

# Town of Hillsborough

## Vegetation Management Strategy & Guidelines

(Including Project Selection for Open Space Lands)



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## 1.0 EXECUTIVE SUMMARY

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The vegetation management strategy and guidelines presented in this document are intended to provide a framework for the Town of Hillsborough to make decisions about future vegetation management priorities and actions. It is important to note that this document does not provide a plan of action, but simply presents a series of strategies, suggestions, and guidelines necessary to help guide future decisions about vegetation management. This document describes the biological setting (Section 3.0), regulatory framework (Section 4.0), vegetation management goals and objectives (Section 5.0), vegetation management techniques and approaches (Section 6.0), and long-term maintenance needs (Section 8.0) that will help guide vegetation management activities in the open space areas. This document also provides a system for assessing and prioritizing potential projects (Section 7.0), and for building public awareness, support, and involvement with the open space areas (Section 9.0).

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## 2.0 INTRODUCTION

### 2.1 PURPOSE AND NEED FOR THESE GUIDELINES

*The purpose and need for this document is to provide an organizing framework that will help the Town of Hillsborough and its stakeholders successfully and strategically identify, plan, and implement vegetation management actions within open space lands over time.*

The Vegetation Management Strategy and Guidelines is intended provide a framework for the Town of Hillsborough to make informed decisions about future vegetation management priorities and actions. It is important to note that this document does not provide a plan of action, but is simply a series of strategies and guidelines to help guide future decision-making about vegetation management. In addition, this document is intended to provide user-friendly “how to” advice to staff, contractors, volunteers, and others for selecting appropriate vegetation management actions that are efficient and effective.

This document describes the biological setting (Section 3.0), regulatory framework (Section 4.0), vegetation management goals and objectives (Section 5.0), vegetation and management techniques and approaches (Section 6.0), and long-term maintenance needs (Section 8.0) that will help guide vegetation management activities on the ground in the open space areas.

This document also provides a system for assessing and prioritizing potential projects (Section 7.0), and for building public awareness, support, and involvement with the open space areas (Section 9.0). Finally, using the prioritization system that was developed for this project, this document suggests priority projects that should be considered for implementation, and provides information related to conducting, scheduling, and costing the suggested priority actions (Section 7) to help the Town of Hillsborough move forward rapidly into implementation, if desired.

This document focuses primarily on vegetation management; however, several related issues such as trail and road maintenance, erosion control, educational uses of the sites, and possible land management partnerships with other agencies are also mentioned briefly, but are not discussed at the same level of detail. These non-vegetation issues are intertwined with vegetation management activities. This document is not intended to address non-vegetation management activities; however these activities are mentioned when necessary to provide the reader with a full range of land use and management options.

### 2.2 ADOPTED GENERAL PLAN GOALS AND OBJECTIVES FOR OPEN SPACE AREAS

The following goals and objectives were excerpted directly from the open space section of the Town of Hillsborough’s General Plan (2005), and form the basis for the vegetation management goals, objectives, and actions presented in this report.

#### **Goal 1. (OSC-2) Preserve open space for existing and future residents**

- **Objective 1** (OSC-2.1) Continue to maintain Town-owned open space in a manner that balances the need to protect natural habitat with controlling vegetation to reduce fuel loads, arrangement, and potential wildfire hazards.

- **Objective 2.** Consider the limited public use of town-owned public open space, where appropriate, in a manner that considers mitigation of impacts on adjacent neighbors and natural resources and does not conflict with existing reversion restrictions or increase the risk of fire hazards.

**Goal 2 (OSC-3) Ensure the continued preservation, protection, and restoration** of the natural features and resources of the Town that are essential to maintaining the quality of life for residents and wildlife, including creek corridors, trees, slopes, and woodlands, while minimizing potential conflicts, such as deer overpopulation.

- **Objective 3.** (Policy OSC-3-1) Continue to encourage and preserve drainages, watercourses and riparian habitat in a natural state by not allowing the culverting of existing creeks and requiring appropriate setbacks and buffers from creek beds.
- **Objective 4** (Policy OSC-3-2). Preserve and enhance valuable riparian habitat and other important areas that provide important water quality benefits, such as watersheds.
- **Objective 5** (Policy OSC-3.3): Continue to preserve and protect valuable native tree life, such as redwoods, oaks, and bays, while recognizing the need to allow for the gradual replacement of trees to provide for on-going natural renewal.
- **Objective 6.** Preserve and protect rare and endangered species and their habitats.

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## 3.0 BIOLOGICAL SETTING

### 3.1 OVERVIEW OF TOWN OF HILLSBOROUGH'S OPEN SPACE LANDS

This section provides a brief overview of the biological resources present within Town of Hillsborough open space lands. Information presented below summarizes the results of the 2006 vegetation mapping efforts (May & Associates, 2006), and special-status plant and wildlife surveys (May & Associates, 2007) that were conducted in support of this project. Refer to these documents for the complete results of site investigations. Figure 1 illustrates the locations of the Town of Hillsborough's open space parcels.

### 3.2 BIOLOGICAL RESOURCES

#### 3.2.1 Plant Communities

The following information was excerpted directly from the 2006 Vegetation Resource Mapping and GIS Database Development Plan (May & Associates, 2006).

The Town of Hillsborough's open space areas support approximately 88% relative cover of native vegetation types; 9% cover of non-native vegetation types; and an additional 3% cover of "other" classifications (including rock, disturbed, water and road).

The majority of native vegetation types were intact, with the exception of grassland areas, which were dominated by non-native annual grasses (a typical condition in California grasslands). Approximately 65% of mapping areas had target invasive non-native plant species occurrences. It is likely that most of these areas have some level of invasion, particularly in areas adjacent to roads, undesignated trails and/or other properties.

All sites exhibited typical characteristics of lands at the urban and natural areas interface. The majority of invasive plant species populations were found along roads, trails, areas of disturbance, or adjacent to developed areas. In several areas, invasive plant species appeared to have been introduced into the open space area from adjacent lands, or possibly inadvertently spread via green yard waste piles at the edge of property boundaries. In general, the interior of the open space areas away from roads and property boundaries were less infected with invasive plant species, supported more native species, and were more natural in appearance. For example, mixed oak woodlands (also referred to as hardwood forest) stands that were not invaded by non-native plants had a well-developed dense upper canopy structure and a moderate or sparse shrub and herbaceous layer. In contrast, mixed oak woodlands with invasive plant infestations (typically French broom) had limited diversity, for example, a dense shrub layer of French broom that created a nearly impenetrable understory.

Table 3.2.1 presents the acres of each vegetation type by location, and for all sites combined.

Figures 2A and 2B illustrate the distribution of vegetation communities within each open space parcel.

**Figure 1. Location of Town of Hillsborough Open Space Parcels**

Table 3.2.1 Vegetation Management Classifications Presented by Location

Vegetation Management Classification	A Spencer Lake	B Rowan Tree	C Nueva / Macadamia	D Strawberry Hill	E Crocker Lake	F Cottonwood Court	G Southdown	H Crystal Springs Open Space	I Tobin Clark	Subtotal All Sites
<i>Native Vegetation Communities (Acres)</i>										
California Annual Grassland	1.3	0.1	5.7	0.1	0.1	0.3	1.7	0.4	3.2	12.9
Chaparral									14.1	14.1
Coastal Scrub	0.4		1.4	0.5	2.2	0.2	16.1	5.9	0.4	27.1
Douglas Fir/Coast Redwood					0.1					0.1
Hardwood Forest (Mixed Oak Woodland)	29.4		15.8	5.4	37.8		2.5	15.5	32.3	138.7
Herbaceous Wetland	0.4	4.1			0.2	0.6			0.1	5.4
Riparian Forest/Scrub	2.1		0.2	0.4	1.8			7.6	0.6	12.7
<b>SUBTOTAL NATIVE VEGETATION</b>										<b>211.0</b>
<i>Invasive Non-Native Vegetation (Acres)</i>										
Broom (French, Scotch, Other )	0.3		0.3		0.5					1.1
Cape Ivy					0.1					0.1
Eucalyptus	4.4		1.8	1.5	2.7				0.7	11.1
Harding Grass						0.3			0.2	0.5
Invasive Hardwood Forest			0.1		1.8	0.4			0.1	2.4
Monterey Cypress/Pine			0.3	0.9	3.3		0.3			4.8
Pampas Grass	0.3				0.2		0.1		0.1	0.7
Yellow Star Thistle									0.3	0.3
<b>SUBTOTAL INVASIVE NON-NATIVE VEGETATION</b>										<b>21.0</b>
<i>Other Habitats (Acres)</i>										
Disturbed/Agricultural/Other	1.6	0.2	0.6	0.2	1.9				1.7	6.2
Water	0.5				0.9					1.4
<b>SUBTOTAL OTHER HABITATS</b>										<b>7.6</b>
<b>TOTAL ACRES ALL SITES</b>										<b>239.6</b>

**Figure 2A. Mapped Vegetation Communities, Town of Hillsborough Open Space (Northern Section)**

**Figure 2B. Mapped Vegetation Communities, Town of Hillsborough Open Space (Southern Section)**

### 3.2.2 Lakes and Other Wetland Features

The Town of Hillsborough's open space lands support two lakes, Crocker Lake (Site E), and Spencer Lake (Site A) as well as various creeks, tributaries, seeps, and other wetlands.

***Crocker Lake.*** *The following information was excerpted from the Crocker Lake Open Space Preliminary Report (John Northmore Roberts & Associates, 2006).*

"...Crocker Lake is a 1.4-acre reservoir situated in steep 60-acre canyon. The circa-1905 earthen dam was created as an integral part of the original 700-acre Crocker Estate, and both the dam and surrounding structures have historical importance. Although artificially created as an impoundment along a natural waterway, Crocker Lake provides important habitat for dependent plant and wildlife species, including a variety of aquatic species (fish, amphibians), hydrophytic plants, and important wildlife and bird habitat. There is a known great blue heron rookery associated with Crocker Lake, as well as historic raptor nests in several trees and snags surrounding the lake. Deer and other common wildlife species use the lake as an important source of food, water, and as a travel corridor..."

"...A preliminary winter limnological survey indicated that the reservoir is near the end of its lifespan as an open waterbody, due to high rates of sediment accumulation (estimated at approximately 1.4 inches per year) The lake has been gradually filling with sediment, and is expected continue to fill with sediment unless active management of the lake is undertaken (e.g. dredging, bank stabilization of the upslope waterway. Based on the current rate of fill, the estimated time until it becomes completely full is about 10-15 years..." (Alex Horne Associates, *in* John Northmore Roberts & Associates, 2006).

"...The reservoir is a primary source of irrigation water for the Burlingame Country Club, located just downstream. Maintaining the water supply, as well as the lake's scenery and habitat, will require dredging and upstream sediment controls in the very near future..." (John Northmore Roberts & Associates, 2006).

***Spencer Lake.*** Spencer Lake is a small shallow pond with a maximum depth of 6 feet, and surface area of approximately 0.23 acres. This lake is situated in a closed watershed that is bisected from its natural watercourse by a road and earthen berm. Similar to Crocker Lake, Spencer Lake is filling with sediment, and will likely revert to a freshwater marsh habitat if accumulated sediments are not actively removed. Like Crocker Lake, Spencer Lake provides important habitat for dependent plant and wildlife species, including a variety of aquatic species (fish, amphibians), hydrophytic plants, and important wildlife and bird habitat. Several raptor nests are known or suspected to be present at Spencer Lake (Alex Horne Associates, *in* John Northmore Roberts & Associates, 2006).

In 2006, the Town of Hillsborough completed a partial sediment and vegetation removal from Spencer Lake sufficient to keep the lake operating as a water detention basin and keep the original outflow structure operating. However, the Town of Hillsborough has indicated that it is not interested in a full-scale lake restoration of Spencer Lake, and intends to allow the lake to convert to a wet meadow over time. (M. Debry, pers. comm., 2007).

***Creeks and Drainages.*** Many of the creeks and other minor tributaries with the open space lands are moderately to highly eroded and may require active management to stabilize the creek banks and reduce sedimentation rates, especially the creeks flowing in to and out of Spencer and Crocker Lakes.

Several other creeks are located in and adjacent to the open space lands, including the Crystal Springs Creek (Site H).

**Other Wetland Habitats.** Other wetland habitats within the open space areas include several natural seeps, as well as small patches of emergent aquatic vegetation along tributary waterways. In general, these areas support relatively high species richness (number of species), and a high percentage of native plant species. Seeps can cause slope instability, and may be associated with some of the observed sewer and water line damage observed at Spencer Lake, and with some of the slope instability at other sites.

### 3.2.3 Sensitive Plant and Wildlife Species

A California Natural Diversity Data Base (CNDDDB) records search was conducted in 2006 for the project area for the two 7.5 minute U.S. Geological Service (USGS) quadrangles in which the project area occurs (May & Associates, 2006). The database search yielded 31 sensitive plant species, 10 sensitive invertebrates, 6 sensitive bird species, 4 sensitive mammal species, 1 sensitive fish species, and 2 sensitive amphibian/reptile species considered to have potential to occur within open space lands (May & Associates, 2006).

Of the species identified as having potential to occur, the following sensitive plant and wildlife species or associated habitat features were observed within open space lands during the 2007 Special-Status Species Surveys (May & Associates 2007):

- **California bottlebrush grass** (*Elymus californicus*) - Rowan Tree, Nueva Macadamia, Strawberry Hill, Crocker Lake, Crystal Springs
- **San Francisco collinsia** (*Collinsia multicolor*) - Nueva Macadamia, Strawberry Hill, Crystal Springs, Tobin Clark
- **Wood rat nests** (possibly of the San Francisco dusky-footed woodrat - *Neotoma fuscipes annectens*) were observed at all sites;
- **Raptor nests**, including red-tailed hawk (*Buteo jamaicensis*), red-shouldered hawk (*Buteo lineatus*), and other raptor species. Nesting was observed at Nueva Macadamia, Crocker Lake, Spencer Lake; foraging was observed at all sites;
- **Great blue heron rookery** (*Ardea herodias*) - rookery present at Crocker Lake;
- **Double-crested cormorant foraging site** (*Phalacrocorax auritus*) - foraging habitat observed at Crocker Lake; and
- **Acorn woodpecker granary tree** (*Melanerpes formicivorus*) - granary trees located at Crocker Lake.

Table 3.2.3 summarizes the location of special-status species observed within open space lands. Refer to Figures 3A and 3B for the locations of special-status species on open space lands. A follow-up survey for early-spring blooming special-status plants will be conducted in February or March 2008, and will update the findings presented in this report.

**Figure 3A.**  
**Special-Status Species, Town of Hillsborough open Space Lands (Northern Section)**

**Figure 3B.**

**Special-Status Species, Town of Hillsborough Open Space Lands (Southern Section)**

**Table 3.2.3 Special-Status Species Observed during the 2007 Botanical Surveys, Town of Hillsborough Open Space Areas.**

Common Name	Scientific name	Location								
		A Spencer Lake	B Rowan Tree	C Nueva / Macadamia	D Strawberry Hill	E Crocker Lake	F Cottonwood Court	G Southdown	H Crystal Springs Open Space	I Tobin Clark
<b>PLANTS</b>										
California bottlebrush	<i>Elymus californicus</i>		X	X	X	X		X	X	
San Francisco collinsia	<i>Collinsia multicolor</i>			X	X	X			X	X
<b>MAMMALS</b>										
Woodrat (Possibly San Francisco dusky-footed woodrat )	<i>Neotoma fuscipes</i>	X	X	X	X	X	X	X	X	X
<b>BIRDS</b>										
Acorn Woodpecker	<i>Melanerpes formicivorus</i>			X		X (Granary)				
Double-crested cormorant	<i>Phalacrocorax auritus</i>					X				
Great Blue Heron	<i>Ardea Herodias</i>					X (Rookery)				
Red-tailed Hawk	<i>Buteo jamaicensis</i>		X	X (Nest)						X
Red-shouldered Hawk	<i>Buteo lineatus</i>	X (Pot. Nest)				X			X	X

### 3.3 VEGETATION STRUCTURE - FUEL LOAD ASSESSMENT FIRE MANAGEMENT

In general, the observed open space lands have fuel load and fire management issues similar to other wild land areas in San Mateo County and surrounding coastal areas. The combination of arid Mediterranean climate, high winds, steep canyon and drainage slopes, flammable vegetation, and surrounding land uses (especially roadways and residential use areas) tend to increase fire risk at the sites.

Based on information provided by the California Department of Forestry & Fire Protection (CDF), recent vegetation surveys and site assessments, our knowledge of hazardous fuel loading conditions, and the recent results from the Fire Hazard Severity Zoning created by the State of California (see Section 6.2.1), we identified the following areas as potential fuel and fire management areas:

- **Areas within 100 feet of residential houses** (based on recent California Department of Forestry fire management requirement for San Mateo County for fire safety zone between wild lands and urban interface and consistent with PRC 4291 with minimum clearances to

100 feet. In some areas where the slopes are greater than 30 percent and the vegetation supports non-native eucalyptus forests, recommend increasing this distance (actual distance to be identified based upon forest management and fuel break feasibility).

- **Areas with well-developed “fuel ladders” within the wildland urban interface.** Fuel ladders are defined as multilayered vegetation that effectively connect fires from the forest floor via shrubs, small trees, and vines to the top of the forest canopy. Areas with greater than 50% tree canopy, greater than 50% shrub cover, and grasses present were considered to have a well-developed fuel ladder.
- **Areas with dense to moderate chaparral shrubs and a grassy understory within the wildland urban interface.** Several areas of the site were observed to support shrub vegetation (i.e., chaparral, coastal scrub) with the following characteristics: moderate to dense canopy cover of chaparral shrubs that are known to be flammable (i.e. greater than 50% cover of chaparral shrub species), and grasses present. These areas were considered a high priority for fire management activities.
- **Areas with plants that are known to be flammable.** Several shrubs, notably chamise, eucalyptus, acacia, French broom and other broom species are known to have oils that are flammable, and are therefore considered a high priority for fire management activities when growing in dense to moderately dense stands within the wildland urban interface.
- **Downed trees/slash and woody debris within the wildland urban interface.** The open space areas had some large piles of downed wood, woody debris, and woody slash, as well as garden waste piles that may be considered a fire hazard

Refer to Figures 4A and 4B for locations of recommended fire management zones on open space parcels.

**Figure 4A. Proposed Fire Management Areas (Northern Section)**

**Figure 4B. Proposed Fire Management Areas (Southern Section)**

## 4.0 REGULATORY SETTING

### 4.1 EXISTING EASEMENTS AND LAND USE AGREEMENTS PERTAINING TO OPEN SPACE AREAS

There are several Grant Deeds related to transferring title of Open Space Lands to the Town of Hillsborough. Some of these Grant Deeds also include restrictions related to land uses that may affect vegetation management decisions. Grant Deeds pertaining to Open Space lands are listed below in Table 4.1.

**Table 4.1. Summary of Grants and Easement Restrictions, Open Space Lands**

Agency Recording Deed Grant	Year	Title of Legal Document	Summary of Contents
San Mateo County	2005	Resolution of the City Council of the Town of Hillsborough Approving Amendment the the Agreement Regarding Crocker lake Open Space Area	Amends the original agreement with regards to partial rights of reversionary interest for Crocker lake open Space Area.
San Mateo County	1976	Grant of Water Rights and Deed of Easement, Crocker Lake	Describes Burlingame Country Club's Water rights since 1954. Burlingame Country Club has exclusive right to take and use water from Crocker Lake, subject to the right of the Town of Hillsborough to lower the water in said lake for flood control purposes. Burlingame Country Club also has the right to drill wells and take water from the surrounding adjacent property, subject to approval by Town of Hillsborough as to the location and access of said wells. Burlingame also has easement to install, reinstall, change and maintain such pipelines and conduits as may be required to convey water from Crocker Lake .
San Mateo County	1977	Grant Deed, Spencer Lake Parcels A-1, A-2, A-3 Vol 7455 page 62	Easement reserves right to 1) Public Utilities purposes, 2) Embankment and excavation slopes.
San Mateo County	1977	Grant Deed, Spencer Lake Open Space Uses, Vol 7455 page 69	Easement restricts real property uses to the following "open Space uses" A) Scenic Land; B) watershed or ground recharge land; and C) Wildlife habitat. If said property ceases continuously for two (2) years or more to be used for such purposes the same shall revert to fee ownership to Grantor and its heir and assigns.

San Mateo County	1976	Grant Deed, Skyfarm Unit One, Vol 7049 page 500-518	Easement reserves right to 1) Public Utilities purposes, 2) Embankment and excavation slopes. Easement restricts real property uses to the following "open Space uses" A) Scenic Land; B) watershed or ground recharge land; and C) Wildlife habitat. If said property ceases continuously for two (2) years or more to be used for such purposes the same shall revert to fee ownership to Grantor and its heir and assigns.
<b>Agency Recording Deed Grant</b>	<b>Year</b>	<b>Title of Legal Document</b>	<b>Summary of Contents</b>
San Mateo County	1972	Grant Deed, Skyfarm Unit Two, Lots 31 and 32 Vol 6113 pages 1-8	Easement for the purpose of installing, constructing, completing, repairing, maintaining, operating, replacing and reconstructing any and all public utilities over, under, across, along, and within said parcels one, two, and three herein described. Easement restricts real property uses to the following "open Space uses" A) Scenic Land; B) watershed or ground recharge land; and C) Wildlife habitat. If said property ceases continuously for two (2) years or more to be used for such purposes the same shall revert to fee ownership to Grantor and its heir and assigns.
San Mateo County	1946	Crystal Springs Open Space Parcel Maps	Maps
San Mateo County	1977	Tobin Clark Estates Unit 4, Grant Deed,	(No restrictions on use)

## 4.2 STATE AND FEDERAL LAWS AND POLICIES

### 4.2.1 Wetlands

#### Clean Water Act of 1977

The U.S. Army Corps of Engineers (USACE) and the US Environmental Protection Agency (EPA) have jurisdiction over "Waters of the United States." Waters of the United States are classified as Wetlands, Navigable Water, or Other Waters and include marine waters, tidal areas, stream channels, and associated wetlands. Under federal regulations, wetlands are defined as "those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas."

Policies regulating the loss of wetlands generally stress the need to compensate for wetland acreage losses by creating wetlands from non-wetland habitat on at least an acre-for-acre basis. Projects that cause the discharge of dredged or fill materials in Waters of the United States require permitting by the USACE. Actions affecting small areas of jurisdictional Waters may qualify for a Nationwide Permit, provided conditions of the permit are met (such as avoiding impacts to threatened or endangered species or to important cultural sites). Projects that do not meet the Nationwide Permit

conditions or projects that disturb a larger area require an Individual Permit. The process for obtaining an Individual Permit requires a detailed alternatives analysis and development of a comprehensive mitigation/monitoring plan.

#### **California Department of Fish and Game Code**

California Fish and Game Code governs state-designated wetlands, including riparian and stream habitat, and mandates that mitigation be implemented to replace wetland extent and value lost to development. Sections 1600-1607 of the California Fish and Game Code regulate activities that would affect rivers, streams, or lakes by altering the flow, substantially change or use any materials from the bed, channel or bank of any river, stream or lake, or disposing of debris. Activities that affect these areas, as well as associated riparian habitats, would require a Streambed Alteration Permit from the California Department of Fish and Game (CDFG). In addition, Section 3503 of the California Fish and Game Code prohibits impacts to actively nesting birds, their nests, or their eggs.

#### **Porter-Cologne Water Quality Control Act and Section 401 of the Clean Water Act**

The Regional Water Quality Control Board (RWQCB) administers both the Porter-Cologne Water Quality Control Act and Section 401 of the Clean Water Act. The Porter-Cologne Water Quality Control Act, Water Code Section 13260, requires that “any person discharging waste, or proposing to discharge waste, within any region that could affect the ‘waters of the State’ to file a report of discharge” with the RWQCB. Waters of the State as defined in the Porter-Cologne Act (Water Code Section 13050 [e]) are “any surface water or groundwater, including saline waters, within the boundaries of the state.” Pursuant to Section 401 of the Clean Water Act, the RWQCB consider waters of the state to include but are not limited to rivers, streams, lakes, bays, marshes, mudflats, unvegetated seasonally ponded areas, drainage swales, sloughs, wet meadows, natural ponds, vernal pools, diked bay lands, seasonal wetlands, and riparian woodlands. The RWQCB has also claimed jurisdiction and exercised discretionary authority over “isolated waters.”

### **4.2.2 Sensitive Plant and Wildlife Species**

#### **Federal Endangered Species Act**

The Federal Endangered Species Act (FESA) provides legislation to protect federally listed plant and animal species. Impacts to listed species resulting from the implementation of a project would require the responsible agency to consult the U.S. Fish and Wildlife Service (USFWS). Section 7 of the FESA requires that all federal agencies must, in consultation with the USFWS or National Marine Fisheries Service (NMFS), ensure that its (the agency’s) actions do not jeopardize the continued existence of a listed species, or destroy or adversely modify the listed species’ “critical habitat.” Section 10 of the Act describes the process by which take permits are issued by USFWS/NMFS for take of listed species incidental to an otherwise lawful activity.

#### **California Endangered Species Act**

The State of California Endangered Species Act (CESA) provides legal protection for plants or wildlife species listed as rare, threatened, or endangered. The California Code of Regulations Title 14 Section 670.5 lists animal species considered endangered or threatened by the state and the CDFG maintains lists of plant and animal species designated endangered, threatened, and rare. The CDFG also maintains a list of “Species of Special Concern” based on limited distribution, declining populations, diminishing habitat, or unusual scientific, recreational, or educational value. Under State law, the CDFG is empowered to review projects for their potential to impact state listed species and Species of Special Concern, and their habitats.

**Migratory Bird Treaty Act**

The Migratory Bird Treaty Act makes it unlawful to “take” (kill, harm, harass, shoot, etc.) any migratory bird listed in 50CFR 10, including their nests, eggs, or young. Migratory birds include geese, ducks, shorebirds, raptors, songbirds, and seabirds.

## 4.3 LOCAL PLANS, POLICIES, AND ORDINANCES PERTAINING TO VEGETATION MANAGEMENT

### San Mateo County General Plan

The San Mateo County General Plan identifies goals and objectives pertaining to vegetation, water, fish, and wildlife resources. Relevant portions include:

- Promote the conservation, enhancement, protection, maintenance and managed use of the County's Vegetative, Water, Fish and Wildlife Resources.
- Protect sensitive habitats from reduction in size or degradation of the conditions necessary for their maintenance.
- Regulate land uses and development activities to prevent, and if infeasible mitigate to the extent possible, significant adverse impacts on vegetative, water, fish and wildlife resources.
- Place a priority on the managed use and protection of vegetative, water, fish and wildlife resources in rural areas of the County.
- Ensure that development will:
  - (i) minimize the removal of vegetative resources and/or;
  - (ii) protect vegetation which enhances microclimate, stabilizes slopes or reduces surface water runoff, erosion or sedimentation; and/or
  - (iii) protect historic and scenic trees.
  - (iv) minimize the alteration of natural water bodies;
  - (v) maintain adequate stream flows and water quality for vegetative, fish and wildlife habitats;
  - (vi) maintain and improve, if possible, the quality of groundwater basins and recharge areas; and
  - (vii) prevent to the greatest extent possible the depletion of groundwater resources.
- Ensure that development will minimize the disruption of fish and wildlife and their habitats.
- Regulate land uses and development activities within and adjacent to sensitive habitats in order to protect critical vegetative, water, fish and wildlife resources; protect rare, endangered, and unique plants and animals from reduction in their range or degradation of their environment; and protect and maintain the biological productivity of important plant and animal habitats.
- Establish necessary buffer zones adjacent to sensitive habitats which include areas that directly affect the natural conditions in the habitats.
- Encourage and support the control of vegetation, fish and wildlife resources which are harmful to the surrounding environment or pose a threat to public health, safety and welfare.
- Minimize the negative impacts and risks of programs controlling incompatible vegetation, fish and wildlife.

### Town of Hillsborough Tree Ordinance

Title 14 of the Town of Hillsborough's Municipal Code provides some provisions for tree removal that would likely apply to Open Space lands. Specifically, Section *14.04.050 Procedure—Unimproved Land Other Than Subdivisions* includes the following guidance:

A. No tree removal shall be permitted on any vacant unimproved land without first obtaining approval from the city engineer or his authorized representative.

- B. The city engineer shall consider the following in determining his approval or denial:
1. Type of tree;
  2. Desirability in the neighborhood;
  3. Condition of the tree with respect to disease, danger of falling, or interference with utility services;
  4. Effect on erosion, soil retention, and the diversion or increased flow of surface water;
  5. Good forestry practices;
  6. Number of existing trees to remain;
  7. Alternatives available.

Once final tree plans are developed, the city engineer should be contacted for approval or denial of planned tree removals.

## **4.4 FIRE MANAGEMENT REGIONAL AND LOCAL RESTRICTIONS, GUIDELINES, INITIATIVES AND ORDINANCES**

### **4.4.1 Defensible Space/Vegetation Clearing around Buildings**

The protection of all buildings from wildfire within the Town of Hillsborough requires the continued clearing of vegetation around residential structures, fire and access roads and park infrastructure. The defensible space required around residential structures directly adjacent to open space land is defined as 100 feet utilizing PRC 4192 standards. The 100-foot defensible space requirement is stated within 3 different pieces of California legislative code – Public Resources Code 4921-4299, Government Code 51182, the Code of Regulations 1299. These codes all apply to structures/property that are upon or adjacent to a mountainous area, forest-covered, brush-covered and/or grass-covered lands, or any land covered with flammable materials.

Brush and weeds must be cut to the ground, raked up, and removed from the property. Single specimens of trees and shrubbery and some ground cover, provided that they don't form a means of rapidly transmitting fire. Trees within this space should also be limbed up a minimum of 6 feet above the ground for large trees and proportionately for smaller trees. Flammable vegetation and combustible growth should be cut and removed from below the canopies of the *trees* (Source: *Living with Fire – A Guide for the Homeowner, County of San Mateo- Appendix B*).

Fire-safe or fire-resistant landscaping may be recommended in areas abutting natural open space areas, with the goal of reducing the risk of fire movement. The County of San Mateo Firesafe website ([www.smcfiresafe.org](http://www.smcfiresafe.org)) provides a list of plants that can be integrated into residential and commercial landscapes. See Appendices A and B for a list of additional resources, public education tools and publications related to fire management.

### **4.4.2 Wildland-Urban Interface Initiative**

The federal Wildland-Urban Interface Initiative (WUI) program was designed to facilitate cooperative ventures with federal agencies, states, counties, private landowners, and local fire agencies to reduce the potential for wildland fire to burn from federal lands to neighboring properties. Nearby federal lands include the National Park Service, Golden Gate National Recreation Area. Fuel reduction projects in communities adjacent to GGNRA occur on parklands near the interface with private property or lands managed by other agencies.

#### **4.4.3 Wildfire Suppression**

The current policy for the Town of Hillsborough is to suppress all unplanned ignitions (San Mateo County Fire Chiefs' Response Plan). Suppression of fires will be aggressive and will be conducted with the highest regard for human safety while minimizing resource impacts within open space areas from suppression activities. A "confine," "contain," or "control" strategy would be used in the suppression of all wildfires, with the majority of wildfires suppressed using the control strategy. Fire suppression methods used should be those that cause minimum resource damage while accomplishing effective control.

## **5.0 VEGETATION MANAGEMENT GOALS**

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The following goals were developed specifically to help guide the vegetation management strategy. Many of these goals also help meet the Town of Hillsborough's stated open space goals, as stated in the General Plan (Town of Hillsborough General Plan, Adopted March 2005).

### **5.1 GOAL 1. PROTECT NATURAL RESOURCES**

The Town of Hillsborough intends to manage its open space lands in a manner that protects its natural resource values over time. The following sub-goals were developed for the open space vegetation management program to reach this goal.

**Sub-Goal 1. Manage Open Space Lands to Maximize Overall Habitat Diversity**

**Sub-Goal 2. Maintain Sensitive Species and Their Associated Habitats**

**Sub-Goal 3. Control and Remove Invasive Non-Native Plant Species**

**Sub-Goal 4. Stabilize and Restore Natural Creek Channels and Drainage Systems**

**Sub-Goal 5. Reduce and Control Non-Natural Erosion**

### **5.2 GOAL 2. REDUCE FUEL LOAD, IMPROVE FIRE PROTECTION, MAINTAIN FOREST HEALTH**

The Town of Hillsborough intends to manage open space lands in a manner that reduced overall fuel load and reduces fire risk, while maintaining the health of the forested areas within the open space lands. The following sub-goals were developed for the open space vegetation management program to reach this goal.

**Sub-Goal 6. Actively Manage Forests to Reduce Fuel Loads and Increase Forest Health**

**Sub-Goal 7. Facilitate Establishment and Maintenance of 100-foot Defensible Space Buffer near Buildings; Coordinate with Local Fire Management Agencies and Residents to Reduce Fire Potential on Open Space and Surrounding Lands**

**Sub-Goal 8. Replace Non-Native Trees (Acacia, Eucalyptus) with Native Trees Over Time**

**Sub-Goal 9. Conduct Outreach to Neighbors to Reduce Garden Waste Dumping on Public Lands**

**Sub-Goal 10. Conduct Routine Hazard Tree and Tree Disease Assessments, Treat Problem Trees as Necessary for Forest Health and Resident Safety**

**Sub-Goal 11. Adopt the International Wildland Urban Interface Code into Town Ordinance**

**5.3 GOAL 3. MAINTAIN CROCKER LAKE, CREEKS, OTHER WETLAND HABITATS**

The Town of Hillsborough intends to work with the Burlingame Country Club to maintain Crocker Lake as a functioning wetland feature. Crocker Lake is partially used for water storage, in accordance with its water rights agreement with the Burlingame Country Club. The Town of Hillsborough intends to remove sediment, and work to reduce sediment loads from entering into Crocker Lake to help ensure the long term viability of the lake.

Spencer Lake, because of its advanced state of eutrophication and the difficulty and expense of managing the lake in its current ecological setting in a closed watershed basin, will be passively managed for flood flow retention only. The drainage structure in Spencer Lake will be kept clear of debris to help ensure the functioning of Spencer lake as a flood flow retention structure over time.

The Town of Hillsborough also intends to maintain the overall functioning of the many creeks and tributary waterways and other wetlands within open space areas. The following objectives were developed for the open space vegetation management program to reach this goal.

**Sub-Goal 12. Maintain Water Storage Potential, Water Quality, and Aquatic Habitat Values in Crocker Lake**

**Sub-Goal 13. Maintain Drainage Structure in Spencer Lake**

**Sub-Goal 14. Protect Lakes, Creeks, and Other Wetlands from Erosion and Non-Point Source Pollutants**

**5.4 GOAL 4. CONSIDER INCREASING PUBLIC OR EDUCATIONAL USES OF OPEN SPACE LANDS**

The Town of Hillsborough intends to actively seek opportunities for partnerships with educational institutions who may wish to use open space lands for educational purposes. Finally, the Town of Hillsborough wishes to encourage volunteer stewardship of open space lands in the context of the goals and objectives for vegetation management stated herein. The following objectives were developed for the open space vegetation management program to reach this goal.

**Sub-Goal 15. Investigate Partnerships with College of San Mateo and Local Schools to Assist in the Management of Open Space Lands**

**Sub-Goal 16. Encourage Volunteer Stewardship and Educational Uses within Open Space Lands**

**Sub-Goal 17. Reduce Impacts from Human Use and Trespass onto Open Space Lands**

**Sub-Goal 18. Consider Providing Limited Access to Some Open Space Lands.**

## 6.0 VEGETATION MANAGEMENT TECHNIQUES AND APPROACHES

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### 6.1 SENSITIVE RESOURCE MANAGEMENT

Natural resources exist in a dynamic, ever-changing state that is affected as much by environmental conditions (rainfall, temperature, vegetation succession) and random events (wildfires, landslides, diseases, etc.) as by management activities. Therefore, effective management of sensitive resources must recognize and account for the ever-changing nature of the sites and shift focus to maintaining the long term health and viability of the natural communities that sensitive resources depend on. Sensitive resources include special-status plant and wildlife species, raptor and other migratory bird nests, wood rat nests, acorn woodpecker granaries, great blue heron rookeries, native plant communities, and wetlands.

In practical terms, this means management decisions require (1) baseline knowledge of the individual sensitive species' ecological needs, and (2) periodic assessment of the sensitive resource populations and their habitats at each open space area.

#### 6.1.1 Detecting Trends in Special-Status Species Populations

Knowing the number and distribution of target special-status species is an important component to determining effective management strategies. Over time, if this data is collected, a staff person or land manager can detect trends in population decline, and also where such declines are taking place, important clues to determining where and how best to spend management efforts on protecting the species. Regular monitoring of special-status species known to occupy open space lands (i.e., California bottlebrush, San Francisco collinsia, wood rat nests, great blue heron nests/rookeries, woodpecker granary trees, and raptor nests) is recommended to provide staff with information to support management decisions regarding appropriate management.

An invaluable resource for Town staff are local experts -- representatives from Audubon Society, California Native Plant Society, and local citizens who often have a wealth of knowledge about the ecological requirements and population status of the special-status species in Town of Hillsborough's open space lands. These organizations and individuals will usually provide accurate and low cost or free information which is usually more up-to date than traditional sources such as the California Department of Fish and Game's Natural Diversity Database (CNDDDB). A list of valuable references with regards to sensitive resources is provided in Appendices A and B.

Equally important is to maintain an effective system for storing and comparing biological resource data. A GIS database of natural communities and special status species has been developed for the open space lands (May & Associates 2006, 2007). The GIS database should be maintained, and updated (i.e. as new special-status species are found, and/or approximately every 3-5 years, as funding allows). This would greatly increase effective management of all species. Data on species occurrence and population size can be periodically collected as funding allows, or collected by volunteers, or during various studies, and added to the Town's centralized database.

### **6.1.2 Detect Changes in Habitat Required by Sensitive Species**

Knowing the distribution and abundance of the natural habitats associated with sensitive species is important in determining effective management strategies. For example, San Francisco collinsia is usually found on cut banks and other disturbed rocky soil areas along trails and roads. Management of this species, therefore requires not only efforts to prevent harm to individual plants along roads (i.e., fencing signing, limiting work in and near the habitats), but also making sure that enough suitable habitat (i.e., cut banks, rock areas) is present over time. In this example, it would be important for a land manager to know where the host plant's suitable habitat is located, and in what condition the habitat is in any given management year. If, for instance, rocky cut banks and other rocky soil areas were found to be declining due to grassland expansion, management could focus on reducing grasses and other plant cover in such areas that may be displacing the San Francisco collinsia and therefore limiting the health of the population. Refer to Appendix B for handouts describing special-status species, habitat requirements, and respective management recommendations.

### **6.1.3 Maintain a Diversity of Natural Habitats for Special-Status Species**

One of the simplest and most effective ways to help ensure that special-status species populations are sustained into the future is to preserve the variety and health of the natural habitats that are currently present at each open space site. While the concept is simple, detecting changes can be difficult. For example, climatic changes such as cycles of drought and heavy rain can shift the abundance and distribution of shrublands, grasslands and even forests over time. Likewise, some evidence suggests that global warming is altering the distribution of both common and sensitive species and habitats, shifting species along elevation (and related temperature) gradients. While we do not suggest trying to manage for a static (unchanging) condition on Hillsborough's open space lands, it is valuable for managers to be able to track vegetation changes over time.

The Town of Hillsborough has already developed a GIS database of vegetation types found on open space lands (May & Associates, Inc. 2006, 2007). This database should be updated over time, as funding allows. In some instances, active management may be required to artificially correct shifts in vegetation types over time. For example, it is very likely that grassland habitats at Tobin Clark may be shifting towards becoming chaparral shrubland. In this example, actively removing shrubs in specific locations may help maintain habitat 'mosaics' that could then be allowed to persist at this site, as well as reduce fuel loads on steep slopes. Similar management decisions can be reached on an open space site-by-site basis through a relatively fast and inexpensive comparison of past and present aerial photographs every 3 to 5 years. Comparing aerial photographs of the same site over decades can provide indicators of vegetation trends, including loss or expansion of grasslands, shrublands, and forested lands. This also provides important information for future management.

### **6.1.4 Maintain Wildlife Corridors**

Wildlife corridors, large connected areas of habitat, are recognized as important to maintaining wildlife species diversity and abundance (Noss 1983, Noss 1987; Gilbert *et al.*, 1998; Perault and Lomolino, 2000). Such corridors allow wildlife (and plant) species to move between habitat patches, allowing re-colonization where a local extinction event has occurred, and providing increased foraging area and escape areas for a wide variety of species. A network of small patches in close proximity to one another (habitat "stepping stones") can also increase wildlife population sizes and persistence.

The Town of Hillsborough's open space lands are important as wildlife movement corridors. The general rule of thumb for maintaining wildlife corridors is 'bigger is better'; i.e. the larger and more

contiguous the area, the more likely that it will act as a wildlife corridor. Staff should consider the effects of placing trails, access points, fire breaks, and other features on these larger contiguous tracts of habitat, and if possible, place such features on the edges or in clusters to help keep the corridors as 'intact' as possible.

### 6.1.5 Minimize 'Edge Effect'

Another simple way to help preserve sensitive resources is to minimize edge effects. This simple concept means that resources in the center of a site are less subject to effects from negative pressures such as weed infestations than resources located on the edges. The shape of the open space land parcel becomes important, as square and round parks have less edge than long thin or rectangular parks.

In practical terms, staff should check park perimeters periodically for the following pressures that could affect the health of the open space areas. These 'edge effects,' including but not limited to:

- **Invasion of invasive plants from neighborhood backyards.** This is thought to be one of the main pathways on how invasive non-native plants enter into wildlands. Backyard garden plants that become problematic in wildlands include calla lily, periwinkle, several species of ivies, several species of brooms, Pampas grass (or jubata grass), fountain grass, and other cultivated ornamental garden plants.
- **Neighborhood trespass onto open space land,** including the following types of private uses on open space lands - dog kennels, gardens, volleyball, tennis courts and other private recreational uses, tree forts, barbeque sites, etc.
- **Inadvertent introduction of irrigation water and backyard chemicals** (e.g., oil dump sites, herbicide and pesticide runoff, irrigation runoff, broken water and sewer pipelines, drainage and/or pipeline outfall from urban landscaping).
- **Fuel and fire breaks next to neighborhood fence lines** (mostly thought of as a positive edge effect).
- **Domestic pets that escape into park lands** and hunt and kill native wildlife and songbirds.

In most cases, developing good relationships with neighbors will help ensure minimal edge effects on sensitive natural resources. A public outreach and education program may be helpful in correcting problems such as green waste dumping. In some instances, active management may be required to correct problems, such as fixing fences to exclude pet trespass, fixing irrigation problems, cooperatively maintaining adequate fuel reduction areas etc.

### 6.1.6. Actively Manage for Special-Status Species

Some species within open space lands are rare, some of which are protected under state or federal law, or may become listed in the future as threatened or endangered under the state or federal Endangered Species Acts. Refer to Table 3.2.3, and Figures 3A and 3B above for details of special-status species observed on Town of Hillsborough open space lands.

Management decisions related to special-status species should be guided by the following:

- **Is the species proposed for listing or listed under the federal or state endangered species act?** If so, some consultation (formal or informal) may be required with state and federal resource agencies before implementing management activities for the species. At present, no listed species are known within open space lands. However, open space lands are within the range of two federally-listed species, the threatened California

red-legged frog and the endangered San Francisco garter snake. Since detailed protocol-level surveys were not included as part of the open space lands assessment, presence or absence of these two species could not be concluded as part of this report. The overall potential for occurrence of both California red-legged frog and San Francisco garter snake is considered low (based on habitat conditions at open space lands, the relatively small size of the open space parcels, the lack of clear travel corridors for the species, and the overall heavy development surrounding the open space parcels). To help ensure that neither of these species is affected by management activities, if present, the Town of Hillsborough should consider the potential presence of these two species during open space management planning. In addition, the Town should actively seek to improve habitat conditions for them wherever possible (i.e., maintain and improve aquatic habitat at Crocker Lake and Spencer Lake [the most likely locations to support these species], retain native vegetation, and reduce overall habitat fragmentation on open space lands). **Is the species in decline with the open space lands or regionally? If so, active management may be required.**

- **What is limiting the species?** In some instances, the condition of the open space may be limiting the amount of suitable habitat available for the species. For example, steelhead, a federally listed species, may be affected if erosion and/or sediment are introduced into spawning streams adjacent to the Crystal Springs open space area. Reducing erosion on the adjacent upslope Crystal Spring parcel, may help improve conditions for the species in the nearby (offsite) creek.
- **What are other (nearby) land managers doing to maintain the health of the species?** Where possible, staff should seek to add to existing program or use similar management approaches as other nearby land managers. An example of this would be the GGNRA who is actively managing the Mori Point Park site for both San Francisco garter snake and California red-legged frog. The GGNRA, in association with the U.S. Fish and Wildlife Service has developed land management actions intended to maintain the recreation uses of this site while managing snake and frog populations and enhancing habitat values of the site. Although there are no official records of San Francisco garter snake or California red-legged frogs within the Hillsborough open space lands, it is possible that these species are present, or will move into the area in the future. In this example, it would be useful for staff to coordinate with GGNRA and USFWS to implement similar management strategies (if their open space lands are found to support San Francisco garter snake and California red-legged frog in the future). Another example would be partnering with SFPUC to maintain populations of California bottlebrush grass on Town lands at Crystal Springs open space lands and the adjacent SFPUC right-of-way.

Once these factors and issues are identified, appropriate active management actions can be identified. Some of the active management actions that may be considered by Town staff include:

- **Controlling invasive non-native plants** that are displacing native habitats required by special-status species.
- **Creating or restoring natural habitats** to create larger, interconnected habitat areas;
- **Modifying maintenance practices** to help reduce potential for mortality or harm. For example, open space managers and maintenance crews can change the timing of mowing

for fuel reduction to after seed set is complete in California bottlebrush (Typically in August).

- **Establishing a training program** to build staff understanding and capacity, and ensure best management practices are successfully implemented.
- **Initiating a forest monitoring and adaptive management program** to include annual assessments of hazard trees and presence of sudden oak death and other tree and plant diseases. Maintenance crews could work with arborists to reduce hazards and the spread of pathogens with open space areas.

## 6.2 FUEL LOAD MANAGEMENT

This section provides greater detail regarding the identification and detection of problem areas, and vegetation management approaches for implementing effective fire and fuel load management.

Successful fuel management includes strategic planning and implementation of treatments ranging in scale from site-specific to landscape level. These treatments should be designed to improve the Town's ability to protect life and property as well as maintaining healthy natural areas. Fuel reduction activities can reduce the fire hazard of all fuel types when risk assessments demonstrate a reasonable chance for future wildland fire damage. A goal of fuel reduction projects is to provide for increased protection of homes within and adjacent to open space areas while protecting and enhancing natural systems to the greatest degree feasible.

Fuels are considered to be any organic material (e.g., live and dead vegetation, litter, and duff) that may combust during a fire. Fuel models are often used to evaluate the arrangement and type of fuels. There are several models that assess environmental parameters (e.g. weather, slope, aspect, vegetation community, canopy cover, etc.) and fuel characteristics into predicting fire behavior and hazard risks. Assessing the degree of a potential fire hazard is also dependent upon the degree of human use and occupancy in and near the open space area, the level and ability of public services to respond to fires.

The Town of Hillsborough is using the recently published (2007) CAL-FIRE maps as a tool to assess fire hazards, specifically the maps for Local Responsibility Areas (LRA). The LRA maps designate areas as Very High, High, and Moderate fire hazard severity zones where appropriate using parameters which include fuels, weather, slope, housing density, and vegetation type and structure.

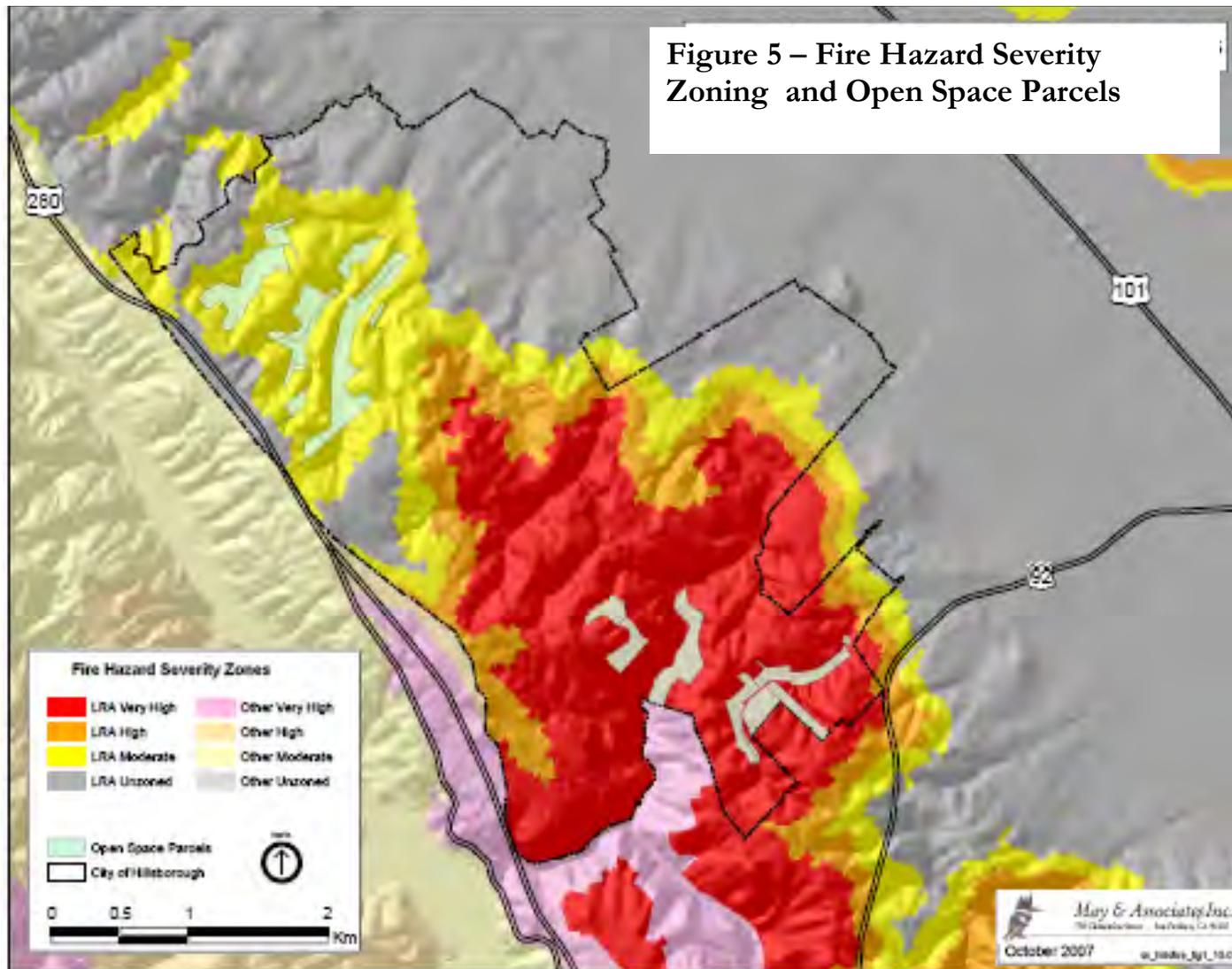
Section 6.2.1 further describes the fire hazard zoning assessment technique, including the environmental parameters used to inform the assessment. Figure 5 is an output from the CAL-FIRE assessment and illustrates fire hazard severity zones.

**Figure 4A. Proposed Fire Management Areas (Northern Section)**

**Figure 4 B. Proposed Fire Management Areas (Southern Section)**

**Figure 5 – Fire Hazard Severity Zoning for the Town of Hillsborough As Developed Through the FRAP Assessment (2007)**

[Note: the open space parcels that are the focus of this Vegetation Management Strategy are depicted as white polygons on the map to provide spatial context. Assume that the fire hazard severity for each polygon is consistent with the surrounding zoning.]



### 6.2.1. Assessing Vegetation Density and Structure as a Part of Fire Hazard Severity Zoning

In addition to weather factors and slope characteristics, one of the key components in measuring fire hazard severity is the type, density and quantity of flammable vegetation within a given unit of land area. This factor, known as “fuel loading characteristics” is combined with weather and slope information to determine fire hazard (Polet and Omi, 1999). Fuel loading is broken into 3 categories:

- **“Heavy” Fuel Loading Vegetation** is comprised of woodland and mixed woodland and brush areas with vegetation more than six feet tall, including conifers, mixed conifer/oak woodlands, riparian forests and riparian woodlands, and oak woodlands. Fuel ‘ladders’ (i.e., multilayered vegetation that effectively connects fires from the forest floor via shrubs, small trees, and vines to the top of the forest canopy) are especially dangerous during fires.
- **“Medium” Fuel Loading Vegetation** includes open savanna type oak stands, individual trees, and scrub vegetation less than six feet in height, such as California sagebrush, coyote brush, chaparral, and manzanita.
- **“Light” Fuel Loading Areas** are mostly treeless and shrub-less areas. Vegetation types include grasslands, herbaceous rangelands, and irrigated pasture lands.

Vegetation community types and distributions can be determined from interpreting aerial photographs and then validated through field surveys. Vegetation community types were differentiated using hyper-spectral mapping (performed by U.C. Berkeley) for creating CALFIRE’s Fire Hazard Severity Zoning. May and Associates (2006) also performed vegetation field surveys of individual open space parcels that further differentiated the vegetation community composition within all of the open space areas. This data, combined with the LRA data, provides the Town of Hillsborough with both an understanding of the distribution of the fire severity zoning, and the specific distribution of heavy fuel loading vegetation within the open space areas. Such information could assist the Town with making decisions related to reducing fuel loads on open space lands and potentially lowering the fire severity hazard rating in the general area surrounding open space parcels.

Figures 4A and 4B (above) depicts the heavy vegetation fuel load areas on open space parcels and the 100-foot defensible buffer area within each open space parcel.

### 6.2.2 Fuel and Fire Breaks, Fire Resistant Landscaping

Three basic methods are commonly used to manage the spread of wildfires: firebreaks, fuel reduction areas and fire-safe landscaping. A firebreak eliminates all vegetation and combustible growth within a defined corridor (often a fire road) to prevent fires from spreading. A fuel reduction area reduces the fuel mass and structure of flammable vegetation and combustible growth, thereby limiting the intensity of fire and slowing its rate of spread. Landscaping with fire resistant or fire-safe plants provides a third option for slowing the spread of wildfires adjacent to structures.

A 100-foot buffer between urban areas and wildlands is required based upon the Town’s adoption of Appendix II-A of the Uniform Fire Code (Yballa, pers. comm. .) The Town will manage its open space lands, where appropriate and within the 100-foot buffer to residential/commercial structures to further aid in the reduction of fire risk (Figure 4A and 4B above). Annual inspections and

maintenance of existing fire breaks, strengthening ‘good neighbor’ relationships (e.g., seeking to reduce the threats of wildfires spreading from the park perimeters into the parks by undertaking fire management restrictions on adjacent lands), and establishment of new fire breaks in areas designated as “high” fire danger areas are all recommended as part of this effort.

For the most part, new fire and fuel reduction areas are established using traditional mechanical methods of mowing, thinning, chipping or disking a swath of habitat that is wide enough to stop a wildfire from moving across or into an area. Shaded fuel breaks – reducing density of underbrush, removing tree limbs can also provide an effective mechanism to reduce the vegetation structure and density while maintaining habitat values such as nesting substrate, canopy cover, soil moisture and protection. Alternatively, fuel density can be reduced within areas adjacent to natural areas by strategically clearing vegetation in a mosaic pattern, leaving patches of uncleared areas that can continue to support wildlife habitat and potentially sustain sensitive species.

A number of land management agencies integrate the short-term use of animals (such as cows or goats) to reduce fuels. Goats are often used on steep slopes and in areas with dense grassland thatch and understory species.

Fire and fuel reduction areas can cause environmental damage, including segmenting native habitats, disrupting wildlife movement corridors, causing mortality of sensitive species, and increasing and spreading invasive plant populations. New fire breaks should be carefully planned to avoid such impacts by relocating the fire breaks to less sensitive areas to the greatest degree feasible. For example, creating fire break should be avoided during peak bird nesting season, and near sensitive plant populations while the plants are actively flowering and setting seed (e.g. near California bottlebrush grass populations). Providing seasonal timing restrictions helps ensure that sensitive plant and wildlife resources are protected while fuel break are maintained.

Establishing fuel breaks or reducing fuel density in areas infested by non-native shrubs and trees provides an optimal strategy to accomplish multiple vegetation management goals. Species such as French broom, acacia, eucalyptus and Monterey cypress and cultivated pine trees are very flammable and convey fire quickly. Containing, removing or thinning these species is important in areas directly adjacent to urban and suburban edges.

Fire-safe or fire-resistant landscaping techniques are continually being researched and refined. Most of the research has focused on developing guidelines for maintaining vegetation and landscape features within residential and commercial properties abutting natural open space areas. Appendix B includes a selection of local resources available for home and landowners to create effective defensible space. Two excellent publications for selecting fire resistant landscaping include *Living with Fire – A Guide for the Homeowner, County of San Mateo*; (Appendix B) and “*Firescape Landscaping to Reduce Fire Hazard (EBMUD, 2003)*”, available in Appendix B and online at: [http://www.ebmud.com/conserving\\_&\\_recycling/conservation\\_publications/firescape\\_booklet.pdf](http://www.ebmud.com/conserving_&_recycling/conservation_publications/firescape_booklet.pdf).

There is much less research available or underway regarding the creation and subsequent management of ecologically-sustainable natural habitats along park urban interfaces to reduce fuel structure and load. There are several research and adaptive management efforts currently underway in California studying these alternative methods of establishing fire breaks, including revegetation with fire resistant vegetation. Although the results of these initial adaptive management activities have not yet been published, Town of Hillsborough should seek to keep abreast of new fire break methodologies as they are developed.

### 6.2.3 Related Fire Plans

**Golden Gate National Recreation Area.** The GGNRA signed a Record of Decision and published the Final Environmental Impact Statement (FEIS) for Fire Management in San Francisco, Marin, and San Mateo National Parks lands in 2006 (GGNRA 2006). Although this document is not specific to The Town of Hillsborough, it may provide useful information on the types of fire management practices that can be effectively implemented in wildland situations near urban areas, and fuel reduction programs conducted in sensitive species habitats.

The following information was excerpted from the final GGNRA fire management plan FEIS:

“...Naturally occurring fire is an important ecological process necessary for maintaining the native plant communities of the park, but wildfire poses a hazard to life and property in the park's urban / wildland interface and developed sites within the park. GGNRA practice has been to aggressively suppress all wildland fire in the park whether naturally occurring or human-caused. The fire management plan includes the following fuel reduction strategies:

- Prescribed fire;
- Mechanical fuel reduction (e.g., mowing, cutting to remove invasive shrubs and trees, and selective thinning in forested stands);
- Continued implementation of the Wildland Urban Interface Initiative;
- Maintenance of the park's fire roads and trails;
- Vegetation clearing around park buildings;
- Suppression of unplanned ignitions;
- Public information and education;
- Construction of a new fire cache for equipment storage; and
- Continuation of the current fire monitoring program...”

San Mateo County locations included within the GGNRA Fire Management Plan include:

- **Milagra Ridge.** The site contains significant cultural and historical resources as well as important mission blue butterfly, California red-legged frog, and San Francisco garter snake habitat. The vegetation in the project area is dominated by coastal scrub, and includes areas of grassland and riparian forest. Nonnative evergreen forest is also present. The primary fire management issue here is the reduction of hazardous fuel loads in areas adjacent to developed communities.
- **Mori Point.** The area is dominated by grassland interspersed with coastal scrub. The low-lying areas contain herbaceous wetlands and riparian scrub, which are home to the San Francisco garter snake and the California red-legged frog. The western edge of the area consists of unvegetated shoreline.
- **Phleger Estate.** Vegetation in the area is dominated by Douglas-fir/coast redwood (second-growth) and native hardwood forests. Several acres of coastal scrub are located along the northern boundary, and a small amount of grassland is found along the eastern edge. The Phleger Estate is in the West Union/Francisquito Creek watershed, which contains steelhead. The fire management concern in this project area is the hazardous fuel load buildup with the potential for wildland fire in close proximity to developed areas.
- **Pedro Point.** The vegetation in this area is mostly coastal scrub, with nonnative evergreen forest encroaching from the northern boundary. The fire management issue here is the buildup of hazardous fuels adjacent to the Highway 1 corridor and other built-up areas.

- **Sweeney Ridge/Cattle Hill.** The majority of this area is coastal scrub, with large areas of grassland in the north and riparian scrub in several of the drainages. Stands of nonnative evergreen forest (mostly eucalyptus) encroach into the project area from outside the park boundary. The fire management needs in this project area are to reduce the fire hazards adjacent to the Vallemar neighborhood and to maintain adequate fire road access.

**California Department of Forestry and Fire Protection Fire Management Plan for the San Mateo/Santa Cruz Unit.** The California Department of Forestry And Fire Protection Fire Management Plan San Mateo/Santa Cruz Unit, California Northern Region published a Fire Management Plan in July 2002. The overall goal of this plan is to reduce total wildfire costs and losses from wildland fire by protecting assets at risk through focused vegetation management projects and aggressive “Fire Safe Defense Awareness” Programs throughout the San Mateo and Santa Cruz Unit. This document is a dynamic working plan that will be reviewed and updated periodically yet is flexible enough to meet the needs of the Unit. The intent is to keep it simple, easy to understand and, above all, a “guide”. The major components of the plan (excerpted from the document) include:

- Creation of local forums to determine what the fire problem is through input from citizens, community groups, local agencies and other stakeholders.
- Identification of assets at risk, enabling the stakeholder forums and the Unit to set priorities for vegetation management project work. These assets include citizen and firefighter safety, structures, watersheds, wildlife and habitat, timber or unique areas of cultural or historic significance, and air quality.
- Development of wildfire protection zones through vegetation management projects that reduce the risks of large damaging wildland fires.
- Development and implementation of vegetation management projects cooperatively with stakeholder forums. Projects may include a combination of mechanical clearing or prescribed fire.

Given that several adjacent land managers have completed fire management documents, the Town of Hillsborough could create joint practices with San Mateo City and San Mateo County in so far as meeting some type of standard approach to address Wildland Urban Interface issues through a cooperating agreement or Memorandum of Understanding. An optimal open space area to pilot this approach with both the City and County of San Mateo County could be Tobin Clark.

### 6.3 INVASIVE NON-NATIVE PLANT SPECIES CONTROL

Table 6.3 presents invasive species that were detected in open space lands in 2007.

**Table 6.3. Invasive Species Known to Occur in Town of Hillsborough Open Space Areas.**

Scientific name	Common name	Location									
		A Spencer Lake	B Rowan Tree	C Nueva / Macadamia	D Strawberry Hill	E Crocker Lake	F Cottonwood Court	G Southdown	H Crystal Springs Open Space	I Tobin Clark	Unspecified location
<i>Acacia sp. (baileyana)</i> (Cultivar)	Bailey's acacia			X		X	X		X		
<i>Acacia decurrens</i>	Green wattle			X		X	X		X		
<i>Acacia melanoxylon</i>	Blackwood acacia					X					X
<i>Agave sp.(americana)</i> (Cultivar)	Century plant					X					
<i>Arceuthobium sp.</i>	Dwarf mistletoe					X					X
<i>Bambusa sp.</i>	Bamboo					X		X			
<i>Bellardia trixago</i>	Bellardia								X	X	X
<i>Brachypodium distachyon</i>	False brome			X					X		
<i>Carduus pycnocephalus</i>	Italian thistle					X	X				
<i>Centaurea calcitrapa</i>	Purple star-thistle									X	X
<i>Centaurea melitensis</i>	Tocalote									X	X
<i>Centaurea solstitialis</i>	Yellow star-thistle					X			X	X	
<i>Cortaderia selloana, C. jubata</i>	Pampass grass	X		X		X			X	X	
<i>Cotoneaster pannosa</i>	Cotoneaster	X		X		X			X		
<i>Cupressus macrocarpa</i> (Cultivar)	Monterey cypress (Cultivar)			X		X					
<i>Cytisus scoparius</i>	Scotch broom			X		X	X		X		
<i>Delairea odorata</i>	Cape ivy	X				X			X		
<i>Erharta erecta</i>	Erharta					X					
<i>Eucalyptus globulus</i>	Blue gum eucalyptus	X				X			X	X	
<i>Eucalyptus sp (sideroxylon)</i> (Cultivar)	Eucalyptus					X					
<i>Euphorbia oblongata</i>	Egg-leaved spurge			X							
<i>Foeniculum vulgare</i>	Sweet fennel					X				X	
<i>Genista monspessulanus</i>	French broom	X		X		X	X		X		
<i>Hedera helix</i>	English ivy	X				X			X		
<i>Myoporum sp.</i>	Mirror tree			X							
<i>Nerium oleander</i>	Oleander (Cultivar)			X		X					
<i>Opuntia sp. (Cultivar)</i>	Beavertail cactus	X				X					
<i>Phalaris aquatica</i>	Harding grass	X		X		X		X		X	
<i>Rubus discolor</i>	Himalayan berry	X				X					X
<i>Vinca minor</i>	Periwinkle, Vinca	X				X				X	

The overall goal of an invasive plant control program is sustained control, leading to elimination of target invasive plants, a goal that will require a large time commitment. There is no single effective method to control invasive plants (also referred to in this report as weeds). Most land managers that have successfully completed invasive plant control programs indicate that what works best is to adaptively implement several control techniques. One consistent element of failed invasive plant control programs is reported to be underestimating the time and the resources (staff, costs) that will be necessary to control weeds. Our advice is to pick your weed “battles” and not start something that you cannot finish (source: numerous conversations with weed management professionals, information presented at the CalIPPC and SERCAL conferences, November 2004, 2005, 2006).

The information provided below is intended to be a tool to help guide decisions about weed control efforts. Refer to Appendix B for specific invasive control treatments for individual weed species. Any invasive plant project should consider and follow Integrated Pest Management procedures to help ensure the most effective and least environmentally damaging alternative is selected. Because weed control techniques are ever evolving, we strongly suggest checking with the local Agricultural Commissioner’s office, Weed Management Area and other weed resources (e.g., California Invasive Plant Council [CalIPC], The Nature Conservancy’s weed websites) listed in Appendix A before finalizing an approach to weed control.

All applications of pesticides or herbicides, when needed, should follow Agricultural Commissioner’s recommendations, Environmental Protection Agency guidelines, state and federal law, and product labeling guidance. Herbicides should be prescribed and applied under the directions of a qualified herbicide applicator with a valid Qualified Applicator’s License (QAL) license and experience in applying herbicides in wildland settings. Park representatives should oversee contractor work on site.

Best Management Practices should be employed during invasive plant control to minimize soil disturbance, and to help ensure that biomass is removed from the site, or is sufficiently composted and stored out of sight. Removal of large infestations of weeds can result in the increased potential for erosion on slopes and stream banks. Therefore, an erosion control strategy must be in place before large-scale removal efforts are undertaken. In areas where invasive plants occur on steep and unstable coastal cliffs and bluffs, special control methods should be employed (e.g., contractor rappel and spray, broadcast spray and decompose onsite).

The following section provides a very simple review of invasive removal options. Refer to Appendix B for treatment options provided for each of the most important target weed species currently known from Town of Hillsborough open space lands.

- **Hand removal**
  - Hand pull (Weed wrench).
  - Cut above ground vegetation (loppers, brushcutters, scythe).
  - Dig out entire plants, including roots (Hula hoe, rake, shovel).
  
- **Machine removal**
  - Light plow (bobcat, ATV).
  - Masticate above-ground vegetation (weedeater, brushhog).
  - Large-scale mastication, dense brush (‘brontosaurus’, caterpillar, tractor).
  - Pluck (Truck with winch and cable).

- **Tree removal**
  - Chainsaw into sections.
  - Use of cables to remove in sections.
  - Helicopter logging.
  - Brontosaurus, chip in place.
  
- **Herbicide Application**
  - Foliar application.
  - Basal bark application.
  - Spot application,(cut and paint).
  - Spot application (wick).
  - Remove biomass, allow plant to re-grow, then foliar spray new growth.
  - Rappel, then foliar spray.

Controlling invasive plants will be an ongoing maintenance action. Invasive plant species of primary concern, and methods for their control/removal, are found in “How to Control Invasive Plants” handouts in Appendix B.

### 6.3.1 Guidelines for Management of Invasive Species

The following Guidelines are intended to assist staff in making informed decisions about managing invasive species:

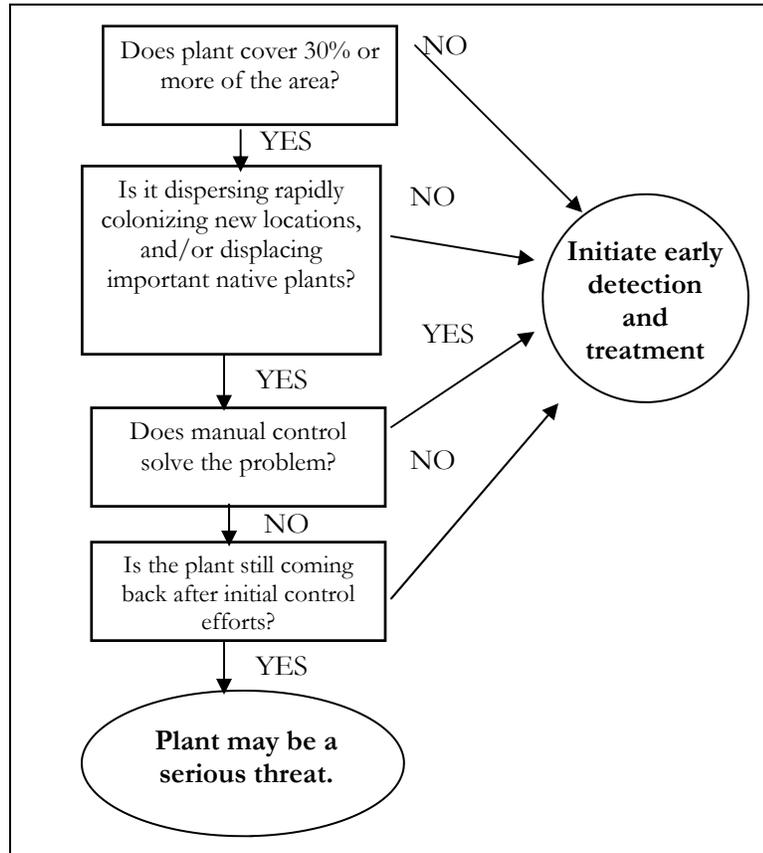
#### 6.3.1.1 Collect Baseline Information on Invasive Plant Locations

The logical starting point for any invasive plant management project is a map of the weed locations. Maps can be hand drawn or GIS based, and should contain as much information as possible on the species present, density, age, and presence or absence of sensitive species. However, the absence of detailed GIS mapping of every invasive plant should not stop weed management activities as the maps can be developed to first document ongoing activities and then can be expanded to include species of particular concern. A list of invasive species present in each park is already available, and in conjunction with the prioritization methods listed below the most high priority weeds can be mapped first.

#### 6.3.1.2 Prioritize Control Efforts

Once baseline maps are available for a site, a prioritization process will help determine where control efforts should be focused. It should be possible to decide which species should be **eradicated, contained or monitored** for future spread. The decision can be based on the feasibility of control of the species itself as well as the location of the weed in relation to other park resources. A rough prioritization method for each species is available in the form of the California Invasive Plant Counsel (CalIPC)’s Invasive Plant Inventory. This inventory uses available scientific data and expert knowledge to rank the plants considered most highly invasive in California. The ranking categories are: high, moderate, limited and evaluated but not listed. Open space land managers can simply list the invasive plants in the site with their respective CalIPC ranking to determine which pose the most immediate threat to open space resources. Flow Chart 1 below can be used to help managers determine whether or not a plant should be considered a serious threat.

### Decision-Making Flow Chart 1: Identifying Plants that are Serious Threats

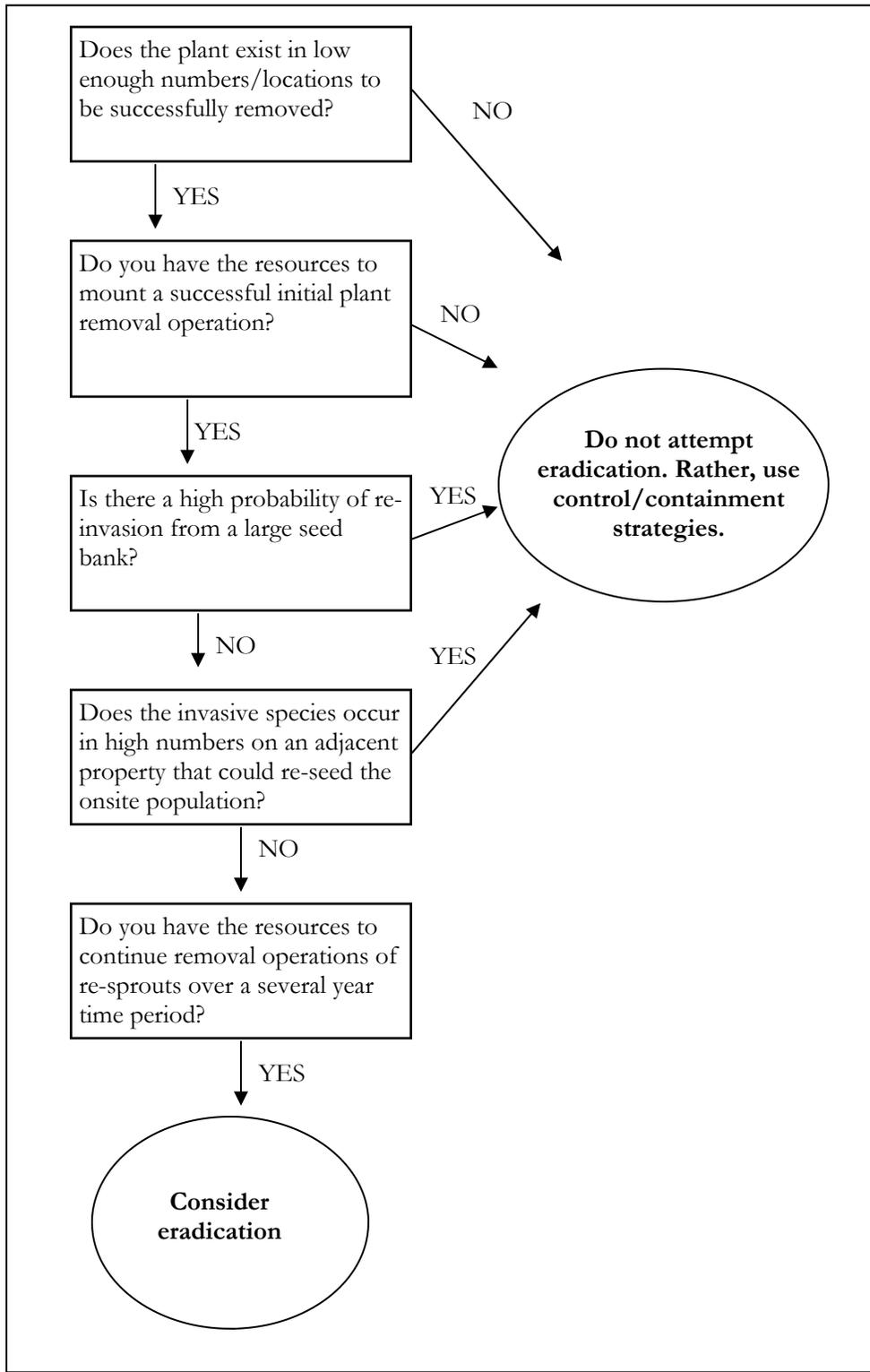


#### **6.3.1.3. Assess the Potential for Successful Control or Eradication**

Assessing whether or not a project will successfully control (or preferably eradicate) an invasive plant is a good “test” as to whether you should proceed. If the project is too big, too ambitious, or the treatment area is likely to be re-infested from nearby sources, it may not be a good candidate project. Flow Chart 2 (below) may help with the decision-making process.

For invasive plants that pose a serious threat but can not realistically be eradicated (because they are just too widespread, or the probability of re-invasion is high), land managers can focus on sustained control, or containment of the invasive plant population.

**Decision-Making Flow Chart 2:**  
**Identifying Plants that are Candidates for Eradication**



#### **6.3.1.4. Initiate an Early Detection and Rapid Response Plan for Both New Weeds and New Infestations of Existing Weeds**

Detecting new weed infestations and responding to them quickly is as important as controlling the weeds that you already have in the open space areas. Containing a new weed, like containing an epidemic, depends on identifying it as soon as possible and initiating a rapid, coordinated response. The main need is for open space users, volunteers, and staff to be attentive. Some agencies such as the National Park Service, State Parks, and “Friends of” groups working in various parts of the state have instituted “invasive plant patrols” made up of volunteers who systematically search trails and other likely places for weed populations. The volunteers report findings to staff, who, in consultation with the Agricultural Commissioner’s office and Weed Management Area representative, decide what to do about the new weed. Not all new weeds turn into invasive plants that threaten native habitats! Some simply die out. Other weeds, if they are problematic elsewhere in the state, should be considered as a potential problem in the Town of Hillsborough’s open space lands.

Small infestations should be immediately controlled, larger ones, given priority for control before they spread. All this work is worth it. As two veteran weed workers put it, “preventing or stopping just one new invasive weed would be of greater conservation benefit in the long run than far more costly and difficult efforts to control an already widespread pest.”

#### **6.3.1.5. Eradicate Infestations Where Feasible**

Eradication means destroying every single plant in the population, not just most of them. Typically, even if caught in the early phases, eradication will require more than one treatment, often extended treatment periods of 3, 5, or even 10 years. The key is diligence. If the site is weeded thoroughly enough and often enough, the remaining seed bank (i.e. seeds left dormant in the soil) can be exhausted, and the eradication will be successful.

Because eradication is labor intensive and requires a focused effort over time, it is important to pick your battles. Identify only the most problematic weeds, and among those, only attempt to eradicate the species and sites that can be completely removed within the available staffing, budget, and volunteer support base. Projects that are not followed through to completion will be a waste of time and money, because any remaining seed will eventually lead to a new infestation. Also, make sure the whole population can be removed and new populations can’t seed in from outside sources.

The key to eradication is:

- Detecting Early.
- Responding Quickly.
- Monitoring Carefully.
- Repeating as Necessary until all Plants and Seedlings are Gone!

Eradication efforts should only be undertaken under the following conditions:

- The plant is truly a threat. It spreads rapidly out of control with no limitation, biological control or seasonal control, and it displaces important native plants.
- The whole population and/or infestation can be successfully removed and new populations can’t seed in from outside sources.

#### **6.3.1.6. Where Eradication is Not Feasible, Contain and Control.**

If it is not possible to eradicate an invasive plant infestation, don't give up! Change the project goals to sustained control or containment of the invasive plant population. Sustained control and containment will keep the invasive plant in check and prevent it from flowering and setting seed, and spreading to nearby areas. For some species such as French broom or cape ivy that grow near sensitive species habitats, containment is a very effective management strategy to keep the invasive plant from adversely affecting sensitive resources.

When a particular weed has become widespread, eradication is no longer a sensible strategy. Instead, the most effective action is to contain and control the spread of the plant. To contain the spread, focus on "outlier" populations—small patches in areas otherwise weed-free. At the same time, prevent additional seed from being dispersed by cutting back fruit-bearing plant parts. Following this strategy will limit the spread of the local population to the area it currently occupies.

Containment alone works best with plants that expand outward (or upstream/drainage/slope) from the edge of their colony (such as ivy or broom species). When dealing with such plants, focus on containing the large infestations and eliminating all the outlier populations, rather than spending energy trying to eradicate the main population. It's easy to feel compelled to throw all your effort into working on the dense weed patches, but doing so is like sending fire fighters into the middle of a huge wildfire while ignoring its perimeter. The fire keeps spreading, as if you hadn't done a thing. If necessary, delineate a containment line or zone. This can be done by dividing the park into areas defined by a trail system, stream, fenceline or other linear feature.

Fruit and seed producing plants and plants which disperse seed over long distances are not effectively controlled using containment alone. The fruiting source must also be reduced.

This should be done by:

- 1) Take out all mature plants and never allow remaining plants to flower or set seed again. An example of this approach would be ongoing pampas grass (or jubata grass) control along the north coast where volunteers remove and bag all of the feathery seed "plumes" each year to prevent the wind from spreading seeds along the coast. Carefully timed mowing or weed eating can be an effective way to 'cut off' the flowering or seeding heads before they mature.
- 2) Pull seedlings and continue to mow re-sprouting (treat with herbicides as necessary).
- 3) Replace invasive non-native plants with native plants, or cover treated areas with tarps, mulch, or other barriers to shade the remaining seed bank and help prevent germination and prevent resprouting.

To effectively eliminate invasive non-native plants, not only do the mature plant material needs to be removed, but the re-sprouting rhizomes, roots, and seedlings also need to be pulled on a regular basis. Once you've decided to remove a population, a key to success is to re-treat the site every year in spring until no more resprouting or seed germination is occurring. Regular site monitoring will identify areas of regrowth before they re-establish.

### 6.3.1.7. Use Integrated Pest Management and Adaptive Management for Controlling Priority Infestations

Integrated Pest Management (IPM) is an effective and environmentally sensitive approach to pest management that relies on a combination of common-sense practices. IPM programs use current, comprehensive information on the life cycles of pests and their interaction with the environment. This information, in combination with available pest control methods, is used to manage pest damage by the most economical means, and with the least possible hazard to people, property, and the environment.

The IPM approach can be applied to both agricultural and non-agricultural settings, such as the home, garden, and workplace. IPM takes advantage of all appropriate pest management options including, but not limited to, the judicious use of pesticides. In contrast, organic food production applies many of the same concepts as IPM but limits the use of pesticides to those that are produced from natural sources, as opposed to synthetic chemicals.

IPM is not a single pest control method but, rather, a series of pest management evaluations, decisions and controls. IPM Park managers who practice IPM are aware of the potential for pest infestation follow a four-tiered approach. The four steps include:

- **Set Action Thresholds.** Before taking any pest control action, IPM first sets an action threshold, a point at which pest populations or environmental conditions indicate that pest control action must be taken. Sighting a single pest does not always mean control is needed. The level at which pests will either become an economic threat is critical to guide future pest control decisions.
- **Monitor and Identify Pests.** Not all insects, weeds, and other living organisms require control. Many organisms are innocuous, and some are even beneficial. A typical IPM program monitors pests and identifies them accurately, so that appropriate control decisions can be made in conjunction with action thresholds. This monitoring and identification removes the possibility that pesticides will be used when they are not really needed or that the wrong kind of pesticide will be used.
- **Prevention.** As a first line of pest control, IPM programs work to manage the crop, lawn, or wildland to prevent pests from becoming a threat. In a park setting, this may mean using herbicide-minimizing methods, such as selecting pest-resistant landscaping stock, and planting pest-free rootstock. These control methods can be very effective and cost-efficient and present little to no risk to people or the environment.
- **Control.** Once monitoring, identification, and action thresholds indicate that pest control is required, and preventive methods are no longer effective or available, IPM programs then evaluate the proper control method both for effectiveness and risk. Effective, less risky pest controls are chosen first, including highly targeted chemicals, such as pheromones to disrupt pest mating, or mechanical control, such as trapping or weeding. If further monitoring, identifications and action thresholds indicate that less risky controls are not working, then additional pest control methods would be employed, such as targeted spraying of pesticides. Broadcast spraying of non-specific pesticides is a last resort.

#### **6.3.1.8. Document Invasive Species Treatments and Effectiveness**

Keep track of on-going work with written documentation and a map. Maps and good record-keeping are extremely important. Except in small parks, it is nearly impossible to keep track of all the sites where weeds have been removed unless written records are kept. Since every site needs to be revisited, good record keeping will be synonymous with success. The aim of control is not to eradicate weeds, but to reduce weed density and abundance below an acceptable threshold.

#### **6.3.1.9. Prevent the Spread of Invasive Non-Native Plants**

Preventing the spread of invasive non-native plants into new areas is one of the best ways of eliminating invasive problems. In general, invasive plants are brought into a new area by human activities, bird and wildlife foraging or natural processes such as fire and erosion. Human activities such as hiking can track undesirable seed from one space to another when we walk or bike through an area and pick up seed on shoes or bike tire treads. Some agencies provide a boot brush and a low-concentration bleach solution near trail heads, and ask visitors to clean their boots and tires before entering the trail system to help reduce weed seed spread.

Weed spread also occurs during vegetation management and construction, as weed seeds are carried from site to site on vehicles and equipment (including shovels, chain saws, weed-eaters, and other tools). Weeds can also enter a site in fill dirt, erosion control, or in hay bales used for slope stabilization. All Town of Hillsborough Bid Specifications related to work in open space areas should include a requirement for contractors to wash all vehicles and equipment before entering open space lands, and to wash equipment before transporting vehicles between site.

Bird and wildlife foraging also contributes to the spread of invasive plants. Many plants need their seed to pass through the gut of an animal or bird before it can germinate. Typically these sorts of plants have attractive and delicious fruit. Birds and wildlife eat the fruits and later drop the activated seed. An example of this is cotoneaster, a plant with attractive red berries that are ingested and spread by birds. In order to effectively reduce invasive plant spread, it is necessary to replace this food source with native plant fruit.

Providing basic educational materials to staff, volunteers, and the general public will go a long way towards contributing to weed control efforts. Information for land management and maintenance staff (especially for those involved in weed removal efforts) will be more comprehensive, but in general, educational materials should contain the following key elements:

- General boot and equipment cleaning instructions for before and after entering the parks.
- Photos of the most noxious weeds and a request for new sightings of invasive weeds to be reported to land management staff (Appendix B).
- Appropriate behavioral “dos” and “don’ts” around weeds to prevent further seed dispersal.
- How to handle green waste once the weeds are removed.

#### **6.3.1.10. Monitoring**

Monitoring of invasive species control programs is essential to determining their effectiveness. Monitoring as it relates to vegetation management in general is discussed extensively below.

Given limited Town of Hillsborough staffing, volunteers may be an invaluable resource for tracking invasive plant infestations, identifying new weeds, removing invasive plants, and monitoring the results of invasive plant projects. Local citizens who are able to access open space lands and are trained to identify target weeds can be an invaluable source of information and, with staff direction, may be able to support or independently conduct invasive plant control projects.

Weed removal and monitoring projects should be matched with the skills, abilities, and ages of the interested volunteers. For example, youth groups are typically excellent resources for removing large, single species infestations of weeds, whereas college students are typically able to work independently and perform detection and removal of multiple weeds (“roving” a site). We recommend that the Town’s maintenance staff receive volunteer management training as part of creating a volunteer-based weed control program. The training should help address roles and responsibilities, volunteer appropriate activities, tool safety, and methods to empower volunteers to work independently to achieve the Town’s weed management goals.

### **6.3.2 Techniques for Invasive Non-Native Plant Species Control**

This section provides a broad overview of invasive non-native plant species control options, and recommends what is at present considered the most effective approach to controlling these species with the least level of environmental harm. Because invasive plant control techniques are constantly evolving, we recommend a brief literature search or contact with local weed control experts be conducted to help make sure the most up to date and effective methods and application techniques are being employed. Handouts providing specific recommendations for the target invasive species known from open space lands is provided in Appendix B.

Consistent with most successful control programs, the invasive weed management strategy should be to adaptively implement a diversity of control techniques, with the goal of sustained control. The information provided below is presented as a tool to help guide and prioritize weed control efforts within the Open Space Lands in Hillsborough. The suggested techniques should be modified to meet site-specific, budgetary and compliance-based needs. Additionally, the selected techniques should follow the Integrated Pest Management (IPM) procedures.

Best Management Practices should be employed during invasive plant control to minimize soil disturbance, and to help ensure that biomass is removed from the site, or sufficiently composted and stored out of sight. Removal of large infestations of weeds can result in the increased potential for erosion on slopes and stream banks. Therefore, an erosion control strategy must be in place before large-scale removal efforts are undertaken. Best Management Practices should be developed in coordination with the Agricultural Commissioner’s office to ensure consistency with their policies and guidelines.

***Selecting an Appropriate Herbicide.*** Herbicide selection will vary with the species to be treated and with site conditions. As with all herbicides, when selecting an appropriate herbicide, mixture, and application method, follow IPM guidelines, and consult with the

local Agricultural Commissioner's office and EPA guidelines for herbicide application near endangered species. Herbicide application should be conducted by maintenance staff or a local licensed QAL herbicide applicator who has extensive experience with wildland weeds. The following represents some common herbicides used throughout the state for invasive plant control. However, new, more effective, and less toxic herbicides are constantly being developed, so staff are advised to check with the County Agricultural Commissioner's office and local practitioners before finalizing an herbicide selection for a project.

- **Glyphosate formulations** such as Roundup Pro™, (Rodeo™ or AquaMaster™ in areas near or in water), are the most commonly used herbicides in wildland settings, and especially in highly sensitive areas because of their minimal effects on surrounding areas and short environmental lifespan. Glyphosate only works on actively growing plant tissue and is most effective on grasses and flowering plants. Although somewhat less effective in controlling woody species, it can be effective if used in multiple applications, or when used in combination with other herbicides as a “cocktail” mixture. Some common mixtures include Roundup Pro™ with Garlon 3A™ or 4™, and Roundup Pro™ with Stalker™ for use on specific hard-to-treat woody species such as broom species and tough grasses such as pampas grass and giant reed. If glyphosate is selected for use on woody plants, plan to monitor the treatment site, and re-treat the area as necessary to ensure success of the control effort.

**Triclopyr formulations** such as Garlon 3A™, Garlon4™, and Pathfinder™ are often used to control woody species in less sensitive areas (i.e. sites that do not support sensitive plants, native communities, or rare species). Garlon 4™ has less effect on surrounding grasses and forbs than the other formulas. As mentioned above, one common treatment is to apply a “cocktail” of Roundup Pro™ with Garlon 3A™ or 4™ on specific hard-to treat woody species and through grasses such as pampas grass, giant reed, and broom species.

**Imazapyr formulations** (Stalker™, Habitat™) are effective on both broadleaf plants and grasses. As mentioned above, a popular application is a cocktail of Roundup Pro™ with Stalker™ for use on specific hard-to treat woody species and tough grasses such as pampas grass, giant reed, and broom species.

**Clopyralid formulations** such as Transline™ are plant-specific herbicides that are effective on members of the Pea (*Fabacea*) and sunflower (*Asteraceae*) plant families (e.g., Scotch Broom, French Broom, Spanish Broom, yellow star-thistle, purple star thistle, tocalote, and other thistles), however, this herbicide tends to have a longer activity period, and higher toxicity level than others, and should be used sparingly, applied with caution to very small areas, and only used in non-sensitive areas.

### ***Treating Invasive Non-Native Trees***

Several invasive non-native trees are becoming problems on open space lands because they are displacing native vegetation, are becoming unstable or hazardous and/or are spreading from historic landscaped areas into wildlands.

Invasive trees that are problematic within Bay Area open space lands include:

- Bailey's acacia (*Acacia baileyana*)
- Blackwood acacia (*Acacia melanoxylon*)

- Blue gum eucalyptus (*Eucalyptus globulus*);
- Eucalyptus (*Eucalyptus sideroxylon* and other cultivars)
- Green wattle (*Acacia decurrens*)
- Mirror tree (*Myoporum* sp.)
- Monterey cypress (*Cupressus macrocarpa*);
- Monterey pine (*Pinus radiata*); and
- Other pine species (*Pinus spp.*)

The following section provides guidance for invasive non-native tree removal activities.

1. Mark trees in the field, and notify the public of removal, if required.
2. Conduct any necessary public awareness and notification procedures, including meeting with stakeholders, public meeting(s), and posting tree removal notifications as necessary.
3. Staff shall conduct work, or shall contract work through a licensed and bonded professional arborist with experience working in wildland settings. The scope of work should include:
  - a. Removal of invasive trees.
  - b. Requirement to remove trees and or trim trees in a manner that does not substantively disturb the surrounding soil surface and minimizes erosion potential. Trees are to be removed outside of bird nesting season, from August 16<sup>th</sup> to January 14<sup>th</sup> (no trees are to be removed during bird nesting season, from approximately January 15<sup>th</sup> to August 15<sup>th</sup> without prior approval from staff). If tree removal is required during nesting season, an approved biologist shall conduct a preconstruction bird nesting survey within 2 weeks of the start of tree removal. The survey should confirm that no active bird nests are present in trees scheduled for removal or within the area of impact. If active bird nests are found, tree removal should be delayed until young birds have left the nest, (typically by the end of August).
  - c. Best Management Practices (BMPs) for tree trimming and removal should be included in Bid Specifications. Prior to the start of work, the Contractor/Arborist should be required to submit a plan describing methods to be employed during tree removal. The arborist may use some or all of the following acceptable methods to remove hazard trees in difficult situations:
    - The use of a pulley system or a crane to lift the trees from steep slopes in sections or in their entirety from the removal site to a truck or staging area. Arborist/Consultants should be strongly encouraged to “net” the trees prior to transport to reduce potential for slash and/or soil disturbance.
    - Arborist/Consultants should consider “limbing up” the hazard tree before the tree is felled to avoid damage to adjacent trees.
  - d. The Arborist/Consultant should be required to cut remaining stumps to no more than 6 inches above the ground surface. For trees such as Eucalyptus that sprout from the cut stumps, the cut stumps should be either stump-ground in

place, or cut then immediately painted with an appropriate herbicide (typically Roundup™) to prevent re-sprouts.

- e. All woody debris (slash, duff, wood chips) should be collected and removed from the site (unless otherwise directed by staff), and the areas surrounding the removal site shall be raked clean to the soil surface. If tree removal is conducted in an area with significant native species populations, existing natives should be protected prior, and during, removal.
- f. Arborist/Contractor should be required to install erosion control as necessary to prevent future soil erosion. Erosion control shall follow staff BMP standards, including use of certified seed free rice straw, straw wattles, or other acceptable erosion control materials that will decompose naturally over time and that will not introduce invasive plant species into the park.
- g. Woody debris is to be removed from the site to a nearby staging area, or to a site determined by staff, or disposed of offsite (See Green Waste Disposal Section of the report). If offsite disposal is required, woody debris must be transported and disposed of at an approved disposal facility in accordance with staff procedures and state and federal laws.
- h. Staff may elect to reuse some or all woody debris materials in future trail building and habitat restoration activities. In some instances, and at the direction of staff, the arborist may be required to chip, cut, or separate woody debris into various sized debris piles. If required, this material will be separated from the rest of the woody debris, and stored onsite at an approved staging area.
- i. Following tree removal, staff should undertake necessary invasive plant control to prevent secondary infestations between the end of tree removal and the start of any planned habitat restoration of the site. A containment line should be developed around larger tree removal sites, and the site periodically monitored for invasive plants.

***Treating Small Trees, Large Shrubs, Small Woody Shrubs and Sub-Shrubs.*** Small invasive trees can be difficult to control because of their extensive distribution and density. The following invasive small tree and shrub species are considered problems within open space lands because they form a dense understory beneath the invasive forest canopy, resulting in increased fire risk and fuel load development. Invasive small trees and large shrubs that were detected and mapped in 2007 on Hillsborough open space lands include:

- Beavertail cactus (*Opuntia sp.* - Cultivar);
- Century plant (*Agave americana* - Cultivar);
- Cotoneaster (*Cotoneaster pannosa.*);
- French broom (*Genista monspessulana*);
- Himalayan blackberry (*Rubus discolor*);
- Oleander (*Nerium oleander* - Cultivar)
- Scotch broom(*Cystisus scoparius*); and
- Spanish broom (*Spartium junceum*).

Refer to Appendix B for the preferred treatment methods for these species.

***Treating Perennial and Biennial Herbaceous Plants.*** Several species of invasive herbaceous plants are found on open space lands. Many of them produce a large number of seeds that have long-term viability in the soil. They can invade and dominate the understory, shading out smaller native plants. Perennial or biennial herbaceous plants that have infested Town of Hillsborough open space lands include:

- Sweet fennel (*Foeniculum vulgare*); and
- Poison hemlock (*Conium maculatum*).

Refer to Appendix B for the preferred treatment methods for these species.

***Treating Groundcover Plants.*** Invasive groundcover plants found on Town of Hillsborough Open Space lands can form dense carpets of both above-ground vegetation and matted roots that exclude native groundcover species and prevent the establishment of native tree and shrub seedlings. Periwinkle and English ivy in particular can grow in dense, continuous mats, blanketing native vegetation. Eventually even large trees can be killed by ivy climbing into and over-topping their canopies. Groundcover plants that have infested Town of Hillsborough open space lands include:

- Cape ivy (*Delairea odorata*), formerly known as German ivy (*Senecio mikanioides*);
- English ivy (*Hedera helix*); and
- Periwinkle (*Vinca major*).

Refer to Appendix B for the preferred treatment methods for these species. Some groundcover species are combined because they have the same or similar treatments.

***Treating Early Colonizing and Annual Invasive Plants.*** Early colonizing invasive plants typically are the first to establish in newly disturbed soils, or in areas where large patches of groundcover weeds or small stands of invasive trees and shrubs are removed. These plants typically include a large number of quick-growing invasive annual plants, including:

- Bellardia (*Bellardia trixago*);
- Egg-leaved spurge (*Euphorbia oblongata*);
- Italian thistle (*Carduus pycnocephalus*);
- Purple star thistle (*Centaurea calcitropa*);
- Tocalote (*Centaurea melitensis*); and
- Yellow star-thistle (*Centaurea solstitialis*).

Most of these plants are widely distributed throughout the open space lands. They occur in both dense and sparse infestations, consisting of a few individuals, or elsewhere as concentrated clusters. Refer to Appendix B for the preferred treatment methods for these species.

***Treating Invasive Perennial Grasses.*** Several invasive perennial grasses occur in Town of Hillsborough Open Space lands and may become larger problems if allowed to spread untreated. Pampas grass and bamboo are highly competitive with native plants once runners or seedlings become established, becoming a substantial threat to the ecological

quality of the open space areas. Invasive perennial grasses that are of concern in open space lands and elsewhere in San Mateo County include:

- Bamboo (*Bambusa* sp.)
- Erharta, African veldt grass (*Ehrharta erecta*);
- False brome (*Brachypodium distachyon*)
- Harding grass (*Pbalaris aquatica*); and
- Pampas grass (*Cortaderia jubata* or *Cortaderia selloana*);

Most of these grasses occur as scattered individuals or as small cluster infestations throughout the open space lands. Most of these perennial grasses reproduce both sexually and vegetatively, therefore it is important to remove the entire plant (roots and above ground vegetation), and the optimal treatment timing is before the grasses set seed. Disposal of grass biomass should be carefully planned to prevent inadvertent spread. In most cases, grass biomass should be mulched in place, then transported to an offsite green waste disposal area. If this is not possible, using bins for transporting the biomass to designated disposal sites and then monitoring the sites for resprouts and seedlings may be required. Refer to Appendix B for the preferred treatment methods for these species.

**Treating Parasitic Plants.** Dwarf mistletoe is a small, leafless, parasitic flowering plant. The seeds are explosively discharged from the fruit and adhere to any surface they strike. Seeds that adhere to young branches of susceptible trees germinate, and the mistletoe rootlet penetrates the bark. Birds occasionally may spread the seeds to uninfected trees. Dwarf mistletoe seeds generally are dispersed in August and early September. Mistletoe spreads slowly from tree to tree. In closely spaced trees of about the same height, this spread is 1 to 2 feet per year. Most dwarf mistletoes are specific to a particular type of tree (e.g. pines) and do not infect other tree species. Refer to Appendix B for the preferred treatment methods for parasitic plants.

## 6.4 PEST AND PLANT DISEASE DETECTION AND CONTROL

Pests and plant disease management should focus on detection, containment, and treatment as necessary to control damage. New diseases and pests are likely to invade the open space system over time; therefore we recommend land managers keep up to speed on new threats by partnering with the Agricultural Commissioner's office and other pest and disease organizations. A helpful list of resources is provided in Appendix A. The following describes the pests and plant diseases that have been detected on Town of Hillsborough's open space lands to date, or have potential to be present based on proximity to other nearby known infestations.

### 6.4.1 California Oak Mortality Disease (Sudden Oak Death Syndrome)

**Background:** California Oak Mortality disease, formerly called Sudden Oak Death, is caused by the plant pathogen *Phytophthora ramorum*. Oaks in the Town of Hillsborough have tested positive for SOD. This pathogen has caused widespread diebacks (tens of thousands of trees) of tanoak and several oak species (coast live oak, California black oak, Shreve's oak, and canyon live oak) in California's central and northern coastal counties. The disease spreads from tree to tree and persists in wet and damp places. It can accumulate on other tree species such as California bay laurel, which often traps moisture on its broad leaves, then spreads via wind or leaves (or is transported by animals or humans) to other trees, such as oaks, where it causes infection. The pathogen also infects the leaves and twigs of common ornamental nursery plants, such as rhododendrons and camellias, which can serve as vectors for pathogen dispersal. *P. ramorum* thrives in cool, wet climates.

In California, infestations in natural settings have been found in 14 central and northern coastal counties, including San Mateo. Within the Town of Hillsborough's open space lands, several sites are suspected to support dead oaks that were likely killed by the disease, although the disease has not been officially tested and identified as present by a forester. A handout about detecting and treating Sudden Oak Death Syndrome is provided in Appendix B.

#### 6.4.2 Pitch Canker Disease

**Background:** Pitch canker, a disease of conifers (pines and Douglas fir) caused by the fungus *Fusarium circinatum* (*F. subglutinans f.sp. pini*) was discovered in California in 1986 (McCain et al. 1987). An initial survey conducted in 1987 located the disease in five counties, primarily infecting ornamental Monterey pine (*Pinus radiata*), centered in the area from Santa Cruz County to south Alameda County (Interagency Working Group, 1987). Monterey pine and Bishop pine, as well as other conifers are highly susceptible to pitch canker disease. Trees of all ages can be infected and eventually killed.

It is unknown if the trees in the Town of Hillsborough are infested with this disease, however in nearby parks in San Mateo County such as Junipero Serra Park, many of the pines have pitch canker. The potential for the spread of the pitch canker fungus is significant considering the susceptibility of most pine species. For this disease to occur, a suitable wounding agent is required. In the western United States, this is typically an insect. There are a wide variety of insects that can spread it to other nearby trees. Not all susceptible trees will be damaged by pitch canker, even if the pathogen is present, therefore infected trees should be monitored before a decision is made to cut them down. A handout about detecting and treating pitch canker disease is provided in Appendix B.

#### 6.4.3 Western Tussock Moth

The western tussock moth (*Orgyia vetusta*), a native of California, feeds on leaves, decreasing or eliminating a tree's photosynthetic capability and therefore limiting its growth. In an extreme outbreak, complete defoliation and tree mortality can result in a single season. Although no western tussock moth infestations have been detected in the Town of Hillsborough's open space lands, western tussock moth was identified in one area of San Bruno Mountain. A handout about detecting and treating western tussock moth infestations is provided in Appendix B.

#### 6.4.4 . Root Rot Fungus (*Armillaria mellea*)

The following information was excerpted from the Integrated Hardwood Range Management's web site: <http://www.ipm.ucdavis.edu/PMG/r583100211.html>.

Common root rot fungus (*Armillaria mellea*) is a common soil-borne fungus that lives on a wide range of woody and herbaceous plants. Also known as oak root fungus, mushroom root rot, honey fungus and shoestring fungus, it is found in the soil of temperate regions throughout the world and is native to many areas including California.

When trees become stressed, the fungus can rot the tree's roots, resulting in death of branches or the entire tree. Infected plants may have no symptoms, or may have yellowing foliage, small and few leaves. Infection may be localized to only one or so roots at first. In advanced stages it may develop into the wood. Infected wood is firm at first, eventually decaying to a soft, watery consistency with

the characteristic mushroom smell. Some infected plants deteriorate slowly over a period of years while others may wilt and die abruptly. A handout about detecting and treating root rot fungus is provided in Appendix B.

## **6.5 FOREST HEALTH**

The Town of Hillsborough's open space lands contain many mature woodland and forest communities. Naturally, some of these trees are in a state of decline, either from natural causes (aging, disease, structural damage from natural causes) or human-induced reasons (structural damage from human use, irrigation, or soil compaction effects). Mature trees, as well as dead and dying trees (also known as "snags") provide important wildlife habitat value and play an integral role in forest dynamics.

The challenge for land managers is to balance the need for structural diversity in a forest (e.g., keeping a diverse forest full of trees of every life stage including retention of snags, woodpecker granary trees, downed wood, and brush piles) with the need to provide safe and accessible open space lands.

### **6.5.1 Assessing Hazardous Trees**

The Town of Hillsborough should assess trees within open space lands regularly to identify hazardous trees. In areas where human uses are expected to be low (e.g., in the interior of a forest community far away from main trails), mature and damaged trees should be left to complete their natural life cycle. In high human use areas, such as major trails and access roads, possible future trail heads and parking lots should be assessed annually for their potential to become hazardous or unsafe. Refer to the handout in Appendix B for information on how to assess hazardous trees.

It is recommended that an annual hazardous tree assessment be conducted at every open space site. Hazard trees should be assessed and their relative level of hazard ranked using the following hazard ranking criteria:

- High probability of failure;
- Observed poor health;
- Evidence of significant die-back;
- Problematic tree structure;
- Root damage;
- Visible cankers and/or rot;
- Observed or suspected disease or pest infestations (refer to information on California Oak Mortality disease, pitch canker, and other tree diseases above); and
- Probability of striking a target (human or structure).

### **6.5.2. Forest Structure**

Forest structure refers to both the vertical structure of the vegetation (e.g., variations in tree, shrub, and understory heights, presence of snags, downed wood and brush piles) and also the variations in horizontal structure and species diversity across a landscape (e.g., patch size, tree density, mixture of open areas and closed tree canopy areas, and microclimate variations such as moist and cool shaded areas, and hot dry un-shaded areas).

Numerous studies have shown a direct correlation between forest structure diversity and wildlife diversity (Maser et al, 1979, University of New Hampshire Cooperative Extension 1995). In simple terms, the more types of microhabitats, food plants, types of shelter in a forested system, the more the area is able to support many different species of birds, insects, mammals, and plants. The challenge for open space managers is to maintain forest diversity while controlling fuel load, access and safety, and tree hazards.

To help ensure the health of open space forests over time and to help maintain the diversity of the wildlife species that the forests support, land managers should seek to achieve a multi-age, multi-storied forest structure. In practical terms, this may be as simple as actively managing forests near roads and trails and other high use areas, including managing brush, maintaining fire breaks and implementing fuel reduction programs (i.e. brush removal), removing downed wood and other obstacles and, (as necessary), selectively thinning or planting trees and shrubs. In low use areas such as inaccessible forest interiors, a policy of annual monitoring and limited active management (e.g. leaving snags and downed wood, not cutting unnecessary fire breaks, not actively planting trees and shrubs) may help the open space staff maintain a diverse forest structure. The annual hazard tree assessment and mapping efforts can also include an assessment of forest health, structure, and diversity to help focus resources on the most important forest management actions required to maintain a diverse structure.

The forests within the Town of Hillsborough's open space lands are relatively mature, including some old growth mixed riparian forest, and mature mixed oak woodland. These forests have been for the most part unmanaged since the open space areas were established. While these forested areas are relatively healthy and diverse (as compared with other forests in the region), there are several management activities that could improve the overall functioning of the forested areas within the open space lands:

- Remove dead and downed logs and brushpiles;
- Identify and retain some snags that provide nesting bird habitat and/or have special wildlife values (such as woodpecker granary trees at Crocker Lake) and remove remaining snags.
- Clear brush to reduce fuel loads and prevent development of fire ladders.
- Contain non-native forested areas by removing tree seedlings, saplings of acacia and eucalyptus to prevent spread of these non-native trees into native forests.
- Consider forest stand conversion by replacing non-native acacia and eucalyptus trees with native oaks, California bay tree, and other native trees over time.
- Consider creating habitat patches within forested areas to increase forest structure, diversity (e.g. consider planting foraging habitat for songbirds).

## **6.6 GREEN WASTE MANAGEMENT**

Green waste (vegetation biomass) generated by Town of Hillsborough open space lands includes trees and shrubs cut for fuel reduction and fire management, invasive trees and shrubs removed for habitat restoration, and other large-scale vegetation removal projects. At present, the majority of vegetation biomass is either left onsite, or is brought back to the corporation yard, separated, loaded into a debris box, and hauled to a green waste processing facility (E. Cooney, pers. comm. 2007). The green waste that is left onsite is typically piled "as is" in inaccessible locations (e.g., brushpiles, logs, downed wood). Due to the cost of transportation and the large amount of biomass generated when managing open space lands, many times the only feasible alternative is onsite disposal. This

practice is consistent with other land managers in the state, including San Mateo County Parks and Recreation, the National Parks Service, the State Parks system, and other counties. However, the practice is contributing to the fuel loading and increased fire risk on open space lands.

The following suggestions are provided for open space management consideration:

- Ensure open space lands have designated disposal sites for green waste.
- Consider designating a centralized green waste disposal area (intended to reduce fuel loading that results from leaving materials in wildlands).
- Ensure any green waste that is to be disposed of offsite is "clean" and not mixed with trash.
- Invasive weeds and infested trees must be separated and disposed of differently than native plants.

### 6.6.1 Options for Processing Green Waste

The following alternatives were developed for the Town of Hillsborough for processing its green waste from open space areas:

- **Dispose of onsite** (Suitable for brush and downed wood. Cut into sections and store in designated disposal locations. Allow to break down naturally. Suitable for disease-free trees and shrubs). **NOTE: Not applicable to sites with high fire danger.**
- **Compost or chip onsite** (Suitable for native plants, leaf litter, mowing and mulching grass cuttings, and chipping ground cover). These materials can be used for compost or mulch. Compost should be spread thinly to speed composing, and reduce fire risk.
- **Compost at an existing off-site green waste facility** (Large amounts of biomass, some invasive weeds). There are currently no sites in San Mateo County. Available sites that accept green waste include Z Best in Gilroy, Jepson Prairie in Davis, and Newby Island in San Jose.
- **Possible development of a shared green waste facility**, possibly in partnership with Burlingame Country Club, or with the College of San Mateo, using lands near Tobin Clark.
- Transport to a local transfer station.
- **Landfill disposal of green yard waste** (Higher cost).
- **Possible partnership with contractor who transports logs to co-generation plant.**
- **Special disposal methods** for biomass in areas with potential for plant diseases such as Sudden Oak Death syndrome

The following suggestions are provided to assist park managers in making decisions regarding green waste management.

- 1) **Estimate the amount of vegetation biomass that could be generated by a project.** For example, eucalyptus and acacia forest conversion at Crocker Lake will result in the need to dispose of up to 200 to 300 small and large trees, therefore disposal methods should be determined that can handle this volume of material.
- 2) **Assess the type of vegetation biomass being generated and determine the most appropriate disposal method.** This will require staff to make a judgment based on the type of vegetation, how fast it can be expected to break down or mulch, and the potential for the

biomass to contain viable seeds and roots that could cause inadvertent spread to other areas. As stated above, trees and invasive plants should be disposed of differently than small brush and grass clippings.

- 3) **Find an appropriate disposal site.** Possible sites include the original removal/treatment site; a nearby existing designated green waste disposal site, a newly-developed shared green waste facility (possibly at Tobin Clark). NOTE: some land managers stash small tree branches and cut logs under dense shrubs, however, this will increase fuel loading and is therefore not encouraged at open space sites with high fire potential); a centralized compost pile, storage bin, maintenance yard, or convenient onsite storage location developed for an individual project; or offsite disposal.
- 4) **Monitor all onsite disposal sites.** The job is not over until the vegetation material is completely composted! As needed to properly compost vegetation (may require monthly or bimonthly management for up to 1 year) and control the spread of invasives, monitor your disposal sites periodically to detect problems (annual assessment and spot treatment for several years).

Additional information about these actions is provided below. A list of valuable references with regards to disposing and treating green waste is provided in Appendix A.

### 6.6.2 Estimating the Amount of Vegetation Biomass that could be Generated by a Project

This section is designed to provide staff with a very rough “back of the envelope” method to estimate the amount of biomass that may be generated by a vegetation management project based on reported average tons per acre for common vegetation types of the west.

There are several ways to estimate fuel loading. One is to take measurements of the current vegetation or debris. Brown's transects (Brown 1974) can be used for woody fuels, and clip, dry, and weigh can be used for grass fuels. Other methods include using fuel models (Fire Behavior or NFDRS, others) (Anderson 1982), photo series, or ocular estimates. There are several mathematical models available online that can accurately determine fuel loads and biomass volume for forest systems. Consult a professional forester and refer to these more accurate biomass estimation methods if precise accuracy is required for your project. Refer to the Table 6.6.2 below for rough tons per acre estimates for some common types of vegetation that are present in Town of Hillsborough open space lands:

**Table 6.6.2 Biomass Estimates**

Vegetation type	Approximate tons per acre*
Grassland	0.5 to .75 average
Shrublands, Chaparral, Brush	5 to 23
Forested areas	5 to 25
Slash (loose-not piled)	9 to 46

Source: Anderson 1982.

### 6.6.3 Treatment of Biomass:

**Trees and Woody Debris** can be used in a variety of ways:

- **Firewood.** (eucalyptus, pine, oak etc) cut into 8-12 inch rounds, split (possibly seasoned). Sell or give to residents, sell to commercial firewood distributors.

- **Erosion control, brushpiles, natural fencing.** (All trees) Cut into appropriate lengths for use. For erosion control, 6-8 foot lengths, remove branches and leaves. Use with packed earth to stabilize slides and restore trail erosion. Brushpiles, cut branches into 4-6 foot lengths, pile onsite for wildlife habitat, also as a deterrent to prevent trespass and unauthorized trail building. Natural fencing- cut into 6-8 foot lengths, remove limbs, split. Alternatively cut logs into rounds for use as “stepping stones”, or other uses.
- **Wood chips, wood fiber, other mulch (eucalyptus, pine).** Trees can be chipped into woodchips, wood fiber, or finely ground into a mulch for use around landscape plantings, for dust control in picnic areas, or as a landscaping treatment. Eucalyptus should be used in areas where weed suppression is desired as it tends to restrict growth of other plant species. Oak should not be used.
- **Composting.** Refer to the section below. Grind trees and woody debris in a tub grinder and compost with high nitrogen green waste such as grass clippings.

**Mulch or Compost Leaves, Lawn Clippings, and Other Fine Biomass** that is expected to break down quickly onsite where feasible. If not feasible, offsite disposal should be considered. As mentioned above, staff should consider establishing a centralized composting area at Tobin Clark or near the Golf Course, perhaps in partnership with the College of San Mateo or the Burlingame Country Club. In general, compost piles need to be managed (i.e., not allowed to grow too big, include layers of branches in between finer biomass to create air pockets and speed up the breakdown cycle, and be turned (using a pitch fork, commercial turning bin, or backhoe) for up to 1 year before composting is complete.

The following information is intended to be a general description of a municipal composting procedure. It will be necessary to have a waste management professional to develop a detailed site plan for individual parks.

**Assessing Equipment and Facilities for a Composting Operation:**

*The following information was obtained from the U.S. Environmental Protection Agency publication NO. EPA530-R-99-016 entitled: Organic Materials Management Strategies. (U.S. EPA 1999).*

Composting facilities for yard trimmings range from medium-sized, low-technology operations, where piles of leaves are turned periodically with front-end loaders or bobcats, to large high-technology operations, where size reduction equipment, dedicated windrow turners, and screening equipment are used to process large amounts of biomass and green waste. Very small composters are also commercially available for very low capacity use. An advantage to using high-technology processing methods, aside from producing a higher quality product, is that compost can be produced and moved off site within a year, making space for the following year’s material. Low-technology operations generally require more time to complete the composting process and consequently more land area to accommodate more than one season’s material. Available land, therefore, is a key criterion for determining the most appropriate composting method for a given site.

The following Table B-10b will assist Town staff in determining the necessary size of a composting area (Source: R.W. Bech, Inc., 1999. Letter report to the City of Indiana regarding proposal to develop a waste management system for green waste). Available online at: [www.dep.state.pa.us/dep/DEPUTATE/AIRWASTE/WM/Recycle/Tech\\_Rpts/Indiana.pdf](http://www.dep.state.pa.us/dep/DEPUTATE/AIRWASTE/WM/Recycle/Tech_Rpts/Indiana.pdf)

**Table 6.6.3. Estimating Volume and Acreage Required for a Composting Site**

Green Waste (In Tons)	Total Pounds	Approximate Total Cubic Yds.*	Active Composting Area Required(aces)	Total Composting Area (aces)**
2,000	4,000,000	10,050	3.5	7.45
4,000	8,000,000	20,100	7.0	14.9
5,000	10,000,000	25,190.48	8.40	18.2
7,500	15,000,000	37,785.71	12.60	25.6
10,000	20,000,000	50,380.95	16.79	33.2

\*Assumes 300 lbs. per cubic yard average for approximately 40% of tonnage, 525 lbs. per cubic yard for the balance of the material.

\*\*Assumes 2 acres for staging area, storage area sized at approximately 50% of active composting area, and 50 foot buffer.

Materials to be composted should be deposited into rows of approximately 10-15 feet wide x 4-6 feet high. The rows should be turned two times per month on a set schedule using a front end loader (or a windrow turning machine or other specialized equipment). Piles should be kept at a temperature range of 90 to 140 degrees Fahrenheit, and a moisture content of 40 to 60%. As the size of the rows decreases because of decomposition, two or more rows should be combined to maintain the optimum row dimensions for decomposition. The decomposition process will take approximately 350 days, during which the piles should be turned twice a month. Water should be added as needed during turnings and between turnings if needed to maintain sufficient moisture for decomposition. Additional green material may be added to maintain optima temperatures. Following the decomposition, the material should be allowed to cure for an additional 30-35 day period prior to use. (Source: R.W. Bech, Inc., 1999. Letter report to the City of Indiana regarding proposal to develop a waste management system for green waste). Available online at: [www.dep.state.pa.us/dep/DEPUTATE/AIRWASTE/WM/Recycle/Tech\\_Rpts/Indiana.pdf](http://www.dep.state.pa.us/dep/DEPUTATE/AIRWASTE/WM/Recycle/Tech_Rpts/Indiana.pdf))

If brush is used in composting, it must be reduced in size prior to composting. Small quantities of brush can be processed through a chipper. A tub grinder is recommended to process large quantities or woody debris. It should be composed with a high nitrogen material such as grass. Brush chips can also be stored separately and used for landscaping or can be composted with high nitrogen material such as grass. Leaves and grass also can be size-reduced in a tub grinder to reduce the time required to complete the composting process.

In addition, access to the site must be controlled, so the site must be in a location where such control is possible. Vehicle access points must be gated or protected by some other barrier. Sites with natural barriers or those that are somewhat remote are preferable because they are less visible and therefore less prone to be entered by unauthorized persons, and generally less likely to cause problems because of proximity to occupied dwellings or businesses.

**Treatment of Non-Native Invasive Plants.** Invasive non-native plants should be disposed of in a manner that does not spread them to other areas. Proper handling of invasive plants MUST be determined on a case by case basis based on the characteristics of the individual plants. For some invasive plants, transport to a green waste facility is appropriate (especially if the plant is removed before seeds are mature or if the material has already been solarized to kill seeds and roots). Some invasive plants should be cut, and then solarized onsite to

'kill' seeds and roots by piling the cut material onsite and covering it with a plastic tarp to allow the plants to decompose before being transported. In some cases, invasive non-native plants **SHOULD NOT BE TRANSPORTED**, but rather should be chipped and spread right back onto the removal site where they can be managed for seedlings and resprouts, and can break down without spreading to other sites. Therefore, a centralized, convenient disposal site is recommended for invasive plants. One final suggestion is that wherever invasive plants are disposed of, the disposal site should be monitored to detect new seedlings and sprouts, and these promptly treated to prevent spread.

**Finding an Appropriate Onsite Disposal Site.** Staff should designate a green waste disposal site or sites. Mulching or compost facilities, as well as invasive plant biomass storage sites should be located in an out of sight, screened or fenced areas away from high public use areas, wetlands, and sensitive areas. They should be located along existing roads in easily accessible areas.

**Monitoring Onsite Disposal Facilities.** Onsite disposal sites will require regular monitoring and management to help ensure they are functioning properly and that green waste does not support invasive plants or other undesirable characteristics (insects, smell) that will require remediation. For invasive biomass disposal sites, we recommend inspection 2-3 times per year, and spot-treatment with herbicides as necessary to control new weed seedlings and re-sprouts. For mulch and composting facilities, a regular management schedule will be required, as described below. Three options are provided for composting facilities; 1) a small (5 to 10 feet square) compost "cube" that is commercially available can treat small amounts of compost, 2) a medium sized compost storage area (usually a cement-lined 3 sided structure in which material is stored, then turned using a backhoe or bobcat, and 3) a large commercial sized composting facility with specialized equipment to process compost. If a large facility is required, consider developing a composting area at Ox Mountain or possibly a transfer station that can serve all of Town of Hillsborough open space areas.

## 6.7 EROSION CONTROL

The following section describes Best Management Practices that apply to most minor types of erosion control techniques related to vegetation management activities (e.g., tree removal, creation of fire breaks, fuel load reduction/brush removal, installation of plants, etc.). Information presented in this section is not intended to be a comprehensive review of all erosion control methods that are available; rather, this section provides basic information on "typical" erosion control as it relates to vegetation management.

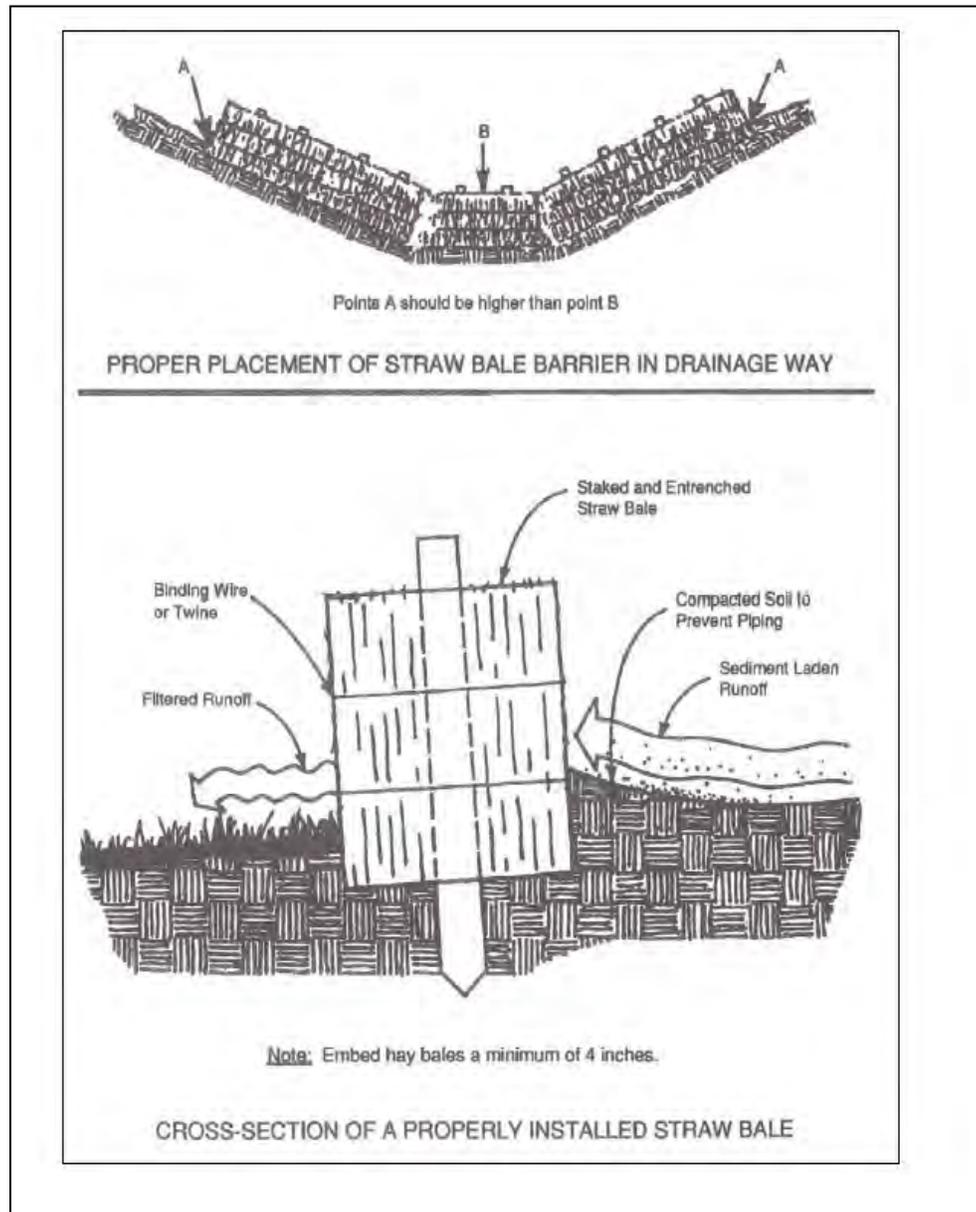
The following information was adapted from an erosion control reference published by the State of New Hampshire Division of Parks and Recreation, available online at [www.nhtrails.org](http://www.nhtrails.org) (State of New Hampshire 1994.), and based on personal experience.

- **Dust Control.** Use water as necessary to temporarily control dust on access roads, in staging areas, and other high use areas where dust is temporarily a problem. An alternative method is to maintain natural vegetation as a barrier against wind and dust. Mulch and "cover crops" of native grasses can also be used where long-term dust control is needed.
- **Mulching.** Mulching is the application of plant residues such as seed-free rice straw to the soil surface. Mulch protects the soil surface from the erosive force of raindrop impact and reduces the velocity of overland flow. It often helps seedlings germinate and grow by

conserving moisture, protecting against temperature extremes and controlling weeds. Mulch also maintains the infiltration capacity of the soil. Mulch can be applied to seeded areas to help establish plant cover. It can also be used in unseeded areas to protect against erosion over the winter or until final grading and shaping can be accomplished. Seed-free straw is used to prevent inadvertent introduction of unwanted non-native grasses to the site. Mulch can be hand-applied (spread 4-8 inches thick, depending on site conditions), or machine-applied using a hay “blower”. For steep sites, a “tackifier” may be used to stick the straw to the soils and prevent blowing. “Crimping” (i.e. mechanical treatment that punches some of the straw fibers into the topsoil) is also used to stabilize slopes that are very steep. In windy areas, and other special conditions. A good rule of thumb is 1.5 to 3 tons, or 100-150 lbs of straw should be applied per acre of treated area (depending on desired thickness of the application).

- **Erosion Control Blanket.** Erosion control blankets provide a protective cover made of straw, jute, wood or other plant fibers. This practice is best utilized on slopes and channels where the erosion hazard is high and plant growth is likely to be too slow to provide adequate protective cover (e.g., following tree and brush removal, bank stabilization projects, trail construction projects). Erosion control blankets are typically used as an alternative to mulching on steep slopes or in windy environments because they also provide light structural erosion protection. Some important factors in the choice of a blanket are: soil conditions, steepness of slope, length of slope, type and duration of protection required to establish desired vegetation, and probable shear stress. Some blankets contain a biodegradable plastic netting that adds structural support. While the netting eventually degrades (usually 2-3 years), it can pose a threat to wildlife such as snakes, amphibians, small birds etc., that can get trapped in the material. Blankets that contain this material should not be used in red-legged frog or San Francisco garter snake habitat.
- **Straw Wattles.** Straw wattles are typically rolls of seed free straw that is wrapped in a mesh (typically plastic, fiber netting or burlap). These wattles can be easily applied to a hill slope, and typically have a longer effectiveness period than straw bales. Straw wattles can be used in combination with mulch or erosion control blankets. If used in combination, straw wattles should be keyed (slightly cut into slope) into the slopes under the blankets. Straw wattles are typically placed perpendicular (on contour), and slightly tilted to a slope to catch, slow the velocity, and evenly disperse water flows off of a slope and onto surrounding vegetation. Wattles also catch and hold sediment. We recommend using seed free straw wattles with a natural fiber casings, as the plastic netting is suspected to entrap small amphibians such as tree frogs and salamanders as described above. Wattles are often placed on 10-20-foot intervals along the slopes’ face, with the interval dependent upon the steepness of the slope. Typically wattles will biodegrade over a period of 1-2 years.
- **Straw Bales.** Seed-free straw bales can be used as a temporary sediment trap or small catch basin. In this application, the bales are placed with the cut end down (so water is forced to flow through the long parallel strands of straw, catching soils and sediments. Bales are installed perpendicular to the slope, and are usually staked or otherwise. The purpose is to intercept and detain small amounts of sediment to prevent sediment from leaving the site. This practice applies within disturbed areas with small drainage basins on very steep slopes where the flow of water is concentrated. Straw bales have a very short period of effectiveness before they fill with sediment and/or soils erode under, between, or around the bales, and should not be used for more than three months before being replaced.

Figure 6. Installation of Straw Bales for Erosion Control



- **Sediment Barrier /Erosion Control Fabric.** A sediment barrier using erosion control fabric is a temporary structure used across a landscape to reduce the quantity of sediment that is moving farther downslope. Commonly used barriers include erosion control fabric also referred to as silt fencing (a geotextile fabric which is trenched into the ground and attached to supporting posts) or hay bales trenched into the ground. Silt fences are fences that are temporarily erected during a project to limit the transport of sediments into wetlands, drainage features and/or storm drain systems. The fence typically consists of a fiber/fabric-based material that is attached to 3 or 4-foot wooden stakes. The base of the material is typically buried 4-6 inches below the surface of the ground so that no sediment can travel under it. The material is then attached to the wooden stakes. Silt fences are often used in conjunction with rice straw bales and wattles. Silt fences need to be maintained on a regular basis and are not a long-term technique.

Other barrier materials include sand bags, brush piles and various man-made materials that can be used in a similar manner as silt fence and hay bales. This practice applies where sheet and rill erosion occurs on small disturbed areas. Barriers intercept runoff from upslope to form ponds that temporarily store runoff and allow sediment to settle out of the water and stay on the construction site. Barriers can also prevent sheet erosion by decreasing the velocity of the runoff.

In instances of severe erosion, (for example, the stream bank erosion at Crocker Lake that caused the historic bridge to wash out), engineered erosion control solutions, such as grading, installation of rock gabions, geotextile fabric, installation of drainage systems (French drains, etc) or similar large-scale erosion control efforts are not addressed in this section. In instances where severe erosion is encountered and needs to be corrected, we recommend development and implementation of a separate erosion control plan by a professional erosion control specialist and/or engineer to adequately address the erosion problem.

Examples of severe erosion on open space that should be addressed through an engineered solution include, but are not limited to:

- streambank instability and soil erosion of tributaries to Crocker Lake, Spencer Lake, and the waterway at Nueva Macadamia;
- Extreme roadbed erosion adjacent to Crocker Lake;
- extreme siltation rates and related filling of sediment basins at Crocker Lake and Spencer Lake;
- large hill slide, soil slumping, seep activity, and some erosion resulting from activities from adjacent properties at Strawberry Hill, Rowan Tree, Crocker Lake, Nueva, Macadamia, and many other sites;
- Severe soil erosion observed at Tobin Clark (possibly caused by trespass of motor vehicles and/or mountain bicycles).

## 7.0 PROJECT PRIORITIZATION PROCESS

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### 7.1 SUGGESTED PROJECT SELECTION AND PRIORITIZATION PROCESS

The next step is to prioritize and rank the list of projects to determine which projects are priorities for immediate action/funding. Many methods exist to prioritize and rank projects. Prioritization systems usually fall into one of two categories: numerical ranking systems, or flow-chart-type sieving systems. There is no ideal method for a given project, and every system has shortfalls and biases. We recommend a system utilized by the National Park Service, an organization that must deal with diverse resources, interest groups, and stakeholder groups, and would therefore apply to Town of Hillsborough.

The prioritization process described below, referred to as a Modified Delphi Technique, would allow stakeholders and experts to collectively discuss, refine, and produce a prioritization list for vegetation management projects in County Parks. The Delphi technique was developed by the RAND Corporation in the late 1960s as a forecasting tool. Later, the U.S. government enhanced it as a group decision-making tool in which a group of experts could come to some consensus of opinion when the decisive factors were subjective, and not knowledge-based. The Delphi technique is particularly appropriate when decision-making is required in the context of a political or emotional environment, and works formally or informally, in large or small contexts. It reaps the benefits of group decision making while insulating the process from the limitations of group decision-making such as over-dominant group members, skewing results towards one interest, or lobbying. This approach has the added advantage that it works as an informal, subjective model when the decisions are based on opinion, and can be directly converted to a formal model, when the data is more knowledge-based. For the purposes of assessing Town of Hillsborough Open Space priorities, this methodology can be combined with a data-driven (i.e. numerical project scoring system) to allow for the inclusion of both subjective and objective information.

Using the Delphi method, a group of knowledgeable individuals who know the Open Space resources intimately and who have differing backgrounds are recruited to participate in the process. For example, participants could be a maintenance crew member, a member of the fire department, a local historian, a neighbor, recreationist, and/ or a local naturalist. Once the group is selected, the group would develop an inclusive list of projects to consider. Refer to Section 7.3 for a list of possible actions that can be used as a starting place for this process.

The group should be encouraged to conduct a planning session(s) whereby the objectives, importance, and possible results of a project are freely discussed. Maps and aerial photography are important tools when discussing the location and the size and scope of a project. Having such a broad base of experts can help flush out critical issues, and also can help the group reach consensus on issues of concern before a project moves towards implementation.

### 7.1.1 Suggested Prioritization Procedure

**1. Select Facilitation Leader.**

Select a facilitator for the meetings that is NOT a stakeholder, and therefore can participate objectively.

**2. Create a Panel Representing Stakeholders and Experts.**

The stakeholders and experts should be selected to represent various aspects of resources and values of the Town of Hillsborough, the individual open space areas, and the stakeholders. Participants should be selected because of their intimate knowledge of, or vested interest in, the Town of Hillsborough and its open space lands, planning process, and/or familiarity with technical subject matter that are considered important to the projects (e.g., trail planning, landscape architecture, hydrology, wildlife biology, historical and archaeological studies). Member selection should be based largely on the participant's "real-world" experience that will enable them to prioritize the project actions effectively.

**3. Synthesize Existing Resource Data Into a Visual Format.**

Relevant natural, cultural and infrastructure data should be synthesized and compiled into a visual format that can be readily manipulated. We recommend a GIS database as an excellent format for this planning exercise, but printed aerial photographs, vegetation maps, with clear overlays can also be used. A series of mapping layers representing similar resources or subject matter should be created as clear acetate overlays for a common base map. The participants will use the various resource layers to identify where there are overlapping areas of concern (e.g., weeds on a cultural resource site, bird nests near hazard trees to be removed) or areas of high resource values and restoration opportunities (e.g., areas with wetland resources, important wildlife areas, major trails). This Vegetation Management Strategy contains most of the necessary data that could be used and/or further synthesized for this process.

**4. Identify an Initial List of Selection Criteria.**

Table 7.2 contains a list of suggested planning criteria. This list was developed by May and Associates Inc. following several meetings with Town of Hillsborough staff and an interdisciplinary team visit to the open space areas. The list should be reviewed and possibly modified during a brainstorming session with the participants described above. Ultimately, participants should agree that the criteria tie back to project goals and objectives. Sample goals and objectives are presented in this report.

**5. Conduct Planning Session to Discuss Possible Selection Criteria for Projects.**

Once the proposed list of criteria is revised and agreed upon, by the panel, it is recommended that the group conduct a free form discussion of what projects might meet the suggested criteria. The visual aids (maps) described above would provide a reference throughout the discussion so that all resource issues can be accurately considered. Additionally, Tables 7.3 and 7.4 provide a starting point for discussion. Both were developed by May and Associates Inc. following the open space site visits, review of existing reports and studies and discussions with staff. Table 7.3 is a summary of all possible projects discussed during the visits, and Table 7.4 is a refined list of preliminary priority projects developed using the proposed criteria (Table 7.2). It is recommended that the planning group review, discuss and refine these proposed projects as a starting point for discussion.

It is recommended that the group reach full or partial consensus on both the selection criteria and on the priority projects that the group thought should be considered.

**6. Prepare Revised List of Selection Criteria, Initial List of Project Priorities.** The intent of the first meeting is not to reach complete agreement on all issues and projects, but rather to “flush out” those projects and issues that will or will not be acceptable to all participants. This allows the group to focus on those projects and issues that require more consideration and discussion to reach consensus. Based on the results of the first meeting, the list of initial selection criteria and priority projects should be refined. This list should then be circulated to the panel in advance of a second planning session meeting.

**7. Conduct Second Planning Session.**

At the second planning session, the participants should discuss the project priorities that were generated from applying the revised selection criteria. The project boundaries, objectives, and timing of each of the various proposed projects should be considered, as well as new projects and modified projects. As a result of the second planning session, it is recommended that the participants reach agreement on most of the major issues and project priorities.

**8. Assess Capacity, Capabilities, and Planning Timeframe, Adjust Projects Accordingly.**

The projects that are selected as a result of the second planning session should then be screened to see if they could be accomplished within the specified timeframe, and if staff and other stakeholder groups have sufficient oversight, and other capacities to successfully implement the selected project with available staff, contractors, or both. A smaller group of senior managers with extensive experience implementing projects can be involved with this assessment. As a result of input from these senior managers, the list of projects under consideration will be reduced to those that are considered reasonable to implement within the planning timeframe.

**9. Gather Any Remaining Technical Data Necessary to Finalize Decisions.**

As the proposed project actions are further refined, technical questions will surface that require additional data collection and assessment efforts. Additional information gathering should be conducted to help develop a greater understanding about the feasibility and appropriateness of the proposed projects.

**10. Prepare List of Project Priorities.**

Based on the initial list of projects, the capabilities and timeframe assessment, and the additional technical data, a list of “final” project priorities should be developed and circulated to the participants for review and comment. The group should be encouraged to view the projects in the field, and then submit any final comments, suggestions, changes, or approvals.

**11. Finalize List of Projects.**

After receiving final input from participants, a final list of projects will be developed that meet project selection criteria. These will be the projects that are considered by the group to be technically sound, feasible to undertake, and possible to coordinate within the planned project timeframe.

## 7.2 SUGGESTED RANKING CRITERIA AND PRIORITIZATION SYSTEM

Table 7.2 outlines suggested project prioritization criteria for vegetation management actions undertaken by the Town of Hillsborough. As described above, this criteria was developed by May and Associates, Inc. as a foundation for discussion. The criteria is used as a part of the project prioritization process described above. Criteria should provide an objective framework for numerically scoring potential projects in order of importance. It is suggested that the criteria be reviewed annually and modified if necessary to meet the Town's goals and objectives. It is also recommended that the Town conduct the prioritization process annually to update the list of priority projects.

**Table 7.2 Town of Hillsborough Ranking and Prioritization Scoring Sheet**  
**Page 1 of 3**

<b>Proposed Project Ranking Criteria</b>	
<p>Scores within each criteria category should be between 3 and 0, with 3 being the highest possible ranking.</p> <p>3 - this project meets all the applicable criteria for this category            2 - this project meets most of the applicable criteria for this category            1 - this project meets a few of the applicable criteria for this category            0 - this project does not meet any of the criteria for this category            n/a - this project does not have any relevance to this criteria category</p>	
<b>Vegetation Management Criteria</b>	<b>Score</b>
<b>Biological Resources</b>	
<ul style="list-style-type: none"> <li>a). Project protects or enhances T&amp;E, special status species, locally rare species</li> <li>b). Project protects or enhances wetlands, improves wetland functions</li> <li>c). Parcel is a Special Ecological Area, supports rare or sensitive vegetation communities and/or unique geologic feature</li> <li>d) Proposed project will increase native plant or wildlife species richness, habitat diversity</li> </ul>	
<b>Fire Management/Fuel Load Reduction</b>	
<ul style="list-style-type: none"> <li>a) Fire management issues are not severe at parcel</li> <li>b) Project will result in short-term reduction fuel load/ wildfire risk</li> <li>c). Project will result in long-term reduction of fuel load/wildfire risk</li> </ul>	
<b>Natural Resource Maintenance Issues and Maintenance of Natural Processes</b>	
<ul style="list-style-type: none"> <li>a). Project Controls and/or removes priority targeted invasive plant material</li> <li>b). Project controls non-natural erosion sources &amp; restores natural hydrology/drainage</li> <li>c). Project stabilizes natural erosion sources that affect infrastructure and structure</li> <li>d). Project removes sediment (lakes) and/or controls upstream erosion to restore more natural sedimentation pattern entering lakes</li> </ul>	
<b>SUBTOTAL VEGETATION MANAGEMENT CRITERIA</b>	

**Town of Hillsborough Ranking and Prioritization Scoring Sheet - Page 2 of 3**

<b>Proposed Project Ranking Criteria</b>	
Scores within each criteria category should be between 3 and 0 with 3 being the highest possible ranking.	
3 - this project meets all the applicable criteria for this category 2 - this project meets most of the applicable criteria for this category 1 - this project meets a few of the applicable criteria for this category 0 - this project does not meet any of the criteria for this category n/a - this project does not have any relevance to this criteria category	
<b>Land Use, Recreation Criteria</b>	<b>Score</b>
<b>Potential for Recreational Uses</b>	
a) Parcel has an existing trail or fire road that can be used for a public trail b) Parcel has logical public access points that would not result in conflict/disturbance to local neighbors c) Proposed project will upgrade/increase visitor use/safety/enjoyment/recreational opportunities d) Parcel has existing amenities (e.g., large trees, wetland features, historic structures) that are compatible with recreational uses e). Parcel has available parking or opportunity for parking amenities within or adjacent to area. f) Parcel has Grant Deed, land use restrictions that allow for proposed recreational use	
<b>Trail and Visitor Use Improvements</b>	
a). Project reduces need for trail maintenance b). Project would improve the integrity and circulation of the trail system 1. Clear logical main trail 2. "Rib" connectors to destinations and communities 3. Parking, Trail heads and loops etc.	
<b>Human Use &amp; Infrastructure Issues</b>	
a). Proposed project will improve overall site conditions (i.e. control social trails, trespass/dumping/sewer water line issues)	
<b>Physical Site Characteristics</b>	
a. Parcel is large (over 100 acres) b) Parcel has limited "edge effects" (i.e. parcel is round or square, is not long and linear, parcel is not surrounded on all sides by development) c) Parcel connects to other sites or is in close proximity to other open space sites d). Site access to project area does not require significant grading, trail maintenance or other infrastructure improvements	
<b>SUBTOTAL LAND USE, RECREATION CRITERIA</b>	

**Town of Hillsborough Ranking and Prioritization Scoring Sheet - Page 3 of 3**

<b>Proposed Project Ranking Criteria</b>		
Scores within each criteria category should be between 3 and 0 with 3 being the highest possible ranking.		
3 - this project meets all the applicable criteria for this category 2 - this project meets most of the applicable criteria for this category 1 - this project meets a few of the applicable criteria for this category 0 - this project does not meet any of the criteria for this category n/a - this project does not have any relevance to this criteria category		
<b>Management, Staffing, Program Capacity Criteria</b>		<b>Score</b>
<b>Consistency with Town of Hillsborough General Plan, Goals and Objectives, existing Projects</b>		
a). Project is consistent with Town of Hillsborough General Plan, Goals and Objectives, existing Projects b). There is sufficient staff/resources to conduct project c) The project has strong staff support d). The project can leverage Town staff/Volunteer/other partnerships		
<b>Potential for Funding</b>		
a). Funding available (in part) through other programs/projects b). Funding potential c). Future leverage "quotient"		
<b>Potential for Implementation Success, Project Feasibility</b>		
a). Project can be accomplished within projected timeline including permitting and CEQA ("project readiness") b). High level of outcome for resources expended c). Project is technically possible		
<b>Public Engagement and Support</b>		
a). Provides interpretive opportunities b). Provides for increased volunteer/stewardship opportunities c) Demonstrated or potential to garner significant public interest and support d). The project has strong public support/advocacy. e). Improves intrinsic visitor and recreational experiences f). Increases understanding and support for open space and natural resource values of site		
<b>SUBTOTAL MGT, STAFFING, PRGRM CAPACITY CRITERIA</b>		
<b>TOTAL SCORE</b>		
	Vegetation Management Score	
	Land Use, Recreation Score	
	Mgt, Staffing, Capacity Score	
	<b>TOTAL SCORE</b>	

### 7.3 POSSIBLE VEGETATION MANAGEMENT ACTIONS

In order to 'jump-start' the Town of Hillsborough's open space management project selection and prioritization process, a small group consisting of Town staff, and May & Associates' biologists developed an initial list of vegetation management actions that may be used to develop a list of priority projects for open space lands.

This list of possible actions should be considered a preliminary list of possible actions that may benefit open space lands, and is not meant to be a final determination of vegetation management actions, nor is it a list of selected or adopted projects. Land use actions discussed by the group were also captured in list.

The Town of Hillsborough intended to use this list as a starting point from which to develop and refine its final program activities. Refer to Table 7.3 for possible management actions presented by individual open space site.

**Table 7.3 Proposed Vegetation and Land Management Actions, Town of Hillsborough Open Space Lands**

	Project Location									
	Spencer Lake	Rowan Tree	Nueva Macadamia	Strawberry Hill	Crocker Lake	Site F	Southdown	Crystal Springs	Tobin Clark	All Locations
<b>Proposed Vegetation Management Actions</b>										
<b>Special Status Species Management</b>										
Manage for special status species (e.g., San Francisco Collinsia, California bottlebrush grass, Hawk nests)			X	X	X					
California bottlebrush grass - Develop "No Mow" area until seed set		X	X	X	X		X	X		
San Francisco Collinsia- Establish restricted vegetation management area (usually applicable to cut banks)			X	X	X			X	X	
Hawks and other raptors - Develop snag maintenance program, and establish seasonal restrictions on brush tree removal work near nest sites	X	X	X		X			X	X	
Great blue heron- rookery protection					X					
Double crested cormorant- foraging protection					X					
Woodrat nest retention program	X	X	X	X	X	X	X	X	X	X
Salmonids- Maintain riparian corridor, partner with SFPUC to control streambank erosion, limit erosion from SFPUC pipeline into creek.								X		
<b>Wildlife Management- Common Wildlife Species</b>										
Develop wildlife management plan for birds, other wildlife uses (e.g. develop recommendations regarding site restoration e.g., cover, food crops; retention of known bird nesting trees, snags and granary trees; manage site for biodiversity.)			X		X					
Identify, protect and enhance opportunities for woodpecker granary trees					X					
Manage bullfrogs and fish populations					X					
<b>Forest Management, Fire Management, Fuel Load Reduction</b>										
Forest stand conversion: eucalyptus to oak woodland	X				X					
Forest stand containment, sapling control on leading edge	X			X	X					
Fire management/fuel load reduction	X	X	X	X	X	X	X	X	X	X
Phase 1 - Implement high threat/emergency actions (clear fire and access roads etc.)			X		X		X	X	X	
Phase 2- brush and sapling thinning, long-term management of 100 foot buffer zone near houses	X	X	X	X	X	X	X		X	
Phase 3- take out logs/downed wood	X				X	X	X		X	
Initiate sudden oak death syndrome monitoring program	X	X	X	X	X	X	X	X	X	X

## Proposed Vegetation Management Actions (Continued)

	Project Location									
	Spencer Lake	Rowan Tree	Nueva Macadamia	Strawberry Hill	Crocker Lake	Site F	Southdown	Crystal Springs	Tobin Clark	All Locations
<b>Forest Management, Fire Management, Fuel Load Reduction (Continued)</b>										
Phase 1- Detect diseased trees	X		X	X	X				X	
Phase 2- Contain diseased trees, reduce potential for transmission to other trees onsite (clear brush around infected trees, possibly treat surrounding trees etc)			X		X				X	
Phase 3 - Reduce vectors and spreading fungi - add boot washing stations, distribute public information brochures, limit human access to infected area to reduce potential for transmission					X(If open to public)					
Assess which trees are historic (if any) and protect as appropriate				X	X					
<b>Invasive Non-Native Plant Management</b>										
Prioritize weed infestations that are just establishing, weeds that are affecting wetland and special status species habitat and infestations that can easily be controlled	X	X	X	X	X	X	X	X	X	X
Strategically control pioneer and priority invasive non-native plants	X		X		X			X	X	
Pampas grass and Bamboo	X		X		X		X	X	X	
Cape ivy	X				X			X		
Canary reed grass, false brome and other non-native grasses	X		X		X		X	X		
Acacia, cotoneaster, other non-native trees & shrubs	X		X		X	X		X	X	
English and other ivies				X	X			X		
egg-leaved spurge			X							
French broom and other broom species	X	X	X	X	X	X		X		
Periwinkle and other groundcovers	X				X				X	
Sweet fennel and other herbaceous non-native invasive plants					X				X	
Yellow star thistle and other thistle species					X	X		X		
Establish an early detection weed monitoring and control program	X		X		X			X	X	
Establish invasive non-native plant control best management practices for newly constructed (and existing) homes directly adjacent to park lands. Targeted plants include, but are not limited to pampas grass, Harding grass and French broom.	X		X		X		X		X	
Check for new priority invasive plants from County Agricultural Commissioner's office. Conduct literature search for new weed control techniques. Update maintenance staff training on detection and control techniques(annually)										X

<b>Proposed Vegetation Management Actions (Continued)</b>										
	<b>Project Location</b>									
	<b>Spencer Lake</b>	<b>Rowan Tree</b>	<b>Nueva Macadamia</b>	<b>Strawberry Hill</b>	<b>Crocker Lake</b>	<b>Site F</b>	<b>Southdown</b>	<b>Crystal Springs</b>	<b>Tobin Clark</b>	<b>All Locations</b>
<b>Ecological and/or Natural Process/Function Improvements</b>										
Minimal restoration to maintain open water feature in Spencer Lake (minimal remediation- dredge every 5-10 years)	X									
Improve ecological health and function of Crocker Lake					X					
Phase 1. Initial sediment removal in partnership with Gold Course (AE proposal)					X					
Phase 2. Clean Out Sediment Basin (long term AE Proposal)					X					
Phase 3- Fix upstream erosion- fix silted culverts, stabilize creek bed.					X					
Phase 4- Manage lake for resources (bullfrog, fish control, improve water quality, etc.)					X					
<b>Landscape Management</b>										
Identify historic landscape plantings from Crocker estate- manage for original garden concept- remove and/or contain rest of landscape plantings				X	X					
<b>Green Waste Management</b>										
Evaluate lower parking lot area abutting site for spoils disposal site and green waste management site - use sediment from lakes- set up drying facility. Determine feasibility of using fill and green waste material to fix trail system/erosion gullies. Prepare feasibility study for establishing green waste processing facility- consider using drum chippers and drying area to process.									X	
<b>Public Outreach, Agency Partnerships, Best Management Practices</b>										
Prepare map of SFPUC easement areas and establish mutually agreed upon BMP's for vegetation management								X		
Establish mutually agreed upon partnerships, Best Management Practices for vegetation management with the San Mateo College landscape maintenance program									X	
Address vegetation debris dumping issues- proactively outreach to neighbors- develop green waste collection /processing site (assess feasibility of establishing site at either Crocker Lake or Tobin Clark). Prepare community awareness strategy to include sending out no dumping notices. Work with Central County Fire Department on outreach efforts related to brush clearing					X				X	
Develop and install signage to inform neighbors/college staff not to dump materials on open space areas' establish monitoring program.					X				X	

## Proposed Land Use, Infrastructure, Access, Recreational and Stewardship Actions

	Project Location									
	Spencer Lake	Rowan Tree	Nueva Macadamia	Strawberry Hill	Crocker Lake	Site F	Southdown	Crystal Springs	Tobin Clark	All Locations
<b>Land Use</b>										
Consider developing a joint MOU with College of San Mateo to establish a green waste program and dredge spoils drying area on the vacant student parking lot that is currently being used by College as a spoils dumping area. Consider easements/shared emergency vehicle road access from college parking lot.									X	
Establish and enforce site boundaries--- address adjacent owner's trespass (e.g. gates to property, hole in fence/trail to country club/picnic table/landscaping and irrigation of Park lands by adjacent owners- stairs leading onto site etc.)					X				X	
<b>Infrastructure</b>										
Check and assess possible sewer line overflow issue- prevent from entering creek								X		
Remove asphalt dump, fix existing fire / access road			X						X	
Maintain rock walls throughout site.				X	X					
Prepare map of infrastructure features and non-natural drainage into open space					X				X	
<b>Site Access</b>										
Establish "No public access" policy for some sites		X				X	X			
Explore feasibility of establishing a walking trail corridor on parcel of land on opposite side of street from lake, including establishing an easement on property directly below City land	X									
Evaluate feasibility of constructing an interpretive trail system through community down Macadamia between sites A, C, E	X		X		X					
Conduct feasibility assessment of establishing trail loops/parking facility/site entrances (2)/ recreational facilities. Prior to assessment determine ROW and easement restrictions (e.g. determination as to whether or not public access is an option).					X					
Phase 1- Trail stabilization: Fix road section near southeast corner of reservoir- realign road to more stable location- address downed bridge address broken sewer and water pipes					X					
Phase 2- Infrastructure Improvements: Realign upper trail and fix leaking sewer and water pipelines...narrow/move trail and fix sewer pipes or relocate to one side of trail so use does not impact water/sewer lines					X					
Phase 3- Create comprehensive loop trail system at site; address steep portions of the existing carriage route that are not as user-friendly- consider a spur trail nearer to lake edge.					X					

## Proposed Land Use, Infrastructure, Access, Recreational and Stewardship Actions (Continued)

	Project Location									
	Spencer Lake	Rowan Tree	Nueva Macadamia	Strawberry Hill	Crocker Lake	Site F	Southdown	Crystal Springs	Tobin Clark	All Locations
<b>Site Access (Continued)</b>										
Evaluate feasibility of adding a possible pier site/picnic facility.					X					
Evaluate adding parking facility at Macadamia for 6-8 vehicles or create parking at another park entrance (entrance location to be determined)					X					
Maintain a fire road access on SFPUC ROW at base of hill; assess feasibility to develop site access from top of site for emergency vehicle access. Check with legal to see if Town can establish permanent easements through private property.								X		
Prepare visitor circulation strategy, consider enhancing exercise circuit loop, developing trail corridors and connectors, signing parking facility, amenities and entrances. Determine ROW and easement restrictions- see if public access is an option as well as how best to coordinate access with the College of San Mateo.									X	
Design and complete emergency access fixes (e.g. repair erosion along fire trail, remove erosion-causing non-designated trails, repair gullyng and redirect non-natural drainages throughout site.					X				X	
<b>Public Safety</b>										
Fence and exclude dangerous sites, re-route trail to safe locations			X							
Conduct feasibility assessment for rebuilding bridges. Perform cost/benefit analysis for possible alternatives (e.g. re-construction, limiting public access, etc.)			X							
Stabilize streambank erosion features to prevent future bridge collapses. Initiate stream stabilization program.			X							
Remove old trash and debris to include rusted cars, couches, landscape materials, garbage etc.									X	
<b>Recreation</b>										
Explore developing wildlife interpretive program- possible bird watching location/partnership with Audubon, other groups, as well as Nuevo school			X		X					
Assess feasibility of initiating Historic/cultural resource interpretive site. Include feasibility assessment of establishing possible trail link as a part of possible planned future Larger Strawberry Hill acquisition/open space area				X						

## Proposed Land Use, Infrastructure, Access, Recreational and Stewardship Actions (Continued)

	Project Location									
	Spencer Lake	Rowan Tree	Nueva Macadamia	Strawberry Hill	Crocker Lake	Site F	Southdown	Crystal Springs	Tobin Clark	All Locations
<b>Recreation (Continued)</b>										
Assess feasibility of developing historical interpretive uses of site. (Contact Historical Society, Consider fundraising event to restore historic carriage trail system and gardens). May need a separate assessment for fixing the historic bridge (see safety/infrastructure)					X					
<b>Stewardship</b>										
Cultivate and help establish and support "Friends of" Neighborhood Group	X				X					
Establish partnership with nearby school to assist in long-term stewardship/public awareness			X							
1. Possible outdoor classroom opportunities			X							
2. Students develop and conduct water quality and sediment monitoring program			X							
3. Possible site restoration/native planting program using students to grow and/or plant			X							
Initiate water quality and sediment monitoring program					X			X		
Explore feasibility of maintaining site as a research corridor (possible site for monitoring for the movement of Sudden Oak Death, health of riparian oak woodland and oak woodland habitats, etc.). Site would not likely support public access.					X			X		
Develop (or build from existing programs) student organization in support of monitoring, public education and clean up efforts.									X	
Determine feasibility of using site for college-based habitat restoration/land-planning initiative with College of San Mateo. Program would be modeled from City College Center for Habitat Restoration and Merritt College Sustainability Center where student course work would result in direct improvements/management/monitoring or features as well as plan development. Investigate cooperative agreement with College of San Mateo.									X	

## Proposed Other Program Actions

	Project Location									
	Spencer Lake	Rowan Tree	Nueva Macadamia	Strawberry Hill	Crocker Lake	Site F	Southdown	Crystal Springs	Tobin Clark	All Locations
<b>Other Actions</b>										
Maintain GIS database of special-status species, invasive plants, fire management areas, and vegetation mapping. Update every 3-5 years, as time and funding allow										X
Ongoing training about sensitive species and site maintenance (annually)										X
Check perimeters of open space for invasive species infestations from neighborhood backyard gardens, neighbor trespass, fuel and firebreak buffers, inadvertent dumping, trash, irrigation runoff, pesticide drift from neighbors (annually)										X
Check for new federal and state species listings from DFG, USFWS (annually)										X
Check with neighboring land management agencies for new or updated reports or other pertinent information on special-status species (especially California red-legged frog and San Francisco garter snake occurrence and management information), Sudden oak death Syndrome, and invasive species. (annually)										X
Develop neighbor or "Friends of" group(s) to help provide early detection of invasive species at Open Space Lands										X
Help ensure that Tow of Hillsborough bid specifications related to land management at open Space lands includes requirements to clean equipment and vehicles when working in weed infested areas or forested areas that may contain SODS										X
Provide basic educational materials (brochures, handouts) on invasive plant control efforts (boot cleaning procedures, appropriate "do's" and "don'ts" around weed infestations, how to handle green waste etc.)										X
Continue to monitor green waste disposal options, and work with staff to create centralized processing locations										X
Define and develop a shared vision of volunteer stewardship and participation in open space land maangement										X

## 7.4 PRELIMINARY PROJECT LIST FOR CONSIDERATION

Based on the preliminary list of Vegetation Management Actions presented in section 7.3 above, a list of possible priority projects was developed by the Town staff and May & Associates' biologist. The resulting list of possible pilot projects were then ranked and scored using criteria presented in Section 7.2 above.

The resulting list of possible pilot projects presented in Table 7.4 below should be considered preliminary, and is not meant to be a final determination of adopted or final vegetation management projects that will be implemented by the Town. The Town of Hillsborough intended to use this list as a starting point from which to refine its final vegetation management program.

**TABLE 7.4 PROPOSED PROJECT LIST**

Project No.	Project Title	Location	Project Elements	Cost Range	Type of Event/Duration	Possible funding source
<b>Special-Status Species Management</b>						
1	<b>Develop and Implement Special-Status Species Best Management Practices</b>	All Sites	1A. Prepare best management practices related to ongoing maintenance (mowing and brush clearing, general site maintenance)	\$1,000-\$3,000	TBD	Program funds
			1B. Develop training materials and conduct training	\$1,000-\$3,000	1 Time event	Program funds
			1C. On-site biologist support for Yr 1	\$1,000-\$3,000	1 Time event	Program funds
			1D. California Red legged frog surveys- Crocker Lake	\$5,000-\$10,000	1 Time event	Program funds
<b>Wildlife Habitat Management</b>						
2	<b>Develop Wildlife Management Plan, Program &amp; Policy</b>	Crocker and Nueva Macademia (can apply to other sites too)	2A Prepare plan to include best management practices for vegetation management during bird nesting season, pruning, snag retention, brush piles etc.	\$3,000-\$5,000	1 Time event	Program funds
3	<b>Raptor Nest/ Habitat Enhancement Snag Retention Program</b>	Crocker, Spencer, Rowan Tree, Nueva Macademia, Crystal Springs, Tobin Clark	3A Prepare map of high importance trees (raptor nest sites, heron rookery, acorn woodpecker granary trees) and a few snags	\$5,000-\$10,000	1 Time event (re-evaluate every 5 yrs)	Program funds
			3B Mark trees and Retain	\$1,000-\$3,000	Ongoing asesment and marking	Program Funds

**TABLE 7.4 PROPOSED PROJECT LIST (Continued)**

Project No.	Project Title	Location	Project Elements	Cost Range	Type of Event/Duration	Possible funding source
<b>Forest and Fire Management</b>						
4	<b>Initiate public education and awareness program on fuel reduction/defensible space requirements</b>	All sites	4A. Develop goals for education plan and prepare strategy (to include types of materials and media used)	\$10,000- \$15,000	1-Time event	Fire Grant
			4B. Develop materials, launch strategy and facilitate public education walks/meetings	\$20,000- \$50,000	1-Time event with \$5,000/yr following	Fire Grant
5	<b>Undertake high priority fuel load reduction projects in very high fire hazard severity areas (to include managing defensible space on Town land in priority areas)</b>	Tobin Clark, Crystal Springs, Southdown	5A. Refine boundaries and management actions within high priority mapped areas	\$5,000-\$10,000	1-time event	Grants, Program funds
			5B. Conduct first phase fuels management in high priority mapped areas	\$100,000 - \$150,000	1-time event	Grants, Program funds
			5C. Prepare and implement maintenance strategy for maintenance of priority management actions	\$50,000- \$100,000	3-5 yrs	Grants, Program funds
6	<b>Forest Stand Conversion (Acacia to Mixed Oak Woodland)</b>	Crocker Lake	6A. Update Acacia Mapping, Define Historic Extent	\$5,000-\$10,000	1 Time event	Fire Grant
			6B. Prepare Revegetation Plan	\$5,000-\$15,000	1 Time event	Fire Grant
			6C Collection and Propagation	TBD	Ongoing 2 years	Fire Grant

**TABLE 7.4 PROPOSED PROJECT LIST (Continued)**

Project No.	Project Title	Location	Project Elements	Cost Range	Type of Event/Duration	Possible funding source
<b>Forest and Fire Management (Continued)</b>						
<b>6</b>	<b>Forest Stand Conversion (Acacia to Mixed Oak Woodland) (Continued)</b>					
			6D. Prepare contract specs and RFP, select contractor, finalize contract	\$5,000 - \$10,000		Fire Grant
			6E. Conduct Acacia Tree removal, sapling management	\$100,000-\$150,000	2-5 years	Fire Grant
			6F Install and Maintain Plantings	TBD	5-10 years	Program funds
			6G Project Management	TBD	1-3 yrs	Program funds
<b>7</b>	<b>Forest Stand Conversion - Eucalyptus to Mixed Oak Woodland</b>	Crocker Lake, Spencer Lake	7A. Update Eucalyptus Mapping, Define Groves to be removed	\$5,000-\$10,000	1 Time event	Fire Grant, Eucalyptus Legal Settlement?
			7B. Prepare Revegetation Plan	\$5,000-\$15,000	1 Time event	Fire Grant, Eucalyptus Legal Settlement?
			7C Collection and Propagation	TBD	Ongoing 2 years	Fire Grant, Eucalyptus Legal Settlement?
			7D. Eucalyptus Historic Stand definition, Leading Edge Tree Removal, Sapling Management	\$50,000-\$75,000	2-5 years	Fire Grant, Eucalyptus Legal Settlement?
			7E. Prepare contract specs and RFP, select contractor, finalize contract	\$5,000 - \$10,000		Fire Grant, Eucalyptus Legal Settlement?

**TABLE 7.4 PROPOSED PROJECT LIST (Continued)**

Project No.	Project Title	Location	Project Elements	Cost Range	Type of Event/Duration	Possible funding source
<b>Forest and Fire Management (Continued)</b>						
7	<b>Forest Stand Conversion -Eucalyptus to Mixed Oak Woodland (Continued)</b>		7F. Conduct Eucalyptus Tree removal, sapling management	\$100,000- \$150,000	2-5 years	Fire Grant, Eucalyptus Legal Settlement?
			7G Install and Maintain Plantings	TBD	5-10 years	Program funds
			7H Project Management	TBD	1-3 yrs	Program funds
8	<b>Fuel Load Reduction-Defensible Space Management</b>	All sites	8A- Clear 100 Foot Buffer Defensible Space and Clear fire trails (Concurrent with 19)	\$300,000- \$500,000	1-2 years	Combination Fire Grant and Program Funds
			8B- Public Outreach/Education Program see 4B above)		Ongoing	Combination Fire Grant and Program Funds
			8C- Ongoing Assessment and Management of Defensible Areas (Concurrent with 17B)	\$5,000-\$10,000 per year	Ongoing	Combination Fire Grant and Program Funds
9	<b>Sudden Oak Death Syndrome Management Program, Hazardous Tree Assessment and Removal</b>	All Sites	9A Detect and Map Diseased Trees, Hazard trees	\$10,000- \$15,000- \$20,000-	1-Time event	Possible Grant, Program Funds
			9B Public Outreach and Education	\$30,000	1-Time event	Program funds
			9C Remove Hazard Trees, Contain Diseased Trees, Reduce Potential for transmission (remove brush, install fencing, boot washing etc)	75,000 - 100,000	1-time event	Program funds
			9D. Retain Forester to conduct annual education, surveillance and maintenance actions	\$10,000- \$15,000/year	Ongoing	Program funds

**TABLE 7.4 PROPOSED PROJECT LIST (Continued)**

Project No.	Project Title	Location	Project Elements	Cost Range	Type of Event/Duration	Possible funding source
<b>Invasive Non-Native Plant Control Program</b>						
10	<b>Develop Invasive Plant Early Detection Program</b>	All Sites	10A Develop Program Partners, Supporting materials	\$3,000-\$5,000	1 Time event	Grant
		All Sites	10B Ongoing Plant Patrol (Concurrent with 14A)	\$5,000 - \$10,000/yr	Ongoing	Volunteers, with Staff Support?
11	<b>Treat highest Priority New Invasives, High Priority Sites (Egg leaved Spurge, Star Thistle Species)</b>	Nueva Macadamia, Tobin Clark	11A- remove high priority invasives	\$5,000 - \$10,000	1 Time event	Program Funds
12	<b>Invasive Plant Control- Crocker Lake</b>	Crocker Lake	12A- Remove invasives associated with Acacia, Eucalyptus stand removal, Fire management Areas (Concurrent with Projects 13, and 14) (about 3-5 acres)	\$30,000-50,000	1 year initial treatment, 3-5 years re-treatment	Possible Partial Fire grant, Program Funds
			12B Treat all other invasives (Concurrent with Project 20)	\$20,000-\$30,000	1 year initial treatment, 3-5 years re-treatment	Program funds
13	<b>Invasive Plant Control- Tobin Clark</b>	Tobin Clark	13A- Remove invasives associated with Fire management Areas (Concurrent with Projects 13, and 14) (about 1-2 acres)	\$15,000-\$25,000	1 year initial treatment, 3-5 years re-treatment	Possible Partial Fire grant, Program Funds
			13B Treat all other invasives (Concurrent with Project 12B)	\$25,000-\$50,000	1 year initial treatment, 3-5 years re-treatment	Program funds

**TABLE 7.4 PROPOSED PROJECT LIST (Continued)**

Project No.	Project Title	Location	Project Elements	Cost Range	Type of Event/Duration	Possible funding source
<b>Invasive Non-Native Plant Control Program (Continued)</b>						
14	<b>Invasive Control Outreach and Policies for New Construction</b>	All Sites	14A. Develop Policies for landscaping new homes adjacent to open space. Develop "Don't plant a Pest and Green Waste dumping / trespass policies (Concurrent with 18D)	Minimal, Staff time to monitor, develop and mail outreach materials, patrol sites \$3,000-\$5,000/year	Year Round	Program funds
<b>Ecological and/or Natural Process Function Improvements</b>						
15	<b>Improve Ecological Health and Function of Crocker Lake</b>	Crocker Lake	15A Phase 1. Initial sediment removal in partnership with Gold Course (AE proposal)	See AE proposal	1 Time event	Possibly funded by Golf Course as part of water rights agreement
			15B Phase 2. Clean Out Sediment Basin (long term AE Proposal)	See AE Proposal	1 Time event	Possibly funded by Golf Course as part of water rights agreement
			15C Phase 3- Fix upstream erosion-fix silted culverts, stabilize creek bed.	See AE Proposal	1 Time event	Program funds/ Grants
<b>Green Waste Management</b>						
16	<b>Set up centralized green waste processing area to serve Open Space Lands</b>	Tobin Clark	16A Look in to opportunities to share sites/equipment (green waste, composting facility, chipper)	Minimal, Staff time to set up MOU \$1,000-\$2,000	1 Time event	Program funds
			16B Develop MOU (College of San Mateo and/or Golf Course/Country Club)	Minimal, Staff time to set up MOU \$1,000-\$2,000	1 Time event	Program funds
			16C Purchase equipment, set up composting facility, Ongoing management operations budget	\$75,000-\$100,000	1 Time event	Grant

**TABLE 7.4 PROPOSED PROJECT LIST (Continued)**

Project No.	Project Title	Location	Project Elements	Cost Range	Type of Event/Duration	Possible funding source
<b>Public Outreach, Agency Partnerships, Best Management Practices</b>						
17	<b>Develop MOU with College of San Mateo</b>	Tobin Clark	17A Develop MOU (College of San Mateo) Determine feasibility of using site for college-based habitat restoration/land-planning initiative with College of San Mateo. Program would be modeled from City College Center for Habitat Restoration and Merritt College Sustainability Center where student course work would result in direct improvements, management, monitoring or features as well as plan development. Investigate cooperative agreement for Tobin Clark site management with College of San Mateo. (See project 13 above)	Minimal, Staff time to set up MOU \$1,000-\$2,000	1 Time event	Program funds
18	<b>Develop Outreach Materials Addressing Neighbor Issues</b>	All Sites	18A Address vegetation debris dumping issues- proactively outreach to neighbors. Prepare community awareness strategy to include sending out no dumping notices.	Staff time to contact neighbors, patrol open space sites mailings - \$10,000-\$20,000 Concurrent with 18B, 18D)	Ongoing	Program funds
			18B Work with Central County Fire Department on outreach efforts related to brush clearing see 8B above)	Staff time to contact neighbors, patrol open space sites mailings - \$10,000-\$20,000 (Concurrent with 18A, 18D)	Ongoing	Program funds

**TABLE 7.4 PROPOSED PROJECT LIST (Continued)**

Project No.	Project Title	Location	Project Elements	Cost Range	Type of Event/Duration	Possible funding source
<b>Public Outreach, Agency Partnerships, Best Management Practices (Continued)</b>						
18	<b>Develop Outreach Materials Addressing Neighbor Issues (Continued)</b>					
			18C. Develop Sudden Oak Death Syndrome educational materials. Distribute to neighbors. Provide technical assistance with SODS detection and treatment. Conduct Community Awareness meetings about SODS. (Concurrent with Project 9)	Provide On Call Forester services, \$25,000 per year/	3-5 years	Possible Grant, Program Funds
			18D. Address backyard garden escapees, "Don't Plant A Pest" materials to be distributed to neighbors - (See 14A)	Staff time to contact neighbors, patrol open space sites mailings - \$10,000-\$20,000 Concurrent with 18A, 18B)	Ongoing	Program funds
19	<b>Develop Partnership with School at Nueva Macadamia</b>	Nueva Macadamia	19A. Develop MOU with School district re. use of Nueva Macadamia use as outdoor classroom. See Project 6A	Minimal, Staff time to set up MOU \$1,000-\$2,000	1 Time event	Program funds
			19B. Students develop and conduct water quality and sediment monitoring program	Minimal, Staff time to work with Friends of group \$1000-\$2,000/year	Ongoing	Program funds

**TABLE 7.4 PROPOSED PROJECT LIST (Continued)**

Project No.	Project Title	Location	Project Elements	Cost Range	Type of Event/Duration	Possible funding source
<b>Public Outreach, Agency Partnerships, Best Management Practices (Continued)</b>						
19	<b>Develop Partnership with School at Nueva Macadamia (Continued)</b>					
			19C. Possible site restoration/native planting program using students to grow and/or plant see project 6A	Minimal, Staff time to work with friends of group \$1000-\$2,000/year	Ongoing	Program funds
<b>Public Safety / Erosion Control</b>						
20	<b>Fence and exclude dangerous sites, re-route trail to safe locations</b>	Crocker Lake, Tobin Clark, Nueva Macadamia	20A. Fence and stabilize collapsed bridges, eroding roadbeds, stream banks	\$10,000-\$30,000	1 Time event	Program funds
21	<b>Conduct feasibility assessment for rebuilding bridges at Nueva Macadamia and Crocker Lake. Perform cost/benefit analysis for alternatives (e.g. re-construction, limiting public access, etc.)</b>	Crocker Lake, Nueva Macadamia	21A. Assess options for rebuilding historic bridges versus minimal rehabilitation of road system	Feasibility Study, \$10,000-\$25,000	1 Time event	Program funds
22	<b>Remove old trash and debris at Tobin Clark to include rusted cars, couches, landscape materials, garbage etc.</b>	Tobin Clark	22A.Remove Debris	TBD, Possibly \$10,000 to \$25,000	1 Time event	Program funds

## **8.0 SUMMARY OF LONG-TERM MAINTENANCE NEEDS**

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Open Space lands will require ongoing management and maintenance. This cannot be overemphasized because many land management agencies have in the past underestimated and under-funded ongoing maintenance, often with adverse effects. As a rule of thumb, approximately 10-20% of the total cost of each project should be assigned to ongoing maintenance and management. The cost and time required for maintenance should be included in the project description.

This section describes the ongoing maintenance needs that are related to vegetation management. This section is intended for staff to factor in maintenance staffing and costs into the project planning process.

### **8.1 FOREST MAINTENANCE AND FIRE CONTROL MANAGEMENT**

Ongoing forest health maintenance (including hazard tree detection and removal) and monitoring of overall fire risk is an ongoing responsibility of staff. Ongoing maintenance activities will be required for the following:

**Hazardous Tree Removal, Tree Disease Control.** Over time, trees will naturally age and may be damaged by wind, pests, disease, and mechanical damage. Trees that are located adjacent to trails and facilities should be routinely inspected by an experienced forest ecologist or arborist. Newly detected hazard trees should be removed as necessary to maintain the health of the forest. Likewise, regular forest assessments should be conducted to detect tree diseases, and key trees removed, treated, or otherwise contained to reduce spread of the disease.

**Brush, Sapling, and Understory Removal and Thinning.** Forested sites and forest stand conversion sites will require ongoing brush, sampling and understory removal and thinning. Follow-up maintenance includes detection and treatment of saplings, seedlings, and re-sprouts of stump-sprouting trees and shrubs such as eucalyptus and acacia, and for species that produce copious amounts of seed such as French broom and acacia species that are difficult to control.

Brush cutting of shrubs and grasses within the 100-foot wide fire management buffer areas is recommended on an annual basis, preferably in summer (August) after California bottlebrush has set seed. New seedlings and re-sprouts may be hand-pulled using contract or volunteer labor. For stubborn infestations, chain-sawing or brush-cutting, followed by immediate herbicide application may be required. Covering the area with black tarps to solarize vegetation may also help control localized problem areas.

### **8.2 TRAIL MAINTENANCE AND HUMAN USE ISSUES**

Maintenance staff already routinely inspects many of the open space sites. During site inspections, other issues such as green waste dumping, trespass, fence breaks, or other human use issues should be noted, and appropriate actions identified. In most cases, a combination of landowner outreach,

and fixing the problem (e.g. repairing fences, posting no trespass or no dumping signs, removing green waste piles), will be required on an ongoing basis.

### **8.3 INVASIVE PLANT CONTROL**

Invasive plant control projects will require active management for many years following completion of initial removal activities. Sites should be monitored 2-3 times per year for the first 3-5 years, tapering off to annual monitoring over time.

In addition, all open space lands should be patrolled annual to detect new invasive plants, and to detect re-infestations of target invasive plants that were previously treated and controlled. Maintenance staff should regularly contact the Weed Management Area and the Agricultural Commissioner's office to see if new invasive plants are becoming problematic in San Mateo County or elsewhere in California.

### **8.4 EROSION CONTROL**

As mentioned above, maintenance staff already routinely inspects many of the open space sites. During site inspections, staff should inspect the parcels for severe erosion that may require maintenance. In particular, access roads and trails should be inspected for water damage. If present, trails and roads should be re-graded, preferably to install 'rolling dips' that will catch and divert water off the road/trail surface. As an alternative, drainage ditches, water bars, culverts, sand bags, and other structures can be installed permanently or temporarily to address erosion issues related to roads and trails.

Several of the open space sites have natural slumps, slides, and seeps that will naturally continue to move, possibly causing soil erosion and slope instability. Natural slumps, slides and seeps should be assessed regularly for potential to cause damage to the site and surrounding lands, and repaired as necessary. Repairs may include hand or machine grading, soil compaction, installing drainage or diverting natural water flows, installing jute mesh erosion control netting, straw wattles, and/or seed-free rive straws to stabilize slopes.

Creeks and drainages should be assessed regularly, (in particular bridge and trail crossings such as those at Crocker and Nueva Macadamia) for signs of streambank erosion. Walking the creek once a year prior to winter rains is recommended to assess damage. Repairs can be minor (requiring some hand grading and installation of some simple erosion control), or major (requiring a streambank stabilization plan) and heavy equipment to repair.

## **9.0 BUILDING PUBLIC AWARENESS, SUPPORT AND INVOLVEMENT FOR VEGETATION MANAGEMENT**

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Community participation in natural areas stewardship has been growing exponentially during the last 15 years. Volunteers contribute millions of hours of donated labor to conservation each year. According to a recent survey, an estimated two million Californians participated in volunteer workdays sponsored by community-based stewardship groups such as the “Adopt a Creek” or “Friends of a Local Parks” groups that have become ubiquitous throughout California.

While volunteerism is not currently integral to the Town’s maintenance operations, it is envisioned that the adoption of the Vegetation Management Strategy and the implementation of priority pilot projects will generate a greater role and opportunities for volunteer stewardship and public participation. It is anticipated that building active community involvement and support will help improve the health of the Town’s open space areas, improve the recreational and aesthetic experiences of its residents; and beautify the residential buffers through “on-the-ground” stewardship activities that yield tangible results. The program will also likely yield less tangible outcomes including growth of individual learning, improved community spirit, greater public advocacy and interest, and stronger community appreciation and connection to the local open space areas.

### **9.1 STRATEGIES FOR BUILDING PUBLIC EDUCATION AND AWARENESS**

The Town of Hillsborough and surrounding vicinity supports a primarily affluent suburban community. Traditional park settings draw a myriad of recreational users including youth and adult sports participants, dog walkers, and picnickers. However few local opportunities exist for passive recreational experiences within the area such as bird watching, hiking and community gardening. Several of the Town’s open space parcels offer the potential to support these passive recreational values. Additionally, several local schools and colleges (e.g. Nueva Macademia school and College of San Mateo) have expressed a strong desire to engage students in meaningful service projects and outdoor educational experiences. Nueva Macademia, Crocker Lake and Tobin Clark could serve as “outdoor classrooms” for various service and educational projects, providing opportunities for local environmentally-based experiences. The College of San Mateo could offer courses, train staff, and create internships or credential programs that focus students on supporting open space priorities.

Illegal vegetation dumping actions and encroachments persist in some of the Town’s open space parcels, suggesting a need for increased staff presence and additional resources to monitor and manage these actions. Fuel load management ranks high for Town staff and neighbors abutting open space parcels. Active outreach programs could be developed around both of these issues, to include workshops on alternative fire-safe landscaping materials, material development on who to contact if illegal actions are observed, and incentive programs which could be developed for businesses and residents who support and participate in the Vegetation Management Strategy priorities.

Special events promoting environmental stewardship activities such as bird counts, themed environmental and historical walks, water quality monitoring, weed removal, habitat restoration and garbage removal in the open space areas would likely draw community interest and participation both

locally and regionally, and may generate continued interest and awareness. These could be used to capture initial interest and cultivate long-term advocacy and support.

All of the above suggest that a number of opportunities exist for developing and facilitating a successful public awareness program. Given that this level of community engagement would be the first of its kind managed by the Town or designated partner toward fulfilling open space protection goals, engaging and sustaining community participation will need to be an active process, yielding genuine participation and a shared investment that produces tangible outcomes for the benefit of individuals, communities, and open space resources.

Additionally, to be most successful, engagement must be consistent with the Town's mission and priorities while also reflecting those related interests and needs of the community served. Identification of potential community interests and "audiences" is critical for targeting volunteer involvement. Programming and outreach strategies should be built around an understanding of these audiences and their optimal communication pathways.

Audiences could include:

- Local residents, neighborhood and interest groups; and
- Local youth, schools, and colleges; and
- Local community groups, foundations, service groups and affiliated organizations.

Each audience may have a preferred pathway for effective communication. The following outreach and engagement materials would likely best meet the initial needs of the Town of Hillsborough, and could be considered as a part of a comprehensive awareness and engagement strategy linked to the larger Vegetation Management Strategy..

- Electronic communication, possibly in the form of an E-Newsletter;
- Brochure – a simple, compelling and concise tri-fold brochure (for fire management, illegal dumping and "being a good neighbor");
- Website links to the Town's (and other relevant) current website and community and school groups;
- Phone trees; and
- Articles and outreach bulletins in existing community and environmental newsletters.

## **9.2 BUILDING VOLUNTEER STEWARDSHIP**

Currently the Town of Hillsborough does not have an active natural areas volunteer program. If developing a program is deemed mutually beneficial to the local constituents, schools and Town staff, it will be important to develop a shared vision that will serve as a foundation to build and sustain the commitment of staff, partners and volunteers. Critical to this, will also be developing and defining the role of community members and partners in volunteer stewardship activities.

Recognizing that the development of volunteer programming should be guided by the Town's vegetation management priorities and community interest, it is recommended that Hillsborough prepare a Stewardship Program Plan prior to initiating the Strategy. The Plan would identify an appropriate framework for building a sustainable natural areas stewardship program based upon the capacity of Town staff; it would also further develop strategies for community engagement and partnerships; identify and understand community interest, and identify possible program structures,

staffing, training needs and associated costs. Town staff and officials would work cooperatively with the Hillsborough community, stakeholders and partners to create the Stewardship Program Plan and build a mutually beneficial volunteer program.

The following program elements could be cultivated and offered by the Town and its designated partners to meet community interests, agency management goals and achieve meaningful community engagement and participation.

- Adopt-An-Open Space;
- Drop-in Public Programs;
- Special Events;
- Service Learning and Environmental Education Programs;
- Internships;
- Service Projects;
- Neighborhood Watch;
- Site Amenity Sponsorship; and
- Community Clean-up Events.

These potential program opportunities apply to one or more audiences and many could be modified to meet the need of the specific audience if desired. The number of program elements, and the ability to develop, publicize and offer these programs however, would depend upon the Town's staffing capacity, funding, resources and community interest.

## 10.0 REFERENCES

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Polet, J. and P. Omi. 1999. The effects of thinning and prescribed burning on wildland fire severity in Ponderosa Pine Forests. *Report in: Federal Wildfire Activities*, report to the Clinton Administration, Aug. 1999. Washington D.C.

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University of New Hampshire Cooperative Extension, 1995. Wildlife habitat improvements; woodlands and wildlife. Newport, New Hampshire.

U.S. Environmental Protection Agency. 1999. Organic Materials Management Strategies. Publication NO. EPA530-R-99-016. Washington, D.C.

## 10.2 PERSONAL COMMUNICATIONS

Cooney, Ed. Assistant Planner to Director of Public Works. Town of Hillsborough. Various meetings and telephone calls, July to November 2007. (650)-579-3355. [ecooney@hillsborough.net](mailto:ecooney@hillsborough.net).

Debry, Martha. Director, Public Works Town of Hillsborough. Onsite Meeting, July 2007. (650)-375-7400 [mdebry@hillsborough.net](mailto:mdebry@hillsborough.net)

Yballa, Rocque. Division Chief/Fire Marshall. Central County Fire Department. (650)-558-7618. [ryballa@centralcountyfd.org](mailto:ryballa@centralcountyfd.org). Meeting, October 2007.

# Appendix A. HELPFUL RESOURCES

## 1. GENERAL REFERENCES ON VEGETATION MANAGEMENT

### Websites

- **National Park Service - Restoration Projects around the Bay Area**  
<http://www.nps.gov/goga/parklabs/restoration/index.htm>
- **East Bay Regional Parks Wildlands Management Plan**  
[www.ebparcs.org/resources/pdf/hr/job\\_desc/WILDLAND\\_VEG\\_PROG\\_MNGR.pdf](http://www.ebparcs.org/resources/pdf/hr/job_desc/WILDLAND_VEG_PROG_MNGR.pdf)
- **Western Watershed Program** <http://www.westernwatersheds.org/>

## 2. INVASIVE PLANT RESOURCES

### Books

- **Weed Worker's Handbook: A Guide to Techniques for Removing Bay Area Invasive Plants.** The Watershed Project and California Invasive Plant Council. 2004. Available online at: [http://www.cal-ipc.org/ww\\_handbook/](http://www.cal-ipc.org/ww_handbook/)
- **San Mateo County Weed Guide**  
[http://www.cdfa.ca.gov/phpps/ipc/weedmgareas/SanMateo/smwma\\_brochure.pdf](http://www.cdfa.ca.gov/phpps/ipc/weedmgareas/SanMateo/smwma_brochure.pdf)
- **Invasive Plants of California Wildlands.** 2000. Carla Bossard, John M. Randall, and Mark C. Hoshovsky. University of California Press, Berkeley and Los Angeles, CA. Available online at:  
[http://groups.ucanr.org/ceppc/Invasive\\_Plants\\_of\\_California's\\_Wildlands](http://groups.ucanr.org/ceppc/Invasive_Plants_of_California's_Wildlands)

### Websites

- **The Nature Conservancy Invasive Plant Resources website**  
<http://tncweeds.ucdavis.edu/handbook.html>
- **California Invasive Plant Council (Cal-IPC) website**  
<http://www.cal-ipc.org/>
- **San Mateo Agriculture Commissioner**  
<http://www.co.sanmateo.ca.us/agriculture/agriculture.html>
- **San Mateo Weed Management Area**  
[http://www.cdfa.ca.gov/phpps/ipc/weedmgareas/wma\\_index\\_hp.htm](http://www.cdfa.ca.gov/phpps/ipc/weedmgareas/wma_index_hp.htm)

### Contacts

- **San Mateo Weed Management Area**  
San Mateo County  
Contact: Ronald Pummer  
(650) 363-4700  
[rpummer@co.sanmateo.ca.us](mailto:rpummer@co.sanmateo.ca.us)  
[sanmateoag@co.sanmateo.ca.us](mailto:sanmateoag@co.sanmateo.ca.us)
- **San Mateo County Agricultural Commissioners Office**  
728 Heller Street  
Redwood City, CA 94064  
Contact: Gail Raabe  
(650) 363-4700  
[smateoag@co.sanmateo.ca.us](mailto:smateoag@co.sanmateo.ca.us)  
[www.co.sanmateo.ca.us](http://www.co.sanmateo.ca.us)
- **California Native Plant Society Invasive Exotics Chairs, Santa Clara Valley Chapter**  
Ken Himes, North County (650) 591-8560  
Don Thomas, South County (408) 867-1515

### 3. SENSITIVE SPECIES INFORMATION

#### Websites

- **Department of Fish and Game website**  
<http://www.dfg.ca.gov/hcpb/species/species.shtml>
- **U.S. Fish and Wildlife Service**  
<http://ecos.fws.gov/ecos/index.do>
- **California Native Plant Society**  
[www.cnps.org/](http://www.cnps.org/)
- **Audubon Society of California**  
[http://www.audubon-ca.org/california\\_birding.htm](http://www.audubon-ca.org/california_birding.htm)

### 4. SPECIES IDENTIFICATION GUIDEBOOKS

#### Books

- **Peterson's Field Guide: Pacific States Wildflowers.** Niehaus and Ripper. 1976. Houghton Mifflin Company.
- **Jepson Manual:** Higher Plants of California. Larry Hickman, Editor. 1993. University of California Press.
- **Pacific Coast Trees.** McMinn and Maino. 1951. University of California Press.
- **Birds of North America.** National Geographic.
- **Peterson Field Guides: Western Birds.** Roger T. Peterson. 1990. Houghton Mifflin Company.
- **Peterson Field Guides: Insects.** Christopher Leahy. 1987. Houghton Mifflin.
- **California Insects.** Jerry A. Powell. 1981. University of California Press.
- **Peterson Field Guides: Western Amphibians and Reptiles.** Robert C. Stebbins. 2003. Houghton Mifflin Company.
- **Bugs of Northern California.** John Acorn. 2002. Lone Pine.

#### Websites

- **Calflora website** (pictorial index to most plants and animals in California)  
<http://www.calflora.org/species/index.html>
- **Jepson Manual Online**  
<http://ucjeps.berkeley.edu/interchange.html> (plants)
- **National Park Service Online Identification Guide** (common plants and animals in local National Parks) <http://www.nps.gov/goga/parklabs/library/wildlifeguide/>
- **San Mateo County Weed Guide** (weeds)  
[http://www.cdfa.ca.gov/phpps/ipc/weedmgareas/SanMateo/smwma\\_brochure.pdf](http://www.cdfa.ca.gov/phpps/ipc/weedmgareas/SanMateo/smwma_brochure.pdf)

### 5. PLANT DISEASES AND PESTS

#### Websites

- **California Oak Mortality Task Force**  
[www.suddenoakdeath.org](http://www.suddenoakdeath.org)
- **California Department of Food and Agriculture**  
[http://www.cdfa.ca.gov/phpps/pe/sod\\_survey/](http://www.cdfa.ca.gov/phpps/pe/sod_survey/)
- **Pitch Canker Task Force**  
[http://frap.cdf.ca.gov/pitch\\_canker/](http://frap.cdf.ca.gov/pitch_canker/)
- **UC IPM Pitch Canker management Guidelines**  
<http://www.ipm.ucdavis.edu/PMG/PESTNOTES/pn74107.html>
- **UC Cooperative Extension Tree Root Rot Fungus Detection and Control.**  
<http://danr.ucop.edu/ihrmp/oak16.htm>

## 6. FORESTRY AND FIRE PROTECTION

### Websites

- **Central County Fire Department**  
[www.centralcountyfd.org](http://www.centralcountyfd.org)
- **California Department of Forestry**  
<http://frap.cdf.ca.gov/>
- **UC Berkeley Forestry Dept**  
<http://forestry.berkeley.edu/lectures/wmmain3.html>
- **UC Berkeley Fire Management Plan**  
[http://oep.berkeley.edu/programs/fire\\_mitigation/](http://oep.berkeley.edu/programs/fire_mitigation/)
- **US Forest Service**  
<http://www.fs.fed.us/psw/>
- **San Mateo County FIRESAFE program**  
<http://www.smcfiresafe.org/members.htm>

### Fuel Load Modeling Software:

- <http://www.fire.org> and at the following website under "software":  
<http://farsite.org/index.php?option=content&task=section&id=2&Itemid=25>.

### Information on Fire Resistant Landscaping

- San Mateo County- Living with Fire (Appendix C)
- **East Bay Municipal Utilities**, Document entitled "Firescape: Landscaping to Reduce Fire Hazard order from web site at:

## 7. LIVESTOCK GRAZING IN WILDLANDS

### Websites

- **RangeNet website** <http://www.westernwatersheds.org/rangenet/rangenet.html>
- **Range Biome**  
<http://www.rangebiome.org/>
- **Society for Range Management**  
<http://www.rangelands.org/srm.shtml>
- **California Cattlemen's Association**  
<http://www.calcattlemen.org/>
- **California Native Grassland Association**  
<http://www.cnga.org/index.php>
- **Use of Goats for Management of Unwanted Vegetation**  
[http://www.cals.ncsu.edu/an\\_sci/extension/animal/meatgoat/MGVeget.htm](http://www.cals.ncsu.edu/an_sci/extension/animal/meatgoat/MGVeget.htm)
- **Prescription Grazing for Vegetation Management**  
<http://www.cnr.uidaho.edu/rx-grazing/prescriptions.htm>

### Knowledgeable Individuals

- **Goats R Us**  
P.O. Box 37  
Orinda, CA 94563
- **David Amme**  
Resource Restoration and Management  
1504 Beverly Place  
Albany, CA 94706  
(510) 524-3637  
[Doug Allshouse <dougsr@rcn.com>](mailto:dougsr@rcn.com) (415) 584-5114

## 8. VOLUNTEER ORGANIZATIONS

- **Audubon Society California**  
[http://www.audubon-ca.org/california\\_birding.htm](http://www.audubon-ca.org/california_birding.htm)
- **California Native Plant Society**  
[www.cnps.org/](http://www.cnps.org/)
- **Hillsborough Beautification Foundation**  
1600 Floribunda Ave, Hillsborough, CA 94010 (650) 829-5159  
[www.hillsborough.net/about/links/hbf.asp](http://www.hillsborough.net/about/links/hbf.asp)

## 9. INTEGRATED PEST MANAGEMENT

- **U.C. Davis Integrated Pest Management**  
<http://www.ipm.ucdavis.edu/>
- **U.S. Environmental Protection Agency**  
<http://www.epa.gov/pesticides/ipm/>
- **National Integrated Pest Management Center**  
<http://www.ippc.orst.edu/DIR/>

## 10. VEGETATION BIOMASS DISPOSAL AND PROCESSING

- **Organic Materials Management Strategies** 1999. United States Environmental Protection Agency Publication No. EPA530-R-99-016. Washington D.C. July 1999.

## 11. TRAIL CONSTRUCTION AND TRAIL MAINTENANCE

### Knowledgeable Individuals

- **Barth Campbell – Campbell Grading**  
100-A Wickiup Drive  
Santa Rosa, CA 95403  
(707) 433-1183

## Appendix B. HANDOUTS AND BROCHURES

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## **Appendix C. GRANTS AND OTHER FINANCIAL RESOURCES, POSSIBLE PROJECT PARTNERS**

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## FEDERAL SOURCES

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**U.S. Army Corps of Engineers - Sections 1135 & 206:** Section 1135 funds are available for the restoration and acquisition of wetlands previously affected by an Army Corps project. For more information, contact the Army Corps of Engineers at 415-977-8703. Section 206 funds provide for the restoration of aquatic ecosystem structure and function. Projects usually include the manipulation of the hydrology in and along bodies of water, including wetlands and riparian areas. No relationship to an existing Corps project is required. Contact Jay Kinberger 415 977- 8773.

**Environmental Protection Agency:** Various grants in the range of \$25,000-\$350,000 are available through the EPA for watershed planning, restoration and stewardship studies for state, tribal and local governments. Grants are also available for Environmental justice issues, Pollution prevention, Brownfields assessment, Community/Economic development and Environmental education. Their public information line is 415-947-8000 and may be reached at Environmental Protection Agency, Region 9; 75 Hawthorne Street; San Francisco, CA 94105.

**Watershed Grants:** The United States Environmental Protection Agency (USEPA) has announced the availability of up to \$21 million in federal funds for watershed grants. This is a nationally competitive grant program to encourage community-based approaches to watershed management. The majority of funds will be made available in the form of grants (between \$300,000 and \$1,300,000) for specific watershed "studies" or "demonstrations". Similar to last year's competitive process, nominations for Watershed Initiative grants are accepted from Governors and Tribal Leaders only. Nominations were due to USEPA on or before Jan. 15, 2004. Each state's Governor is allowed to submit 2 in-state watershed nominations and unlimited interstate nominations to their USEPA Regional Office for this competition.

**Wetlands Protection - Program Development Grants:** The purpose and special emphasis of this grant program is to provide funding for projects which develop: 1) comprehensive wetland monitoring programs using environmental indicators, assess biological health, estimate wetland losses, gains, and functions; 2) ecologically effective compensatory mitigation for unavoidable impacts; 3) protection for isolated wetlands and other sensitive aquatic resources; and 4) tribal wetland conservation plans. Development of Habitat Conservation Plans, projects set forth by other federal agencies, or long-term planning projects not connected to near-term implementation are a low priority. For additional information, please contact Cheryl McGovern at (415) 972-3415 .

**Land and Water Conservation Fund (LWCF):** The Land and Water Conservation Fund is the largest source of federal money for parks, wildlife, and open space land acquisition. Its funding comes primarily from offshore oil and gas drilling receipts, with an authorized expenditure of \$900 million each year. Under the act, a portion of the money is intended to go to federal land purchases and a portion to the states as matching grants for state and local park projects. Congress generally has appropriated only a fraction of the \$900 million authorized, however, significant strides have been taken in recent years to increase the levels of the Land and Water Conservation Fund. Contact your Congressional representative or regional office of any of the federal agencies for more specific information.

**2004 Neotropical Migratory Bird Conservation Act Grants Program Grants:** The grant application for the FY2004 Neotrop program is now available at <http://birdhabitat.fws.gov>. This program particularly pertains to projects that include upland habitats or those with riparian habitats.

For 2004, almost \$1 mil. will be available for US projects. Habitat work (including monitoring, education and outreach, and other) will be considered. In the US and Mexico, wetland projects will generally not be considered, so as not to compete with the larger NAWCA program. A neotropical project on upland could make a nice complement to a wetland conservation project. Proposals are expected to contribute directly to the continental bird conservation plans as developed by bird initiatives. Furthermore, proposals that develop or support international partnerships for shared priorities, especially between the US and Mexico, have been funded at a higher proportion than proposals strictly within the US. Note that they are not accepting paper this time! Check back for upcoming deadlines.

**North American Wetlands Conservation Act (NAWCA):** NAWCA provides federal funds specifically to "conserve North American wetland ecosystems and waterfowl and the other migratory birds and fish and wildlife that depend on such habitats." (PL 101-233) Eligible projects include acquisition and restoration of wetlands, among other activities. Proposals require a 50/50 nonfederal match.

- 2004 NAWCA Standard Grants:** New application instructions are available on the NAWCA web site at <http://birdhabitat.fws.gov>. Click on Wetlands Grants Program and then click on U.S. Standard Grants. For additional information, contact Rodicia McKnight at 703-358-2266/rodecia\_mcknight@fws.gov or David Buie at david\_buie@fws.gov.
- **2004 NAWCA Small Grants** In conjunction with the Standard Grants program, the North American Wetlands Conservation Council (Council) has created a Small Grants program. The objective is to promote long-term wetlands conservation activities through encouraging participation by new grantees and partners who may not otherwise be able to compete in the Standard Grants program. From 1996, when the program began, about 203 projects have been selected for funding for a total of about \$8.6 million. For 2004, with the approval of the Migratory Bird Conservation Commission, the Council is establishing a \$2.0 million Small Grants funding goal for high quality proposals.

**NPS Rivers, Trails, and Conservation Assistance Program** The National Park Service (NPS) has just announced that the Rivers, Trails, and Conservation Assistance Program (RTCA) is now accepting applications for 2004 technical assistance. This program helps to fulfill the National Park Service's mission of preserving the nation's natural and cultural resources by cooperating with partners to extend the benefits of NPS expertise beyond the boundaries of the national parks to benefit conservation and outdoor recreation throughout the country. RTCA staff can assist in a variety of ways from a one time telephone consultation to longer term project involvement. For more information call Barbara Rice at 510-817-1449. Deadline is July 1st each year although NPS likes to work with project proponents prior to the deadline.

**Partners for Fish & Wildlife Program:** The F&WS Partners for Fish & Wildlife Program works in voluntary partnership with private landowners to restore ecological habitat. The Program provides advice on the design and location of potential restoration as well as financial assistance to implement the projects. A dollar-for-dollar cost share is sought. Contact Deb Schlafmann, Partners for Fish and Wildlife & Habitat Conservation, California/Nevada Operations Office, 916/414-6464, 916/414-6462 Fax

**U.S. Department of Agriculture, Natural Resource Conservation Service (NRCS) Wetlands Reserve Program (WRP):** Funds are available through the U.S. Department of Agriculture, Natural Resource Conservation Service for the acquisition of conservation easements on agricultural lands. Both permanent and 30-year easements can be purchased under the WRP, with priority given to

projects that maximize wildlife values. Funds for wetland restoration are also available. Contact: Alan Forkey, Wetlands Biologist, 530-792-5653 or your local NRCS field office.

- **Farm Bill:** Significant funds are available to Joint Venture partners through Farm Bill funding even if they have a project that remotely qualifies. Applicable Farm Bill programs include WHIP, WRP and NRCS (above). For more information, read [How to Apply for Farm Bill Funding](#).
- **Wildlife Habitat Incentive Program (WHIP):** WHIP is a voluntary program for private landowners who want to develop or improve fish and wildlife habitat on their property. The Natural Resources Conservation Service (NRCS) administers the program, providing technical assistance and up to 75% of the cost of the project. Contact your local NRCS field office for more information.

**Watershed Assistance Grants (WAG):** The River Network allocated funding to build capacity of existing or new watershed partnerships to protect and restore their watersheds.

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## STATE SOURCES

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**Department of Conservation Watershed Coordinator Grant Program** The Request for Proposals (RFP) for the Watershed Coordinator Grant Program is now available on the Department's website. The Grant Program is open to locally based nonprofit groups with 501(c)(3) status, special districts and local governments. The Program is not open to federal or state agencies. To receive a hard copy of the RFP, please send a request to [rcd@consrv.ca.gov](mailto:rcd@consrv.ca.gov).

**Department of Fish and Game (DFG) Fines:** DFG collects fine monies for fish and game code violations. County fish and game committees typically administer these funds. Contact your local Fish and Game office for information.

**Environmental Enhancement and Mitigation Program (EEM):** Established in 1989, the EEM Program requires the state to spend an additional \$10 million a year over a 10- year period from FY 1991-92 to FY 2000-01 beyond what is legally required to mitigate the effects of transportation facility development. Grants are available for projects that mitigate, directly or indirectly, the environmental impacts of transportation facilities. This program awards funds in the following three categories: Highway Landscape and Urban Forestry, Resource Lands, and Roadside Recreation. Local, state, or federal agency, non-profit organizations, or public/private partnership are eligible to apply. Requests are generally limited to \$250,000. No matching funds are required, although matching funds greatly strengthen your application. Contact: Bill Borden, California Resources Agency, 1416 Ninth Street, Room 1311, Sacramento, 95814, 916-653-5656.

**Habitat Conservation Fund:** The California Department of Parks and Recreation administers this grant program for local public agencies for the acquisition and restoration of wildlife habitats and significant natural areas. Eligible projects include acquisition/restoration of deer/mountain lion, rare, threatened and endangered species, wetlands, riparian, anadromous fish and trout habitat and urban trail/wildlife corridor projects. Contact Odel King at 916-653-8758, California Department of Parks and Recreation; PO Box 942896; Sacramento, 94296-0007.

**Proposition 12 Funding.** Passage of Proposition 12 in March 2000 increased funding to existing programs or established new sources of funds for parks and recreational resources. Following is a list

of the agencies administering Proposition 12 funds, names of funding programs, and contact information.

Department of Parks and Recreation: Urban Recreational and Cultural Centers, Museums, and Facilities for Wildlife or Environmental Education Program - Per Capita Program - Roberti-Z'berg-Harris Program - Non-Motorized Trails - Murray Hayden Urban Parks and Youth Services Program - Riparian and Riverine Program - Zoos and Aquariums Program. Please call (916) 653-7423 or visit the program website.

- California Conservation Corps: Project Funds. Please call (916) 341-3153
- Wildlife Conservation Board: Project Funds. Please call (916) 653-7664
- Department of Conservation: Project Funds. Please call (916) 322-1080
- Department of Fish and Game: Project Funds. Please call (916) 653-7664
- Resources Agency: Project Funds. Please call (916) 653-5656

**State Water Resources Control Board (SWRCB) Nonpoint Source & Water Quality Planning**

**Programs:** SWRCB offers funding (grants and loans) for projects that improve or protect water quality that is impaired or threatened by non-point source pollution through the NPS section of the SWRCB. State and local agencies and non-profits may apply. For more information, contact Paul Roggensack (loans to address water quality associated with discharges and estuary enhancement) at 916-657-0673, Paul Lillebo [205(j) planning grants] at 916-657-1031, or Lauma Jurkevics [319(h) implementation grants] at 916-657-0518. NOTE: Last month, EPA published new guidelines for the National Nonpoint Source (NPS) Program implemented under section 319 of the Clean Water Act. These guidelines replace all previous NPS grants guidelines beginning in fiscal year 2004. The guidelines focus approximately one-half of section 319 dollars on the remediation of impaired waters through the development of total maximum daily loads (TMDLs), and the development and implementation of watershed-based plans. These plans provide an analytical framework for assessing the sources of water pollution; estimating the amount of pollutant reduction needed to achieve water quality standards; identifying the management measures whose implementation will enable those reductions to be achieved; and identifying financial and regulatory tools, as appropriate, that will enable the watershed plan's goals to be achieved. The guidelines were published in the Federal Register on Oct. 23, 2003 and are posted on EPA's NPS web site at: <http://www.epa.gov/fedrgstr/EPA-WATER/2003/October/Day-23/w26755.htm>.

**Watershed Grants:** The State Water Resources Control Board and the California Environmental Protection Agency are now jointly soliciting grant proposals for screening, selection, and recommendation to the Governor. Upon approval by the Governor, two in-state proposals and selected interstate proposals can be forwarded to the USEPA for the funding competition. Tribal leaders may also submit nominations directly to the USEPA. Applicants must meet the USEPA Watershed Initiative grant criteria to be eligible and competitive for funding. The criteria are very restrictive and potential nominees should read the 'Question and Answer' document (under 'Call for 2004 Nominations') at the [USEPA website](#) before considering whether to put in the time and effort needed to apply. Criteria for selection and other information can be found at the USEPA website. The December 4, 2003 deadline has passed. Submitted nominations will be reviewed by staff from the California Environmental Protection Agency, the California Resources Agency, the Department of Water Resources, and the Water Resources Control Board. For additional information, please contact Ken Coulter at the State Water Resources Control Board at (916) 341-5496 and Sam Ziegler at USEPA at (415) 972-3399.

**Transportation Enhancement Activities Program:** The federal Transportation Equity Act for the 21st Century (TEA-21) extends the life and intent of ISTEA through 2003, including the

requirement that states spend a minimum of 10% of their Surface Transportation Program funds on "transportation enhancements" or conservation-related projects such as the acquisition of scenic lands, easements, and historic sites, construction of bicycle trails, removal of outdoor advertising, and archeological/historic preservation. Eligible projects must relate to a transportation facility and be above and beyond normal transportation projects or mitigation. Non-federal matching funds are required. California's TEA funds are separated into four pots, with the bulk of the funding available through regional transportation planning agencies. Local, state, and federal agencies are eligible to receive funding; non-profits are encouraged to submit joint applications. Application deadlines vary. Contact: Marsha Mason, Caltrans TEA Office, 1120 N Street, Sacramento, 95814, 916-654-5275 or your local regional transportation planning agency.

**Urban Park Program:** Eligible projects: Acquisition or development, or both, of property for new urban parks or new recreational or multipurpose facilities. Funds available: \$130,690,000. Match Requirement: Applicants that provide a commitment for matching contributions will be more competitive in this program. Eligible applicants: (1) Heavily urbanized counties (population of 500,000 or more and a density of at least 1,100 persons per sq. mile) [Note: Heavily urbanized counties include the counties of Alameda, Contra Costa, Los Angeles, Orange, Sacramento, San Francisco, San Mateo, and Santa Clara]. (2) Cities, districts, as defined, and joint powers authorities located in a heavily urbanized county. (3) Cities with a population of 100,000 or more that are not in a heavily urbanized county [Note: cities with a population of 100,000 or more that are not in a heavily urbanized county include the cities of Bakersfield, Chula Vista, Corona, Escondido, Fairfield, Fontana, Fresno, Modesto, Moreno Valley, Oceanside, Ontario, Oxnard, Rancho Cucamonga, Riverside, Salinas, San Bernardino, San Buenaventura, San Diego, Santa Rosa, Simi Valley, Stockton, Thousand Oaks, and Vallejo]. (4) Non-profit organizations in all of the above.

**Wildlife Conservation Board (WCB) Inland Wetlands and Riparian Habitat Conservation Programs:**

WCB acquires and restores wildlife habitat throughout California.

WCB also manages the Inland Wetlands Program for the acquisition and restoration of wetlands in the Central Valley and the Riparian Habitat Conservation Program that focuses on protecting and restoring riparian systems throughout the state. For more information on available funding, contact Marilyn Cundiff-Gee (Inland Wetlands) or Scott Clemons (Riparian) at 916-445-8448.

With the passage of Prop 50, an unspecified amount of funding will be available through the Wildlife Conservation Board on a continuous basis. Stay tuned for more details.

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## **LOCAL SOURCES /OTHER GRANTS**

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**The California Wildlands Grassroots Fund** was established by the San Francisco-based Tides Foundation to support the efforts of activists to preserve California's wildlands. The Fund supports conservationists advocating for the permanent protection of intact wildlands on both public and private lands in order to help preserve California's wilderness and native biological diversity. CWGF defines "wildlands" as natural habitats, privately or publicly owned, that are (or have the potential to be) permanently preserved through legislation or deed restrictions. The Fund provides a broad range of support to promote the ability of activists and organizations to protect wildernesses throughout the state. Specifically, it focuses on small nonprofit organizations (budgets of \$100,000 or less) and individual activists (with a sponsoring organization) that show a demonstrated ability and commitment to conserve California's natural landscapes, ecosystems, plants, and wildlife; and

geographic areas and advocacy efforts that have not received significant foundation support. The typical grant award is between \$1,000-\$3,500, with a maximum award of \$5,000. There is an open deadline for these grants.

**The Candle Foundation:** Seeks innovative, high-impact, low-overhead projects for which beneficiaries are chosen on a nonreligious, nonpolitical, nonethnic basis. A sample program that has been funded in the past is watershed education for inner-city students. The Candle Foundation supports grant-seekers throughout North America with some preference given to areas in which there are Candle offices. Grants ranging from \$1,000 to \$10,000 are awarded in five categories: Community investment; Education and information dissemination; Hunger and homelessness; Medical research; Preventive health services. There is an open deadline for these grants.

**Community Technology Foundation of California Grants:** The goal of our General Grants program is to be responsive to the efforts of community-based organizations in designing and integrating telecommunications and technology into their programs. We believe that underserved communities drive and know best how to incorporate technology into their lives, identify barriers in access, and propose community-building and problem solving strategies. The Foundation conducts two grant rounds per year, but we accept General Grants proposals year round from qualified applicants. We greatly appreciate early proposal submissions.

**Ducks Unlimited:** Ducks Unlimited (DU) provides technical assistance, matching funds and help in securing grants for the completion of wetland habitat restoration projects on both public and private land. Call the Western Regional Office of DU at 916-852-2000.

**The E. Alexander Bergstrom Memorial Research Award from the Association of Field Ornithologists:** The purpose of this award is to promote field studies of birds, by helping to support a specific research or analysis project. Approximately five Domestic awards (maximum \$1000 each) and two or three Latin American Awards (maximum \$1500 each) will be awarded annually. Applications may be made for a grant of AFO mist nets in lieu of a cash award. Applications may be submitted in English, Spanish, or Portuguese. Visit their website or call (979) 480-0999 for further details. The 2003 deadline has passed; the next deadline t.b.a.

**The Five-Star Restoration Challenge Grants** Request for Proposals is now open. Applications must be postmarked by March 1, 2004. Click on the links for .pdf versions of the RFP and Application. This is a national program (including Puerto Rico, and Virgin Islands) open to all small-scale wetland, riparian and coastal restoration projects that have an educational component, monitoring plan, and diverse strong partnerships with ideally five organizations that contribute funding, land, technical assistance, workforce support or in-kind contributions. The partners can include local, state or tribal governments, local businesses, corporations, schools, foundations, conservation organizations, non-profits or youth organizations. For more information go to: [http://www.nmfs.noaa.gov/habitat/restoration/projects\\_programs/crp/partners/nfwf.html#5star](http://www.nmfs.noaa.gov/habitat/restoration/projects_programs/crp/partners/nfwf.html#5star)  
<http://www.epa.gov/owow/wetlands/restore/5star/>

**The Home Depot Foundation:** Supports a wide range of nonprofit organizations throughout the U.S. and Canada in the communities where company associates live and work. The Foundation focuses on organizations that create or rehabilitate affordable housing, assist at-risk youth, protect the environment, and prepare for and respond to disasters. Applications are accepted four times a year. The Foundation only considers unsolicited requests that match its eligibility requirements.

**National Geographic Society Education Foundation Grant:** The Foundation's grants facilitate work in the classroom, school, district, and/or community. Projects that feature outreach to urban areas are particularly encouraged. Two broad categories: 1) promoting geographic knowledge through education, and 2) promoting stewardship of natural and cultural resources. Applications are accepted from any current teacher or administrator in an accredited K-12 school within the United States. Online applications are strongly encouraged.

**National Fish and Wildlife Foundation (NFWF):**

- Funds are available for acquiring significant resource lands for the protection and restoration of sensitive fish, wildlife and plant species within NFWF's Wetlands and Private Lands and Wildlife and Habitat Initiatives. Other NFWF programs provide funds for projects that include Conservation Education, Fisheries Conservation and Management and Neotropical Migratory Bird Conservation.
- Eligible Applicants: Federal, state and local governments, educational institutions, and nonprofit organizations. Deadlines, request amount and matching requirements vary from program to program. Contact: David Brunner, NFWF, 28 2nd Street, San Francisco, CA 94105; 415-778-0999.

**Pathways To Nature** is a partnership between the nearly 300 Wild Birds Unlimited, Inc. retail stores and National Fish and Wildlife Foundation. In 2003, the Pathways To Nature program seeks to award one grant of up to \$200,000 for an education exhibit or wildlife watching structure or tour. Funds must be matched on a minimum 1:1 basis with cash or contributed goods and services. The project must include a "naming" opportunity for Wild Birds Unlimited. Projects must be located at major (minimum 100,000 visitors annually) nature tourism destinations for birders. Send a brief (not to exceed 200 words) project description to Peter Stangel, National Fish and Wildlife Foundation at [stangel@nfwf.org](mailto:stangel@nfwf.org). There is no deadline for submissions, and full applications will be distributed by invitation only. <http://www.pathwaystonature.com/>

**The Five-Star Restoration Challenge Grants** Request for Proposals is now open. Click on the links for .pdf versions of the RFP and Application. This is a national program (including Puerto Rico, and Virgin Islands) open to all small-scale wetland, riparian and coastal restoration projects that have an educational component, monitoring plan, and diverse strong partnerships with ideally five organizations that contribute funding, land, technical assistance, workforce support or in-kind contributions. The partners can include local, state or tribal governments, local businesses, corporations, schools, foundations, conservation organizations, non-profits or youth organizations. For more information go to: [http://www.nmfs.noaa.gov/habitat/restoration/projects\\_programs/crp/partners/nfwf.html#5star](http://www.nmfs.noaa.gov/habitat/restoration/projects_programs/crp/partners/nfwf.html#5star).

**Bring Back the Natives:** Supports on-the-ground habitat restoration projects that benefit native aquatic species (e.g., native fish, aquatic insects, mollusks, and amphibians) in their historic range. Application deadline: next deadline t.b.a.. For more information, contact [krystyna.wolniakowski@nfwf.org](mailto:krystyna.wolniakowski@nfwf.org) or visit [http://www.nfwf.org/programs/grant\\_apply.htm](http://www.nfwf.org/programs/grant_apply.htm).

**The Nature of Learning Start-Up Grants:** The Nature of Learning is a new community-based environmental education initiative that seeks to use National Wildlife Refuges and other natural areas as outdoor classrooms to promote a greater understanding of local conservation issues; encourage an interdisciplinary approach to learning that seeks to enhance student academic achievement; utilize field experiences and student-led stewardship projects to connect classroom lessons to real-world issues; and involve a partnership among local schools, community groups, natural resource

professionals, and local businesses. The program will award grants of up to \$5,000 on a competitive basis to support start-up expenses. Programs must involve a partnership among a local school(s), community group (e.g., refuge support group), and National Wildlife Refuge.

**The Northern California Environmental Grassroots Fund** was established in 2003 by a consortium of foundations to support community-based grassroots environmental efforts throughout Northern California. The Fund's goal is to award small grants (\$5000 or less) to small organizations (with budgets of \$100,000 or less) that are currently underserved by most funding strategies. For the first year, the Fund anticipates four grant cycles, about 3 months apart. In each cycle, the Fund will award approximately 10 grants, totaling \$30,000 each cycle. Geographic Scope: Northern California (Includes the entire Sierra Nevada Mountains, Central Valley, Central Coast, and North Coast) Organizational Size: Annual budget of \$100,000 or less (for exceptions, see application) Issues: Include, but are not limited to: Environmental health and justice, land management and urban sprawl, habitat and wilderness protection, sustainable forestry, water resources, agriculture, and pollution. Strategies: General support for organizations with an environmental mission, or project support for strategies such as community-based advocacy, technical assistance, litigation, restoration projects, organizing expenses, grassroots campaigns, and environmental education. Tax status: Applicants may show proof of nonprofit status, be sponsored by another nonprofit, or ask for sponsorship from the fund. Deadlines: Submit the completed application and attachments by mail, postmarked by the deadline date: March 31, June 30, September 30, or December 31. If you are uncertain if your organization is eligible, please e-mail us before applying: [grassroots@rosefdn.org](mailto:grassroots@rosefdn.org)

**Packard Foundation:** The foundation's Conserving California Landscapes Initiatives funds habitat protection and watershed projects in the Central Valley, Sierra, and Central Coast. For more information and grant guidelines, call 650-948-7658.

**Project AWARE Foundation:** The Project AWARE Foundation conserves underwater environments through education, advocacy and action. The Foundation funds projects that have a direct benefit to the aquatic environment such as: public education, grassroots conservation and enhancement projects, environmentally focused research that leads to conservation measures, public awareness initiatives, environmental assessment and monitoring projects, and volunteer-supported community activism. The Micro Grant Program provides funding for local grassroots efforts up to \$1,000. The Macro Grant Program provides funding for regional, national, or international efforts in excess of \$1,000 but not more than \$10,000. Support is provided for community groups and grassroots organizations around the world. Deadlines for submitting applications are February 15, May 15, August 15, and November 15, annually. Visit the above website for more information or to access application instructions.

**Temper of the Times Foundation, Inc.:** Provides \$500 to \$15,000 grants to nonprofits to do environmental advertising or publication.

**The Tiffany and Co. Foundation Environmental Conservation:** The Foundation supports organizations dedicated to conservation of natural resources, an area of vital concern because it is from the natural world that the company draws the raw materials and the inspiration that are at the heart of Tiffany. Partnering with environmental groups that study how to protect our natural resources around the globe will lead to better understanding of how to conserve them. In addition, the Foundation considers groups who concentrate on social responsibility in the area of urban growth and minimizing the negative effects on the environment. The Board of Directors of The Tiffany and Co. Foundation meets annually in January and July.