8.0 Biological Resources

8.0 BIOLOGICAL RESOURCES

Due to variations in the character of vegetation, historic uses, and recreational impacts in AWCWP, management requirements for biological resources range from a "hands off" approach in some cases to relatively intensive, active habitat manipulation. Much of the vegetation in the park is composed of natural plant communities that are naturally adapted to recovery from disturbances such as fires or landslides. Therefore, in many cases where natural or even artificial disturbances have occurred, quick recovery or somewhat slower natural succession will lead to restored natural plant communities without benefit of active management techniques. The only management required will be to avoid additional impacts and let nature take its course. In other situations, particularly with regard to fire prevention, excessive management adversely affects the health of natural plant communities. Again, it may be advisable to allow natural events to occur, although some active management techniques may be required. Finally, there are times when the only means to restore a native plant community is intensive manipulation and management. This approach is usually only necessary where damage has been severe or where introduced exotic plants, such as Italian thistle or giant reed out-compete the native plants that historically occupied a given area.

The following management and monitoring techniques are organized according to the above approaches. For most plant associations, monitoring will either confirm that active management is not necessary, or indicate minimal management techniques. However, in a few cases, it is presumed that active management is appropriate, and the function of monitoring will be to assist in the timing of management activities and to assess management success.

More specific resource management information is included in Appendix F, Restoration Methods and Materials.

8.1 RESOURCE PROTECTION

8.1.1 Protection/Maintenance of Natural Assemblages

In order to protect and maintain populations of native plants and wildlife within the park several management actions are needed. In addition, while accomplishing these management actions, collaboration with other agencies, organizations and volunteers will likely be necessary.

Vegetation Communities. Ecological diversity must be maintained by managing plant associations, while still allowing natural succession to occur. This may require both active and "hands off" management. Importantly, threatened or under-protected vegetation communities such as coastal sage scrub, oak woodlands and riparian areas need to be protected from human disturbance to allow those communities to thrive. Figure 20, Sensitive

Vegetation Communities, depicts areas that have sensitive vegetation plant communities that should be targeted for protection and long-term persistence.

Edge Effects. Where the park boundary meets urban areas, "edge effects" can negatively impact the park's natural resources. Thus, it will be necessary to work with adjacent landowners and jurisdictions to create appropriate buffer zones to minimize edge effects. Where existing development does not provide an adequate buffer, methods need to be promoted with new and existing urban areas to minimize edge effects.

Park Trails. Park trails should be designed and located to avoid encroachment into sensitive habitats and principal off-site wildlife linkages to the maximum extent feasible. Most of the existing trails and some of the proposed trails go through important habitat, which is unavoidable as the entire park is considered important habitat. However, the benefits derived from closing and restoring unauthorized trails are intended to off-set these proposed impacts.

Access Restrictions. In areas that are unsafe or inappropriate for users, public access must be restricted. Such areas include sites where conflicts with wildlife may occur, where conditions are degraded, and where it is necessary to minimize impacts to sensitive habitat for conservation or restoration. In addition, temporary closure of trails or other facilities may be necessary to effect a beneficial change in a significant habitat.

8.1.2 Improving Biological Productivity and Diversity

In order to improve biological productivity and diversity, habitats must be protected, enhanced, restored, and controlled for pest animal species. Management of the NCCP/HCP Reserve (Reserve) should follow recommendations in the Habitat Restoration and Enhancement Plan (HREP) that was prepared for the NROC (LSA 2003). The HREP is an approved plan for the Reserve, is consistent with the strategies in the HCCP/NCP, and specifically addresses the restoration and management needs for the coastal subregion portion of the Reserve, of which AWCWP is a part.

Improving Habitat Quality. To improve habitat quality selected unauthorized trails within the park must be closed and restored to native habitat, as described in the trail section of the RMP (Section 6.4). Also, a long-term invasive exotic plant management plan and implementation program must be developed that includes both natural and disturbed areas in the park. Similarly, a park-wide management program needs to be developed to control vertebrate pest species for the purpose of protecting park resources and public health. Controlling the presence of non-native species will allow natural biodiversity and biological productivity to improve. To encourage native vegetation growth to increase and to restore the biotic and abiotic processes of naturally occurring plant communities, it will be necessary to explore the use of prescribed burns or other selective fuel reduction.

Ensuring Connectivity. Off-site areas that may serve as connection routes for large mammals between the AWCWP and other open space, including lands owned and managed by the County, must be considered in trail plans and habitat management. Connectivity between open spaces will ensure that animal movement constraints within the

Laguna Coast Wilderness Park

Aliso and Wood Canyons Wilderness Park

Pacific Ocean

Coastal Treatment Plant

Aliso Creek Golfcourse

EL TORO RD

LAGUNA CANYON RD

GLENWOOD DR

LAGUNA HILLS DR

PACIFIC PARK DR

WOOD CANYON LN

LA PAZ RD

MOULTON PKWY

ALICIA PKWY

PASEO DE VALENCIA

ALISO CREEK RD

WOOD CYN DR

HIGHLANDS AV

PACIFIC ISLAND DR

CROWN VALLEY PKWY

Aliso Creek

Sulphur Creek Reservoir

Feet

0 2,300 4,600 6,900 9,200

LEGEND

- Aliso and Wood Canyons Wilderness Park
- Contour Interval 40ft
- Authorized Trail
- Utility Access
- Proposed Trail
- Unauthorized Trail

CENTRAL & COASTAL NCCP - HCP CLASSIFICATIONS

- Existing Use
- Non-Reserve Open Space
- Reserve
- Conservation Easement

SENSITIVE PLANT SPECIES

- Laguna Beach Dudleya
- Catalina Mariposa Lily
- Intermediate Mariposa Lily
- Many - Stemmed Dudleya
- Palmer's Grappling - Hook
- Small - Flowered Microseris
- Summer Holly / Big - Leaved Crown - Beard
- Bushrue
- San Diego Tarweed
- Ocean Spray
- Vernal Barley
- Western Dichondra
- Summer Holly
- Pomona Locoweed
- Turkish Rugging
- Thread - Leaved Brodiaea
- Small - Flowered Morning Glory
- Hummingbird Sage
- Nuttall's Scrub Oak
- Summer Holly / Big - Leaved Crown - Beard
- Turkish Rugging
- Neiblas Lichen Species
- Big - Leaved Crown - Beard
- Thread - Leaved Brodiaea

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GIS Mapping Unit
Brian Anderson

DATA SOURCE:
- Geomatics Land Information Systems Division
- NOAA 3 meter DEM 2002
- Eagle Aerial Image 1 foot resolution, flown April 2004
- Draft Aliso and Wood Canyons Wilderness Park Resource Management Plan Dated July 1991
- California Natural Diversity Data Base, April 12, 1999
- Field Surveys conducted by Harmsworth and Associates between March and July, 1998
- Supervising Park Ranger Tom Maloney, February 10, 2006

DATE: June 4, 2008

Aliso and Wood Canyons Wilderness Park
Resource Management Plan
Figure 20: Sensitive Vegetation Communities

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park are minimized, thus creating a more natural environment for highly mobile species. Figure 15, Wildlife Corridors, displays areas that should be targeted for maintaining connectivity for wildlife.

8.2 HABITAT ENHANCEMENT AND RESTORATION

8.2.1 Existing Conditions

Biologically, the NCCP/HCP Habitat Reserve preserves a microcosm of the California Floristic Province, an identified biodiversity hot spot in North America and a genetic reserve for the continent. The Reserve, of which AWCWP is a part, is therefore regionally and nationally significant as a prime example of this unique habitat web, yet it occurs in an area that is nearly surrounded by existing development with attendant human influences.

The distribution of vegetation types and subtypes within the AWCWP is influenced by a variety of abiotic factors, including soils, slope steepness and aspect, elevation, and microclimate. These, in turn are influenced significantly by the combination of the geology of the region and local climatic influences (*e.g.*, coastal fog). AWCWP is in a region that represents a transition between two coastal sage scrub habitat types, Venturan and Diegan, as classified state-wide by Holland (1986).

The AWCWP contains many unique habitat types and includes the confluence of two creeks (Aliso Creek and Wood Creek) including the canyon slopes surrounding each of these creeks. As a result, the AWCWP is composed of a mosaic of wildlife habitats including coastal scrub, chaparral, grassland, riparian, woodland, and rock-and-cliff. The AWCWP is known to have high species diversity due to the quality native habitat associated with the undisturbed slopes and canyons, diverse habitat types and the connectivity and continuity of habitat with adjacent native lands (VST 1991; Almanza 1992; County 1998; County map 2002). A discussion of general wildlife and endangered, threatened and special interest species known to occur or having the potential to occur within the AWCWP are addressed in Section 4.4 and the Existing Conditions Report (Appendix I), including information based on previous and ongoing studies conducted by research biologists in and adjacent to the AWCWP. Vegetation communities in the park are greatly affected by modified fire regimes, changes in hydrology, and invasion by exotic plant species. These are major factors that influence the structure and composition of the park's habitats, and are further discussed in the Existing Conditions Report. Factors that influence the natural vegetation communities in the park need to be managed to reduce future degradation and encourage natural communities to emerge

Unauthorized Trails. Visitor-created unauthorized trails and shortcuts exist in the AWCWP due to a long history of use prior to the establishment of the park. The Lower Wood Canyon Management Zone contains many of the park's unauthorized trails which come down from the ridge separating Wood and Laguna Canyons. Unauthorized trails contribute to erosion, habitat fragmentation, alteration of natural drainage patterns, introduction of exotic vegetation, degradation of native vegetation, and increased human-wildlife conflicts. Steep trails without adequate ground cover are heavily eroded with cutting and compaction along their edges. In some areas, trails act as drainage ditches carrying water during storm

events. In addition, off-trail use by people and pets tramples native vegetation, degrades habitat, disturbs wildlife, and promotes invasive exotic species growth. In particular, downhill mountain biking trails on steep hillsides exacerbate conditions that lead to erosion because they compact soils, remove ground cover and concentrate runoff flows. Erosion in turn impacts streams and watercourses by increasing sedimentation and degrading water quality. Thus, soil productivity and water-holding capacity is reduced and the habitat value of riparian and wetland ecosystems are diminished or lost.

Fuel Modification Areas. The AWCWP has urban areas along most of its boundaries that require fuel modification (Figures 21A through 21D: Fuel Modification Zones). Mismanagement of these fuel modification zones has the potential to adversely affect the park. Overzealous vegetation removal, overuse of herbicides and failure to revegetate with fire-resistant, native plant species contribute to soil erosion, poor water quality and degradation of native habitat. In addition, the large number of fuel mod/landscape plans governing the fuel modification zones and inconsistency in management approaches make it difficult for park managers to ensure appropriate management is taking place. Proper management of these areas is important for erosion and weed control, and wildlife management.

Exotic Vegetation/Weed Polygons. California has become the adopted home of over 1,000 plant species from other parts of the world. Most of these originated in the Mediterranean region, where the climate is similar to Southern California's. The majority of California's exotic species are fast-growing annuals that prefer disturbed habitats and are prodigious seed producers (Barbour et al. 1993). Exotic or nonnative plant species often change the landscape and the natural relationships between native plant cover, soil, hydrology, and wildlife by outcompeting native plants. Not all nonnative species are invasive and harmful, but many (e.g., giant reed) can completely take over and change entire established ecosystems. The consequences of the invasion, including alteration of habitat and disruption of natural ecosystem processes, can be catastrophic for native species.

Weed polygons were mapped for the NROC Habitat Restoration and Enhancement Plan (LSA 2003) by The Nature Conservancy (Figures 22 and 23). The minimum mapping unit was one acre. Weed polygons were delineated based on the type of exotic species and their cover in a given area. New weed polygons within the disturbed habitat types were created if the suite of exotic species changed or if exotic species cover values changed. Variables collected for each weed polygon consisted of weed polygon number, access potential, erosion potential, disturbance factors, the top four dominant exotic species present, percent exotic cover value, existing native habitat, percent native cover value, and number of native species. Cover class values used were 0-10 percent, 11-30 percent, 31-50 percent, and greater than 50 percent. Native species occurring within the weed polygons were noted. Photographs were also taken of each new weed polygon. These data, along with updates of current weed infestation areas identified by park rangers and maintenance personnel, should be used to prepare a comprehensive Habitat Restoration and Enhancement Map. This map will be used to guide future habitat restoration activities, and track the locations of past and ongoing activities. Table H summarizes the weed polygon data.

Fuel Modification Easements

Proposed Park

Laguna Coast Wilderness Park

Aliso and Wood Canyons Wilderness Park

Tract # 15007
Tract # 15006
Tract # 13367
Tract # 15008
Tract # 15004
Tract # 13297
Tract # 13368
Tract # 15425
Tract # 15424
Tract # 15426
Tract # 15307
Tract # 15752
Tract # 15963
Tract # 14974
Tract # 15761
Tract # 15715
Tract # 15649
Tract # 13936

LEGEND

- Wilderness Park
- County Scenic Preservation Easement
- HOA Fuel Modification Easement
- NROC Reserve Boundary
- Tract Boundary

N

0 500 1,000 1,500 Feet

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OC Public Works
GIS Mapping Unit
Brian Anderson

DATA SOURCE:
- Geomatics Land Information Systems Division
- Eagle Aerial Image 1 foot resolution, flown 04/2004

DATE: June 4, 2008

Aliso and Wood Canyons Wilderness Park
Resource Management Plan
Fuel Modification Within Park Boundary
Figure 21A: HOA Fuel Modification Easements

Los Angeles County
San Bernardino County
Riverside County
ORANGE COUNTY
Area of Interest
Pacific Ocean
San Diego County

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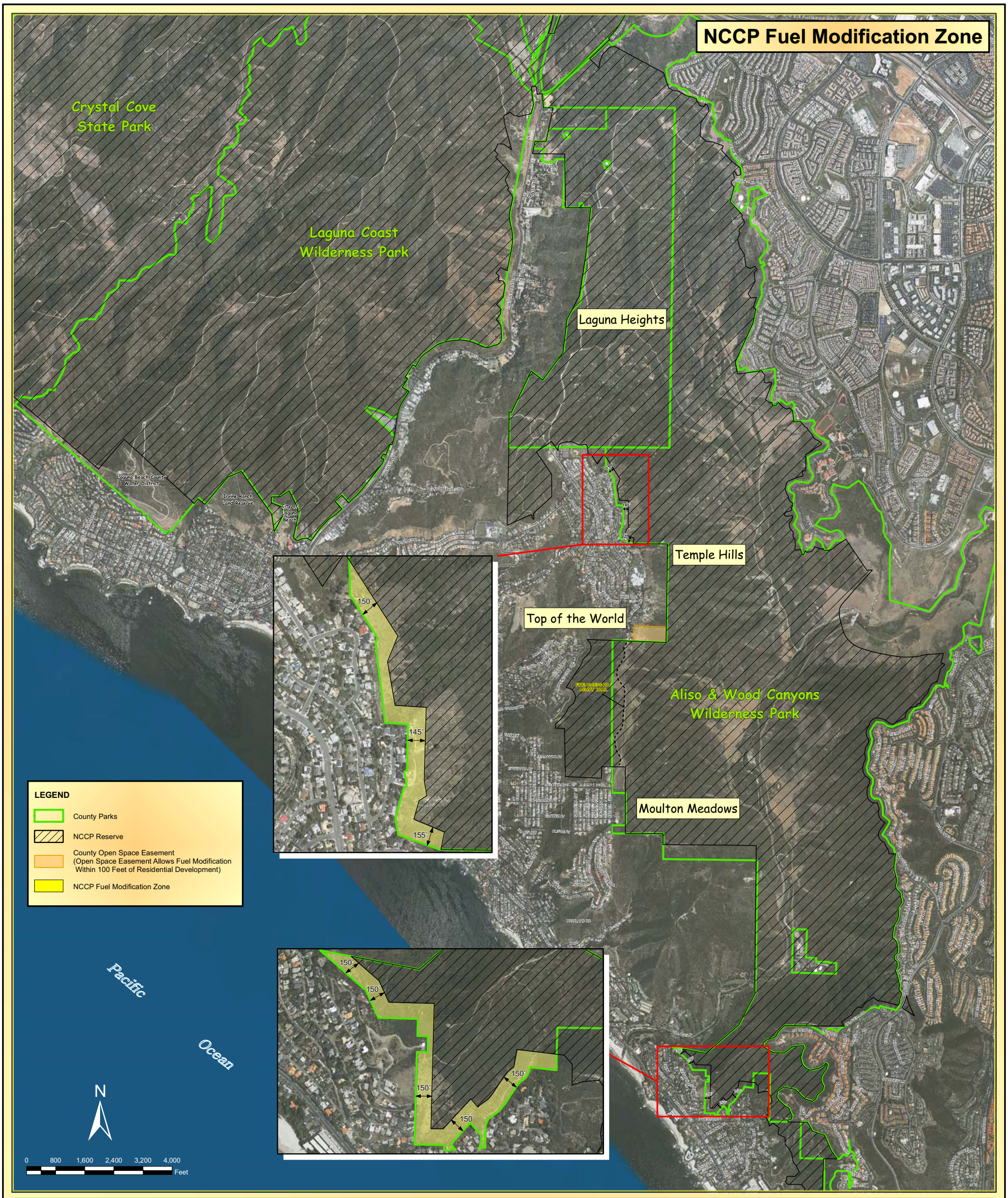
Back of Figure 21a



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DATA SOURCE:
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- Eagle Aerial Image 1 foot resolution, flown 06/2005

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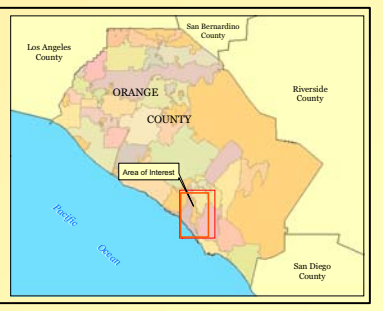
DATE: June 3, 2008

Aliso and Wood Canyons Wilderness Park
Resource Management Plan
Fuel Modification Within Park Boundary
Figure 21B: NCCP Fuel Modification Zone



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Fuel Mod Performed by Park Staff

Location	Affected Area	Method of Removal	Maintenance Schedule	Type
North Border of Anneliese's School 20062 Laguna Canyon Rd	100 Foot Wide Strip	Selective Thinning	April - June	Elective
Near Intersection of El Toro Rd and Laguna Canyon Rd	About 2 Acres	Mowing	April - June	Elective
Valido Trail	100 Foot Wide Strip	Selective Thinning	April - June	Elective
Villa Solana Apartments North Border of Tract 12039 Near Intersection of Moulton parkway and Via Lomas	100 Foot Wide Strip	Mowing	April - June	Elective
Park / SOCWA Access Road	10 Feet on Each Side of Road	Mowing	April - June	Elective
ASWUT Fire Access Road	20 Feet on Each Side of Road	Mowing	April - June	Required

Aliso and Wood Canyons Wilderness Park

Pacific Ocean

LEGEND

- Park / SOCWA Access Road
- ASWUT Fire Access Road
- Aliso and Wood Canyons Wilderness Park
- Laguna Coast Wilderness Park

Fuel Modification Method

- Mowing
- Selective Thinning (100ft wide strip)

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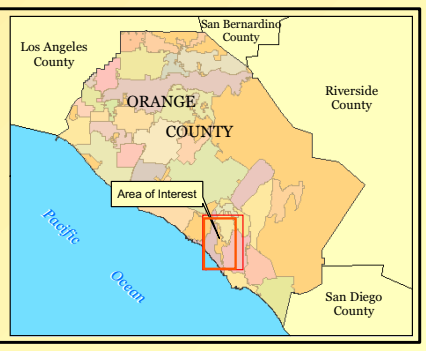
DATA SOURCE:
- Geomatics Land Information Systems Division
- Eagle Aerial Image 1 foot resolution, flown 06/2005

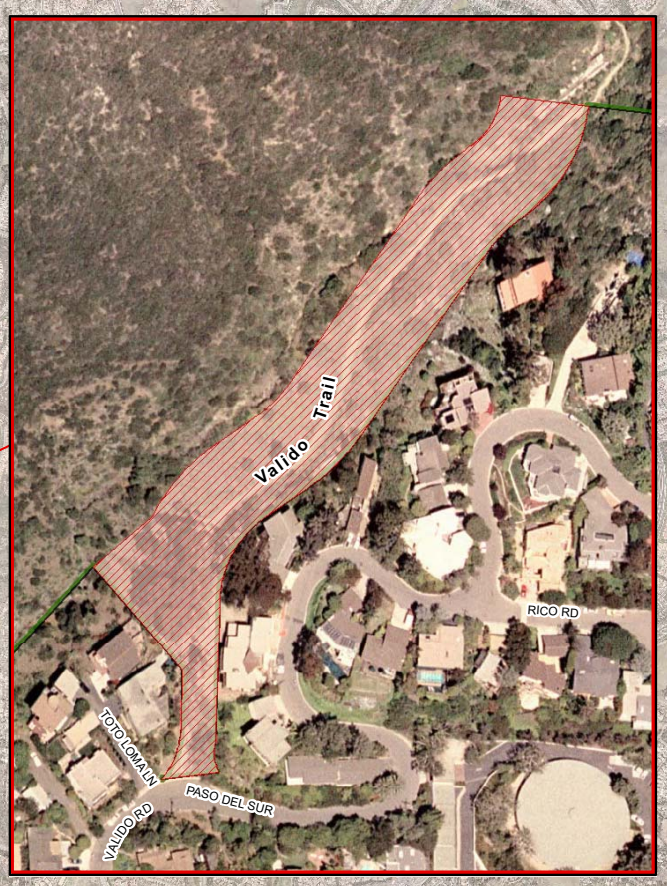
DATE: June 3, 2008

Aliso and Wood Canyons Wilderness Park
Resource Management Plan
Fuel Modification Within Park Boundary
Figure 21C: OC Parks Fuel Modification



Back of Figure 21c

Aliso and Wood Canyons Wilderness Park



Location	Affected Area	Method of Removal	Maintenance Schedule
North Border of Anneliese's School 20062 Laguna Canyon Rd	100 foot wide strip	Selective Thinning	April - June
Near Intersection of El Toro Rd and Laguna Canyon Rd	About 2 Acres	Mowing	April - June
Valido Trail	100 foot wide strip	Selective Thinning	April - June
Villa Solana Apartments North Border of Tract 12039 Near Intersection of Moulton Parkway and Via Lomas	100 foot wide strip	Mowing	April - June
Park / SOCWA Access Road	10 feet on each side of road	Mowing	April - June

LEGEND

Fuel Modification Method

- Mowing
- Selective Thinning (100ft wide strip)
- Park / SOCWA Access Road

Elective Fuel Modification

Aliso and Wood Canyons Wilderness Park

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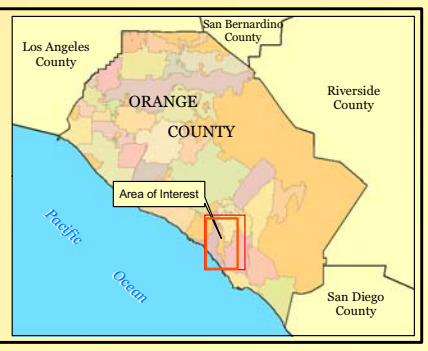
OC Public Works
GIS Mapping Unit
Brian Anderson

DATA SOURCE:
- Geomatics Land Information Systems Division
- Eagle Aerial Image 1 foot resolution, flown 06/2005

DATE: June 3, 2008

Aliso and Wood Canyons Wilderness Park
Resource Management Plan
Fuel Modification Within Park Boundary
Figure 21D: Elective OC Parks Fuel Modification



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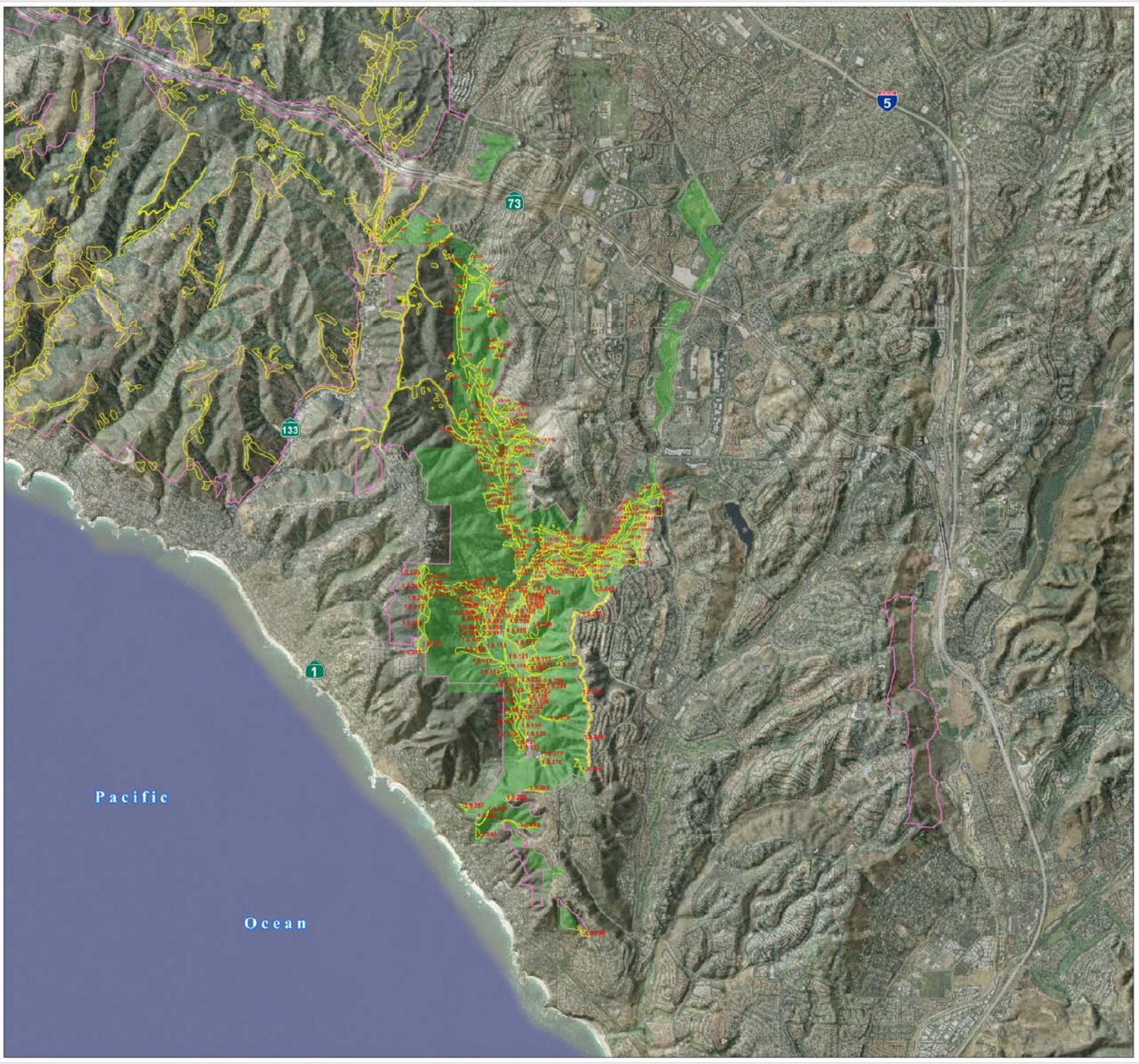

RESTORATION AND ENHANCEMENT

Orange County, California

Aliso & Wood Canyon Wilderness Park

county of orange
HARBORS BEACHES & PARKS
in coordination with
Planning & Development Services Department

Exotic Plant Survey
Aliso & Wood Canyons Wilderness Park
NCCP Reserve Boundary

Orange County, California
BRYAN G. SPEEGLE, DIRECTOR
RESOURCES & DEVELOPMENT MANAGEMENT DEPARTMENT (RDMD)
TIMOTHY S. KELLY, DIRECTOR
PLANNING & DEVELOPMENT SERVICES (PDS)
PLANNING III SECTION

0 1,500 2,800 3,000
Feet

DESIGNED AND PRODUCED BY:

Planning and Development Services
Planning GIS Section
Albert Lucero

DATA SOURCE:
- Planning and Development Services
- Nature Reserve of Orange County

DATE: May 11, 2009

Aliso and Wood Canyons Wilderness Park
Resource Management Plan
Figure 22: Weed Polygons
(Restoration and Enhancement)

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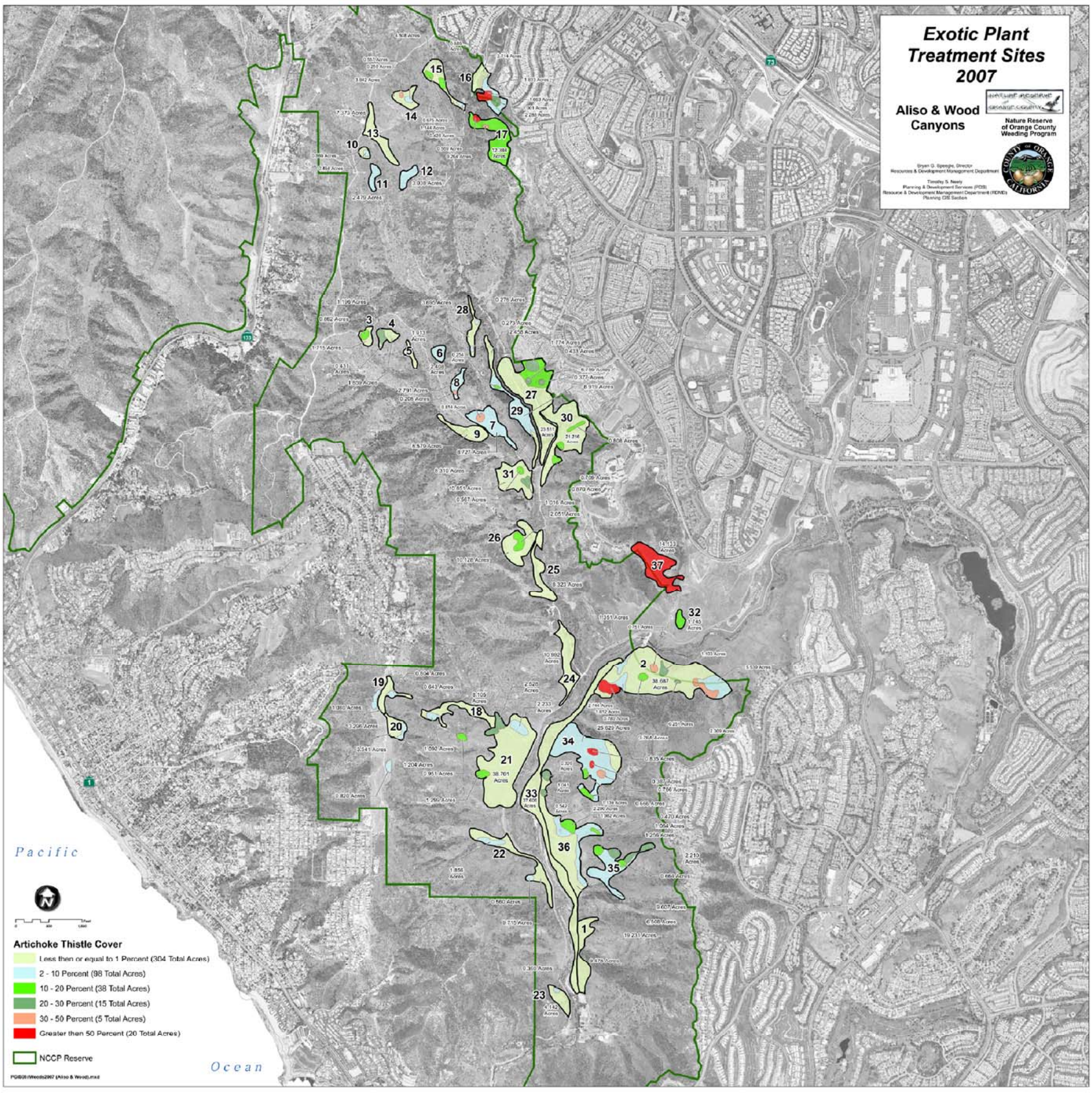
Back of Figure 22



DESIGNED AND PRODUCED BY:

Planning and Development Services
Planning GIS Section
Albert Lucero

DATA SOURCE:
- Planning and Development Services
- Nature Reserve of Orange County

DATE: May 11, 2009

Aliso and Wood Canyons Wilderness Park
Resource Management Plan
Figure 23: Weed Polygons
(Exotic Plant Treatment Sites)

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Back of Figure 23

Table H: Weed Polygon Data within AWCWP

Total Number of Weed Polygons		293
Total Weed Polygon Acreage		1,006
% of AWCWP mapped as Weed Polygons		25%
Dominant Exotic Species in Order of Polygon Abundance (Scientific Name)	**Number of Polygons with the Species**	**Total Polygon Acreage**
Brassica nigra	192	693.12
Cynara cardunculus	165	635.39
Carpobrotus edulis	112	0.40
Nicotiana glauca	59	201.37
Nonnative grass	54	181.13
Centaurea melitensis	51	162.07
Foeniculum vulgare	43	182.62
Conium maculatum	38	138.55
Xanthium spinosum	30	95.14
Cortaderia selloana	20	130.56
Arundo donax	12	71.38
Melilotus indica	11	17.05
Marrubium vulgare	10	39.35
Silybum marianum	9	42.97
Cirsium vulgare	6	9.67
Schinus terebinthifolius	4	19.62
Eucalyptus globulus	3	14.10
Hirschfeldia incana	3	16.98
Pinus species	3	15.71
Carduus pycnocephalus	2	423.65
Myoporum laetum	2	8.62
Pennisetum setaceum	2	2.71
Ricinus communis	2	8.88
Salsola tragus	2	3.40
Agave species	1	0.14
Chrysanthemum coronarium	1	6.25
Ehrharta calycina	1	4.37
Lactuca serriola	1	0.54
Limonium sinuatum	1	12.89
Sonchus species	1	0.77

8.2.2 Locations of Dominant Invasive Exotic Weeds

The most abundant dominant exotic species occurring within grassland areas of AWCWP are: exotic annual grasses; black mustard; poison hemlock; artichoke thistle; milk thistle; Italian thistle; and bristly ox-tongue. Within the drainages and other areas, giant reed, tree

tobacco, poison hemlock, castor bean, and pampas grass are of concern (LSA 2003). Eucalyptus and other ornamental shrubs and groundcover are planted at the Coastal Treatment Plant, and the eucalyptus continues downstream to the nine-hole Aliso Creek Golf Club just outside of AWCWP. Many of the ornamental plants are not invasive in southern California. Clearly, nonnative grasses, black mustard, thistle species, and giant reed are the major obstacles to restoration in both distribution and density.

Artichoke Thistle (*Cynara cardunculus*), Milk Thistle (*Silybum marianum*), and Italian Thistle (*Carduus pycnocephalus*). Artichoke thistle is primarily found in patches along hillsides, gullies, and drainages in Aliso Canyon. It is plentiful in Aliso Canyon, particularly in the open slopes just north of the confluence with Wood Creek. It is not as dominant in Wood Canyon, except at the beginning of Mathis Canyon Trail. Milk thistle is found throughout the large grasslands of Aliso and Wood Canyons, often in association with black mustard, Italian thistle, and artichoke thistle. These exotic species are often found concentrated at the grassland/sage scrub ecotone, along roads and trails, and at the edges of oak woodlands.

Black Mustard (*Brassica nigra*) and Poison Hemlock (*Conium maculatum*). Black mustard and poison hemlock are found commonly in the disturbed lowlands and at the sage scrub/grassland ecotone. Black mustard appears to be invading from adjacent development areas on the ridges surrounding AWCWP. Dense stands are evident throughout Aliso and Wood Canyons, particularly on the disturbed slopes and in the fuel break areas below ridgeline homes. Poison hemlock grows in dense stands in the disturbed lowland areas in both Aliso and Wood Canyons.

Giant Reed (*Arundo donax*). The highly invasive giant reed from the Mediterranean is found in dense patches within Aliso Creek, often in association with invasive species like poison hemlock, sweet fennel, and common cocklebur. Giant reed spreads by thick rhizomes and requires a reliable water source. This dense, bamboo-like grass, which can reach heights of 30 feet, excludes many native species, particularly willows and western cottonwoods. Very little giant reed is found in Wood Creek. This species may be spreading more slowly due to increased channelization, which has lowered the water table in some areas.

Pampas Grass (*Cortaderia selloana*). Isolated individuals or clumps of pampas grass are found in a few locations in Aliso and Wood Canyons. Dispersal is through windblown seeds that grow on white, feathery stalks.

Tree Tobacco (*Nicotiana glauca*) and Castor Bean (*Ricinis communis*). Tree tobacco and castor bean are found in several areas in Aliso and Wood Canyons, but are more apparent in Aliso Canyon. Tree tobacco is typically found in steep ravines and hillsides, often in disturbed CSS. Large stands of the moderately invasive tree tobacco are also found in grassy lowlands. Tree tobacco was treated with Roundup from 1999 to 2001, which eradicated many of the concentrated areas. Both of these species is now somewhat uncommon in AWCWP.

8.2.3 Prioritization of Restoration/Enhancement Activities

In order to improve biological productivity and diversity, habitat areas first need to be evaluated for their conservation value and then prioritized for restoration and enhancement. The following NCCP/HCP criteria will be used in conjunction with professional judgment to evaluate habitats for their conservation value.

High conservation value areas are:

- Larger in size
- Close to or contiguous with other habitat areas
- Provide linkages between areas
- Contain a diversity of habitat types, associations, elevations, etc.
- Can be protected from encroachment to remain viable over the long term

Low conservation value areas are:

- Smaller in size
- Distant or separate from other habitat areas
- Are not strategically located to provide linkages (*i.e.,* form “dean-end fingers”)
- Have minimum diversity and/or are largely nonnative communities
- Are highly vulnerable to future disturbance

Medium conservation values are associated with characteristics intermediate between the higher and lower values described above.

Habitat areas (i.e., polygons) dominated by weeds have been prioritized (Appendix F) according to the recommendations in the HREP prepared for NROC to ensure that the most effective and valuable projects are undertaken first. The HREP for the NROC Central Coastal Subregion recommends that active restoration and enhancement efforts within the AWCWP be conducted effectively and cost-efficiently with focus on (1) control of artichoke thistle, (2) restoration of native grassland and CSS in areas where thistle control has already been completed, (3) control of Harding grass and Italian thistle in the El Toro drainage followed by active restoration to oak riparian woodland and wet meadow, and (4) control of giant reed in Aliso Creek. In addition, native habitats, including coastal sage scrub, that were impacted by goat grazing in the fuel modification zones can be quantified (estimated at 20 acres) and restored, as well as other areas impacted by manmade or natural phenomena.

Appendix F discusses management, restoration and enhancement activities and includes a table with the recommended restoration prioritization organized by weed polygons. Appendix F provides a table that includes polygon acreage, native habitat to be restored, percent of existing native cover, and the polygon numbers that correlate to the polygons mapped on Figure 24, Grassland Habitat Quality. The raw data collected by TNC used to generate this table is available at the County NROC department.

Restoration Activities

Close/Restore Unauthorized Trails. The first priority should be to close designated unauthorized trails within the park. Closing may be accomplished by covering the trails with leaf litter and blocking them with physical barriers or signage and citations as necessary to discontinue any additional human disturbance. Closing and abandoning all selected unauthorized trails within the AWCWP, and subsequently restoring the areas will improve the quality of habitat for wildlife.

Eradicate Invasive Weeds. Fuel modification areas should receive priority for invasive weed eradication, because excessive fuel management practices allow nonnative invasive weeds to become easily established within the fuel modification zones and adjacent natural areas. Existing fuel modification areas and zones are located on the edges of AWCWP where they meet residential developments (Figures 21A through 21D: Fuel Modification Zones), and along access roads (e.g., AWMA Road from the park ranger's station to the water treatment facility in the southernmost section of AWCWP) and some trails within AWCWP.

Weed polygons within the category of "interior" invasive weed polygons should be prioritized for eradication. Areas with new, fast-spreading and/or noxious weeds (e.g., thistles, garland chrysanthemum, etc.) should receive high priority for eradication to stop any further spread of the invasive species. Areas with established weeds that impact habitat value (e.g., giant reed) should receive medium priority because these areas are not quickly spreading. Because areas dominated by non-native annual grasses provide useful habitat for many species and are very difficult to eradicate completely, they should receive lowest priority for eradication.

Re-Establish Native Habitat by Replanting. Areas with excessive vegetation removal and type-conversion due to fuel-modification need to be managed aggressively by replanting native species that are compatible with the designated fuel modification zones. Table I has a list of suitable container plants, and Table J has a list of recommended seed types and quantity that may be used to revegetate areas within fuel modification zones. Container plants should be selected based on site specific conditions and the individual species' adaptations. Also, spacing of container plants should be consistent with OCFA guidelines. Selected unauthorized trails should be replanted to prevent further degradation and to encourage natural vegetation to establish. An emphasis should be placed on replanting native Opuntia cactus species for several reasons: cacti have high moisture content and thus are ideal vegetation for fuel-modification areas; and cacti can be used to maintain closures of unauthorized trails, and thus prevent undesirable uses. Importantly, replanting cholla and prickly pear cactus species will augment habitat for the NCCP/HCP-targeted coastal cactus wren, and thus help meet the NROC goal for cactus wren habitat supplementation.

These areas should receive priority for restoration because they can function as a buffer zone between the urban-wildland interfaces and management has already been initiated in some of these areas. In addition, the fuel modification in some of these areas may be in violation of the State Code (Section 51184(a)(b)), which states that fuel management radii

regulations do not apply in “lands kept in a predominantly natural state as habitat for wildlife, plant, or animal communities,” or in “open space lands that are environmentally sensitive parklands.”

Other natural habitat areas should receive moderate priority for restoration by implementing weed removal and replanting. Many of these areas with a moderate to high amount of native cover contain endangered or threatened species or are occupied by sensitive plant and/or animal species, or support sensitive vegetation communities and should be restored. Also, areas considered large enough by best professional judgment (or contiguous to other large areas) to provide essentially complete ecosystem needs for multiple species or temporary needs of migrating species should be restored. For native grassland areas that need revegetation (Figure 24: Grassland Habitat Quality), Table K has a list of recommended seed mix that may be used.

Table I: Recommended Container Plants List for Coastal Sage Scrub within AWCWP

Scientific Name	Common Name
Baccharis pilularis consanguinea	Coyote bush
Baccharis salicifolia	Mulefat
Encelia californica	California encelia
Epilobium canum	California fuchsia
Heteromeles arbutifolia	Toyon
Isocoma menziesii	Coast goldenbush
Isomeris arborea	Bladderpod
Leymus condensatus	Giant wild rye
Malosma laurina	Laurel sumac
Mimulus aurantiacus	Bush monkey flower
Mirabilis californica	California wishbone bush
Opuntia littoralis	Coastal prickly pear
Opuntia prolifera	Coastal cholla
Rhus integrifolia	Lemonade berry
Ribes speciosum	Fuchsia-flowered gooseberry
Sambucus mexicana	Mexican elderberry
Solanum xanti	Chaparral nightshade

Table J: Recommended Seed Mix for Coastal Sage Scrub within AWCWP

Scientific Name	Common Name	Pounds per Acre
Dichelostemma capitatum	Blue dicks	0.20
Encelia californica	California encelia	1.25
Eriophyllum confertiflorum	Golden yarrow	0.75
Eschscholzia californica	California poppy	0.50
Galium angustifolium	Narrow-leaved bedstraw	1.00
Gnaphalium californicum	California everlasting	0.50
Isocoma menziesii	Coast goldenbush	0.50
Lasthenia californica	Coastal goldfields	1.50
Lotus scoparius	Deerweed	0.80
Lupinus bicolor	Miniature lupine	1.00
Lupinus succulentus	Arroyo lupine	0.25
Melica imperfecta	Small-flowered melic	1.00
Nassella lepida	Foothill needlegrass	2.00
Nassella pulchra	Purple needlegrass	7.00
Plantago erecta	California plantain	2.00
Poa secunda	Perennial blue grass	2.00
Sisyrinchium bellum	Blue-eyed grass	0.10
Total		22.35

Table K: Recommended Seed Mix for Native Grasslands within AWCWP

Scientific Name	Common Name	Pounds per Acre
Nasella lepida	Foothill needlegrass	2.0
Nassella pulchra	Purple needlegrass	5.0+
Sisyrinchium bellum	Blue-eyed grass	0.5
Lotus purshianus	Spanish lotus	0.5
Lupinus bicolor	Miniature lupine	1.0-2.0
Lupinus succulentus	Arroyo lupine	1.0-2.0
Ericameria palmeri var. pachylepsis	Box springs goldenbush	0.5
Eschscholtzia californica	California poppy	2.0
Castilleja exserta	Purple owl's clover	0.5+
Hemizonia fasciculata	Clustered tarweed	2.0
Asclepias californica	California milkweed	trace
Asclepias fascicularis	Narrow-leaf milkweed	trace
Daucus pusillus	Rattlesnake weed	0.5
Poa secunda	Malpais bluegrass	0.5-1.0
Lasthenia glabrata	Coulter's goldfields	2.0
Amsinckiamenziesii var. intermedia	Common fiddleneck	2.0
Grindelia camporum var. bracteosum	White-stem gumplant	0.5-1.0
Total		**20.5+**

Laguna Coast Wilderness Park

Aliso and Wood Canyons Wilderness Park

Coastal Treatment Plant

Aliso Creek Golfcourse

Sulphur Creek Reservoir

Pacific Ocean

EL TORO RD

LAGUNA CANYON RD

GLENWOOD DR

LAGUNA HILLS DR

ALISO CREEK RD

PACIFIC PARK DR

WOOD CANYON LN

WOOD CYN DR

MOULTON PKWY

ALICIA PKWY

PASEO DE VALENCIA

LA PAZ RD

ALICIA PY

HIGHLANDS AV

PACIFIC ISLAND DR

NIGUEL RD

MARINA HILLS DR

CROWN VALLEY PKWY

CLUB HO

Aliso Creek

Wood Creek

Moiso Creek

73

N

0 2,000 4,000 6,000 8,000 Feet

LEGEND

- Contour Interval 40ft
- Authorized Trail
- Utility Access
- Proposed Trail
- Unauthorized Trail

CENTRAL & COASTAL NCCP - HCP CLASSIFICATIONS

- Existing Use
- Non-Reserve Open Space
- Reserve
- Aliso and Wood Canyons Wilderness Park

GRASSLAND HABITAT QUALITY

- High Quality - Grasslands with greater than 30% cover of native perennial grass or a dominant cover of diverse native annual grassess and forbs
- Moderate Quality - Grasslands with greater than 5% and less than 30% cover of native perennial or annual grasses, or a moderate cover of native annual grasses and native forbs
- Low Quality - Grasslands with less than 5% cover of native perennial or annual grasses

DESIGNED AND PRODUCED BY:
OC Public Works
GIS Mapping Unit
Brian Anderson

DATA SOURCE:
- Geomatics Land Information Systems Division
- Eagle Aerial Image 1 meter resolution, flown June 2001
- Draft Aliso and Wood Canyons Wilderness Park Resource Management Plan Dated July 1991
- California Natural Diversity Data Base, April 12, 1999
- Field Surveys conducted by Harmsworth and Associates between March and July, 1998

The degree of accuracy of these data sets may differ. In addition, the source of the data, as well as its intended use may also influence the precision. Therefore, Geomatics/LIS/GIS disclaims any responsibility for the accuracy of the data

DATE: June 3, 2008

Aliso and Wood Canyons Wilderness Park
Resource Management Plan
Figure 24: Grassland Habitat Quality

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8.3 HABITAT RESTORATION METHODS

Habitat restoration and enhancement must be site specific, with prescriptions developed based on the site's conditions. The feasibility of restoration/enhancement and the type of habitat most appropriate to be restored on a given site are determined by a number of factors. These include physical characteristics, such as soil type, soil compaction, hydrology, topography, aspect and insolation. Biotic characteristics include current vegetation types (e.g., extent of weed growth), previous use of soil sterilants, and proximity of native communities. Other key factors include access for equipment used in restoration (e.g., hydro seeding equipment) and suitability of terrain for restoration (ability to use equipment and erosion potential).

Restoration of CSS is appropriate where a candidate site's characteristics are consistent with characteristics of sites where CSS is typically found. CSS is typically found where soils are sandy or loamy, well drained, and thin to moderately deep. CSS is found in a wide variety of topographic situations including ridge lines, steep slopes, and gentle hillsides. Species composition within the community varies greatly with differences in soil type, aspect/insolation, fire history, topography, and disturbance history. This community can usually be established on a properly prepared site without supplemental irrigation. Restoration of other plant communities is appropriate where a candidate site's characteristics are not consistent with coastal sage scrub. Oak woodland is typically found where soils are deep, the site is mesic but well drained, and topography is a north-facing slope and/or valley floor. Riparian habitats are typically found where soils are moderate to deep, at least periodically poorly drained (ground water or surface water at or near the surface), and topographically along a drainage or around a spring or depression. Finally, grassland is typically found where soils are moderately deep to deep, with loam to clay textures and higher water holding capacity, and in topographic situations producing highly insulated sites (e.g., ridges, south-facing slopes).

8.3.1 Methods of Site Preparation and Planting of Native Species

Weed Control. Ideally, exotic plants/weeds should be removed from all areas to be revegetated, prior to any planting. Mechanical control methods should be employed, if feasible; however, heavy equipment (e.g., bulldozers, backhoes) should not be used in eradicating exotic plants and weeds, except for such species as pampas grass. Detailed information on exotic plant/weed control can be found in the Exotic Plant Control section.

Grading. Depending on the condition of the site, some grading may be necessary during site preparation. In particular, dirt roads may need to be regraded or created to allow for access onto the site. If grading is necessary, cultural resource issues may need to be addressed prior to construction activities.

Cross Ripping. Cross ripping or rototilling can be used to decompact soils and create an uneven surface for increasing water infiltration and safe sites for native seed and organic matter. Mycorrhizal fungi inoculum can be incorporated into the soil with the cross ripping. Cross ripping is limited to sites no steeper than 2:1 because of equipment access and maneuverability.

Soils Testing/Amendments. In most cases, the soil will not be lacking in nutrients or organic matter; however, if there is an indication of poor, stunted, or deformed plant growth, soil testing may be necessary to determine whether there is a nutrient deficiency or a toxic element in the soil. Another cause for these conditions is a thin soil layer covering an underlaying clay lens, rock, or hard pan layer. If soil nutrient deficiency or toxicity is suspected, soil analysis should be conducted to determine the fertility and agricultural suitability of the surface and subsurface soils. If soil analysis reveals a nutrient or organic deficiency or toxicity, remedial measures (i.e., incorporation of soil amendments, leaching) may be necessary. If there is a possibility that herbicide was applied to the site, agricultural records should be checked to determine whether (and when) an organic herbicide was applied to the site. If organic herbicides are present in the soil, remedial measures, including incorporation of a carbon slurry, may be required prior to plant installation.

Fencing and Signage. Depending on the site and adjacent land uses, fencing and signage may be necessary to keep pedestrian, mountain cyclists, and equestrians out of the revegetation areas during plant establishment. This need for and type of fencing should be determined during the planning phase. Informational signage size, type, and quantity should also be considered if human uses and vandalism are anticipated.

Erosion Control. Potential erosion protective measures should be considered as part of the revegetation effort, especially on sites that are on slopes. The potential for erosion will vary depending on the steepness and size of the slope, drainage patterns, and soil type. The type of erosion control should be determined during the planning phase, and may need to be amended following implementation of the revegetation plan. Some sort of erosion control may be required, since in most cases the weedy vegetation will be cleared from the site and the soil will be exposed for at least a few months. Erosion control measures may include soil swales, drainage ways, straw wattles, rice straw wattles, sand bags, netting, mulching, or other bio engineering techniques. (See Appendix F).

Container Plant Materials and Installation. This method is used to obtain an instant vegetation structure, or vegetation “islands.” It is used in extremely weedy areas where seeding may not be feasible, in order to ensure the presence of species that do not germinate reliably. Where feasible, plant material should be salvaged for replanting efforts from areas proposed for heavy ground disturbance within the park to preserve genetic material. This would be especially beneficial in infrastructure developments within the park where grading for trails or roads is necessary.

Container plants require water for the first one to two months after planting, thus temporary irrigation may be required. The method for this irrigation should be determined based on site specific conditions, such as access and availability of water. For extensive areas it may be worth the effort to run a temporary water supply hose to an installed temporary sprinkler system. For somewhat smaller areas, temporary sprinkler systems can be supplied with a water tank and/or water truck. Small areas may be irrigated by hand with a hose from a water truck or water bladder in the back of a pickup truck. Another option to be considered is supplying individual container plantings with Dri-Water (or similar product) which stores

water in a gelatinous matrix that releases moisture to the plant slowly over time. (See Appendix F).

Seed Materials and Installation. This method can be used on nearly all restoration sites; however, weed control is important to ensure germination of seeds. Site adapted seed materials must be used for each site; therefore, seed collection must be coordinated one to two years in advance and collected on-site or in nearby open space, whenever possible. To encourage the use of local genetic stock, the supervising park ranger should hire seed collectors to collect seed from within the AWCWP for use on restoration sites within or adjacent to the AWCWP. Several methods for dispersing seed materials are outlined below.

Hand Seeding. Hand seeding should be used in relatively flat areas. It should not be used where there is a potential for erosion.

- **Drill Seeding.** Drill seeding should be used on uncompacted sandy, silty soils where the gradient is 3: 1 or less.
- **Imprint Seeding.** This method should be used on uncompacted sandy or silty soils where the gradient is 3: 1 or less. It may be used on slopes of 2: 1 if there is special equipment available.
- **Hydroseeding.** Hydroseeding should be used on bare slopes that have a gradient greater than 3: l and where the potential for erosion is evident. Access to nearby water source by equipment is necessary.
- **Hydroseeding with Bonded Fiber Matrix (BFM).** This type of hydroseeding should also be used on bare slopes where the potential for erosion is evident; however, the gradient can be 2: 1. Access to nearby water source by equipment is necessary.
- **Import Native Topsoil.** Topsoil from a nearby native site that is relatively free of weeds and slated for disturbance may be imported to a site for revegetation.
- **Mycorrhizal Inoculum.** Materials (Inoculum Produced from Site Specific Sources). This should be used in sites that have compacted soil or in disturbed areas with no evidence of native soil. This can be done with most seeding operations, as well as in the container plants.

8.3.2 Exotic Plant Control

Mechanical Methods

Flail Mowing. Flail mowing is effective for clearing weedy vegetation from the site. Flail mowing should be completed prior to weed seed set. This method is useful in areas where patches of native vegetation may be present among a site dominated by nonnative annual species. If seed is not present on the mowed vegetation, the cut vegetation can be left on the site as an organic source. The cut vegetation can be vacuumed or raked off the site if the soil is to be exposed, or raked into three foot high berms to reduce water flow velocities on the slope or at the toe of slope.

This treatment is limited to areas that are accessible by mechanical equipment. Slopes more than 3:1 limit the feasibility and effectiveness of this treatment. In addition, fire prevention measures must be taken to avoid accidental fires due to sparks and machinery operation. These measures may be extensive during the dry season.

Discing. Discing can be used to turn under the thatch and germinate weed seed in the soil. The goal of this operation is to reduce the nonnative, annual grass seed bank that currently exists in the soil by encouraging the seed to germinate (through discing followed by precipitation), then destroying the resulting germinants with a subsequent discing. Discing is limited to large areas that are dominated by nonnative, annual species, without rocks in the substrate, and accessible by mechanical equipment. Slopes more than 3:1 limit the feasibility and effectiveness of this treatment. To minimize erosion, all discing should be conducted parallel to the slope contour. Discing should be conducted following the first rains in the fall and continue through the spring or summer to keep weeds from producing seed. Discing should be scheduled 1) following nonnative annual grass and forb seed germination, and 2) when soil is dry enough to run the equipment.

Extensive experience with discing in the Newport Coast open space enhancement project has demonstrated that discing ultimately encourages the germination of other seed. Therefore, one year of broadcast chemical applications or other treatment (i.e., solarization—see below) is recommended when weed seedlings are in active growth, to reduce the weed seed bank in the soil prior to plant installation.

Solarization. Soil solarization can be used following vegetation clearing and soil preparation to kill weeds and weed seeds in the top two to six inches of soil. This method works best on cool season weeds and grasses, but not on deep rooted summer weeds with rhizomes. Soil is solarized by applying sheets of clear one to two mil polyethylene plastic to the prepared soil during the hottest part of the year for a minimum of four months. This method should be used on sites that do not have obstructive objects such as rocks, or branches that can poke holes in the plastic.

Burning. Burning is useful for weed eradication and thatch removal in large native perennial grassland areas and steep slopes where access by mechanical equipment is often limited. In heavily weed infested areas, burning may be required for two to three consecutive years prior to plant or seed installation. For the most effective weed control, burning should be conducted when the weed seed is in the milky stage.

Given that the AWCWP is surrounded by urban development, burning may not be practical. However, if burning is to be considered, a detailed burn control plan must first be prepared. In addition, special interest species and nesting bird surveys may be required if the burn is to take place during the nesting season. In accordance with OCFA and California Department of Forestry guidelines this plan requires consideration of fuel loads, moisture levels, weather, etc. It also requires extensive notification to surrounding land owners and residents.

Chemical Methods. In circumstances where mechanical control is not effective, chemical application can be used to control weeds. Methods of chemical application include cut and paint, foliar application, and wicking. Herbicides must be carefully applied in order to avoid inadvertent damage to native plants. Some species, such as willows, are very susceptible to drift of small amounts of fine mist.

Cut and Paint Chemical Application. The cut and paint chemical method is typically used on large, woody, exotic species. This method involves cutting the stems to within six inches of the ground, then immediately applying chemicals to the cut stump within two minutes of cutting. The recommended chemical and application rate varies with species. This method often requires a second application, either by foliar or cut and paint, of resprouts within six months of treatment.

Foliar Chemical Application. This treatment involves broadcast spraying with an herbicide during the late winter, spring, and summer. Native seedlings present in this treatment area should be avoided during spraying. Clearing previous years' dried vegetation may be necessary to treat newly germinating weed seedlings. Following the first spray treatment, the dead vegetation, dominated by nonnative grasses and mustard can be cut and raked into berms along the contours or at the toe of the treated slope. The indicator dye "Blazon" should be used with the Roundup pro to keep track of sprayed plants. A low volume spray nozzle should be used to apply the chemical when applying manually.

Wicking. Wicking involves the use of a rag or sponge on the end of a controlled dispenser, typically in the form of a long wand or thin cylindrical stick. Wicking is good for treating smaller species in areas where native species are abundant.

8.4 INVASIVE AND PEST SPECIES CONTROL

8.4.1 Existing Conditions

A number of pest species have the potential to reduce the conservation value of AWCWP by directly affecting one or more NCCP/HCP target and identified species. This group of pests includes the brown-headed cowbird (*Molothrus ater*), a group of medium-sized mammalian predators known as "meso-predators" [including feral dogs and cats, opossum (*Didelphis virginiana*), raccoon (*Procyon lotor*), striped skunk, and nonnative red fox (*Vulpes fidva*)], red-eared sliders (*Trachemys scripta elegans*), African clawed frogs (*Xenopus laevis*), and Argentine ants (*Iridomyrmex humilis*).

Brown-headed Cowbird. Cowbirds are nest parasites of many sensitive bird species, most importantly the least Bell's vireo and coastal California gnatcatcher, a NCCP/HCP target species. This can cause high levels of reduced nest success and nest failures. Cowbird trapping has proven to be an effective tool in successful management efforts for the least Bell's vireo and coastal California gnatcatcher in Southern California.

Meso-predators. Meso-predators can cause high levels of adult mortality, as well as high rates of nest failure to numerous bird species including the gnatcatcher and cactus wren

(Campylorhynchus brunneicapillus). They are also known to prey on a variety of reptile species including the orange-throated whiptail lizard (Cnemidophorus hyperythrus beldingi), an NCCP/HCP target lizard species. There is some evidence to support the theory that removal of the top predators (coyotes, mountain lions, and bobcats in this context) from the system, removes the key population controls of "meso-predators," a phenomenon known as "meso-predator release" (Soule et. al. 1988). The release of the population controls allows the rates to reptilian, avian, and small mammalian species, and increased levels of nest failure among avian species. Since the coyote and bobcat are the main predator and possibly the key population control for these "meso-predators," keeping healthy coyote and bobcat populations is the key factor in the control of these pest species.

One of the most important factors in the maintenance of healthy coyote and bobcat populations in AWCWP is the presence of movement corridors and habitat linkages. The wildlife corridors between AWCWP and LCWP open space areas to the west provide access to a large expanse of suitable coyote and bobcat habitat and should ensure the continued existence of healthy coyote and bobcat populations. This will help to maintain the populations of "meso-predators" at acceptable levels.

Aquatic Species. Three aquatic organisms are present or potentially present in AWCWP and may reduce overall biodiversity within the park. The American bullfrog competes with and preys upon native frogs. The tadpole stage of the bullfrog can significantly impact benthic algae thus changing the community structure. The African clawed frog, an introduced amphibian species, occurs within AWCWP. This frog inhabits ephemeral pools and streams. Through predation, these nonnative frogs can severely damage native amphibian and fish habitat and populations within AWCWP. Red-eared sliders, a nonnative turtle species, may out compete native southwestern pond turtles for dragonflies, which are important indicators of a healthy environment and aggressive predators on both larval and adult mosquitoes.

Argentine Ants. Argentine ants are an insect pest species that could have a devastating effect on the lizard and bird populations of AWCWP. Argentine ants are more dependent on moisture than the native ant species. Argentine ants compete with native harvester ants, the main food item of the coast horned lizard, and are known to consume bird and mammal nestlings. Argentine ants could increase in AWCWP through irrigated areas or be introduced to new areas from infested container plant stock.

8.4.2 Control Methods

If monitoring of "target and identified" species show that populations are declining or their habitats are being degraded due to vertebrate pest species, then control efforts will be undertaken. All vertebrate pest control activities will be monitored, by recording initial pest species densities (as an index by capture effort) and any changes to that index as control efforts proceed. The following guidelines will be used to manage these vertebrate pest species.

1. All pest animal control activities shall be coordinated between the supervising park ranger and the Resource Specialist with, as needed, coordination with NROC,

USFWS, CDFG, and animal control officers and recorded to determine the initial pest densities and the changes in population following the control effort.

2. The supervising park ranger will cooperate with existing brown-headed cowbird control measures conducted by NROC. If monitoring of “target, identified and special interest species” (e.g., California gnatcatcher) show excessive parasitism, and if another entity is not already controlling cowbird populations, the supervising park ranger will undertake cowbird control by placing a cowbird trap(s) strategically. The need for cowbird traps will be determined by analysis of annual trapping results and resource monitoring. When cowbird traps are installed, inform AWCWP users of the reason for the cowbird trapping program through educational signage.
3. Make AWCWP less desirable to cowbirds by keeping staging areas and other equestrian use areas clean of horse droppings and not planting any turf within AWCWP. Local governments participating in the NCCP/HCP will use their best efforts to discourage projects that use extensive turf in projects adjacent to the reserve. This tends to attract cowbirds. As a Wilderness Park, there are no turf areas within the AWCWP and no turf areas will be considered in future plantings.
4. The supervising park ranger will undertake control activities in coordination with NROC for feral dogs and cats, red fox, and opossum if monitoring of these species indicates that control efforts are warranted due to predation on NCCP/HCP "target species." Control efforts will focus first on encouraging increased coyote use of problem areas, such as by providing artificial dens, improving movement corridors, and so forth. Meso-predator non-lethal capture and removal or lethal control measures will be employed only if monitoring shows efforts to encourage coyote use are ineffective. Lethal control measures may be used if non-lethal means are not effective, subject to appropriate safeguards for public safety and protection of other wildlife species.
5. Exclude domestic pets from the AWCWP by enforceable regulations. Park ranger staff should make annual inspections of AWCWP boundaries for feral domestic animals. If feral animals are observed in AWCWP, the park ranger shall coordinate with animal control officers to trap and remove them.
6. The County should encourage the removal and control of American bullfrogs, African clawed frogs, and/or red-eared sliders. The supervising park ranger will cooperate with any control efforts for these species undertaken by third parties to the degree the control measures do not conflict with the primary purpose of the NCCP/HCP.
7. To discourage and prevent the spread of Argentine ants, long-term irrigation within AWCWP should be avoided. Only use short-term irrigation where required to establish native plantings.
8. All container plant materials imported into the AWCWP shall be free of Argentine ants. Specifications for revegetation or habitat enhancement projects shall mandate that suppliers of container stock certify that such stock is free of Argentine ants and the restoration biologist can also check the containers at the time of plant delivery.
9. If Argentine ant colonies are discovered in the AWCWP, the land manager shall consult with the County agricultural commissioner or vector control to determine the most environmentally appropriate removal method.

8.5 BIOLOGICAL RESOURCES DATA KEEPING

The NCCP/HCP requires that all resource management activities be monitored directly to assess their effectiveness in meeting the goals set by the NROC to 1) promote biodiversity, 2) increase habitat for target species, and 3) increase habitat values. The data collected through the monitoring program, as described in the Monitoring and Adaptive Management Program, must be analyzed and used as the basis for evaluating and guiding park management. Analysis will include comparisons of current and previous data, with greater emphasis on identifying long-term trends rather than short-term phenomena. Data from species monitoring will be compiled and analyzed as monitoring cycles are completed. Analyses will include determining reproductive success, mortality rates, and patterns of dispersal. Particular emphasis will be given to identifying any management activities needed to improve or maintain necessary park functions. Data from active management efforts will be analyzed to assess the effectiveness of the management effort, and will guide decisions on future management efforts. Data from species inventories will be compiled in files and a GIS database. Data from passive management/monitoring will be compiled into report format for use in guiding future management. The monitoring program may reveal further research needs which can be used to guide future management practices.

8.5.1 Target and Identified Species Data

Park management will maintain a centralized database to document the populations of locally uncommon, sensitive, federally-threatened or endangered species and other sensitive resources in the AWCWP and their responses to management actions. It is recommended that special status species be monitored once every five years to track the populations, identify threats, develop management recommendations, and determine the effectiveness of management actions. However, monitoring frequency may vary and should be evaluated by the supervising park ranger, the Resource Specialist, NROC, and resource agencies (i.e., CDFG, USFWS).

8.5.2 Exotic Plant Data

To ensure effective exotic plant control NROC has established an exotic plant data collection. The supervising park ranger/Resource Specialist will maintain a database and maps of exotic plant and plant source locations, densities and control efforts on the NROC GIS database, which shall be updated by AWCWP every five years at a minimum with exotic species of greatest threat surveyed annually. The GIS maps will be used to document dates, locations and types of exotic control methods (e.g., mechanical or hand removal, herbicide applications, and/or prescribed burns).

8.5.3 Invasive and Pest Species Data

The supervising park ranger will cooperate with continuing NROC cowbird control efforts and will submit any incidental information to the NROC database. Other pest vertebrate species will also be monitored to determine if control efforts are needed to protect sensitive species. The supervising park ranger will coordinate and record all pest control activities to

determine the initial pest densities and the changes in population following the control effort. Domestic pets will be excluded from the park by enforceable regulations, and removed by the supervising park ranger when found within the park. Park personnel will conduct annual inspections of the fuel modification zones and park boundaries to monitor feral domestic animals.

8.5.4 Habitat Quality Data

The following information will be gathered and maintained in a database that is updated after each monitoring cycle to evaluate the quality of habitats found within the AWCWP.

- Document the location and dates of wildfire occurrences.
- Establish photo points along the creek and at vantage points overlooking the park. Take an annual photograph at the same date and time to compare photographs and determine whether management actions are necessary to maintain habitat quality.
- Once every five years, create a GIS map of the segment of Aliso Creek within AWCWP to track the creek's migration.
- To assess coastal sage scrub and riparian habitat quality, once every five years survey the following species: the threatened coastal California gnatcatcher; the endangered southwestern willow flycatcher and least Bell's vireo; and the sensitive yellow-breasted chat and yellow warbler.
- Once every ten years, create a habitat map using the County's habitat classification system (Gray and Bramlet 1992, Jones and Stokes Associated, Inc. 1993). This map will be used to track changes in habitat distribution, with a particular emphasis on detecting displacement of native vegetation types. If such losses and/or significant native habitat type conversion occur, the causes will be investigated. Remedial action will be implemented as appropriate to remedy human-induced effects on native habitat values. However, natural succession will be allowed to occur.

8.5.5 Habitat Enhancement and Restoration Monitoring Data

Habitat enhancement and restoration activities will be monitored and annual monitoring reports produced with written and photographic documentation of each restoration/enhancement site. The Habitat Enhancement and Restoration Map shall be updated bi-annually, showing existing and future restoration and enhancement areas.

8.6 RECOMMENDATIONS

General Actions

- Protect and maintain existing population of native plants and wildlife using active and passive ("hand off") techniques. Issues include sensitive vegetation communities, edge effects, trail management and design, and, if needed, restricting access permanently or temporarily. Collaborate with other agencies, organizations, adjacent landowners, jurisdictions, and volunteers.

- Develop a park-wide, long-term invasive management plan to control exotic plant species that includes both natural and disturbed areas in the park and Reserve and non-Reserve lands.
- Develop a park-wide, long-term management plan to control vertebrate pest species for the purpose of protecting park resources and public health in Reserve and non-Reserve lands.
- Incorporate applicable provisions of the NROC Fire Management Plan, when completed, into the RMP. That plan, through the NROC, is currently in preparation and shall be incorporated into this RMP when it is completed (See Chapter 13 Fire Management).
- Monitor species and habitat enhancement and restoration activities as part of the adaptive management program to evaluate effectiveness and progress. Through monitoring, seek to identify new enhancement and restoration opportunities and priorities within the park (See Chapter 15 Monitoring and Adaptive Management Program).

As-Needed Actions

- Control pest plants particularly within the known 293 mapped polygons (approximately 1,000 acres), fuel modification zones, and other disturbed priority areas. Follow the management plan (NREP) for NCCP/HCP Reserve lands and any other approved long-term management plan to locate, monitor, and eradicate exotic plant species. Removal methods may include flail mowing, discing, soil solarization, control burning, chemical application, cut and paint and/or wicking chemical application. Eradicate according to an established (maybe species specific) schedule.
- Control pest animal species using a long-term management plan. All pest animal control activities shall be coordinated between the supervising park ranger and the Resource Specialist or Resource Coordinator with, as needed, consultation with NROC, USFWS, CDFG, and animal control officers.
- Brown-headed cowbirds and other pest vertebrate species will also be monitored to determine if control efforts are needed to protect sensitive native species. Known vertebrate pests include the brown-headed cowbird, feral dogs and cats, opossum, raccoon, striped skunk, red fox, red-eared sliders, African clawed frogs, and Argentine ants.
- Restore native habitat actively using approved site specific seeding and planting techniques. Fencing and signage, weed management, and erosion control may be necessary to protect areas during plant establishment. Exotic species prevention measures (e.g., weeds, Argentine ants) should be implemented.
- Close all selected unauthorized trails by covering the trails with leaf litter and blocking them with physical barriers or signage and issue citations as necessary. Restore the areas actively or passively to improve habitat.

Annual Actions

- Conduct annual inspections of the fuel modification zones and park boundaries to monitor fuel modification zone limits, erosion, exotic plant and animal species, including feral domestic animals.

- Establish photo points along the creek and at vantage points overlooking the park. Take an annual photograph at the same date and time to compare photographs and determine whether management actions are necessary to maintain habitat quality.

Bi-annual (Two) Year Actions

- Map habitat enhancement and restoration activities and update the Habitat Enhancement and Restoration Map (HERM; at NROC) to show existing and future restoration and enhancement areas.

Five Year Actions

- Control pest plants particularly within the known 293 mapped polygons (approximately 1,000 acres), fuel modification zones, and other disturbed priority areas. Follow the management plan (NREP) for NCCP/HCP Reserve lands and other approved long-term management plan to locate, monitor, and eradicate exotic plant species. Update the NROC database once every five years, at a minimum.
- Monitor locally uncommon, sensitive, federally-threatened or endangered species and other sensitive resources to track the populations, identify threats, develop management recommendations, and determine the effectiveness of management actions. Monitoring frequency should be evaluated by the supervising park ranger, the Resource Specialist or Resource Coordinator, NROC, and resource agencies (e.g., CDFG, USFWS). Once every five years, recommended.
- Create a GIS map of the segment of Aliso Creek within AWCWP to track the creek's migration.
- To assess coastal sage scrub and riparian habitat quality, survey for the following species: the threatened coastal California gnatcatcher and endangered southwestern willow flycatcher and least Bell's vireo, and the sensitive yellow-breasted chat and yellow warbler.

Ten Year Actions

- Create a habitat map using the County's habitat classification system (Gray and Bramlet 1992, Jones and Stokes Associated, Inc. 1993) to track changes in habitat distribution, with emphasis on detecting conversion to ruderal habitats. Displacement causes will be investigated. Remedial action will be implemented as appropriate, but natural succession will be allowed.

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