6.12 DUNCAN-CASTRO

GENERAL DESCRIPTION AND LOCATION

Duncan-Castro is a 0.5-acre Natural Area located northeast of the intersection of Castro and Duncan Streets in San Francisco, near the west end of a city block bounded by 27th, Noe, Duncan and Newburg Streets (Figure 1-1). Elevations range from approximately 350 feet above mean sea level along the north side of the park (near 27th Street) to approximately 410 feet above mean sea level along Duncan Street on the south side. At approximately half an acre, Duncan-Castro is the smallest designated Natural Area in the City of San Francisco. The Natural Area at Duncan-Castro is almost entirely grasslands (Figure 6.12-1). There is an ornamental planting area along Duncan Street. Although a relatively small Natural Area, Duncan-Castro has high natural resource values that include: some recreational trail use; native grassland habitat; important habitat for native plants and populations of sensitive plant species; and suitable habitat for a variety of bird species and special-status species of butterflies.

GEOLOGY, HYDROLOGY, AND TRAILS

This Natural Area is entirely underlain by Franciscan chert bedrock, including the areas mapped as "thin rocky soil over bedrock" (Figure 6.12-2). The chert is a hard reddish brown silicon rock similar to quartz that occurs in layers. Folded chert layers are exposed along the Duncan Street frontage and in the face of the escarpment along the west side of the Natural Area. Landslide deposits and slope debris form the hillside below the escarpment. The ground surface east of the escarpment is steep but walkable. Shallow slips in the thin soil and raveling of exposed bedrock are common.

There is no surface water at the site. Drainage of the area is by overland flow. Some rainfall percolates into fissures in the bedrock, but runoff generally is rapid. Because of the hardness of the chert and the tightness of the rock layers, few natural runoff furrows have formed on the slopes. Where ground cover remains intact, the thin soil is held in place. Some small gullies have developed along the edges of the trails.

Three well-defined earth trails have developed across the park, and one has developed along the knoll that forms the Duncan Street frontage. Combined, these trails are approximately 330 feet long. Extensive foot traffic has worn the trails' entrances through the thin soil and deeply into the underlying bedrock. Bedrock has been exposed at the top of the knoll around the wooden bench constructed there. Portions of the trails along the top of the escarpment, adjacent to two pipelines on the ground surface, also have worn through the soil. Runoff channeled along these designated trails (333 linear feet) does not appear to have increased the width or depth of the trails very much, indicating that most of the erosion is from foot traffic.

VEGETATION

Based on aerial photo interpretation and ground-truthing, the vegetation of Duncan-Castro was classified into six series (Table 6.12-1; Figure 6.12-3). These series are within three sub-formations: approximately 78 percent of the area is grassland; 4 percent is forest; and 18 percent is rock outcroppings and exotic herbaceous vegetation. Only one series, red fescue prairie, is dominated by native species.

Forest and Grassland

One forest series, pine forest (0.02 acres), was mapped at Duncan-Castro and is found exclusively along the northeast corner of the Natural Area. Three grassland series were mapped within the Natural Area. Wild oat grassland (0.25 acres) dominates all other vegetation series, comprising 50 percent of the total Natural Area acreage of Duncan-Castro. A small patch of native red fescue prairie (0.05 acres) is found near the rocks in the northwestern side of the Natural Area. An area of invasive mixed exotic herbaceous vegetation (0.09 acres) is located in the western part of the Natural Area.

Other

Two series were mapped as "other" habitats at Duncan-Castro (ornamental vegetation and rock outcrops). The rock outcrop (0.08 acres) is continuous from the southern boundary to the northwestern corner. These appear to be mostly the result of slope cuts for housing development that exposed the underlying bedrock.

Sensitive Plant Species

The California Natural Diversity Data Base (CNDDB) does not report the occurrence of any sensitive plant species at Duncan-Castro (CNDDB 2005). Johnny-jump-up (*Viola pedunculata*) occurs within the grasslands and rock outcrops of Duncan-Castro (Figure 6.12-4). This species is considered a sensitive species within San Francisco because it is one of the larval host plants for the San Francisco silverspot butterfly (*Speyeria callippe callippe)* (Table 6.12-2).

Invasive Plant Species

Four vegetation series dominated by invasive species account for almost 75 percent of the land cover at Duncan-Castro. Most of this area is the wild oat grassland (0.25 acres) which is dominated by invasive species. Other invasive vegetation series at Duncan-Castro include relatively small areas of mixed exotic herbaceous, pine forest, and ornamental vegetation. Invasive species within the grasslands include Bermuda buttercup (*Oxalis pes-caprae)*, plantain *(Plantago* spp.*)*, and wild radish (*Raphanus sativus*).

WILDLIFE

Birds

The relatively small amount of forest habitat available and the overall park size limits the potential wildlife use at Duncan Castro. The grassland habitats of Duncan-Castro may provide some foraging habitat for raptors. Habitat for smaller birds (passerines) is very limited because scrub and mosaic habitats do not exist within this Natural Area. The forest habitat adjacent to the Natural Area is probably too small to provide nesting habitat for raptor species, which would qualify as sensitive species. The only sensitive bird species reported from Duncan-Castro is Pacific-slope flycatcher (*Empidonax difficilis*). The CNDDB does not report the occurrence of any special-status species of birds from the Duncan-Castro Natural Area (CNDDB 2005). Important bird habitat has not been identified for this Natural Area.

Mammals, Reptiles, Amphibians, and Insects

To date, no small mammal, reptile, or amphibian surveys have been conducted at Duncan-Castro. The CNDDB does not report the occurrence of any sensitive species within the Natural Area (CNDDB 2005). Larger mammals such as raccoons (*Procyon lotor*), striped skunks (*Mephitis mephitis*) and Virginia opossum (*Didelphis virginiana*) are typical of urbanized parks in general and are expected to occur within Duncan-Castro. Duncan-Castro had the distinction of having the highest abundance of the second-most-common bumblebee species out of 10 Natural Areas sampled in 2003 and 2004 (McFrederick 2004).

MANAGEMENT AREAS

Duncan-Castro has been divided into three Management Areas (MAs) (Figure 6.12-5). The first (MA-1a) includes the rock outcrops, red fescue prairie, and portions of the annual grassland that include the sensitive plant species populations. The second area encompasses the less diverse grasslands and rock outcrops on the south and west sides of the Natural Area (MA-2a). The final area (MA-3a) includes the ornamental vegetation and forest series along the eastern side of the Natural Area.

ISSUES AND RECOMMENDATIONS

Several conservation and recreation-related issues have been identified for Duncan-Castro. Recommendations developed for each of these issues will guide restoration, enhancement, and maintenance work. In the following discussion, system-wide issues and recommendations (GR-1 for example; see Chapter 5) that apply to the entire Natural Area at Duncan-Castro are presented first within each topical area, followed by site-specific issues and recommendations. Site-specific recommendations are keyed to the Management Area in which they should occur.

Site Improvements – Implementation of management recommendations at Duncan-Castro would not significantly change the overall look of the park and would result in:

- increased and more sustainable populations of sensitive plants;
- improved wildlife habitat;
- preservation and enhancement of native grassland habitat;
- beautification of some park entry points with designed native plant gardens
- removal, relocation, or burial of two pipelines that pose a safety hazard; and
- improved access on designated trails.

Restoration and improvement of the grasslands on Duncan-Castro will increase the richness of the grassland habitat and may enhance native plants and sensitive plant species populations. This habitat may be comparable to the native grasslands on the northern slope of Bayview Hill.

Vegetation

Issues relating to vegetation management at Duncan-Castro involve the protection of sensitive species and habitats, typically through the control of invasive plants (GR-1) and management of sensitive species and vegetation series of limited distribution (GR-2). Specific actions to take in managing grasslands such as those present at Duncan-Castro should be implemented (GR-3). No trees are to be removed at Duncan-Castro. Issues relating to the general safety of visitors and surrounding homes, fire hazards posed by vegetation and trees, and illicit activities must be considered during management of the Natural Areas (GR-13). In addition to these general recommendations, the following site-specific issue should be addressed.

Issue DC-1: Native grasslands and sensitive species at Duncan-Castro are at risk due to habitat loss and invasive species. Invasive species occur throughout the site and threaten the continued existence of these native grasslands and sensitive plants.

> ***Recommendation DC-1a*:** To preserve the existing grasslands, within all Management Areas, contain and reduce herbaceous and woody invasive vegetation such as radish, Bermuda buttercup, and annual grasses. Within MA-1a and MA-2a prevent invasive trees from becoming established. There are no trees proposed for removal in the Duncan-Castro Natural Area.
>
> ***Recommendation DC-1b:*** Grasslands within MA-1a and MA-2a shall be maintained and diversified. In MA-3a maintain and enhance the tree cover on the north east side and diversify areas interior of the tall trees with tall shrubs. These improvements will enhance habitat for wildlife. These improvements should be implemented using diversity, cover, and density targets generated from reference sites within and around San Francisco.
>
> ***Recommendation DC-1c*:** Within MA-3a, the existing native scrub community shall be enhanced, including the installation of showy native plants along the road frontage. When coupled with educational signage (GR-14) this effort could help promote gardening with native plants.

Wildlife

Wildlife issues at Duncan-Castro revolve around three main topics: habitat, food sources, and shelter. Vegetation management during the breeding season can impact nesting birds (GR-4); however, vegetation management also can provide materials to create artificial habitat for ground-dwelling birds, small mammals, and reptiles (GR-9) and increase habitat for insects (GR-10). Finally, reduction in predation pressures will benefit all animals within the Natural Area (GR-7). Implementation of these general recommendations and the site-specific recommendations in DC-1b will address all the wildlife issues at Duncan-Castro and therefore, no site-specific recommendations are made.

Soils, Erosion, and Public Use

The erosion and public use issues at Duncan-Castro generally relate to the trail system and public use. A network of secondary trails winds through all Management Areas at Duncan-Castro (Figure 6.2-5). The issue of erosion and habitat impacts related to trails is addressed through implementation of GR-11 and does not require any trail closures. Interpretive signs regarding the ecosystem of Duncan-Castro should also be considered (GR-14). The following site-specific issue should also be addressed.

Issue DC-2: The exposed 2- and 4-inch pipelines along the trails adjacent to the escarpment pose a safety hazard depending on the pipe stability, the material it transports, and the age of the pipe.

> ***Recommendation DC-2a*:** Determine whether the two pipelines crossing the Natural Area are still in service or abandoned and then bury, re-route or remove them as appropriate.

Table 6.12-1. Vegetation series mapped at Duncan-Castro.

	Vegetation Series	Total Acreage
Forest	pine forest	**0.02**
Grassland	wild oat grassland	0.25
	red fescue prairie*	0.05
	Subtotal	**0.30**
Other Herbaceous	mixed exotic herbaceous	**0.09**
Other	ornamental	0.01
	rock outcrop	0.08
	Subtotal	**0.09**
Grand Total		**0.50**

* Indicates vegetation type is dominated by native species.

Table 6.12-2. Sensitive species known to occur at Duncan-Castro.

Species	Common Name	Status Federal, State, CNPS	Occurrance Status
ANIMALS			
Empidonax difficilis	Pacific-slope Flycatcher	LS	Presently occurs
PLANTS			
Viola pedunculata	Johnny-Jump-Up	-	Presently occurs

Status Key:

Federal Status

FE Endangered. Species in danger of extinction throughout all or significant portion of its range.

FT Threatened. Species likely to become endangered within foreseeable future throughout all or a significant portion of its range.

FPE Proposed for listing as endangered.

FC Candidate for listing as endangered. Candidate information now available indicates that listing may be appropriate with supporting data currently on file.

FSC Species of Concern. Former Category 2 Candidate for listing as endangered.

FPD Proposed de-listing.

California State Status

SE Endangered. Species whose continued existence in California is jeopardized.

ST Threatened. Species, although not presently threatened with extinction, that is likely to become endangered in the foreseeable future.

SSC Species of Concern.

SFP State Fully Protected under Sections 3511 and 4700 of the Fish and Game Code.

Sens Considered a sensitive species by the California Department of Forestry.

California Native Plant Society

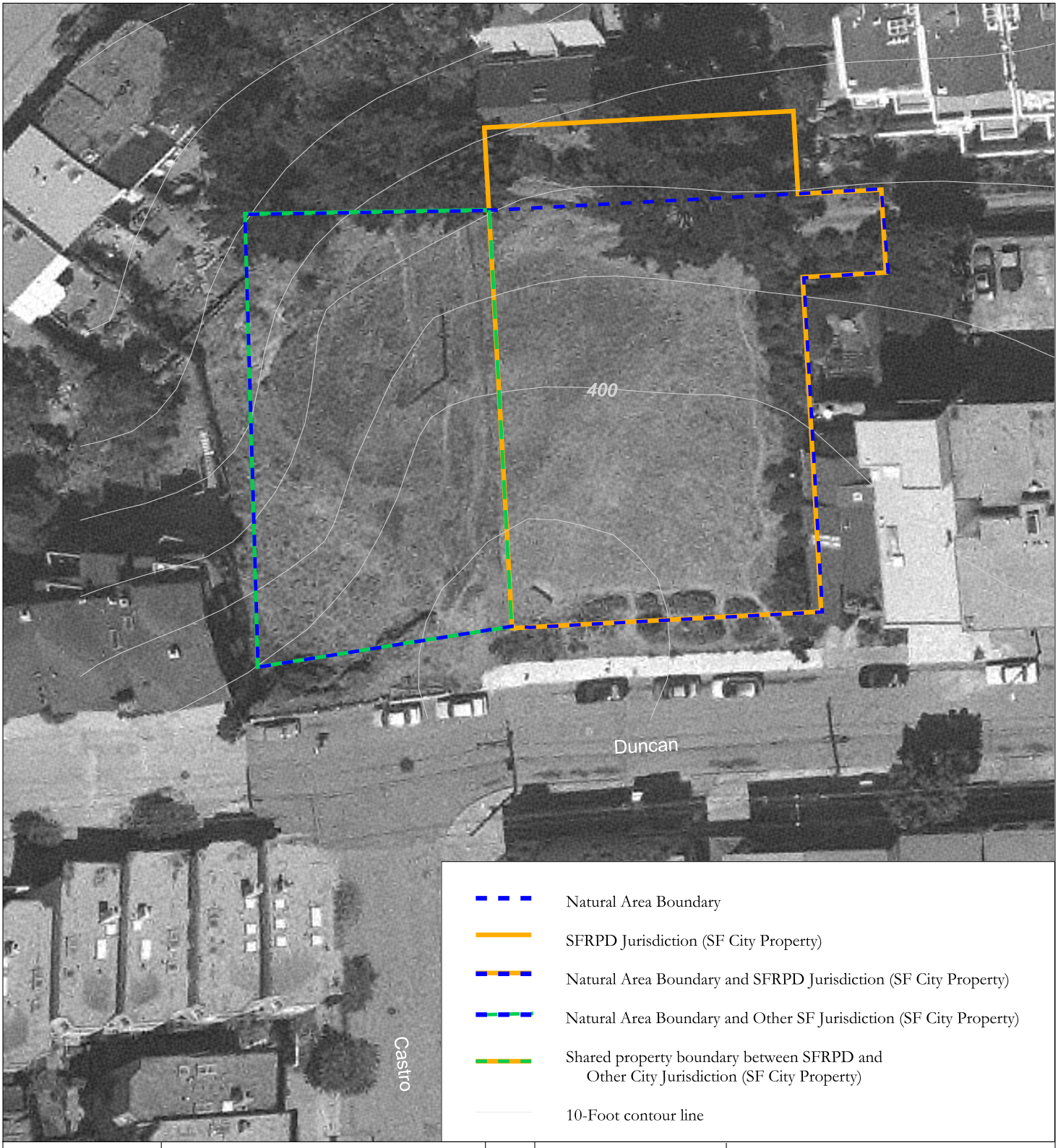
1A Plants presumed extinct in California

1B Plants that are rare or endangered in California and elsewhere.

2 Plants that are endangered in California, but more common elsewhere.

3 Plants about which more information is needed.

4 Plants of limited distribution (a watch list).



Source: Aerial photography San Francisco Department of Public Works, 2002, Orthophoto - San Francisco - 1-foot resolution, 2001; property boundary data derived by San Francisco Recreation and Park Department (RPD) 2005 from data provided by San Francisco Department of Telecommunications and Information Services, 2002; natural area boundary data created by San Francisco State University Institute for GISc from information provided by RPD's Natural Areas Program (NAP), 2005; contour lines provided by San Francisco Department of Conservation; all data are California State Plane Zone III, NAD 83.

Created by Debra Dwyer, San Francisco State University Institute for GISc, May 4, 2002, revised August 21, 2005.

N

0 25 50
Feet

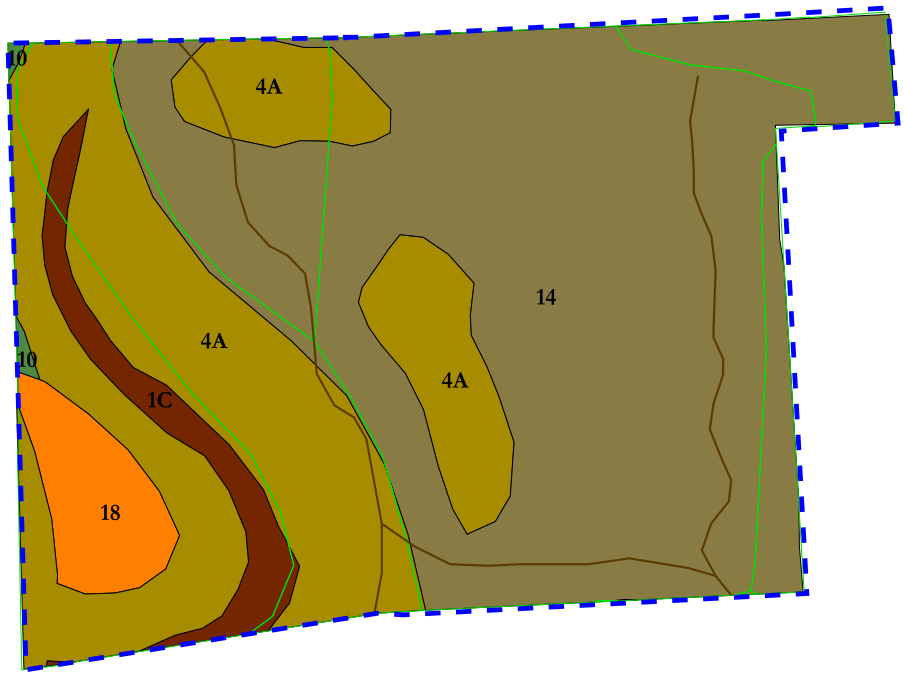
FIGURE 6.12-1

AERIAL PHOTOGRAPH, PROPERTY BOUNDARIES, AND NATURAL AREAS

Duncan-Castro

Significant Natural Resource Areas Management Plan

San Francisco, California



Duncan

Castro

Soils, Land Features, and Trails

- 1C — escarpments
- 4A — chert
- 10 — soil slip/earth flow
- 14 — thin rocky soils over bedrock
- 18 — landslide deposit
- secondary earthen trail
- Natural Area boundary
- vegetation series boundary

EIP ASSOCIATES

Source: Vegetation data collected by San Francisco Department of Recreation and Parks Significant Natural Areas Program (NAP), San Francisco State University Biology Department, and EIP Associates, 1999-2000; soil and land features data collected by EIP Associates, 1999 - 2002; trails data collected by NAP, 2005; data layers digitized by Geotopo, Inc., 1999 - 2000; edited and corrected by San Francisco State University Institute for GISc (SFSUGIS), 2000, 2005; trails data digitized by SFSUGIS, 2005; natural area boundary created by SFSUGIS from data determined by NAP, 2005; streets data excerpted from ArcView StreetMap 2000 Data, copyright 1998-2000, Environmental Systems Research Institute, Inc. (ESRI).

Created by D. Dwyer, San Francisco State University Institute for GISc, November 23, 2001, revised December 10, 2005.

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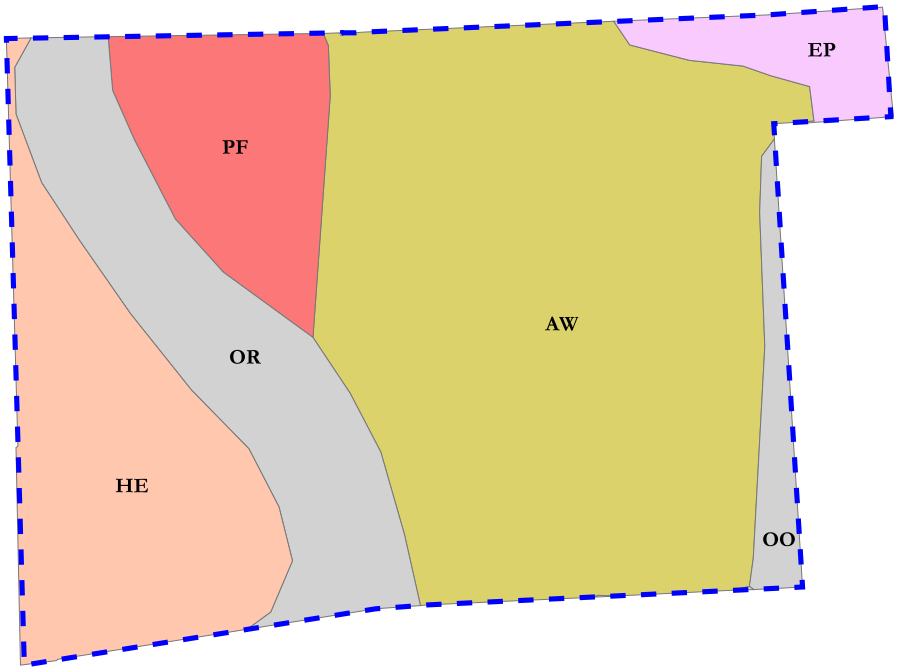
FIGURE 6.12 - 2

SOILS, LAND FEATURES, AND TRAILS

Duncan-Castro

Significant Natural Resource Areas Management Plan

San Francisco, California



Vegetation Subformation and Series

Annual Grassland

AW wild oat grassland

Non-native Forest

EP pine forest

Other

OO ornamental

OR rock outcrop

Other Herb

HE mixed exotic herbaceous

Perennial Grassland

PF red fescue prairie

Natural Area boundary

EIP ASSOCIATES

Source: Vegetation data collected by San Francisco Department of Recreation and Parks Significant Natural Areas Program (NAP), San Francisco State University Biology Department and EIP Associates, 1999-2000; data layers digitized by Geotopo, Inc., 2000; edited and corrected by San Francisco State Institute for GISc (SFSUGIS), 2000 - 2002; natural area boundary created by SFSUGIS from data provided by NAP, 2005; streets data excerpted from ArcView StreetMap 2000 data from Environmental Systems Research Institute, Inc., copyright 1998-2001.

Created by D. Dwyer, San Francisco State University Institute for GISc August 13, 2001, revised June 6, 2005.

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Feet

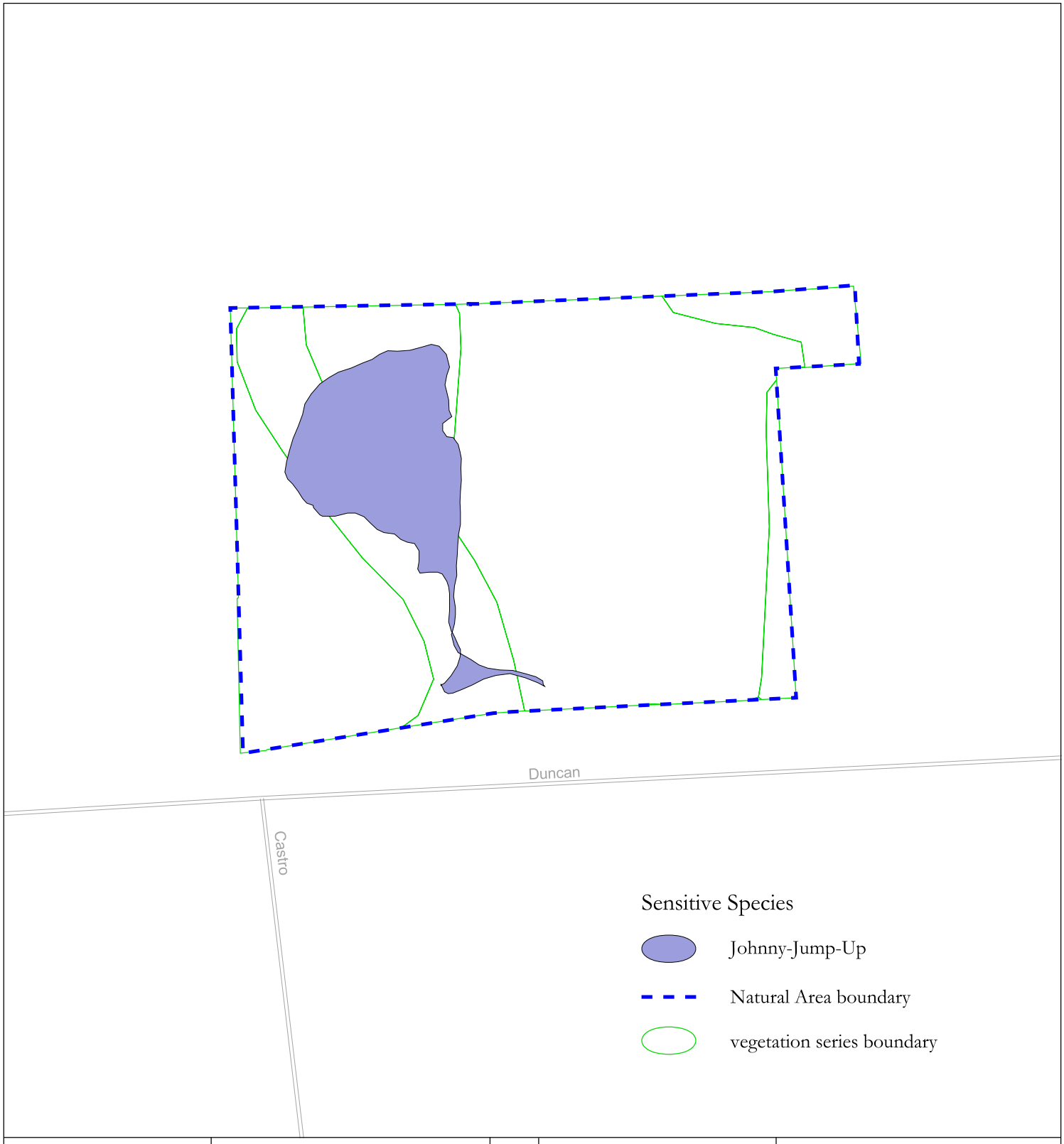
FIGURE 6.12 - 3

VEGETATION

Duncan-Castro

Significant Natural Resource Areas Management Plan

San Francisco, California



EIP ASSOCIATES

Source: Sensitive species data collected by San Francisco Department of Recreation and Parks Significant Natural Areas Program (NAP), 2002; vegetation series data collected by NAP, San Francisco State University Biology Department, and EIP Associates, 1999-2000; data layers digitized by Geotopo, Inc., 2000; edited and corrected by San Francisco State Institute for GISc (SFSUGIS), 2000 - 2002; natural area boundary created by SFSUGIS from data provided by NAP, 2005; streets data excerpted from ArcView StreetMap 2000, copyright 1998-2000, Environmental Systems Research Institute, Inc. (ESRI).

Created by D. Dwyer, San Francisco State University Institute for GISc, September 4, 2001, revised June4, 2005.

N

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Feet

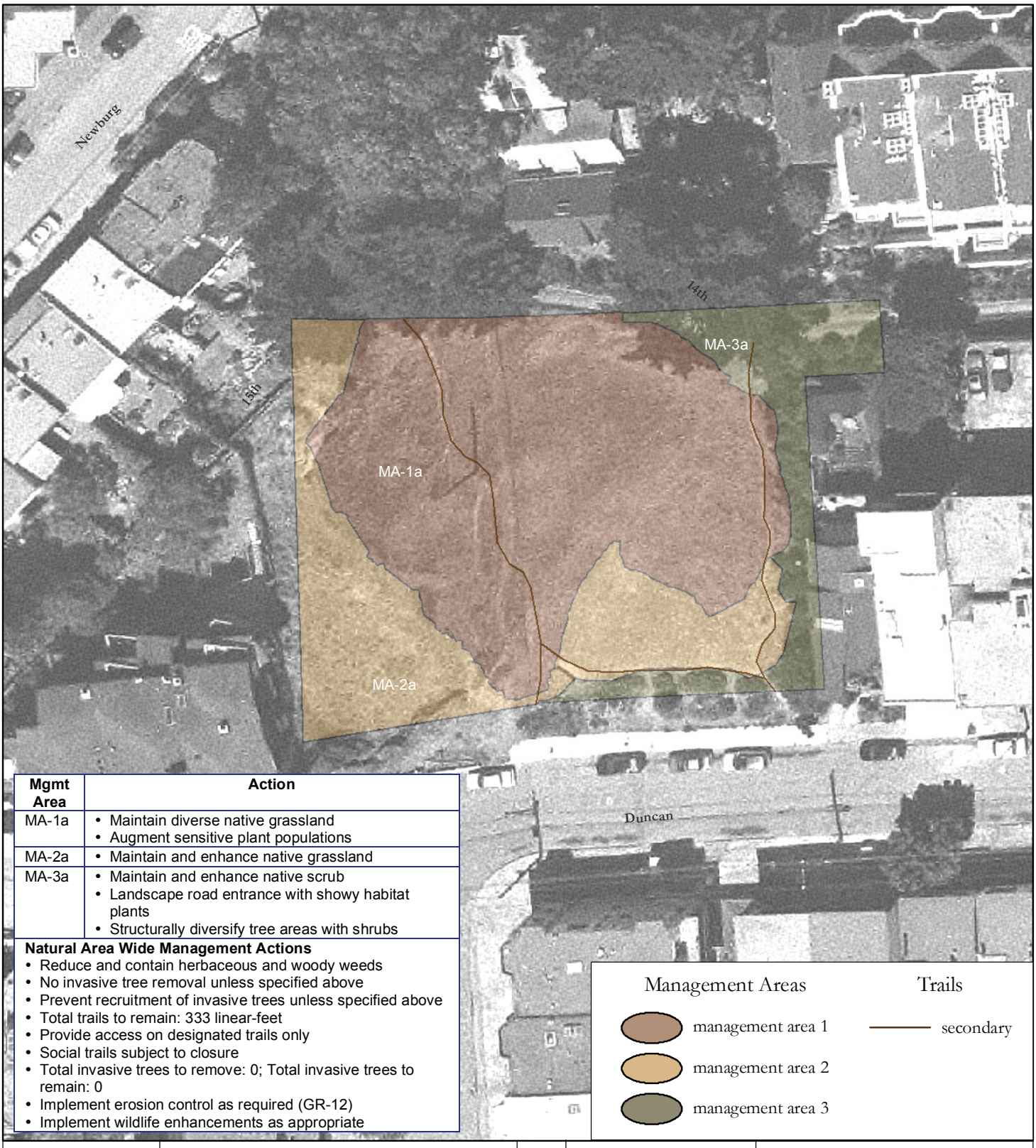
FIGURE 6.12 - 4

Sensitive Species

Duncan-Castro

Significant Natural Resource Areas Management Plan

San Francisco, California



Mgmt Area	Action
MA-1a	• Maintain diverse native grassland • Augment sensitive plant populations
MA-2a	• Maintain and enhance native grassland
MA-3a	• Maintain and enhance native scrub • Landscape road entrance with showy habitat plants • Structurally diversify tree areas with shrubs

Natural Area Wide Management Actions

- Reduce and contain herbaceous and woody weeds
- No invasive tree removal unless specified above
- Prevent recruitment of invasive trees unless specified above
- Total trails to remain: 333 linear-feet
- Provide access on designated trails only
- Social trails subject to closure
- Total invasive trees to remove: 0; Total invasive trees to remain: 0
- Implement erosion control as required (GR-12)
- Implement wildlife enhancements as appropriate

EIP ASSOCIATES

Source: Management areas and trails data collected by San Francisco Department of Recreation and Park Natural Areas Program (NAP), 2005; trails data digitized by San Francisco State University Institute for GISc (SFSU IGIS), 2005; streets data excerpted from Environmental Systems Research Institute (ESRI), Inc.'s StreetMap 2000 data copyright ESRI 1998-2001; aerial photography San Francisco Department of Public Works, 2002, Orthophoto - San Francisco - 1-foot resolution - 2001; all data are in California State Plane Zone III projection, NAD 1983; map produced using ArcGIS 9.0 software by ESRI.

Map created May 29, 2005 by Debra Dwyer, San Francisco State University, Institute for Geographic Information Science; August 23, 2005.

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Feet

FIGURE 6.12 - 5

MANAGEMENT AREAS AND TRAIL PLAN

Duncan-Castro

Significant Natural Resource Areas Management Plan

San Francisco, California