Palos Verdes Canyons, Malaga Cove and backyard native habitats. The plant and animal diversity, however, varies widely site-to-site.

The Staff of many of these facilities have worked to protect and enhance their wildlife habitats. These efforts have reconnected numerous patches of habitat that were once connected. These often-subtle changes have enhanced the value of wildlife habitats of the Preserve and of the above-mentioned wildlife habitat areas. The current level and status of many species in other local island habitat “patches” are best explained in part by the efforts of Staff and volunteers who have worked to maintain such habitats.

DEVELOPMENT OF GOALS AND OBJECTIVES

Ideas, comments and advice from members of the public, Staff, and volunteers were a crucial element in the development of the plant and wildlife resource management goals and objectives for Madrona Marsh Preserve.

To gather this input, the Community Services representatives held focus-group meetings with interested user groups. Over time, many people participated in these meetings to share ideas and views about plant, wildlife and habitat management in Torrance's urban setting.

Additionally as the Plan developed, individuals volunteered to review early drafts. Their comments and suggestions were also used in the development of this Plan.

California Department of Fish and Game biologists, local native-plant experts, backyard wildlife specialists, and habitat biologists also contributed to the development of the plant and wildlife management goals and objectives.

PRESERVE PLANT AND WILDLIFE MANAGEMENT GOALS, OBJECTIVES AND MEASURABLE OUTCOMES

The major goals of this Plan are four-fold: 1) Restore and maintain appropriate Preserve habitats to that which represents a seasonal wetlands circa 1800's, with a native upland habitat; 2) Maximize its resources for the use of native plant and wildlife (all native animals including mammals, birds, reptiles, insects, and aquatic biota [excluding domesticated and/or non-native animals]); 3) Educate visitors about the Preserve and Nature Center content and 4) Provide passive recreation opportunities for visitors. Reaching these goals and deciding which management techniques to be used are very complex issues.

From the above-mentioned major goals, seven broad goals for plant and wildlife resources at the Madrona Marsh Preserve have been developed:

1. Protect and enhance plant and wildlife habitat
2. Protect and enhance wildlife populations
3. Develop and maintain a complete plant and wildlife species inventory
4. Provide environmental education using Madrona Marsh Preserve resources
5. Promote volunteer involvement
6. Promote internal education and consistency in the City of Torrance's and the Friends of Madrona Marsh's actions
7. Promote interdepartmental (City of Torrance) and interagency cooperation to protect and enhance Madrona Marsh Preserve

Management plans, goals, objectives and measurable outcomes are described below. Not all those listed/included are of equal weight and/or priority. Further, some plans may be modified due to further study and/or information. (All projects mentioned in this Plan are recommendations and are subject to review. Only projects that enhance the Preserve and/or are not detrimental to species or habitat will be considered.) Implementing the plans will require an additional commitment of Staff and resources by the Community Services Department, Recreation Services Division. Implementation methods will be a crucial aspect of the plans. All Staff and volunteers must work in a pre-determined and coordinated fashion to implement the plans. All such plans are to be open to review and revised as needed.

There are many projects within the Plan designed for the Preserve's protection and enhancement. Each project, when implemented, should include the following documentation:

- Describe the site and the nature of the restoration needed
- Detail actions to be taken
- Develop a schedule
- List materials and equipment needed
- Detail a maintenance and monitoring program
- Assess the projects success
- List potential corrective actions or rational alternatives in case the project is not successful

1. GOAL: HABITAT MANAGEMENT: PROTECT AND IMPROVE WILDLIFE HABITAT

Objective 1.1 Protect existing habitats from degradation through designating, mapping and continually re-addressing critical localities, such as nesting sites.

Background: Because of past uses of the Preserve, some sensitive habitat areas are degraded to the point of reduced use by species. These areas need to be restored, protected and monitored for any continued degradation.

Action: All habitats within the Madrona Marsh Preserve should be regularly assessed for continued degradation and deterioration. Designations such as "sensitive wildlife habitat areas" or "wildlife protection zones" can be created. These should be mapped and include critical habitat areas and nesting sites for Special Status Species. This will help protect these sensitive areas from encroachment by inappropriate or unintentional activities. When habitat deterioration is found, a plan to prevent further deterioration and to restore the site should be developed and implemented.

Increased support for trail/road maintenance is needed to prevent erosion and/or over-growth. The use of volunteers to help maintain trails/roads can develop a greater sense of citizen awareness for the need of habitat protection and the prevention of habitat degradation.

Emphasis should be placed on protecting habitats such as the Vernal Pool and the Seasonal Wetland areas of the Preserve that are sensitive and have been subject to abuse.

Objective 1.2 Allow human use and enjoyment of the Preserve's natural resources while protecting wildlife and habitats through trail maintenance, signage, development of overlooks and providing relevant education.

Background: Most people visit the Preserve during hours of operation set by Staff. Because of increased interest in the Preserve's natural resources, special interest groups, such as supervised restoration volunteers, wildlife specialists, researchers, artists and photographers are allowed to access the Preserve before-and-after-hours with the Manager's permission.

During regular hours of operation, visitors seek the Preserve's numerous locations where interesting and unusual wildlife can be found. Primary examples of wildlife that visitors want to see are nesting sites of hummingbirds and bushtits, ostrocod (small crustaceans) colonies, fairy shrimp in the vernal pools, macro-invertebrates in the seasonal wetlands, birds in the Sump, the larger mammals and hawks.

Occasionally these areas and the wildlife associated with them are sensitive to disturbance from enthusiastic observers. Access to these highly attractive wildlife-viewing areas should be developed in such a way that observers do not disrupt wildlife, trample

vegetation or cause other habitat destruction. This will need to be done on a site-by-site and case-by-case basis.

Action: Procedures should be developed and promoted so Preserve visitors can enjoy and interact with the natural resources of the Preserve overall, without damaging the resources.

Access trails and viewing areas should be constructed to allow visitors to observe wildlife without disturbing it. For example, viewing sites overlooking the Sump, the open-water area near the southwest corner, and the open-water area in the former Kelt Oil area are locations where human use and enjoyment of wildlife could be enhanced. Small platforms or boardwalks in these areas could be developed to heighten the visitor experience without damaging resources. Viewing platforms and trails should be screened using "blinds", or be far enough from the wildlife so it is not disturbed. Access to some observation areas may need to be limited to small groups guided by Staff or docents.

Well-written explanatory signs and/or brochures should be used to highlight aspects of the natural history of relevant wildlife and how human activities affect it and its habitat.

A bridge over the East Fork could be built to allow wildlife observation while at the same time protecting the banks from being trampled and providing visitors easier access to the south side of the Preserve. Such bridges should be used in locations where observers would have minimal impact on wildlife. In wetland areas where bridges are not appropriate, observation platforms can be constructed.

Objective 1.3 Maintain habitat and species diversity by inventorying and mapping known micro-habitats, and by maintaining and enhancing habitat types.

Background: Wildlife species diversity is founded on appropriate plant species diversity, plant community structural diversity, diversity of non-contrived plant habitat features (snags, woodpiles, overgrown areas, tall grasses, dunes etc.), habitat patch size, and corridor connections between habitat patches. When these components are maintained and protected, wildlife species diversity is promoted.

There are several management requirements in maintaining habitat diversity: maintaining the number of habitat types, adequate acreage of each type, the diversity of plant species within each habitat type, and the structural diversity of each habitat.

The structural diversity of terrestrial habitats can be maintained by allowing native grasses and forbs (broadly defined as any herbaceous plant other than grasses that commonly grow in fields of meadows, including scrub-shrubs, perennials and wildflowers with vegetation at less than 50 centimeters tall) to mature in grassland and dune habitats to grow to maturity, and by encouraging the development of shrub and secondary forest canopy layers in riparian habitats.

An excellent example of the development of increased grassland wildlife habitat occurs in the northeastern area of the Preserve. During portions of the year, this is a large area of seldom-mowed grassland – where a stand of native wildflowers has sprouted. Birds such as Meadowlark and American Goldfinch now use this grassland area – a new behavior. Also, new, insects, including a variety of bees and butterflies, now occupy the area. When this area is unmowed, it has a noticeably greater habitat structure.

Determination of appropriate riparian vegetation will help maintain and increase the diversity of bird species using the Preserve's riparian habitats.

Action: Complex habitat structure should be protected and promoted in order to increase wildlife habitat niches and to maintain and increase wildlife species diversity. Where possible, discontinuous fragments of habitat should be connected with similar plantings to connect the isolated fragments. This allows seamless passage for species to travel between habitats. Trees and shrubs should not be pruned in a complex habitat structure unless there is a pressing need, such as human safety. When limbs and branches must be pruned, cuttings should be left on the ground as wildlife habitat (except for willows).

Several tasks must be done to maintain numerous habitat types in the Preserve's habitat network: taking an inventory and mapping of existing habitats and their acreage must be completed; habitats that are rare or uncommon to the South Bay, such as native plant stands or palustrine scrub-shrub wetlands, must be protected; and additional areas of rare or uncommon habitats must be planted.

A wide variety of native plant species within each habitat must be maintained and encouraged. Areas with low native plant species diversity should be identified through surveys. A list of plants that occur naturally in each habitat type must be developed. Both the surveys and list development should be accomplished using local habitat specialists from the South Bay and the nearby California Native Plant Society. A site-specific planting plan must be developed for areas identified as having low plant diversity, using species typical of the suite of native species that naturally occur in each habitat. Areas where invasive non-native plants are removed should be the first areas to be planted (to prevent reseeding of the invasives).

To allow native grasses and forbs to grow to maturity and increase structural diversity, regular mowing should be eliminated wherever possible (and appropriate) and replaced with planned interval mowing. Some areas where regular mowing is halted may need to be mown in alternate years to prevent brush incursion. Yearly or alternate-year mowing should be done in spring and late summer following grass seedset.

To encourage the development of secondary layers of vegetation in riparian areas, small openings in the riparian forest canopy may need to be created. This can be done by choosing small clusters of three-to-five trees to be felled, leaving dead

trees as snags and by opening light gaps in the forest canopy by pruning limbs. Felled trees, where appropriate, should be left on the ground as dead-and-down wood for additional wildlife habitat. (This would have been the normal state for the Marsh – e.g., periodic floods, disease, and windstorms would have caused trees to fall).

Some riparian-forested areas lacking a lower canopy or shrub layer should be planted with shrubs and sapling trees to increase habitat structural diversity and to fill out the volume of secondary canopies. Vegetative cover should be established in the herbaceous, shrub, subdominant and top-canopy layers in wooded areas.

Following the basic inventory of vegetation communities and wildlife habitats, snags should be created for areas that are depauperate* in snags (<3 snags/acre) (Brown 1985). The policy of leaving snags (dead trees), unless they pose a definite safety hazard, should be continued. When snags must be cut down for safety reasons, as much of the trunk should be left as possible. All parts of cut down snags should be left on the ground as wildlife habitat (Brown 1985).

The wildlife value of landscaped habitats in the Preserve, including the landscaping around the Nature Center, can be improved with plantings of local native plants to provide food, cover, and nesting areas. Some recommended plants are listed in Appendix Q**.**

* impoverished

Objective 1.4 Protect and enhance critical, rare and sensitive habitats by identifying and mapping these areas of the Preserve. Document existing seasonal wetlands' water quality and potential external water sources. Once identified and mapped, these habitats and other areas can be monitored and maintained.

Background: Critical, sensitive and rare habitats include, but are not limited to, such areas as the seasonal wetlands, vernal pools, rare invertebrate reproduction sites, snag-nesting sites and habitat for Special Status Species.

In the past, potable water has been used to increase water levels in the wetlands. However, this is a very costly practice and in large amounts is detrimental to invertebrate species. There are chemicals in potable water – such as chlorine – that adversely effect invertebrate populations.

Action: Critical, sensitive and rare habitats within the Preserve should be identified, mapped and given protective designation. As critical, sensitive and rare habitat areas are identified during the wildlife resources inventory, any existing degradation in their habitat should be noted.

To efficiently manage the water level, the evaporation rate needs to be continually monitored. To achieve this monitoring, two mechanisms need to be put in place. First, a small-scale sophisticated weather station needs to be installed. A weather station can provide a daily account of the weather. In order to use the gathered data effectively, a database should be established. A record of patterns will emerge that can be used for future water management. Second, a water-quality monitoring program and enhancement protocol must be developed and implemented. Water quality in the wetlands should be measured on a regular basis for chemical and biological variations. If abnormalities are found, a treatment plan can be implemented in a timely manner to prevent widespread contamination of the wetlands.

Use of potable water should only be considered during drought years when the water level falls below 74.8 feet above sea level. Near the end of the migratory waterfowl-breeding season (early August), 74.6 feet above sea level is the lowest water level required to sustain habitat adequate to allow young ducks to mature and fly away. Maintaining the water at between 74.6 feet and 74.8 feet above sea level is the minimum water level necessary to ensure that nesting habitat is available for water birds currently and traditionally found on the Preserve.

Water from outside agencies, within the Del Amo Sump (urban run-off) or from West Basin Municipal Water, for example, should be carefully assessed, tested and researched before allowing it on the Preserve. If the water is deemed "not suitable for marsh habitat", it should not be used or should be altered through filtration or by chemical/biological treatment.

Objective 1.5 Promote and protect existing yet unprotected habitat by continuing to pursue acquisition of the southwest corner and developing the Sump walls into Coastal Canyon habitat.

Background: Several different methods are available to provide habitat protection - such as property acquisition, donations and assistance with conservation, and habitat protection from other City of Torrance departments. Other approaches could be developed and explored.

Action: The Community Services Department, Recreation Services Division should continue efforts to procure the southwest corner land, which could become additional wildlife habitat on the Preserve. Additionally, the Sump is a critical habitat for much wildlife because it is the only place on the property that stays wet year-round. Its seclusion is also very beneficial to wildlife. A noticeable difference in behavior is apparent. Efforts to protect and enhance the Sump habitat should continue without disrupting the Sump's vital role of water retention during storm events.

Once procured, a plan to develop the southwest corner into wetland and dune habitat can be finalized.

The Maple/Sepulveda Sump also needs to be cooperatively protected from erosion and as a vital habitat managed by several different departments in the City of Torrance. The Community Services Department and the Public Works Department should continue to work together developing the Sump walls into Coastal Canyon habitat, as it is recognized as such by the wildlife species that use the Sump. Madrona Marsh Preserve Staff can do the planting of the Sump walls after approval of our plans by the Public Works Department.

Objective 1.6 Maintain the Preserve as a critical wildlife corridor for species moving along the Pacific Flyway and for species using (multiple) surrounding neighborhoods and parks.

Background: Madrona Marsh Preserve is a critical wildlife corridor for species using the Pacific Flyway (mainly) and for species in surrounding neighborhoods and cities. As such, the management practices on the Preserve affect surrounding habitat corridors. As mentioned earlier, maintaining and enhancing existing native plant vegetation enhances not only our habitat but also those nearby. Locations known to be connected by shared wildlife individuals and/or species are Wilderness Park, Alondra Park, Harbor Park, the Gardena Willows and the remaining open spaces within Torrance and the greater South Bay region.

Action: Because the Preserve is a critical wildlife corridor for species using the Pacific Flyway and for species in surrounding neighborhoods, certain activities are important to consider when managing the Preserve. These activities include maintaining existing vegetation, modifying vegetation management practices like tree-cutting and mowing, prohibiting development that bisects or interrupts the corridor, and prohibiting programs or behaviors that disrupt species during migration periods. Management practices should take into consideration the

Preserve's role as a vital part of the corridor for many species in the total South Bay ecosystem. What happens on the Preserve affects movement along the corridor.

Objective 1.7 Promote wildlife communities and enhance wildlife habitats through increasing the genetic diversity of component species by means of local seed and plant collection and by the removal of non-native/invasive weeds (exotics).

Background: In 2002, more than twenty Black Willows in a single stand of trees were removed from the Preserve because they were in serious decline. Many had fallen over; others had broken limbs hanging from the canopy. During research into the Preserve's planting history, we discovered all of the trees in that stand were propagated from the same "weak" clone. Weak trees are more subject to disease and therefore tend to die prematurely. This brought our awareness to the fact that there was a lack of diversity of several plant species on the Preserve. Concurrently, we realized local native plants were diminishing in number due to increased housing/business development. The only means to increase genetic diversity on the Preserve is to collect seed, cuttings and plant stock from other local habitats.

Invasive plants are defined by their ability to invade, disrupt and degrade an ecosystem. While most species stay within a set population size and have predators or other limitations on their growth, invasive species tend to overrun ecosystems into which they are introduced. Collectively they are one of the great threats to biodiversity and ecosystem stability. The reason invasives are so successful is multifaceted and is still an unresolved issue. Such invasions cost billions to economies all over the world; everything from loss of grazing land to the destruction of keystone native species are caused by these rogue invaders. Invasive plants can be spread in many ways - by accident and on purpose. Many of these plants have been spread through "impure seed" or through ornamental gardening. Others can appear out of their normal range by hitching a ride on a vehicle/aircraft or in vessel cargo.

But, why should we be truly concerned about invasive species? First of all, invasives cost the United States $173 million a year in terms of management and economic loss. More importantly, some invasive species have the potential to wipe out whole ecosystems, terrestrial and/or aquatic. (From Wikipedia, the free encyclopedia *on the web.*)

Most of the invasive species of the Preserve were introduced by the Spanish as they brought in cattle to graze. The Dominguez family, who previously owned the Preserve property, was known to have owned a large number of cattle.

Action: The integrity of native plant communities and ecosystems can be promoted and wildlife habitats enhanced by removing exotic invasive plants where feasible, and replanting these areas with species that are native to the back-dune/coastal prairie habitats. Areas that lack vegetation, such as the Chevron Corner and zones of the Sump, should also be planted with native plants. Habitats can be enhanced by increasing the structural diversity of plant communities

wherever possible.

Site-specific plans should be developed for each enhancement site. These include a soil survey, vegetation control methods, a list of intended plant species, sources of plant materials, methods for planting, times of planting, any irrigation required and a program to monitor the work. The complexity and detail of the site enhancement plan must match the complexity of the site.

Research on the best methods of invasive plant control must be part of each site's project. Each project also should incorporate a monitoring program for any habitat restoration. A specific plan is needed for each restoration and enhancement project that describes the site plan, details of existing conditions and specific actions needed, and a monitoring plan. Follow-up monitoring is very important so that successful methods can be determined and promoted, and reasons for failures can be understood and corrected.

Propagation of required plants should be done on site or through collaborations with local preserves, parks, college campuses and gardeners. Collection and propagation from multiple and local sites will promote genetic diversity of each species.

The Staff at Madrona Marsh Preserve should develop a plant salvage - specimen cloning and seed-collecting program, using volunteers to save native plants from sites slated for development by the City and to insure genetic diversity of plants on the Preserve. Salvaged and cloned plants can then be used for habitat enhancement and revegetation projects in and on the Preserve as well as sites outside of the City of Torrance. This will require a nursery area for plants, seed storage and propagation. Coordination with project managers is necessary to provide planning time and supervision by Staff. Staff should be given time and resources to develop this program in cooperation with outside agencies. The program should focus on plants native to the Preserve habitats.

The suite of native plant species that occurs in each native habitat type of the Preserve should be promoted. This will help protect the biological integrity of the plant communities and wildlife habitats of the Preserve. This will involve removal of invasive exotic plants, revegetation of exotic plant removal sites, and revegetation of sites where vegetation has been removed from other causes. These efforts will enhance wildlife habitats, which can be further promoted by increasing their structural diversity.

During restoration, plantings should be of locally adapted stock, and should be from local ecosystems and ecotypes. To promote genetic integrity of plant populations, plant-stock and seed-source from Torrance and the South Bay should be used. Local plant-stock should be required of contractors for projects on the Preserve. A preliminary list of plants beneficial to wildlife and native to the Preserve habitats, thus usable for the Preserve and Sump is presented in Appendix

R. Madrona Marsh Preserve should continue to expand and maintain nursery stock of native plant species for use in planting work and volunteer projects.

Monitoring should be part of a research and education program involving volunteers.

Objective 1.8 Identify, research, monitor and refine methods for exotic plant (weeds) control through creating an inventory of such weeds, and researching and using appropriate methods for their removal.

Background: During the Mission period in California, Spanish ranchers introduced cattle to the area. Because cattle would not eat native California species of plants, the Spanish settlers and subsequent farmers introduced plants beneficial to cattle and human consumption. Examples of such plants were grasses like oats, wheat, rye and barley. Other exotics were introduced because their seeds were carried in the toes of the cattle and these dispersed when they arrived in California. As a result, these species and others now dominate many areas of the California landscape. The Madrona Marsh Preserve upland areas thus became dominated by these weeds. For more than thirty years, volunteers have labored over removing them, but they still persist.

Action: Known effective control methods such as hand-weeding, spraying (using non-toxic herbicides), fire, watering and occasional mowing should continue to be investigated and/or employed.

A literature search on control methods for non-native invasive plants, along with interviews of noted experts should be conducted. This should be done by Staff, assisted by volunteers. Collected information should be placed in the Madrona Marsh Nature Center library. Information on known control methods should be conveyed to Staff through internal short courses, workshops, and other information-exchange methods.
For species, such as Loosestrife, for which effective control methods are not known, research on control methods should be encouraged. Professors, researchers and students at local colleges should be contacted to develop research projects at the Preserve on how to control this plant effectively. Resources of the Preserve should be made available to assist in this research.

Each exotic plant removal and revegetation effort in the Preserve should have a research and monitoring program. A basic research design should be included in each invasive plant control project so that methods can be evaluated. Staff, researchers and volunteers should be used for research and monitoring. Results of the monitoring should be published, placed in the library and distributed to other City of Torrance Staff. Future control projects should use information gathered so that the most effective control methods are employed. It is important that effective methods be described and that this information is disseminated.

A list of aggressive, invasive, non-native and native plants should be developed with Staff, resource managers and local specialists. The list will be used to target

species for control and removal. An exotic that is deemed beneficial to a native species should not be removed if it substantially impacts that native species until replacement native species are (is) in place on the Preserve. The State Noxious Weed Control Board and the California Native Plant Society should be among those contacted. As a start, the list below includes our highest-priority target species for removal. Additional target species are listed in Appendix S.

- American Black Nightshade *Solanum americanum*
- Australian Salt Bush *Atriplex semibaccata*
- Bermuda Grass *Cynodon dactylon*
- Black Nightshade *Solanum nigrum*
- California Burclover (Medic) *Medicago polymorpha*
- Cocklebur, Common *Xanthium strumarium*
- Curly Dock *Rumex crispus*
- Filaree, Redstem *Eridium cicutarium*
- Garden Asparagus *Asparagus officinalis*
- Garland Chrysanthemum *Chrysanthemum coronarium*
- Johnsongrass *Sorghum halepense*
- Knotweed *Polygonum arenastrum*
- Loosestrife, Hyssop *Lythrum hyssopifolium*
- Marestail *Conuza canadensis*
- Mustard, Black *Brassica nigra*
- Mustard, Yellow *Brassica campestris*
- Puncturevine *Tribulus terrestris*
- Russian Thistle *Salsola iberica*
- Spikeweed *Hemizonia pungens*
- Sticktight *Bidens cernua*
- Tree Tobacco *Nicotiana glauca*
- Turkey Mullen *Eremocarpus setigerus*
- Western Ragweed *Ambrosia psilostachya*
- White Sweet-Clover *Melilotus alba*
- Wild Radish *Raphanus sativus*

Objective 1.9 Enforce existing regulations that protect the Preserve by setting hours of operation (current hours: 10:00 a.m. – 5:00 p.m. Tuesday through Sunday), and requesting assistance from other City departments such as Animal Control, based on budget.

Background: Numerous policies already exist that provide protection for wildlife and their habitats on the Preserve. These policies prohibit smoking, picnicking, fires, jogging, dog walking, alcohol, fireworks, bike riding, discharging firearms, off-road vehicles, paint-ball games, flying kites, flying model planes, dumping unwanted pets, harassing, harming, removing, or feeding animals. There are also City regulations governing construction and occupancy of unpermitted structures, sewage disposal, and unauthorized camping. More rigorous enforcement of these policies and increased education on the ecological reasons for them are needed because there is continued degradation of habitat due to visitors not following the posted rules.

In December 1986, the City of Torrance Parks and Recreation Commission approved "Interim Rules and Regulations for the Madrona Marsh Nature Preserve" (Appendix T). The regulations set forth in that document should continue to be enforced, with the following changes:

- Rule 10: ENTRANCE TO THE PRESERVE

Visitors' entrance shall be strictly controlled for the protection of wildlife habitat. Entrance shall be only through the Maple Avenue Gate during the scheduled hours of operation. (Change Maple Avenue to Plaza del Amo.)

- Rule 13: REQUIREMENTS FOR PRESERVE VISITORS

Visitors must remain on designated trails, no short cuts or crossovers are allowed. Visitors must obey the instructions of the docents and/or Staff members for their personal safety and the protection of the wetlands and the wildlife (Change: Delete the first sentence of this rule and add, "We encourage visitors to roam the Preserve responsibly". Change the second sentence to read, "Visitors must obey the instructions of the docents, posted signs and/or Staff members…")

- Rule 16: OIL OPERATION

Visitors to the Preserve are prohibited from entering the fenced oil well operation property or interfering in any way with the operation of the oil company. (Change: delete this rule, as the oil company is no longer on the Preserve.)

Action: Staff should encourage the Police Department and the Animal Control Division to enforce current rules and regulations fully. Police Staff or Rangers should be assigned to patrol the Preserve occasionally. Additional enforcement of laws such as the "no dumping law" and the "no dumping animals" policy is necessary to protect wildlife, wildlife habitats, human health, safety and water quality.

Staff and volunteers as well as the public should be encouraged to notify law enforcement whenever illegal activity is observed.

Regulations protecting insects and other invertebrates from collectors need to be vigorously enforced and added to the proposed regulations sign. Several areas of the Preserve have been used for insect and other invertebrate collection by individuals and groups because of the lack of enforcing regulations.

Staff should increase the amount of time spent on the Preserve during spring when most of the collecting is taking place. Limited (responsible) collecting (for educational purposes) is allowed with the Manager's consent. The public needs to be better informed about the effects of over-collecting.

Objective 1.10 Educate visitors on ecological reasons for regulations through the World Wide Web, signs, brochures, tours and classes.

Background: Because some policies posed at the entrance of the Preserve are not followed, increased effort to educate visitors on the ecological reasons for Preserve policies is needed. Better compliance, and thus better environmental and habitat protection, will hopefully result from increased knowledge.

Additionally, providing education on the value of wildlife habitats and natural landscapes is an important part of these environmental education efforts.

Action: Assess what visitors to the Madrona Marsh Preserve know about the Preserve, its natural history and it regulations.

Information on the ecological basis for Preserve regulations will be provided largely through passive education including Web-based mediums. This can be done with informational brochures, signs, interpretive panels and online forums. There may be opportunities at various talks, classes and presentations for more active education.

As a first step in this process a simple brochure explaining Preserve regulations and their design to protect wildlife and help prevent environmental degradation should be developed. The brochure would be distributed at the Visitor Center, the Community Services Department, and other events and locations that attract the public. This brochure, like all brochures developed, should be reviewed for scientific accuracy and cultural appropriateness.

Interpretive panels can be built providing information on the ecology and natural history of the Preserve, along with an explanation of the environmental problems that regulations are designed to prevent.

Measurable Outcomes, Goal 1: (All measurable outcomes throughout this Plan are sequential according to the objectives. They are not in priority order. A complete list of measurable outcomes as capital projects can be found in Appendix V.)

- Build a Sump observation site

- Build a bridge over the East Fork
- Develop an observation platform near the former Kelt Oil Area
- Acquire the Chevron Corner
- Develop the Chevron Corner into an open-water area of the wetlands
- Develop an observation deck on the Chevron Corner
- Map existing habitats
- Increase Special Status Species habitat
- Develop native grasslands and allow them to mature
- Continue to restore the upland and vernal pool habitats
- Install a professional weather station including a Sump water level measuring device
- Develop and administer a water-monitoring program
- Enhance the Sump habitat by planting native flora on the hillsides
- Reduce the amount of non-native plant species on the Preserve
- Research and implement "Best Management Practices" for invasive weed removal
- Develop a new "Regulations" sign
- Add Preserve regulations to appropriate City and Preserve Websites
- Assess what visitors to the Madrona Marsh Preserve know about the Preserve, its natural history and its regulations
- Develop a brochure outlining Madrona Marsh Preserve policies

2. GOAL: WILDLIFE POPULATIONS: PROTECT AND ENHANCE WILDLIFE POPULATIONS

Objective 2.1 Maintain existing Special Status Species areas through mapping and monitoring Preserve Special Status Species use areas and by restricting access to critical nesting sites as necessary.

Background: Long ago, the Tongva/Gabrielino (Native Americans) used the property that is now the Preserve to hunt, fish and collect plant material that was typically fashioned into usable tools, clothes or jewelry. During this time, the local ecosystem included mainly native plant species. Along with other factors, this allowed an abundance of indigenous wildlife including mammals, birds, amphibians, reptiles, insects and fish. As the land was developed and used by the Dominguez family, and subsequently by oil recovery companies, invasive weeds took over the landscape. Most, if not all, plant and animal species were affected – their numbers drastically declined. None-the-less, many species persisted even through the 1970's. Visitors continually come into the Nature Center with (long ago) stories of what species they observed, especially during the wet seasons. As development continued, many species disappeared. An example is the Ringneck snake. Apparently, it has not been a resident at the Madrona marsh Preserve since the 1960's. The memories of theses species is still fresh in many residents' minds. Visitors often inform staff when they catch a rare sighting of an animal that was once abundant. For example, visitors remember the hundreds of meadow and horned larks that used to grace the local open fields and grasslands. Recently these visitors exclaim wonder mixed with sadness when they have spotted an average of six meadowlarks and no horned larks seasonally. In the visitors and the volunteers minds there seems to be a bit of hope that the Preserve, set aside as a place where species can survive and thrive, might again host lost or nearly lost species. These nearly-lost species are now Special Status Species which tend to be closely monitored by several governmental and non-governmental organizations. This hope was spurred on when, in 2004, two butterflies, the Western-tailed Blue and the Dainty Sulphur, returned after a 30-year absence.

There are many areas of the Preserve that Special Status Species use during various times of the year. While many (usually migratory) species are not disturbed by visitors, some are more sensitive. Areas used by Special Status Species animals should be protected from visitor disturbance. The most important sites to protect are breeding/nesting and foraging sites. Fortunately, much of the critical breeding habitat on the Preserve is in the seasonal wetlands and is flooded during the breeding season. Therefore, visitors cannot be allowed to enter this area. In the past however, supervised canoeing took place in the wetlands. This activity was found to be detrimental to our wildlife populations, and now should be limited to maintenance or occasional habitat assessment.

Action: These areas should be mapped as part of the inventory effort. Any areas of designated critical habitat (including those containing special status plants) for Special Status Species within the Preserve should be specifically protected. Some areas may need to be closed to visitors during breeding season to avoid

disturbance of reproducing wildlife. This will need to be assessed on a case-by-case basis, and will depend on species tolerance to human activities and specific site characteristics.

Objective 2.2: Reintroduce species that have become locally extinct (extirpated) when appropriate. Selected species should have no impact on surrounding areas or City of Torrance development projects and be relatively non-mobile, stable species. Reintroduction should be accomplished with the assistance of local agencies.

Background: As previously mentioned, past uses of the Preserve and local population pressure and development have caused several species to become locally extinct.

Action: Wildlife species that have become locally extinct should be reintroduced in areas where reintroduction is biologically feasible and appropriate. There should be sufficient good-quality habitat to support the species and a reintroduction plan specific to the species and the site must be developed. The plan should be developed with input from City of Torrance Staff, United States Department of Fish and Wildlife Staff, California Department of Fish and Game Staff, experts on the species and City of Torrance citizens so that development of property outside the Preserve is not impacted.

A list of species thought to have become locally extinct or rarely observed should be developed and then verified by checking historic documentation in the South Bay and local area. Species that are not highly mobile may be present at some locations locally, yet may be extirpated at locations where they formerly were present. A preliminary list of thought-to-be locally extirpated or rarely observed species that should be considered for reintroduction includes:

Crustaceans

- Riverside Fairy Shrimp — *Streptocephalus woottonii*
- San Diego Fairy Shrimp — *Branchinecta sandiegonensis*

Insects

- Palos Verdes Blue Butterfly — *Glaucopsyche lygdamus palosverdesensis*
- El Segundo Blue Butterfly — *Euphilotes battoided allyni*
- Delhi Sandfly — *Rhaphiomidas terminatus ssp. terminatus*
- California Ringlet Butterfly — *Coenonympha tullia california*
- Gabb's Checkerspot — *Chlosyne gabii*
- Quino Checkerspot — *Euphydryas editha quino*
- Square-spotted Blue — *Euphilotes battoides*

Amphibians

- Pacific Slender Salamander — *Batrachoseps pacificus*

- Western Toad — *Bufo boreas*
- Western Spadefoot Toad — *Spea hammondii*

Reptiles

- Coast Horned Lizard — *Phrynosoma coronatum*
- Western Fence Lizard — *Sceloporus occidentalis*
- Southern Alligator Lizard — *Elgaria multicarinata webbii*
- California Legless Lizard — *Anniella pulchra*
- Ringneck Snake — *Diadophis punctatus*
- Common Garter Snake — *Thamnophis sirtalis dorsalis*
- Common Kingsnake — *Lampropeltis getulus*
- Gopher Snake — *Pituophis melanoleucus*
- Western Pond Turtle — *Clemmys marmorata*

Birds

- Burrowing Owl — *Athene cunicularia*
- Barn Owl — *Tyto alba*
- Great Horned Owl — *Bubo virginianus*

Mammals

- California Ground Squirrel — *Phrynosoma coronatum*
- Little Brown Bat — *Myotis lucifugus*
- Large Brown Bat — *Eptesicus fuscus*
- Western Harvest Mouse — *Reithrodontomys megalotis*
- California Pocket Mouse — *Perognathus californicus*
- California Vole — *Microtus californicus*

An assessment of reintroduction potential will be necessary for locally extirpated species. The assessment should include reasons for their extirpation, existence of appropriate habitat in sufficient quantity for viable populations, possible habitat enhancements to provide for viable populations, establishment of habitat corridor connections, appropriateness of reintroduction, and potential for success.

Objective 2.3: Control free-roaming domestic animals in the Preserve through educational programs for local residents, signs and removal of such animals.

Background: Free-roaming domestic animals have had a substantial negative impact on the plants and wildlife on the Preserve. In the early 2000's, a Red Fox family resided on the Preserve. Before it was removed, it had nearly eliminated the native frog, toad, salamander and lizard populations. After the foxes' removal, feral cats have continued to negatively impact theses same species. Rabbits, too, have been released on the Preserve and have caused tremendous damage by nibbling off new shoots of restored plants and eating seedlings in the nursery.

Action: A reduction in the number of free-roaming domestic animals on the Preserve is needed to prevent further species declined. This involves enforcement

of existing regulations and education of animal owners.

Local residents and visitors can be educated on the ecological reasons for regulations prohibiting the dumping and feeding of free-roaming domestic animals. Pet owners and visitors should be educated about the effects free-roaming pets have on wildlife and wildlife habitat through classes, signs and media outlets.

One possible solution is to solicit increased enforcement of policies and regulations prohibiting feeding of feral animals (i.e., cats, dogs, rabbits, turtles and domestic ducks) at the Preserve. As feasible, Police Department and Animal Control Staff could be assigned to occasionally patrol the Preserve, especially at times when people are likely to drop off food. Improved enforcement and signs explaining the ecological reasons for domestic animal control in the Preserve are also important aspects of this effort.

Objective 2.4 Control non-native animal species that threaten Preserve status through control or removal. Methods for control or removal will be developed on a case-by-case basis.

Background: Non-native (introduced into the Americas) wildlife such as Starlings, Cowbirds, Crows, and Crayfish are well documented to have a severe affect on native wildlife populations. On the Preserve, the above-mentioned birds parasitized many native bird nests. Bullfrogs, Crayfish, and Red-eared Sliders (a non-native turtle) all consume Pacific Tree frogs.

Action: Where feasible, non-native animal species such as cats, domestic rabbits, or bullfrogs that threaten native wildlife populations or native habitats should be removed, controlled or eliminated.

Bullfrog control should be conducted during the breeding season – as a planned activity – by collecting egg masses at breeding sites, as they are discovered. This would have to be done for several breeding seasons. Adults should be captured and removed. An intense, localized effort at breeding sites could eliminate or significantly reduce the bullfrogs.

Control projects should be developed when exotic species are believed to be reducing native wildlife populations. The feasibility of control and the extent of control needed must be assessed; some less mobile exotic species may be easy to control, while it may not be possible to control others. Control methods for exotic wildlife species will need to be developed on a case-by-case basis.

Measurable Outcomes, Goal 2:

- Map Special Status Species of the Preserve
- Create a complete list of species that can be reintroduced to the Preserve
- Reintroduce species to the Preserve as opportunity arises

- Contact Animal Control to request patrol
- Contact City of Torrance Ranger to request patrol
- Research and develop an exotic animal control program

3. GOAL: RESOURCE DATA: DEVELOP AND MAINTAIN A COMPLETE SPECIES INVENTORY

Objective 3.1 Develop a complete plant and wildlife resource inventory similar in design to the one that was included in the 1982 Environmental Impact Report (EIR). Once completed, the information should be placed on a Geographic Information System (GIS) database – which can be used by researchers and periodically adjusted.

Background: The need to develop and maintain (and revise on a regular schedule) a complete inventory of Preserve species became obvious during the development of this Plan. Major gaps were found in the basic information on plant and animal wildlife resources. Soil organisms are an example. Also, there has been no systematic classification and mapping of plant and wildlife habitats. This basic information on plant and wildlife resources is needed to develop detailed site-specific plans, monitor long-term resource changes, and develop more detailed protection measures for existing habitats.

Over the past 25 years, several partial-species inventories have been completed. There has been no inventory since Jones and Stokes completed one in 1982 that included the 160 acres that was originally being considered for development into a Preserve. A complete species inventory consists of: mapping of the vegetation communities and wildlife habitats, classifying the wildlife habitats, and conducting surveys to determine the occurrence of wildlife species, their abundance and breeding status. The database derived from such an inventory would allow the creation of plant community, habitat and specie lists, as well as maps of habitat and species occurrence.

Projects to collect baseline data for the resources inventory can also achieve other goals and objectives of this plan, including using volunteer efforts, promoting research and environmental education. Volunteers, Staff and academic researchers could be used for a species inventory project. Researchers and Staff could plan the survey effort and train volunteers in survey methods and data collection. Staff could supervise the data collection: volunteers collect data, input the data into the database – then assist in interpreting the results.

Action: If the species inventory project is not contracted out, methodologies for habitat survey and assessment, plant and wildlife survey and habitat mapping should be developed in-house, along with guidelines for training survey personnel (including volunteers). The database would be readily available for use by Staff, including key personnel such as the Naturalist and Senior Groundskeeper assigned to the Preserve.

Expertise from local colleges and universities should be used for inventory survey

projects, and volunteer assistance should be used to the greatest degree possible. As specific survey projects are identified, potential volunteers should be notified so that interested individuals with specific needs and talents can be involved. Survey projects may be well-suited to high school or undergraduate class projects.

Data on wildlife and plant species occurrence for each habitat type should be collected. Collecting occurrence information by each mapped habitat area will allow later sub-grouping of information, so that species lists and seasonal occurrence information for each area can be produced for intended research. The inventory database should be designed so that species occurrence can be entered as information is collected. Planned systematic collection of data should include: species present, abundance, season, breeding status, habitat type, specific habitat area, exact location of breeding site (if known) and habitat use. Trained Staff or volunteers should do data entry. Data entry should be limited to a small number of people to maintain quality control.

All information collected during the inventory process should be held in a single database accessible to Madrona Marsh Staff, Staff of other City departments, members of Preserve interest groups and any interested citizens. An additional objective for the inventory would be mapping areas of habitat degradation to help identify areas for habitat improvement projects and invasive-plant control efforts. This includes areas of hillside erosion, invasion by non-native plants and animals, and road/trail erosion.

Objective 3.2 Identify sensitive biological resources (living and non-living) on the Preserve and Sump. Add the gathered information to the above-mentioned inventory.

Background: Examples of sensitive resources on the Preserve and in the Sump include areas such as nesting sites in the wetlands, highly erodible slopes, in the Sump and along trails, invertebrate reproduction sites in the Sump and wetlands, and habitat for sensitive and/or Special Status Species.

Other types of sensitive biological resources may be added to this preliminary list as they are identified.

Action: Information on these resources can be gathered as part of the basic inventory through incidental, opportunistic observation; from research; and in specific surveys for sensitive areas. Specific surveys for the presence of Special Status Species should be conducted. Potential habitats for species identified during inventory efforts should be surveyed during the appropriate seasons for the Special Status Species. Species-specific survey methods should be developed based on established methodologies.

Objective 3.3 Establish and maintain a formal library by organizing the current library housed in the Nature Center.

Background: Within the Madrona Marsh Nature Center, several rooms contain numerous reference books and booklets, leaflets and brochures. The collection includes science, college text, history, ecology, philosophy, gardening and children's books. The library is used on a daily/weekly basis. But, because of the number of volunteers, Staff and visitors who use these books on occasion, some get misplaced, disorganized or lost.

Action: A trained librarian should establish a cataloging system and begin organizing and cataloging the book collection and related materials. Assets of this kind are currently scattered throughout the Nature Center should be added to the catalog. The management plans, research papers, species checklists, vegetation maps, aerial photos, the EIR videos, and other materials should be accessioned into separate collections. This newly-created library catalog database should be accessible on-line.

Since much relevant information is available from on-line science journals, they should be included as needed in the Madrona Marsh Preserve Nature Center library. Subscriptions to key journals could also be accessioned.

Measurable Outcomes, Goal 3:

- Conduct a complete biological species-inventory
- Develop a GIS mapping program for species
- Formalize the library, classifying/cataloging the materials focusing on documents useful specifically to Madrona Marsh Preserve
- Make library database accessible on-line

4. GOAL: EDUCATION: PROVIDE ENVIRONMENTAL EDUCATION, USING THE PRESERVE RESOURCES

Objective 4.1: Provide plant, wildlife, biological and ecological education for visitors.

Background: The Staff at Madrona Marsh Preserve recognize that informed and knowledgeable visitors can be one of the greatest resources for plant and wildlife protection and habitat enhancement. In the past, both active education, (i.e. classes and nature walks) and passive education, (i.e. interpretive displays) have been successful educational programs or program elements.

Action: Promote both active and passive education programs. Expand current environmental education programs. Focusing on plants and wildlife of the Preserve can add interest and excitement to educational activities and provide a vehicle for conveying more abstract and/or academic ecological concepts.

Staff and volunteers should develop short courses and single classes covering natural history, ecology, plant and wildlife biology. Basic topics such as plant and animal identification would be covered in these courses. More advanced classes would cover ecological principles such as nutrient cycling, soil development, plant succession, plant and animal interactions, animal population dynamics and the life history of Preserve animals. Strong emphasis should be placed on using the Preserve as an outdoor classroom (or bring the mobile outdoor [outreach] classroom to schools), focusing on local native biota (flora and fauna). The ecological basis for management activities and policies, such as leaving downed wood in the Preserve (nutrient cycling and wildlife habitat) or removing domestic animals (preventing harassment and injury to plants and wildlife), should be part of the education efforts. These courses should be developed with the involvement of the Manager/Naturalist, the Torrance Unified School District, local schoolteachers, instructors from local colleges, the Audubon Society, the California Native Plant Society, neighborhood and community groups, churches and qualified others.

Schools, youth-groups, schoolteachers and senior citizens should be invited to attend classes. Course content, field activities, and field studies should be tailored to the interests and needs of each group. Courses should also be developed for local residents, families, at-risk youth, seniors, and people with disabilities. Programs that provide environmental education for groups that have little ecological background should especially be promoted.

Signs, brochures, and self-guided nature trails can be used for passive education. An information panel can be built and placed near the entrance, explaining some of the ecology and natural history of the area.

Unobtrusive educational display boards that can provide onsite passive education of visitors should be developed. Natural history displays can explain the local ecology, local ecosystems, and local wildlife, along with the causes of

environmental damage. The ecological reasons for various policies, regulations and management activities should be provided.

The use of plants and animals by the Tongva/Gabrielino (local Native Americans) should also be a part of environmental education. Many plants, from Tule and Cattail, to Willow and Lemonadeberry, were used and traded by these local Native Americans.

Newspaper, local newsletters and radio/television outlets should be used to provide environmental information whenever possible. Other locations where local residents and businesses hold meetings should also be used as places for environmental programs.

Objective 4.2: Provide plant, wildlife, biology and ecology education for Madrona Marsh Preserve, Public Works and Community Services Staff and volunteers.

Background: The management practices and activities of several departments in the City of Torrance affect local natural ecology, habitats and ecosystems and therefore affect the Preserve. Education programs provided to these departments may enhance their understanding of the affects their management plans/projects have on local plant/wildlife habitats and surrounding areas, including those of the Preserve.

Nature Center visitors have commented that education programs provided to the public by Staff and volunteers are greatly enhanced if the program leaders are well-trained. While many volunteer docents and Staff lead walks, no formal Preserve specific docent/Staff training has been developed or implemented.

Action: Local wildlife biologists, Madrona Marsh Preserve Staff and knowledgeable volunteers can present courses and classes to interested Public Works and Community Services Staff. Conveying plant and wildlife biology and ecology concepts to project managers, landscape planners, resource managers and other personnel whose activities directly affect plant and wildlife habitats is particularly important. Prior to developing course and class topics, Department Staff should be surveyed to determine the current level of knowledge and educational needs as well as their particular Marsh related interests.

A Staff/docent training program should be developed to promote a perspective of the ecological communities of the Preserve and interacting organisms in the South Bay, rather than a perspective of the plants and wildlife as a collection of individual trees and shrubs with interspersed weedy areas and paths. In addition to using Staff, knowledgeable volunteers can provide courses to both Staff and prospective docents on ecological fundamentals and native ecosystems.

Instructors at local colleges and universities should be encouraged to present talks or part-day seminars on principles of plant and wildlife biology to Staff, volunteers and visitors. Staff and volunteers could attend local programs such as the Native Plant Education Program given by the Palos Verdes Native Plant

Society. This is especially appropriate for Staff and volunteers involved in day-to-day vegetation management.

Staff should attend programs or seminars that effect everyday management decisions. Learning about topics such as solutions to ecological problems, i.e., urban runoff water quality, should be pursued. Alternatives to design that embody ecological concepts and provide protection of plant and wildlife, habitats and the human and wildlife value of native plants and ecosystems should also be sought after.

Staff and the Friends of the Madrona Marsh should develop a formal, on-going docent-training program for volunteers. Curriculum should include information on the history, biology, ecology and other aspects of the natural history of the Preserve.

Objective 4.3: Provide education about the Preserve to City of Torrance Staff.

Background: Many City of Torrance Staff are curious about Madrona Marsh Preserve, yet know very little about it. In order to share the Preserve with other City of Torrance employees, Madrona Marsh Preserve Staff and volunteers could develop adapted short courses (shorter courses than explained in Objective 4.2), workshops and lunchtime talks on wildlife biology and ecology, native plant communities, and ecological principles for Staff in other City departments.

Action: To present meaningful programs that focus on plant and wildlife habitat protection, the needs and interests of Staff in other City departments should be assessed to determine the types of educational materials and classes that should be developed and presented.

Staff should develop and present courses, workshops, and lunchtime talks on wildlife biology, native plant communities and ecological principles to Staff in other City departments. This education should emphasize native biota, wildlife habitats, nature appreciation and effects of human interactions with natural ecosystems. Madrona Marsh Preserve Staff and volunteers can conduct these programs.

Objective 4.4: Use the Madrona Marsh Preserve for school field trips and educational programs.

Background: Each year several thousand school-age children visit the Preserve and Nature Center. The students that learn most about and achieve an understanding of the Preserve are in classes that include environmental education in their curriculum.

Action: Staff and volunteers should continue to work with teachers in local schools to use the Preserve for environmental education field trips. In order to enhance field trips it is important to provide teachers with information about the wildlife and plant communities of the South Bay. It is important to develop curriculum appropriate for California learning standards.

Effort should be made to determine which schools are not using the Preserve for biology and ecology classes, and then integrate field studies at the Preserve with these schools' curriculum.

Objective 4.5: Promote biological research on the Preserve.

Background: Madrona Marsh Preserve is one of the last seasonal wetlands that remains in L.A. County. Consequently, the Preserve has become a place where many colleges, including UCLA, USC, CSUDH, El Camino, and Harbor College, visit as part of certain biology classes, or conduct/complete research projects. Additionally, teachers from local schools send individual students to the Preserve to conduct research, complete projects/assignments and/or to volunteer for ongoing projects we are pursuing. Also, many middle school and high school students select Madrona Marsh Preserve as the place to conduct Science Fair Projects. These research projects enhance the Preserve, as data collected provides valuable species information and/or leads to management practice changes.

Action: Because research is so valuable to the enhancement of the Preserve, its programs and local habitats Staff should continue to promote biological research. When possible Staff should make our facilities available for use to biological researchers, including storage space, access through locked gates during off-hours, and use of field equipment. Potential researchers, including instructors and students of wildlife biology, botany, ecology, geology, physical geography, natural history, landscape architecture, and other related courses at local colleges and universities should be informed of Madrona Marsh Preserve's efforts to promote research. Staff and local experts should develop and maintain a list of needed and desired research topics, and researchers should be encouraged to focus on these and/or incorporate them into their research. Copies of research reports conducted should be required and placed in our library and in the species inventory. All research should be non-destructive to habitat and should not significantly disrupt wildlife.

Standardized field data collection sheets for research on habitat mapping and description and wildlife occurrence need to be developed and used during the

collection process. This will assure complete and thorough data collection, and facilitate data entry into the database.

Measurable Outcomes, Goal 4:

- Update the interpretative panel by the main entrance
- Develop a self-guided tour brochure
- Develop a "native uses of plants" brochure to include local Tongva/Gabrielino history
- Redesign and redevelop the mobile classroom
- Develop additional mobile unit programs
- Develop need assessment tool to determine natural history interests of City of Torrance employees

5. GOAL: VOLUNTEERS: PROMOTE VOLUNTEER INVOLVEMENT IN PLANT AND WILDLIFE HABITAT PROTECTION AND ENHANCEMENT THROUGH RESEARCH, RESTORATION AND DEVELOPMENT/IMPLEMENTATION OF PROGRAMS AND PROJECTS

Objective 5.1: Promote volunteer involvement in restoration.

Background: Volunteers and community organizations are one of the greatest assets the Preserve has for plant and wildlife habitat enhancement and protection. Their efforts have had an enormously positive influence on plant and wildlife resources. Numerous important habitat enhancement efforts have been initiated, developed and led by our volunteers.

Many groups such as the Friends of the Madrona Marsh, Kiwins (a youth organization of Kiwanis), the Mira Costa Ecology Club, and local Girl and Boy Scouts are already active in enhancing plant and wildlife resources of the Preserve.

Because so many people volunteer for restoration of the Preserve and because the Preserve has been an oil field since 1924, problematic oil saturated soils have been encountered by Staff and volunteers on about 25% of the Preserve. Testing of the soil became necessary to ensure volunteer safety. Testing was completed by Telluris Inc. (a consulting firm) which was used for the Kelt Oil Company equipment removal in September 2003. The results showed that the soil was not harmful and not a significant human health hazard. However, officials from Telluris recommend gloves be worn during all restoration efforts and hands or other contact areas be washed after encountering the soil.

Action: Staff should support the efforts and leadership that volunteers and volunteer groups bring to the protection and enhancement of the plant wildlife resources and strive to be a catalyst to stimulate neighborhood involvement in the protection of the Preserve natural resources.

A list of volunteers and volunteer organizations interested in native ecosystem protection and enhancement should be developed and maintained. Staff should

maintain a list of potential plant and wildlife habitat projects and work closely with the local volunteer coordinators in planning and carrying out projects.

Many types of habitat and program enhancing projects can be conducted by volunteers, such as:

- Surveys of baseline habitat and wildlife
- Trail rehabilitation
- Trail construction to provide nature-study access
- Removal of invasive exotic vegetation
- Planting desirable native wildlife plant species
- Increasing habitat structure with plantings
- Improving wetland habitat
- Monitoring habitat quality
- Monitoring water quality
- Surveying visitors' interests and attitudes
- Controlling exotic and invasive wildlife
- Teaching students and visitors about Preserve resources
- Assisting in the development of educational programs
- Raising funds for educational programs
- Raising native plants in the nursery
- Conducting educational classes for Staff and public groups

For any project involving volunteers, several organizational planning meetings are needed prior to the actual work effort, so that the use of volunteers works well and is satisfying for all involved. Many projects will benefit from the continued involvement of volunteers as they monitor projects – and the projects will require additional post-project effort to insure success.

If volunteers were to assist Staff in developing and running a large habitat enhancement program (not the usual one-day restoration projects), the first step would be to identify a site that would benefit from such an enhancement project (usually an area of environmental degradation). Site identification can come from the basic resource inventory, or from Madrona Marsh Preserve Staff. This will also define one or several problems to be addressed, such as the elimination of non-native plants.
The next step is the development of a site plan. The plan should:

- Describe the site and nature of the restoration needed
- Detail actions to be taken
- Develop a schedule of needed actions and a timeline
- List materials and equipment needed
- Detail a maintenance and monitoring program
- List potential corrective actions or alternatives in case the enhancement goals are not met

Following plan development, at least one organizational meeting will be needed to assure that the project will function well and will be satisfying for all involved. The working plan should also assure integration by Staff and volunteers with regular maintenance and support activities. Additional volunteers for the project should be attained through use of publicity. When the enhancement project has been completed, a report should be prepared and placed in the Nature Center library.

Objective 5.2: Integrate environmental education with volunteer efforts.

Background: For many years young men have completed their Eagle Scout projects on the Preserve. Most of these projects have been very beneficial. However, some volunteers did not get the bigger picture of the importance of their efforts. Many volunteers seemed more interested in the task they were doing than in developing and enhancing vital habitat. Other restoration projects too, have been completed in a timely manner with little or no attention being given as to why the project was important. Consequently, numerous plants were planted incorrectly, and needed to be replanted by Staff at a later date. In early 2005, Staff and volunteers began showing Eagle Scout volunteers the Madrona Marsh slide show. This educational and historical presentation gave volunteers the opportunity to realize how important their work was to the Preserve and the ecosystem. Consequently, much more work is now done with a focus on accuracy, rather than quantity or speed of project completion.

Action: Education should be a component part of each plant/wildlife and habitat project that uses volunteers. The education should focus on the ecological importance of the project, the ecological principles behind the project, and the way the ecology of the site relates to and interacts with plant and wildlife. The way the project is expected to benefit wildlife and habitats of the Preserve should be a focus of the education. This can be done during site visits prior to the actual work, during a short pre-work class, or during the work effort.

Objective 5.3: Train volunteers as land stewards.

Background: Many artists, amateur naturalists, researchers and frequent visitors have expressed interest in being on the Preserve before or after hours. In the past, these visitors have been issued a key allowing 24-hour access but only after agreeing to be a conscientious land steward who will contact the Nature Center if they observe anything – plant, animal or otherwise – out of the ordinary.

Action: The purpose of a Land Steward program should be to train local residents as volunteer land stewards of the Preserve. Volunteer land stewards should assist the Staff by observing and monitoring conditions on the Preserve, reporting concerns, performing minor maintenance and cleanup, and explaining to visitors the ecological effects of their activities.

Training programs should be established for local residents who want to become land stewards. The training would teach basics about the plant communities, wildlife, and ecology of the Preserve, as well as its environmental challenges and the typical environmentally detrimental activities that occur. Teaching stewards various methods of interacting with the public in a positive, non-confrontational manner will be important because stewards may be in the role of explaining Preserve regulations to the public.

Measurable Outcomes, Goal 5:

- Develop a list of local organizations that can assist in projects
- Develop an ongoing list of projects that would attract volunteers
- Train volunteers leading projects to teach participants the benefits of the project to the Preserve
- Develop a Land Steward program

6. GOAL: PROMOTE INTERNAL EDUCATION AND CONSISTENCY IN CITY OF TORRANCE AND FRIENDS OF MADRONA MARSH

Objective 6.1 Provide plant, wildlife, biology and ecology education for City Staff.

Background: Experience has proven that education of Staff members is a benefit to the restoration of the Preserve. This is especially important for Staff involved in vegetation management, landscaping and program development, whose work directly affects plant and wildlife resources.

Action: Educational opportunities and programs for City Staff should be promoted. This is necessary in order to enhance the experience and education of Staff. The focus of these courses should be on ecology and ecological principles, and should emphasize ecological communities of the South Bay, particularly the Madrona Marsh Preserve. Staff training should promote a perspective on ecological communities of interacting Preserve organisms. Ecological processes, including energy flow, nutrient cycling and water flow should be part of the training. It may be possible to enlist knowledgeable volunteers to provide courses.

Education should ensure City Staff has the expertise to make sound daily management decisions.

Objective 6.2 Provide plant and wildlife expertise for Preserve non-vegetation projects.

Background: If Staff, volunteers and consultants with expertise in plant and wildlife management are consulted early in the planning of Preserve projects, protection of plant and wildlife resources will be an integral part of project planning and development. Environmental protection and enhancement can be incorporated into such projects. This can help assure that actions taken and activities planned for are ecologically sound.

Action: Enhancements for improvements such as buildings and trails, should provide or protect habitat, guided by the input of plant and wildlife experts. Protection of sensitive habitats by relocating or redesigning planned projects is best done during preliminary site planning. This forethought should prevent costly redesign late in project-planning and development. This should help ensure that actions and activities are ecologically sound.

Guidelines for buildings, bridges and observation-deck construction should be developed and put in a design manual, possibly titled Building for Wildlife. Guidelines can cover new construction and rehabilitation of existing structures. These guidelines should allow flexibility so that new and nontraditional designs can be employed where they benefit plants and wildlife. Guidelines for wildlife landscaping should be drawn together in a workbook, for use by the Staff.

All construction should leave habitats improved; it should not decrease the value of plant and wildlife habitats in any way.

Objective 6.3 Provide plant and wildlife expertise for Preserve vegetation projects.

Background: There are numerous vegetation projects undertaken on the Preserve annually. Some of the projects are large scale and some are smaller. All projects, no matter the size, affect the total ecosystem of the Preserve. For example, many trees/limbs fall during the wet-season annually, and the tules multiply exponentially due to the consequent enrichment of the water. Reducing tules and removing fallen trees affect the habits and the habitat of many species – especially migrating birds. Knowledge about where to reduce the tules and which trees to remove will be known by those Staff and volunteers who have monitored these species over time.

Action: Staff, volunteers and consultants with knowledge of wildlife biology should review vegetation management plans for the Preserve. Whenever possible and appropriate, plans should be modified to provide increased habitat value and protection. Increased structural diversity and increased species diversity of plant communities should be emphasized. Vegetation management should protect and enhance native ecosystems wherever possible; this will often result in less mowing and pruning than is currently done.

When practices are determined to be adversely affecting ecosystems and its wildlife, such practices should be modified to eliminate or minimize the negative effects. Any use of herbicides, pesticides and fertilizers should be carefully reviewed for their impact on native plants, wildlife and wildlife habitats. Pesticides and fertilizers can reduce insect populations and can contribute to water pollution, so their use must be judicious. Pesticides can directly kill vertebrate wildlife, and can impair reproduction in birds. Intense mowing and pruning of vegetation reduces habitat diversity.

Measurable Outcomes, Goal 6:

- Research and develop a more habitat-friendly mowing and tree-pruning schedule
- Research and develop alternative tule removal patterns/path ways and schedules

7. GOAL: GOVERNMENTAL COORDINATION: PROMOTE INTERDEPARTMENTAL (CITY OF TORRANCE) AND INTERAGENCY (MULTI-GOVERNMENTAL) COOPERATION TO PROTECT AND ENHANCE THE MADRONA MARSH PRESERVE ECOSYSTEM

Objective 7.1 Provide information on protection of plant and wildlife resources to other City of Torrance departments.

Background: Many City of Torrance departments are involved with or regulate different actions that occur on the Preserve.

Action: Staff should provide and offer information and expertise in plant and wildlife biology so that other involved City departments gain knowledge on methods of protecting plant and wildlife resources of the Preserve.

Objective 7.2 Develop guidelines regarding plant and wildlife resources on other City of Torrance properties.

Background: The City of Torrance has many areas within its boundaries considered to have valuable plant and wildlife resources. On many occasions, non-Preserve Staff is not aware of what procedures should be in place to enhance these plant and wildlife resources.

Action: As appropriate, Staff with expertise in plant and wildlife biology should work with other City departments responsible for managing lands that contain, or are adjacent to, plant and wildlife habitat. Staff can offer to review and modify management practices to improve plant and wildlife habitats. If appropriate, a set of guidelines for best management practices on vacant land can be developed emphasizing increasing habitat structural diversity, native plant species diversity, and prevention of degraded habitat. The Community Services Department should

work with other City departments that are actively developing land, to provide protection for Torrance's wildlife habitat network. Any local habitat protection enhances the many habitats of the Preserve because natural resource diversity within the City of Torrance will be enhanced.

Objective 7.3 Assist with the City of Torrance Street-tree Program, the management of City's sumps, the median on Madrona Avenue (running north/south from Plaza del Amo to Sepulveda) and Madrona Marsh Preserve management planning.

Background: Preserve Staff and volunteers have had an active role in protection and enhancement of the natural resources at Wilderness Park, City of Redondo Beach, Alondra Park, City of Lomita, Harbor Park, Harbor Gateway and Chadwick Canyon in Rancho Palos Verdes.

Action: Madrona Marsh Preserve Staff should be involved in planning for and planting native species in the City of Torrance. Staff should take an active role during street-tree, sump and median planning. Efforts should focus on connecting isolated habitat patches with corridors of vegetation. Vertical structure complexity should be increased by planting shrubs in association with trees.

Objective 7.4: Coordinate with federal and local agencies in Preserve management in order to protect plant and wildlife resources.

Background: Because of the number of Special Status Species, special-interest groups and sensitive projects occurring at the Preserve, numerous diverse agencies work in protecting and enhancing plant and wildlife habitats. These include:

- United States Fish and Wildlife Service (USFWS)
- California Department of Fish and Game (CDFG)
- California Environmental Protection Agency (CEPA)
- State of California Regional Water Quality Control Board
- United States Coast Guard
- Palos Verdes/South Bay Audubon Society
- Los Angeles County Natural History Museum
- California Native Plant Society-South Coast Chapter (CNPS)
- California Conservation Corps (CCC)
- Caltrans
- Los Angeles County Vector Control
- Los Angeles County Animal Control
- City of Torrance Animal Control
- City of Torrance (COT)
- Dominguez Watershed Advisory Committee (DWAC)
- El Camino College (ECC)
- Cal State University, Dominguez Hills (CSUDH)
- California State University, Long Beach (CSULB)

- University of Southern California (USC)
- University of California, Los Angeles (UCLA)

USFWS and CDFG have jurisdiction over federally listed, endangered and threatened species. The Community Services Department should discuss any plans to enhance habitat for these species with USFWS and CDFG personnel.

CEPA, Caltrans, and the State of California Water Quality Control Board, monitor the water quality of the Preserve and have designated that the seasonal wetland water must meet standards for REC 1 and REC 2 usage.

Staff has worked with CEPA, Audubon, CNPS and the CCC on habitat restoration projects and will continue to do so.

CEPA, Caltrans and CNPS Staff have expertise in soils and environmental restoration. Staff sought their advice in connection with restoration work on the Preserve and the Native Plant Garden surrounding the Nature Center.

Local colleges and universities typically work on a variety of local restoration and research projects, including the Preserve.

Action: Madrona Marsh Preserve Staff should continue to work cooperatively with the aforementioned agencies to protect and enhance the Preserve's plant and wildlife resources, as Staff of these agencies have a great deal of expertise in resource protection. These agencies also manage lands and habitats near Madrona Marsh Preserve and have responsibility for management of plant and wildlife in those areas. In particular, Staff should work in conjunction with those resource agencies that have expertise in sensitive plant and wildlife species, to enhance populations of Special Status and endangered species.

Measurable Outcomes, Goal 7:

- Provide information to other City of Torrance departments regarding plant and wildlife protection within the City
- Assist in the development of guidelines that protect and enhance plant and wildlife resources within the City
- Participate in the City of Torrance street-tree planting program

8. GOAL: MANAGE THE NATURE CENTER TO MEET COMMUNITY NEEDS

The spring of 2001 saw a civic opportunity with the Preserve's Nature Center Grand Opening. Approximately 18,500 people visited the Preserve and Nature Center in its first year of operation. The community, young and old, near and far, came to visit or participate in Preserve and Nature Center programs. Educational and passive recreational opportunities now range from nature walks to college credit courses and scientific studies. Visitors to the Center have increased by 18% since 2001 – marking the Nature Center as an established city landmark.

Currently, the Nature Center is open from 10 a.m. to 5 p.m. Tuesday through Sunday. In the future, as more visitors participate in programs, more revenue is generated and the budget increases, opening the Nature Center on Mondays should be considered.

Objective 8.1 Expand the Nature Center classroom for visitors and students to participate in programs in a comfortable environment.

Background: Programs held in the classroom have become increasingly popular since the Nature Center opened in April 2001. Currently the classroom comfortably seats about 50 people. There have been several times in the year when there were more than 100 people in this room.

Action: As funds become available, and programs continue to grow, the classroom will need to be expanded. This can be achieved by expanding it to the east towards the existing Native Plant Garden.

Objective 8.2 Expand the Nature Center Project Lab to accommodate the number of students who participate in microscope classes.

Background: Currently, about 3,000 students use the Project Lab annually. A typical class-size is 20 students; however only 12 students fit into the lab comfortably. To seat 20 students, we must provide extra tables that block teaching and aisle space and does not allow the teacher access to all of the students. When students are looking through the microscopes, and asking about what they are seeing, it is necessary for the teacher to have access to the student's scope.

Action: As funds become available, and demand for use of the Project Lab increases, it will need to be expanded to accommodate more students. This can be achieved by expanding to the north into the existing outdoor patio.

Objective 8.3 Expand the Nature Center Curation Lab to accommodate the number of researchers who use the Lab.

Background: The Curation Lab has evolved into a research lab since 2001. In 2001, Vijay Yanamadala completed his research project, using the Curation Lab to conduct his research and store to necessary project-related materials. At the time, he was the only student working on a science-fair project in the lab. At that time there was plenty of space. After Vijay won the year's National Science Fair, Madrona Marsh Preserve became a popular place to conduct research. In 2003, eleven students conducted their research at Madrona Marsh Preserve; nine were selected to compete in the State Science Fair. Several students won prizes in their categories. College-level students also use the Lab to complete research projects. During the past three years, the Curation Lab has been too small and insufficiently equipped to handle the many student/college researchers who have come here.

Action: As funds become available, the Curation Lab needs to be expanded and equipment purchased. This includes not only expansions of working space but also increasing storage space for equipment. This can be achieved by expanding north. Because the Curation Lab is used as a research lab the name "Curation Lab" should be changed to "Research Lab".

Objective 8.4 Install a shower in the Nature Center.

Background: While working on the Preserve one can easily get sweaty and dirty. Staff frequently weed, mow, tree-trim, weed-whack, work in the nursery, repair irrigation equipment or water plants. If a Staff member then has to return to the Nature Center to present a program or attend a meeting after working any of these tasks, he/she is often covered in mud and debris and in need of a shower in order to maintain professional appearance.

Action: Install a keypad-accessible shower for Staff. Move the janitorial closet materials to one of the outside closets and reconstruct the existing janitorial closet into a shower.

Objective 8.5: Develop the Atrium into a usable program-space.

Background: The Atrium is currently a large open-air space that is largely under-utilized.

Action: By finishing the floor, purchasing benches and/or chairs, adding a water feature and some plants, the Atrium would become a center of activity and focal-point for our well-attended artist receptions and other outdoor-appropriate programs.

Objective 8.6: Enhance the Exhibit Hall and other exhibit areas.

Background: As programs have continued to develop, there has been increasing need for additional exhibit space.

Action: Taxidermy currently located in several rooms of the Nature Center should be condensed into a single space in the Nature Center. Additionally, historical interpretive panels should be developed and installed within the Nature Center. Experts should review interpretative information for scientific accuracy and cultural appropriateness. Lighting in the Exhibit Hall should be reassessed and altered as necessary.

Measurable Outcomes, Goal 8:

- Install a shower in the Nature Center
- Expand the Classroom
- Expand the Project Lab
- Expand the Curation Lab
- Purchase research equipment for the Curation Lab
- Develop/modify the Atrium into a suitable program area
- Redevelop and expand exhibit areas

9. GOAL: INCREASE THE NATURE CENTER STAFF AS FUNDS BECOME AVAILABLE

As Madrona Marsh Preserve gains popularity and more programs are held, additional Staff members will be required. As additional funding becomes available more Staff members should be added to meet the community needs (see Phased Staffing Plan Appendix U.) Other local Nature Centers that have similar numbers of visitors have full-time Staff positions for each of the major program areas, such as restoration, education, outreach and volunteer management. Working with each of these Staff members are one-to-three assistants. In addition, with an increase in programs, administrative assistance will be necessary. Over time, additional Staff will be needed to maintain the Preserve and Nature Center grounds. Currently one Senior Groundskeeper is maintaining all aspects of the 44-acre maintenance program, including projects that range from mowing to tree pruning, irrigation installation and pest management. Many times, a problem that needs to be resolved cannot be attended to for many months due to lack of support Staff. A more efficient scenario would be two additional groundskeepers in order to enhance the overall look of the Preserve and Nature Center grounds. Phasing these positions in, as funding becomes available, is a high priority.

Objective 9.1 Add three program coordinator positions so that each of the major program areas are effectively and efficiently managed.

Background: Currently, due to minimal staffing, the major program areas are not managed to their full potential. After three years of managing the Nature Center and Preserve on a skeleton crew, it has become clear that positions need to be added as funds become available. The positions include a Volunteer Coordinator who would oversee docent training, community service and service learning projects; an Education Coordinator to oversee public programs, exhibits, and outreach programs; and a Restoration Coordinator to oversee the restoration of the Preserve, the Native Plant Garden, the Corner planting areas and the native plant nursery. The people hired for these positions should have the appropriate background, education/experience to meet the demands of the position.

Action: As funds become available, add three program coordinator positions.

Objective 9.2 Add two groundskeeper positions to assist in the management of the Nature Center grounds and Preserve.

Background: Currently the Preserve, the grounds surrounding the Nature Center and the adjacent parkways are all the responsibility of a single Senior Groundskeeper. One additional groundskeeper position would allow for an irrigation preventive-maintenance program and better management of the trees and planting beds. The additional groundskeeper would also be available when the Senior Groundskeeper is on move-up or vacation. A second groundskeeper would be beneficial to restoration. The second position would include managing the nursery, assisting in all restoration projects and assisting in restoration-related research.

Action: As funds become available, add two groundskeeper positions to Staff.

Objective 9.3 Add an administrative assistant position to aid in the development and administration of programs.

Background: Currently there is no administrative assistant for the Nature Center and Preserve. Assistance is needed to implement and develop mailers, develop and disseminate fliers, assist with Public Service announcements, maintain the letter boards, coordinate correspondence, order material and purchase materials from local stores for the Nature Center and Preserve, and take care of the animals in the Nature Center.

Action: As funds become available, add an administrative assistant position to the staff.

Objective 9.4 Add staffing positions to assist the program coordinators in developing and administering programs as needed.

Background: It is clear that the coordinators will need support Staff. This will be especially important as the outreach and service-learning program grows. These positions would include people who develop outreach schedules, educational assistants who will teach the outreach programs and a research assistant who will assist in the Lab.

Action: Hire support positions as funds become available.

Measurable Outcomes, Goal 9:

- Develop and hire three coordinator positions
- Develop and hire two groundskeeper positions
- Develop and hire an administrative assistant position
- Develop and hire support staff positions

IN CLOSING

The Madrona Marsh Preserve and Nature Center touches many lives in positive ways that are not immediately apparent. By restoring the Preserve habitats to represent a prior-time seasonal wetlands with a back-dune complex, maximizing its resources for the use of native plant and wildlife and by educating its visitors, the Madrona Marsh Preserve and Nature Center will continue to enhance the lives of many of its visitors.

Staff and the Friends of Madrona Marsh are proud of the progress thus far achieved on the Preserve and in the Nature Center. Implementation of this Plan will produce a logical framework for our efforts. Consequently, we will be able to realize our shared vision of a restored Preserve. Further, we shall be taking an integrated approach to managing the Madrona Marsh Preserve and Nature Center by protecting and enhancing a beautiful plant and wildlife habitat that is now becoming a fully expressed part of the heritage of the City of Torrance and Greater South Bay. Now and in the future the Preserve provides visitors with an oasis where they can renew their kinship with all things natural.

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