

Nature Reserve of Orange County

County of Orange
Central/Coastal NCCP/HCP

2008 ANNUAL REPORT



Much of the Orange County NCCP/HCP Central Reserve was devastated by the Santiago Fire in late 2007. As these photos of the El Toro portion of the Central Reserve show, recovery from the fire began to occur the following spring. The wildflowers on the cover are growing in the grassy area of El Toro where a proposed expansion of federal facilities may occur.

Photos courtesy of Jerry Burchfield

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TABLE OF CONTENTS	PAGE
INTRODUCTION.....	1
1.0 ACCOMPLISHMENTS & ACTIONS.....	1
2.0 NROC PROGRAMS & PROGRESS REPORT 2008.....	2
2.1 Program Budget 2008	
2.2 Biological Monitoring	
2.3 Habitat Restoration & Enhancement	
2.4 Brown-headed Cowbird Trapping	
2.5 Wildland Fire in the Reserve	
2.6 Pacific Pocket Mouse Conservation Custodial Fund	
3.0 NROC WORK PLAN 2009.....	8
3.1 Program Budget 2009	
3.2 Biological Monitoring	
3.3 Habitat Restoration & Enhancement	
3.4 Brown-headed Cowbird Trapping	
3.5 Management Planning	
4.0 RESERVE MANAGEMENT PLANS & POLICIES.....	12
5.0 IMPACTS TO CSS IN THE OC CENTRAL/COASTAL NCCP/HCP.....	13
6.0 ACCOUNTING OF FUNDS RECEIVED & DISPERSED BY NROC.....	13
7.0 BOUNDARY CHANGES IN THE RESERVE SYSTEM.....	14
8.0 NCCP/HCP RESERVE LANDOWNER/MANAGER 2008 PROGRESS REPORTS/2009 WORK PLANS.....	14
8.1 Crystal Cove State Park.....	14
8.2 CA Department of Fish & Game Ecological Reserves.....	18
8.3 Orange County Parks.....	24
8.4 The Irvine Company.....	55

8.5	City of Irvine.....	98
8.6	City of Newport Beach.....	119
8.7	University of California, Irvine.....	121
8.8	Transportation Corridor Agencies.....	126
8.9	OC Integrated Waste Management Department.....	129
9.0	CONCLUSION.....	149

Acknowledgement

With appreciation and thanks to all of the reserve landowners and land managers whose reports made a significant contribution to this NROC Annual Report.

BACKGROUND

The Implementation Agreement for the County of Orange NCCP/HCP Central and Coastal Subregion specifies that an Annual Report be prepared each year to describe activities of the non-profit corporation and activities of land managers within the reserve. The annual report contains a progress report for the preceding year and a work plan for the following year. This report is being submitted to the US Fish & Wildlife Service and California Department of Fish & Game to fulfill that requirement for the year 2008/2009. Guidelines provided by the Wildlife Agencies were used in the preparation of this report.

INTRODUCTION

The Nature Reserve of Orange County (NROC) is the 501(c)(3) non-profit corporation that was formed to manage the Natural Communities Conservation Plan/Habitat Conservation Plan (NCCP/HCP) for the Central/Coastal Subregion of Orange County. NROC's mission is *"To ensure the persistence of the reserve's natural communities, including the full spectrum of native plant and animal species, through the protection, study and restoration of native habitats and natural processes."* Thirty-nine sensitive species are protected, including nine plant and 30 animal species. The primary vegetation type in the Reserve is coastal sage scrub, coexisting in an intricate mosaic of oak woodland, native grassland, chaparral, Tecate cypress and riparian communities.

NROC coordinates the management activities of reserve landowners & managers in the 38,000-acre reserve system, conducts biological research and monitoring, and implements a habitat restoration and enhancement program. The overall biological goal of the Reserve program is to conserve healthy, functioning ecosystems. This is accomplished through adaptive management, a flexible approach that is open to change based on new scientific information.

1.0 ACCOMPLISHMENTS and ACTIONS

- ❖ The board of directors approved the 2007 Annual Report to the Wildlife Agencies, including the work plan for 2008.
- ❖ NROC held a symposium on April 1, "Conservation and Management of the Coastal Cactus Wren in Southern California." The symposium resulted in a working group formed to study the cactus wren throughout the region.
- ❖ The NROC Land Manager Council was initiated and held its first meeting in 2008.
- ❖ The board approved the annual audited financial statement for fiscal year 2007.
- ❖ Kristine Preston, Ph.D., was employed as NROC's science program director.
- ❖ The board of directors passed Resolution #08-01, "Revision to the Endowment Fund Investment Policy."
- ❖ Richard Demerjian of UC Irvine was elected as NROC corporate vice-president, and Wally Kreutzen of the City of Irvine was elected treasurer of the corporation.

- ❖ The board approved a \$1.5 million contribution of funds from the Acquisition/Restoration Fund, toward acquisition of the Saddle Creek South property that would provide a key linkage between the central and southern subregions of Orange County, subject to the following conditions:
 1. The subregional NCCP/HCP boundary will be adjusted to include the entire Saddle Creek parcels within the OC Central/Coastal NCCP/HCP subregion and reserve system.
 2. The acquired property will be enrolled in the Central/Coastal NCCP/HCP, and NROC will participate in the management of the property.
 3. A reasonable landowner, management structure, and a management funding plan consistent with NROC's mission will be established prior to acquisition.
- ❖ NROC applied for two CDFG Local Assistance Grants that were subsequently approved: Cactus Wren Habitat Restoration Linkage Project and Invasive Plant Control within the Santiago Burn area.
- ❖ The board approved a budget for fiscal year 2008.
- ❖ Paul Jones of IRWD was re-elected president of the corporation for an additional two-year term.
- ❖ The board sent a letter to the FBI with a legal analysis of their proposal to develop rifle ranges on the El Toro reserve, and a recommendation to find a site for the development outside of the NCCP/HCP reserve.

2.0 NROC PROGRAMS & PROGRESS REPORT 2008

2.1 NROC 2008 Program Budget

During 2008, NROC continued the vegetation monitoring/statistical sampling study being by Dr. Deutschman of San Diego State University. Because of the devastating Santiago Fire in 2007, a survey of the coastal cactus wren population and habitat in the central reserve was conducted. The passive restoration program was continued for the twelfth year, with the goal of eradicating exotic invasive weeds in areas where native plant populations could prevail in the absence of exotics. The research study to determine the sustainability of the artichoke thistle control program, and to test active restoration in study plots where passive restoration was not taking place, was continued by Dr. Suding of UC Irvine. The cowbird-trapping program placed twelve traps in 2008, including two that were mitigation for the County of Orange, and 160 cowbirds were captured during the season.

NROC 2008 Program Budget

BIOLOGICAL MONITORING & RESEARCH	NROC	CDFG	PROGRAM TOTAL
Vegetation Monitoring –Statistical Sampling	\$ 54,919		\$ 54,919
Central Reserve Cactus Wren/Habitat Survey	11,200	\$ 68,800	80,000
Subtotal	\$ 66,119	\$ 68,800	\$134,919
HABITAT RESTORATION & ENHANCEMENT			
Artichoke Thistle Control	\$ 180,000		\$180,000
Veldtgrass Control	42,032		42,032
Weed Control Management	27,500		27,500
CYCA Control/Active Restoration	70,217	\$24,455	94,672
Subtotal	\$ 319,749	\$24,455	\$344,204
COWBIRD TRAPPING	\$ 29,365		\$ 29,365
*NROC PROGRAM BUDGET TOTAL 2008	\$ 415,233	\$93,255	\$508,488
<i>*Does not include staff costs for program development & oversight, and other management expenses</i>			

2.2 NROC Progress Report - Biological Monitoring

- Improving Statistical Sampling and Vegetation Monitoring** - The Nature Reserve of Orange County funded a second year of sampling in 2008 as part of a multi-year study by Dr. Douglas Deutschman from San Diego State University to design an efficient and effective vegetation monitoring program. Monitoring to detect ecological change is an important component of evaluating the effectiveness of conservation programs. The Nature Reserve of Orange County identified vegetation communities as targets for long term monitoring of the condition of natural ecosystems in the reserve system. Monitoring this large network of land is scientifically and logistically challenging as well as costly. The objective of this project is to evaluate the cost and accuracy of different sampling designs and field protocols for monitoring coastal sage scrub, grassland, and chaparral vegetation. The number of sites and plots sampled were increased in 2008 to improve sampling of spatial variation across the study area. The results from 2008 document a large increase in plant species diversity compared with 2007, a year of extreme drought. This increase in species diversity was largely driven by increased diversity of forbs at resampled plots. Shrub cover varied spatially but was similar across years. In addition to greater species richness, the cover of native forbs and grasses increased dramatically in 2008. A variance components analysis was used to develop recommendations for optimizing monitoring. Three major sources of variation were considered: temporal (interannual), spatial, and methodological. Spatial variation includes three nested levels: vegetation community, site and plot. Methodological variation includes two levels: protocol (quadrat vs. point intercept) and team. Several suites of response variables were analyzed including species richness, cover of major functional groups (e.g. native shrubs, non-native forbs), and several example species from each functional group. Semi-arid shrublands in southern California have high spatial variability, with different species and functional groups displaying different degrees of affinity for specific vegetation types or a different degree of patchiness across sites and plots. As a result, allocating a significant amount of effort to spatial coverage is appropriate for most response variables.

Some species and groups are also dramatically influenced by annual factors such as rainfall, and will require annual monitoring. Team-to-team variability can be minimized with appropriate training and experience. Transects provide the most accurate and precise estimates of cover for individual species and functional groups. Quadrats provide more information on richness and presence of uncommon or small species, but systematically underestimate cover. These results demonstrate that response variables vary across natural spatial gradients and exhibit temporal variability, and that the two principal field protocols capture different aspects of the ecosystem.

- **Central Reserve Cactus Wren Surveys and Habitat Assessment** - A study to determine the status of the coastal Cactus Wren (*Campylorhynchus brunneicapillus*) and cactus resources was undertaken in the Coastal Reserve in 2006. The purpose of the 2008 study was to determine the status of the wren and its habitat in the Central Reserve, using the same methodology as in 2006. These data will establish a baseline condition for Cactus Wrens and cactus scrub resources throughout the Nature Reserve of Orange County. All of the cactus resources in the Central Reserve were mapped in the spring of 2008, and two rounds of focused surveys for Cactus Wrens were conducted in cactus scrub judged mature enough to support nesting pairs. Unanticipated fires burned approximately 75% of the Central Reserve in 2007, so methods were developed to collect data that would enable an evaluation of the impact of fires on the cactus resources. A total of 1,855 acres of cactus scrub was mapped in the Central Reserve. Of that total, 1,420 acres sustained Low, Moderate, or High levels of damage during the fires, 75% of which (1,059 acres) was severely burned and unsuitable for supporting nesting Cactus Wren. Based upon an assessment of burned and unburned cactus scrub, 638 acres were judged suitable for Cactus Wren occupancy and were surveyed. Within this habitat, 263 sites were delineated and surveyed with 58 sites occupied during the first round of surveys, and 56 sites occupied during the second round of surveys. These occupied sites represent an estimated 67 territories in the Central Reserve, a decline of 82.1% compared with the 374 territories estimated in 2004.

2.3 NROC Progress Report – Habitat Restoration and Enhancement

- **Exotic Plant Control Program** - To address the threat that exotic, invasive plant species pose to native ecosystems, the Nature Reserve of Orange County allocated approximately \$260,600 in 2008 for the control of several exotic plant species of management and monitoring concern in the Orange County Coastal and Central subregions of the Natural Communities Conservation Plan. Exotic plant species targeted for control include artichoke thistle (*Cynara cardunculus*), garland chrysanthemum (*Chrysanthemum coronarium*), veldt grass (*Ehrharta calycina*), tree tobacco (*Nicotiana glauca*), castor bean (*Ricinus communis*), and pampas grass (*Cortaderia selloana*). Exotic plant management entailed prioritizing areas for treatment and controlling targeted exotic species through herbicide application. Treatment areas included Laguna Coast Wilderness Park (Emerald Canyon, Willow to Big Bend, north of SR 73 and Laguna Creek), Aliso and Wood Canyons Wilderness Park, Buck Gully, the University of California Irvine Ecological Reserve, City of Irvine Southern Open Space Preserve (North Laguna Canyon, Shady and Bommer Canyons, Bonita Canyon, No Name Ridge

and Quail Hill), El Toro Ecological Reserve, Whiting Ranch, and Crystal Cove State Park. The treatment program began on March 10, 2008 and ended June 2, 2008. In total, treatment required 50 days, with multiple contractors working simultaneously (Nakae 44 days; Nature's Image 11 days; PRG 21 days), and comprised over 2,345 acres of natural habitat. Prior to monitoring and treatment, sites with potential nesting habitat were surveyed for two species of concern, the California Gnatcatcher (*Poliopitila californica californica*) and Cactus Wren. Sensitive species maps were also consulted to avoid impacting additional native plant and wildlife species of concern. Veldt grass was treated with the monocot selective, post-emergent herbicide Envoy in solution with Tripleline (an adjuvant enhancing herbicide performance). Artichoke thistle was treated with the post-emergent, broad-leaf selective herbicide Transline (chlorpyrid). Artichoke thistle at the University of California Irvine Ecological Preserve was treated with the non-selective glyphosphate Roundup-Pro. Garland chrysanthemum was treated with Roundup-Pro and Transline (El Toro). Tree tobacco and castor bean were treated with Garlon 4 with the activator-surfactant Oranj-All (enhances herbicide performance). At all sites, all target species within 100 ft of streams or waterways were treated with Aquamaster. In addition, Telar was mixed with Transline, Roundup-Pro and Aquamaster at all treatment locations, excluding the University of California Irvine Ecological Preserve. Telar (sulfuron) prevents maturation of seed embryos and reduces seed viability when applied during the rosette stage. Lastly, Activator 90, a non-ionic, biodegradable surfactant was applied with Transline.

- **Measuring Sustainability of Artichoke Thistle Control Efforts** - Artichoke thistle, a deep-rooted perennial thistle, is an extremely problematic invader of disturbed grasslands in southern California. It has invaded large areas (over 4,000 acres) of the Nature Reserve of Orange County. The Nature Reserve of Orange County, working with The Nature Conservancy, established a control program for artichoke thistle involving direct application of herbicide to individual plants. Thousands of acres have been treated annually since 1994. Dr. Katharine Suding from the University of California, Irvine conducted a project to evaluate the effectiveness and sustainability of artichoke thistle control efforts. The first objective was to resurvey areas initially surveyed in 1998 to assess changes in plant composition in areas that have been part of the control program. The focus was on changes in artichoke thistle cover, and if it was associated with changes in other aspects of the plant community (e.g., *Brassica nigra* cover, *Nassella pulchra* cover, native species richness). Secondly, treated areas were assessed to determine how they responded to the cessation of herbicide control for one year. Thirdly, a restoration project was initiated in eight areas with low native plant diversity. In 2008, 110 areas were resurveyed in the Coastal Reserve where treatment to control artichoke thistle invasion had occurred for at least 3 years. These same areas were surveyed by The Nature Conservancy in 1998, and by UCI in 2007. Due to drought conditions during the 2007 survey, the results of the 2008 survey were compared primarily to the 1998 survey although measures in 2007 and 2008 are qualitatively similar. The major findings are as follows:

Control efforts have been successful in reducing the invasion of artichoke thistle, reducing cover of artichoke thistle to less than 4% in all the areas surveyed. The remaining artichoke thistle populations tend to be in clay soils and with low

abundance of *Bromus diandrus* (this exotic annual grass species was related to initial invasion trends; artichoke thistle was less likely to invade areas with high *Bromus diandrus* abundance).

Between 1998 and 2008, *Brassica nigra* cover, native species cover, and native species richness significantly increased. However, reduction of artichoke thistle was not related to changes in abundance of native species, *Brassica nigra*, or native diversity. In addition, areas where there has been the largest decrease in artichoke thistle cover were not associated with either greater invasion of *Brassica nigra* or increase of native cover.

The abundance of *Brassica nigra* was not related to artichoke thistle or the treatment history of the artichoke thistle control program. Instead, its abundance was positively associated with clay soils and negatively associated with annual grass cover.

To assess how reserve areas will respond after the control program ends, herbicide treatments were excluded from 18 30X30m experimental control plots. After one year, artichoke thistle recruitment was minimal into these plots.

A restoration experiment was initiated in 2008, in which seeds of native grassland and coastal sage species were added to plots. Results in the first year indicated very low recruitment across the sites, ranging from 0.08 to 2.7 individuals per 0.5m².

2.3 Brown-headed Cowbird Trapping

- **Cowbird Trapping Program** – Twelve modified Australian crow traps were used to trap Brown-headed Cowbirds (*Molothrus ater*) in the vicinity of the San Joaquin Hills Transportation Corridor in 2008. The twelve traps were operational between March 15 and July 15. During this time traps were monitored on a daily basis to remove non-target species and excess cowbirds. The 2008 program, like the 2002 through 2007 programs, represents a substantially decreased effort compared with past years when 20 traps were operated from March 15 to August 15. A total of 160 Brown-headed Cowbirds, including 84 males, 60 females, and 16 juveniles were captured during the trapping period. Sixty-five of the 160 cowbirds (40.6%) were captured in May, the most successful month of trapping. One cowbird trap was vandalized, resulting in the loss of one trap day. A total of 678 individuals from 16 non-target avian species were captured during the 2008 trapping season, of which ten (1.5%) died or were predated in the traps. No threatened or endangered species were captured.

Table 1. Summary of Total Brown-headed Cowbird Captures 1993-2008

Year	No. of Traps	COWBIRDS CAPTURED					
		Male	Female	Juvenile	Total	Per Trap	M:F Ratio
1993	20	106	55	8	169	8.5	1.9
1994	24	217	292	51	560	23.3	0.7
1995	22	229	195	21	445	20.2	1.2
1996	20	235	189	57	481	24.1	1.2
1997	20	112	104	28	244	12.2	1.1
1998	20	132	146	34	312	15.6	0.9
1999	20	174	123	7	304	15.2	1.4
2000	20	123	81	8	212	10.6	1.5
2001	20	159	158	31	348	17.4	1.0
2002	8	35	54	7	96	12.0	0.6
2003	10	58	56	13	127	12.7	1.0
2004	7	37	44	2	83	11.9	0.8
2005	7	45	42	2	89	12.7	1.1
2006	10	58	45	17	120	12.0	1.3
2007	11	57	52	0	109	9.9	1.1
2008	12	84	60	16	160	13.3	1.4
Total		1861	1696	302	3859		
Average	15.7	116.3	106	18.9	241.2	14.5	1.1

2.5 Wildland Fire in the Reserve

There were no wildland fires reported to NROC in 2008.

2.6 Pacific Pocket Mouse Custodial Fund

Pursuant to a Letter of Agreement between the US Fish & Wildlife Service, the California Department of Fish & Game, and the Nature Reserve of Orange County, a fund was created in 1998 to support research, recovery and enhancement efforts for the Pacific pocket mouse. The agreement obligated Chandis Sherman (now Headlands Reserve LLC) to deposit funds annually for seven years into a segregated custodial account held by NROC, for a total of \$350,000. All funding has been received. Funds are dispersed at the direction of USFWS and CDFG for projects in support of pocket mouse research, recovery and enhancement. The 2008 beginning balance of the Pacific Pocket Mouse Custodial Fund was \$187,000. Interest income accrued in the amount of \$3,709 during the year. The 2008 ending balance was \$190,709. There were no dispersals.

3.0 NROC WORK PLAN 2009

3.1 Program Budget

The NROC Technical Advisory Committee met in November 2008 to determine what projects to recommend for funding in 2009. Recommended projects were included in the NROC budget projection for fiscal year 2009, and the board of directors approved the TAC recommendations for projects and associated costs with recommendations to reduce funding for weed control and gnatcatcher protocol comparative analysis. Statistical analysis of vegetation monitoring protocols will continue through 2009. The research project to monitor the assessment of the sustainability of the NROC artichoke thistle eradication program will be continued. The Tecate cypress management plan will be developed in 2009. The invasive weed control program will continue at a lower level of funding due to the board commitment to contribute \$1.5 million toward the Saddle Creek property acquisition and the economic recession. The NROC-funded cowbird-trapping program will continue with 12 traps fielded, including two traps funded by the County of Orange for five years, to carry out OC mitigation.

NROC 2009 Program Budget Projection

BIOLOGICAL MONITORING & RESEARCH	NROC	CDFG	PROGRAM TOTAL
Cactus Wren Banding/Monitoring Pilot Study	\$ 27,110*		\$27,110
Vegetation Monitoring Strategy	74,709		74,709
Gnatcatcher Protocol Comparative Analysis	16,000		16,000
Subtotal	\$ 117,819		\$117,819
HABITAT RESTORATION/ENHANCEMENT & RESEARCH			
Cactus Scrub Linkage Restoration Project		\$50,000	\$ 50,000
CYCA Control Sustainability/Active Restoration	\$ 13,573		13,573
Artichoke Thistle Control	125,000		125,000
Veldtgrass Control	50,169		50,169
Whiting Ranch/EI Toro Weed Control		56,000	56,000
Weed Control Management	25,942		25,942
Subtotal	\$ 214,684	\$106,000	\$330,684
COWBIRD TRAPPING	\$ 29,360**		\$ 29,360
MISCELLANEOUS PROGRAMS			
Tecate Cypress Management Plan	36,525	36,990	73,515
Subtotal	\$ 36,525	\$36,990	\$73,515
*NROC 2007 PROGRAM			
TOTAL BUDGET PROJECTION	\$ 398,388	\$142,990	\$541,378
<i>*Does not include staff costs for program development & oversight, volunteer hours, or agency staff time</i>			
<i>**Includes two traps for County of Orange</i>			

3.2 Biological Monitoring & Research

- **Improving Statistical Sampling and Vegetation Monitoring** – A third year of sampling by Dr. Douglas Deutschman and his research crew from San Diego State University is planned for coastal sage scrub, chaparral and grassland vegetation in the Nature Reserve of Orange County. The number of plots

sampled in the Coastal and Central Reserves will be increased from 20 to 27, with resampling of unburned plots from 2007 and 2008. Researchers will continue to measure plant composition and percent cover using 50 m point intercept transects and 10 1 m² quadrats at each sample plot. At the request of the Nature Reserve of Orange County, the survey crew will begin recording percent dead shrub cover along the point intercept transects to gather baseline data on shrub mortality in the reserve system. This is an important attribute to monitor in order to assess how changing environmental conditions affect plant communities. A subset of ~20% of plots will be double sampled to evaluate observer variability. Data will be analyzed using a variance components approach in which observed variance will be partitioned into spatial heterogeneity (site, plot and subplot scales) and temporal variability (inter-annual differences). Protocol and observer effects will be analysed using a 2-way factorial Analysis of Variance within plots.

In 2009, an oak woodland monitoring component will be added to Dr. Deutschman's study. Oak woodlands are an important part of the southern California landscape, although their extent is small compared to shrublands. They provide crucial ecosystem services and habitat for many species. Oak woodlands are threatened by a number of factors including urbanization, grazing, altered fire frequencies, nitrogen deposition, plant invasion, drought, and various disease pathogens and insect pests, such as bark beetles. Interactions between fire and invasive annual grasses can adversely affect seedling germination, and sapling establishment and survival. Recently, a number of oak woodlands in Orange County have been impacted by wildfire. There have also been large-scale oak tree die-offs in southern San Diego County due to the emergence of new disease pathogens and insect pests. The goal of this monitoring component will be to develop and evaluate monitoring techniques that capture long term trends in the condition of oak woodlands. These data can be used to develop age-class population models and conduct threat assessments. The sampling approach will be individual based as oaks are long-lived and several oaks will be sampled in each woodland to obtain demographic estimates and to compare detailed measurements with quicker, less precise estimation techniques. Data will be collected on acorn production, seedling and sapling production, adult size, exotic herb cover, and signs of disease/insect attack. In future years, mortality will be tracked for the different age classes. Variance components analysis will be used to evaluate the sampling and response designs and to characterize spatial variability between woodlands and between trees in the same woodland. Models will be constructed to explore the relationships between acorns, seedlings, saplings and a suite of environmental variables such as canopy cover, distance to adult, soil moisture and invasive plant cover.

- **Monitoring Cactus Wren Reproduction, Dispersal & Survival** – The Coastal Cactus Wren is a target species in the Nature Reserve of Orange County's Natural Community Conservation Plan. Surveys conducted in the Coastal Reserve during 2006-2007 and in the Central Reserve in 2008 document an 80-90% decline in estimated territories compared with the early 1990's. This decline is largely attributed to catastrophic wildfire destroying large amounts of cactus scrub and causing substantial mortality. The decline in Cactus Wren is further compounded by effects of habitat loss, habitat fragmentation, population isolation, and edge effects of development. There is mounting evidence that

Cactus Wrens populations are decreasing in unburned habitats. To effectively manage Cactus Wren populations within the Nature Reserve of Orange County, requires information on reproduction, dispersal and survival. Currently, it is unknown whether food limitation and nest predation are affecting Cactus Wren reproduction. Over the last decade, southern California has faced multiple years of drought. In arid and semi-arid ecosystems, it is well documented that droughts can reduce insect populations which lead to reductions in avian productivity. Nest predation is the leading cause of nest failure in birds and may also limit offspring production. Both food limitation and nest predation could be simultaneously reducing Cactus Wren productivity with serious implications for the persistence of small, isolated populations. The recent appearance of West Nile Virus in southern California has caused substantial mortality in some bird species. There is no information on whether this virus is affecting Cactus Wrens. Information is also needed on whether population isolation is affecting the ability of juveniles to disperse, find mates, establish territories, and recruit into the breeding population. Finally, there are questions as to the subspecific status of Cactus Wrens within the Nature Reserve of Orange County. This information is important in developing management recommendations, particularly if translocations are contemplated in the future to augment vulnerable populations.

The Nature Reserve of Orange County has initiated a pilot study in 2009 in collaboration with volunteers from Sea and Sage Audubon and the Nature Conservancy to gather information important in understanding Cactus Wren population dynamics. The intent is that this pilot study will lead to development and funding of a larger research program to gather information necessary for developing appropriate management actions to enhance populations of Cactus Wren in the Nature Reserve of Orange County, as well as other regions of southern California.

The objectives of the pilot study include:

1. Monitor individual productivity and annual survival in a population of banded birds.
2. Monitor dispersal, colonization, and survivorship of fledglings.
3. Collect genetic material of coastal Cactus Wren across its range to conduct taxonomic analyses.
4. Test for exposure to West Nile Virus.

Dr. Preston will be working with volunteers from Sea and Sage Audubon to monitor Cactus Wren pairs on a weekly basis to gather information on reproduction, dispersal and survival. An estimated 20-24 territories will be monitored at eight different sites in the Coastal and Central Reserves during 2009. The Nature Reserve of Orange County has contracted with Dana Kamada to capture, color band, and collect blood and feather samples from adult and fledgling/juvenile wrens. The blood and feather samples will be used in a genetic analysis of subspecies status and for testing for West Nile Virus exposure. Data collected in this pilot study will be used to guide the development of a more comprehensive research program to gather information important for managing Coastal Cactus Wren populations.

- **California Gnatcatcher Monitoring Method Comparison** – The Nature Reserve of Orange County is collaborating with the United States Fish and

Wildlife Service to evaluate California Gnatcatcher monitoring methodologies. The California Gnatcatcher is a target species in the Nature Reserve of Orange County Natural Community Conservation Plan. The goal of this project is to develop a cost effective and robust monitoring program that is capable of inferring population trends and or responses to management. There is high inter-annual population variability that make it difficult to develop population estimates for this species. The United States Fish and Wildlife Service has developed an occupancy based approach using point counts to survey for gnatcatchers in San Diego's Multiple Species Conservation Plan. This method will be compared to an occupancy based approach that incorporates walking surveys within a defined search area. To allow for direct comparison, point counts and walking surveys will be conducted at each sample site. The objectives of this project are:

1. To test the relative efficiency of the Multiple Species Conservation Plan point count method with a walking survey method, for the purposes of refining and selecting a long term Natural Community Conservation Plan occupancy based monitoring methodology for the gnatcatcher.
2. To facilitate coordination of gnatcatcher monitoring methods among the regional conservation plans by providing a comparison of the merits of different monitoring approaches.

The United States Fish and Wildlife Service will conduct the point count and walking surveys in San Diego County and the Nature Reserve of Orange County will supply equipment and vehicles for the survey crew. Presence/non-detection data collected during the walking surveys and point counts will be analyzed to estimate the proportion of area occupied by gnatcatchers. Vegetation data and abiotic variables (e.g., slope, aspect, fire history) will be incorporated into this analysis as covariates to investigate hypotheses about how these variables influence habitat occupancy. Population estimates and detection probabilities will be developed and compared for each method. Each method will be evaluate for its efficiency and the number of surveys needed for optimal detection of gnatcatchers.

3.3 Habitat Restoration and Enhancement

- **Exotic Plant Control Program** – The Nature Reserve of Orange County plans to continue the weed eradication program that began in the mid 1990's and which is scheduled to continue until 2015. In 2008, there were 76 days of herbicide application conducted by Nature's Image, NAKAE & Associates, and Pacific Restoration Group. To control costs, this effort will be decreased to 52 days in 2009. Treatment areas in 2009 were prioritized based on the results of 2008 weed control efforts. In the Coastal Reserve, all areas with veldt grass infestation will be treated, with an increase in effort divided into two spraying periods (February and April). Spraying a second time later in the spring will ensure that plants that were missed the first time around or that germinated late will be treated with herbicide. Areas with low artichoke thistle infestation in 2008 will be surveyed, but not treated unless the infestation appears significant during 2009 surveys. It is anticipated that the Nature Reserve of Orange County can begin alternating treatments on an annual basis in areas with low levels of artichoke thistle. For the Central Reserve, garland chrysanthemum, artichoke thistle, castor bean, tree tobacco, and pampas grass will be treated in burned

areas of Whiting Ranch and El Toro. Herbicide applications will be applied from the third week of February until the beginning of May.

- **Measuring Sustainability of Artichoke Thistle Control Efforts** – This study will be continued for a third year in 2009 by Dr. Katharine Suding and her research team at the University of California, Irvine. The goal of this project is to understand the dynamics of plant communities in the Nature Reserve of Orange County following cessation of artichoke thistle control. In 2009, plots in the Coastal Reserve where herbicide application was ended in 2007 will remain untreated and be surveyed to identify trends in inter-annual variability of the plant community. Surveys will also be conducted in restoration plots established in 2008 in areas where native cover had not increased despite a reduction in artichoke thistle cover. These plots will be surveyed to measure any changes in plant cover and composition.

3.4 Brown-Headed Cowbird Trapping

The Brown-headed Cowbird trapping program includes operation and maintenance of cowbird traps in the vicinity of the San Joaquin Hills Transportation Corridor, Nature Reserve of Orange County and local Orange County Regional Parks. Twelve cowbird traps will be operated from March 15 to July 15. Ten of the traps represent those that are operated by the Nature Reserve of Orange County on an annual basis. Two additional traps are being operated for the County of Orange as partial mitigation for their San Diego Creek Project. The total number of traps propose for operation in 2009 are the same as for 2008.

4.0 RESERVE MANAGEMENT PLANS & POLICIES

4.1 Fire Management Plan

The short-term Fire Management Plan (FMP) was approved by the NROC board in 1999 and distributed to the US Fish & Wildlife Service and California Department of Fish & Game. Firewise 2000 was engaged in 2001 as a consulting firm to revise the long-term FMP. It was then decided to combine the short-term tactical and long-term strategic plans to for a “Wildland Fire Management Plan” for the NCCP. The board approved an interim long-term strategic FMP in 2003 with the understanding that there would be additional review and changes. The wildlife agencies and fire authority agreed that the Lake Mathews FMP would be used as a model for the NROC plan. Volume I, the text background section, has been completed. The detailed map section that includes access points and roads as well as sensitive species and other resources is in progress, and will be presented to land owners and managers for input.

4.2 Habitat Restoration & Enhancement Plan

The HREP was completed and approved by the board of directors in 2003. TAC members were provided copies to review in 2005, and there were no suggestions for revision. The plan will be reviewed again in 2009.

4.3 Recreation Management Plan

According to the NCCP and Implementation Agreement, resource management plans for parks and other open spaces within the reserve will comprise a recreation management plan. In 2004 it was decided that NROC should establish an overview of NCCP requirements, and keep park resource management plans on file for reference. Currently NROC is acquiring plans as they become available, and may consider developing a reserve-wide recreation guidance document in the future. The newly formed Land Manager Council will play a role in the development of recreation management guidelines for the reserve system.

4.4 Grazing Management Plan

Though a Grazing Management Plan was adopted, grazing in the reserve by cattle ceased in 2002. A grazing monitoring program has been conducted by The Nature Conservancy for The Irvine Company at 19 permanent vegetation monitoring stations throughout the reserve at the grassland/CSS ecotone. Several of the stations are in areas where grazing did not take place as a control measure.

5.0 IMPACTS TO COASTAL SAGE SCRUB HABITAT IN THE COUNTY OF ORANGE CENTRAL/COASTAL SUBREGION NCCP/HCP 2008

5.1 Authorized Take in the Reserve System by Participating Landowners as Reported to NROC in 2008

IWMD: 6.04 acres of impact for drainage project

NROC continues to have a goal of compiling Take records into a cumulative table that can be updated annually.

5.2 Take by Non-Participating Landowners – Mitigation Fee Option

IRWD: Lake Forest Baker Filtration Plant	\$ 65,000
Lake Forest Temporary Detention Basin	\$ 66,300
TOTAL	\$131,300

6.0 ACCOUNTING OF FUNDS RECEIVED AND DISPERSED BY NROC

In 2008 Headlands Reserve LLC, formerly Chandis Sherman, made the fourth of five annual \$100,000 payments toward their \$500,000 commitment to the endowment. This restricted contribution was placed in the NROC endowment investment fund at Northern Trust Bank.

No funds were dispersed to NCCP/HCP participants. However, in-kind contributions to reserve landowners in the form of invasive weed eradication on their lands totaled \$282,150.

7.0 BOUNDARY CHANGES/MINOR AMENDMENTS IN THE RESERVE SYSTEM

There were no minor amendments proposed for approval by the board of directors in 2008.

8.0 NCCP/HCP RESERVE OWNER/MANAGER PROGRESS REPORTS/ WORK PLANS

8.1 Crystal Cove State Park

2008 NCCP/HCP ANNUAL PROGRESS REPORT CRYSTAL COVE STATE PARK

I. Recreation Use, Monitoring and Management

- A. Crystal Cove State Park (CCSP) includes 2,400 acres of backcountry and 400 acres along the coastal terrace. There are 18 miles of marked backcountry trails, both dirt road and single track, open to all hike, bike and equestrian users. There are 3 environmental campgrounds located from 2 to 3 miles inland. Paved bike/pedestrian paths along the coastal terrace connect with 6 beach parking lots and 10 access ramps. The park's 3 miles of beach is fringed with intertidal reef pools that connect with the 1,140 acre Underwater Park/Marine Life Refuge. The Crystal Cove Historic District is on the National Register of Historic Places and contains 46 beach cottages built in the vernacular style of architecture between 1920 and 1940. General park areas are open every day from 6 AM until dark, while the Historic District welcomes day use fee visitors from 6AM to 10PM daily and hosts registered guests overnight in thirteen of the cottages. Park is property is located within the Irvine Ranch National Natural Landmark and the Irvine Ranch California Natural Landmark.
- B. All legal trails are named and found on free maps and at signed trail intersections in the backcountry. Some illegal trails have been marked with signs noting closure/resource impacts, fenced and obscured with cut vegetation. Backcountry trails have been measured using NROC Trail Condition Assessment protocols set by the Recreational Ecology Subcommittee of the TAC. NROC biological

monitors have included herpetological/amphibian trap arrays, raptors, cowbird control, focused rare bird surveys, and artichoke thistle measures.

A total of 223 Special Events were permitted in 2008. Weddings, picnics, parties, photo shoots and group gatherings were the most popular events located primarily along the coast. Events are reviewed for potential impacts by the Special Events Program Permit Coordinator and Supervising Peace Officer. A small gathering may need no more than a reminder to haul out trash, whereas larger events may go through the CEQA review process and have assigned patrol officers and resource monitors. All events are allowed with plans for no impact to the resources. Special event program guidelines were updated during 2008 to ensure protection of park resources and to address the park and concession operations at the Historic District.

- C. Park facilities and trails are open daily, but may be closed seasonally due to rain-saturated roads or extreme fire danger.

Several groups have embraced coordination and education of the public within the park, including: Crystal Cove Interpretive Association, Crystal Cove Alliance (focused on preserving the Historic District), SHARE- a biking / conservation group, Trails 4 All, the Irvine Ranch Conservancy, the Laguna Canyon Foundation, Friends of the Newport Coast, as well as trained docents to lead tours on the topics of the Historic District, the backcountry, the beach and tide pools, flora, geology, and cycling. The park participates in other area-wide coordinating groups, including: Orange County Wild, South Coast Wilderness Group, Orange County Coastkeeper, and the Marine Life Refuge Committee, a subset of the Orange County Coastal Coalition.

The park has a staff of 9 State Park Peace Officers (three State Park Rangers, five State Park Lifeguards, and a State Park Superintendent). They patrol and monitor all sectors of the park and enforce rules and regulations with warnings, citations, and arrests. The park attracts approximately one and a half million visitors each year and is projected to steadily increase with nearby residential and commercial property development. The beach and Historic District continue to be the major visitation attraction although the backcountry wilderness trails and campsites have experienced steadily increasing visitation as well. 198 swimmer rescues were made during 2008 with an additional 10,667 preventative aquatic actions. 1 boat rescue occurred along with 3 vessel assists and 24 warnings issued. 793 minor medical aids and 33 major medical aids were recorded. State Park law enforcement action included 43 crime reports taken, 82 citations/arrests, and 461 parking citations issued.

- D. Interpretive and educational programs are a core component of the State Park mission of informing the public about natural, cultural, and historic resources. In 2008, 3000 people attended over 300 formal interpretive programs including Historic District tours, tide pools tours, beach processes, gray whales, geology, subtidal life, terrestrial habitats, native flora, Native American culture, raptors, night animals and bats, and mountain biking etiquette. Classes were taught by professional interpreters, park docents, and Orange County Schools (Inside the Outdoors) for a total of over 9,000 participating students. In addition, virtual field trips using online videoconferencing courtesy of PORTS (Parks Online

Resources for Teachers and Students) allowed students from as far away as Alaska to visit Crystal Cove State Park remotely and participate in tide pool study. The remaining portion of interpretive activities include contact with visitors through self-guided tours, trails, videos, brochures, or contact with volunteers at the visitor centers. A total of 42,000 hours were logged during the year for combined interpretive/educational programming at the park.

Community outreach efforts include coordination with neighboring homeowners associations on topics of pet and feral cats and dogs in the park, over-watering and water quality, exotic invasive plants, enforcement patrols, water safety, fuel modification zones and fire safety. In 2008 State Parks entered in to a partnership agreement with the Irvine Ranch Conservancy in order to promote park stewardship projects throughout the park.

II. Recreation Facility Construction and Maintenance

Crystal Cove State Park was purchased in 1979, a General Plan adopted in 1982, and the majority of recreational facilities built by 1985. A General Plan Amendment and EIR were finalized in November 2003 resulting in the Historic District – Preservation and Public Use Plan. The first phase of cottage restoration, a \$14.2 million public works project, was completed on March 29, 2006 and included the restoration of 22 cottages, road and utility improvements, slope stabilization, accessibility improvements, infrastructure upgrades, a new entrance station, accessibility and parking improvements, historic landscape restoration, and water quality measures. On November 16, 2007, the Office of Historic Preservation presented a Governor's Historic Preservation Award to Crystal Cove State Park for the Phase I Restoration of the Historic District cottages.

In March of 2006, State Parks awarded a twenty-year concession contract to the non-profit Crystal Cove Alliance for the management and operation of food and lodging services in the park. These concession amenities include the Crystal Cove Shake Shack located on PCH, the Beachcomber Café, and 13 cottages for overnight lodging. The lodging operation opened to public use on June 26, 2006 and has since enjoyed an astounding 99% occupancy rate. Nearly 50,000 overnight guests have experienced the charm of the Historic District cottages since opening. The Beachcomber Café which opened on August 15, 2006 continues to generate favorable reviews and gain in popularity. Over 200,000 meals were served in 2008. The concession operation generated over \$6 million in gross revenues during 2008 and has proven to be a successful model for partnerships serving the people of California.

Both the park and Southern California Edison, under easement agreement, carry out annual road and trail maintenance. Parks annually address unsafe gullies and rills, excessive weeds, poor drainage, culvert maintenance, brushing back, and single-track repairs, while SCE grades roads to control width and smoothness for equipment access. SCE may also make select cuts to tree limbs that impact either their heavy equipment or power lines. This fall, a Cal Fire Crew hand cut vegetation along El Moro Ridge, Redtail Ridge and portions of Slow and Easy road to ensure comfortable clearances.

Drainage and seasonal water management is addressed at the time of road grading. Grading produces a berm and can block out-sloped drainage. Parks has requested that SCE not produce berms, yet in many cases sheet flow is impacted. We strive for frequent flow-through berm cuts to keep drainage off the roads. Seasonal ponds are left in place until dry.

III. Infrastructure Construction and Maintenance

Operation and maintenance activities are focused within existing footprints of developed areas, i.e. parking lots, restrooms, operations buildings, and roads and paved paths. The interface of open space with these facilities is controlled along their edges by brushing back to maintain Department standards for safe operations and viewshed. Trails and backcountry roads are also brushed back or weeds mown to maintain Department trail standards. If these activities are conducted during sensitive bird nesting season, a biological monitor will conduct surveys for impact avoidance.

2007 saw the installation of distinctive monument signs at the Pelican Point, Reef Point and Historic District entrances as well as new information signage at the kiosks with the generous assistance of The Irvine Company. Native revegetation that accompanied these signs has grown out to soften the views around installations and the decomposed granite trail connection to the highway.

In July of 2008, construction began on the El Moro public use conversion project on the thirty five acre site of the former El Morro Village mobile home park. The \$12.17M public works project, funded by Proposition 12, includes a sixty-site campground, two-hundred day use parking spaces, family picnic areas, accessibility improvements, water quality improvements, habitat restoration, public restrooms, and an outdoor educational amphitheatre. The project is expected to be open to the public in 2010 and generate over \$1M annually in park use fee revenues.

IV. Habitat Restoration and Enhancement

Since 1982, the park has had continuous restoration efforts in coastal sage scrub, grassland, and riparian habitats. Using Department funding sources during 2008, several hundred acres of weeds were controlled by use of herbicides, mowing, and hand pulling. Artichoke thistle, black mustard, fennel, arundo and hemlock were the primary targets. Approximately 431 acres of artichoke thistle were treated by NROC contract crews. All of the sites were treated with the herbicides Transline and Telar at an early growth stage.

At various locations a total of over 5,600 container plants were planted throughout the park.

Habitat restoration continued on the East Flank area within the back country. The entire area was prepared for both drill and imprint seeding. A grassland seed mix for most areas will be utilized along with a scrub mix for the outer slopes.

Habitat enhancement projects included the capture of 155 African clawed frogs in 2008 throughout the park. On-going captures will need to continue for the foreseeable future due to the tenacious nature of the amphibian.

V. Fire Management Activities

No controlled burns were conducted at CCSP in 2008 as most of the fire-prepared plots have recently received intense planting and seeding and jeopardy to young plants is thus avoided.

Annual fuel breaks were treated by the Department surrounding the park HQ and above El Morro School. Fuel Modification Zones were cut by contract under existing agreements with Emerald Bay, Irvine Cove Crest, and Phase 1 of Crystal Cove Heights. Pre-maintenance breeding bird surveys were conducted by the Department in coordination with the various homeowner associations.

VI. Miscellaneous Activities

2008 was the 17th year park staff conducted surveys to assess and monitor the California gnatcatcher population along the coastal terrace. Bio-monitors were present everyday on the location of the old El Moro trailer park observing the new campground construction project. Water quality testing was done on a monthly basis at six locations throughout the park. Surveys were also conducted to monitor the condition of park tidal pools. State Parks managed 12 biological collection permits during 2008 for a variety of projects including exotic plant removal, restoration of coastal sage scrub, intertidal use surveys, intertidal algae growth, ecological studies, vegetation surveys, California gnatcatchers, cactus wren enhancement, and water quality testing. Two illegal trails have been retired in the backcountry, one of over a mile in length. Signs have been posted and cut brush covers the pathways informing users of their closure.

8.2 California Department of Fish & Game Ecological Reserves

Coal Canyon Ecological Reserve NCCP/HCP Progress Report 2008

I. Recreational Use, Monitoring and Management

- A. Current Use Policies: Coal Canyon Ecological Reserve is open to unguided public access seven days a week from sunrise to sunset. Upland Game, Deer Hunting, and Hiking are permitted per regulations (see CCR Title 14, Section 630).
Proposed use policy. Allow bicycle and horse access to trails with coordination from Chino Hills State Park and Cleveland National Forest.

B. Proposed Recreation Monitoring

1. Identification of all Approved Trails: There is one hiking trail that is open to the public. This trail begins near the San Bernardino (91) Freeway, and leaves the reserve at the easterly boundary where it enters the Cleveland National Forest.
2. Proposed Methods to Document Existing Trail Conditions, and Track Changes: No proposed methods of trail monitoring currently exist other than staff and volunteer observations.
3. Coordination with NROC Biological Monitoring Program for Tracking of Recreation Impacts to Specific Sensitive Resources: No coordination in place.
4. Any Other Proposed Monitoring Requirements of the Recreation Management Plan: None
5. Special Events: Restoration events are welcome. Event organizers must submit an event application, which is reviewed by the CDFG.

C. User Compliance Programs

1. Access Restrictions: Currently access is restricted from dusk until dawn. Trail is otherwise open.
2. Coordination with User Groups and Volunteers: Coordination occurs as needs arise.
3. Patrols/Citation: California Department of Fish and Game Warden and Senior Volunteer Patrol.

D. Educational Programs/Outreach: None

II. Recreation Facility Construction and Maintenance

A. Construction of New Recreational Facilities or Expansion of Existing Facilities

1. Project Type: None
2. Anticipated Impacts and Proposed Minimization Measures: None
3. Temporary Impacts and Associated Restoration Measures: None

B. Maintenance of Existing Recreation Facilities

1. Proposed Road and Trail Maintenance: None
2. Drainage and Seasonal Water Management: None
3. Facility Replacement and Repair: None

III. Infrastructure Construction and Maintenance

A. Proposed Construction of New Infrastructure: None

1. Anticipated Implementation Schedule: None
2. Anticipated Impacts to Vegetation Communities and Sensitive Species: None

B. Operation and Maintenance: Signage, fencing, trail maintenance. No work plan.

IV. Habitat Restoration and Enhancement

A. Proposed Landowner/Reserve Manager Funded/Coordinated Restoration Activities

1. Exotic Plant Eradication: Tree Tobacco and Salt Cedar removal.
2. Habitat Restoration/Revegetation: Proposed growing of Tecate Cypress from existing seed stock to maintain species viability in case of fires.

3. Exotic Animal Control: None

B. Proposed NROC funded Restoration and Enhancement Activities

1. Exotic Plant Eradication: None
2. Habitat Restoration/Revegetation: None
3. Exotic Animal Control: None

C. Proposed Restoration and Enhancement Activities Funded By Others: None

1. Exotic Plant Eradication: None
2. Habitat Restoration/Revegetation: None
3. Exotic Animal Control: None

V. Fire Management Activities

- A. Proposed Prescribed Burns or other Fuel Management Projects: None
- B. Maintenance of Existing Fuel Breaks or Fuel Modification Zones: None

VI. Miscellaneous Activities and Management Programs: Cooperation with NROC on Fire Management plan and Tecate Cypress Management plan.

**Laguna Laurel Ecological Reserve
NCCP/HCP Progress Report 2008**

I. Recreational Use, Monitoring and Management

A. Current Use Policies: Laguna Laurel Ecological Reserve is open to unguided public access seven days a week from sunrise to sunset. Hiking is permitted (see CCR, Title 14, Section 630).

B. Proposed Recreation Monitoring

1. Identification of all Approved Trails: There is one hiking trail that is open to the public. This trail begins near El Toro Road and the Laguna Canyon Freeway, and leaves the reserve at the westerly boundary.
2. Proposed Methods to Document Existing Trail Conditions, and Track Changes: No proposed methods of trail monitoring currently exist other than staff and volunteer observations.
3. Coordination with NROC Biological Monitoring Program for Tracking of Recreation Impacts to Specific Sensitive Resources: No coordination in place.
4. Any Other Proposed Monitoring Requirements of the Recreation Management Plan: None
5. Special Events: Restoration events are welcome. Event organizers must submit an event application, which is reviewed by the Reserve Manager.

C. User Compliance Programs

1. Access Restrictions: Currently access is restricted from dusk until dawn. Trail is otherwise open. Parking area is operated in conjunction with County Park hours of operation.
2. Coordination with User Groups and Volunteers: Working with mountain bike users to avoid using the trail. Biking is not a permitted use.

3. Patrols/Citation: California Department of Fish and Game Warden and Senior Volunteers patrol on a weekly basis.

D. Educational Programs/Outreach: None

II. Recreation Facility Construction and Maintenance

A. Construction of New Recreational Facilities or Expansion of Existing Facilities

1. Project Type: Trail construction by Orange County Parks on/adjacent to Reserve.
2. Anticipated Impacts and Proposed Minimization Measures: Weed eradication.
3. Temporary Impacts and Associated Restoration Measures: None, loss of non- native vegetation

B. Maintenance of Existing Recreation Facilities

1. Proposed Road and Trail Maintenance: None
2. Drainage and Seasonal Water Management: None
3. Facility Replacement and Repair: None

III. Infrastructure Construction and Maintenance

C. Proposed Construction of New Infrastructure: None

1. Anticipated Implementation Schedule: None
2. Anticipated Impacts to Vegetation Communities and Sensitive Species: None

D. Operation and Maintenance: Signage, fencing, trail maintenance. No work plan.

IV. Habitat Restoration and Enhancement

B. Proposed Landowner/Reserve Manager Funded/Coordinated Restoration Activities

1. Exotic Plant Eradication: None
2. Habitat Restoration/Revegetation: None
 - a. Implementation Schedule: None
 - b. Associated monitoring: None
3. Exotic Animal Control: None

B. Proposed NROC funded Restoration and Enhancement Activities

1. Exotic Plant Eradication: None
2. Habitat Restoration/Revegetation: None
3. Exotic Animal Control: None

C. Proposed Restoration and Enhancement Activities Funded By Others:

1. Exotic Plant Eradication: None
2. Habitat Restoration/Revegetation: None
3. Exotic Animal Control: None

V. Fire Management Activities

A. Proposed Prescribed Burns or other Fuel Management Projects: None

B. Maintenance of Existing Fuel Breaks or Fuel Modification Zones: None

VI. Miscellaneous Activities and Management Programs: None

**Upper Newport Bay Ecological Reserve
NCCP/HCP Progress Report 2008**

I. Recreational Use, Monitoring and Management

A. Current Use Policies: Laguna Laurel Ecological Reserve is open to unguided public

access seven days a week from sunrise to sunset. Hiking is permitted (see CCR, Title 14, Section 630).

B. Proposed Recreation Monitoring

1. Identification of all Approved Trails: There is one hiking trail that is open to the public. This trail begins near El Toro Road and the Laguna Canyon Freeway, and leaves the reserve at the westerly boundary.
2. Proposed Methods to Document Existing Trail Conditions, and Track Changes: No proposed methods of trail monitoring currently exist other than staff and volunteer observations.
3. Coordination with NROC Biological Monitoring Program for Tracking of Recreation Impacts to Specific Sensitive Resources: No coordination in place.
4. Any Other Proposed Monitoring Requirements of the Recreation Management Plan: None
5. Special Events: Restoration events are welcome. Event organizers must submit an event application, which is reviewed by the Reserve Manager.

C. User Compliance Programs

1. Access Restrictions: Currently access is restricted from dusk until dawn. Trail is otherwise open. Parking area is operated in conjunction with County Park hours of operation.
2. Coordination with User Groups and Volunteers: Working with mountain bike users to avoid using the trail. Biking is not a permitted use.
4. Patrols/Citation: California Department of Fish and Game Warden and Senior Volunteers patrol on a weekly basis.

D. Educational Programs/Outreach: None

II. Recreation Facility Construction and Maintenance

A. Construction of New Recreational Facilities or Expansion of Existing Facilities

1. Project Type: Trail construction by Orange County Parks on/adjacent to Reserve.
2. Anticipated Impacts and Proposed Minimization Measures: Weed eradication.
3. Temporary Impacts and Associated Restoration Measures: None, loss of non- native vegetation

B. Maintenance of Existing Recreation Facilities

1. Proposed Road and Trail Maintenance: None
2. Drainage and Seasonal Water Management: None
3. Facility Replacement and Repair: None

III. Infrastructure Construction and Maintenance

E. Proposed Construction of New Infrastructure: None

1. Anticipated Implementation Schedule: None
2. Anticipated Impacts to Vegetation Communities and Sensitive Species: None

F. Operation and Maintenance: Signage, fencing, trail maintenance. No work plan.

IV. Habitat Restoration and Enhancement

C. Proposed Landowner/Reserve Manager Funded/Coordinated Restoration Activities

1. Exotic Plant Eradication: None
2. Habitat Restoration/Revegetation: None
 - a. Implementation Schedule: None
 - b. Associated monitoring: None
3. Exotic Animal Control: None

B. Proposed NROC funded Restoration and Enhancement Activities

1. Exotic Plant Eradication: None
2. Habitat Restoration/Revegetation: None
3. Exotic Animal Control: None

C. Proposed Restoration and Enhancement Activities Funded By Others:

1. Exotic Plant Eradication: None
2. Habitat Restoration/Revegetation: None
3. Exotic Animal Control: None

V. Fire Management Activities

A. Proposed Prescribed Burns or other Fuel Management Projects: None

B. Maintenance of Existing Fuel Breaks or Fuel Modification Zones: None

VI. Miscellaneous Activities and Management Programs: None

8.3 Orange County Harbors, Beaches & Parks

Orange County Community Resources Orange County Parks

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County of Orange Central and Coastal Subregion Natural Community Conservation Plan/ Habitat Conservation Plan 2008 Progress Report & 2009 Work Program

Prepared January 2009
Orange County Parks
NCCP 2008 Progress Report / 2009 Work Program

Introduction

The Natural Community Conservation Plan/Habitat Conservation Plan (NCCP/HCP) Implementation Agreement states that Reservation Owners/Managers are responsible for: 1) Preparing an annual work program for its ownership for the following year's activities, 2) Providing an annual progress report on the current year work program to the Nature Reserve of Orange County (NROC) for inclusion in the Annual Report submitted to the U.S. Fish & Wildlife Service and California Department of Fish and Game, and 3) Coordinating management activities with NROC and assuring that such activities are consistent with the annually approved work program. This report is being submitted to the NROC to fulfill that requirement. At a Reserve landowner coordination meeting in December 2002, the resource agencies were asked to provide guidelines for progress reports and work programs to be included in the NROC Annual Report. The guidelines provided shortly thereafter were used to provide information about activities within County of Orange, OCCR/Orange County Parks reserve lands for this report.

Introduction.....	24
Permitted Recreation Uses:.....	27
Recreation Monitoring & Management:.....	29
All HBP Operational Facilities	29
Aliso and Wood Canyons Wilderness Park.....	30
Irvine Regional Park.....	31
Laguna Coast Wilderness Park.....	32
Limestone Canyon and Whiting Ranch Wilderness Park.....	33
Peters Canyon Regional Park.....	33
Santiago Oaks Regional Park/Weir Canyon Wilderness Park/.....	34
Talbert Nature Preserve (North Coastal Operations).....	34
Upper Newport Bay Nature Preserve.....	34
Recreation Facility Construction & Maintenance:.....	35
Aliso and Wood Canyons Wilderness Park.....	35
Irvine Regional Park.....	35
Laguna Coast Wilderness Park.....	36
Peters Canyon Regional Park.....	37
Talbert Nature Preserve (North Coastal Operations).....	37
Upper Newport Bay Nature Preserve.....	38
Infrastructure Construction & Maintenance:.....	39
Aliso and Wood Canyons Wilderness Park.....	39
Irvine Regional Park.....	40
Laguna Coast Wilderness Park.....	41
Limestone Canyon and Whiting Ranch Wilderness Park.....	41
Peters Canyon Regional Park.....	41
Santiago Oaks Regional Park/Weir Canyon Wilderness Park.....	42
Talbert Nature Preserve (North Coastal Operations).....	42
Habitat Restoration & Enhancement:.....	42
Aliso and Wood Canyons Wilderness Park.....	42
Irvine Regional Park.....	43
Laguna Coast Wilderness Park.....	43
Limestone Canyon and Whiting Ranch Wilderness Park.....	44

Peters Canyon Regional Park	45
Santiago Oaks Regional Park/Weir Canyon Wilderness Park	45
Talbert Nature Preserve (North Coastal Operations)	47
Upper Newport Bay Nature Preserve	47
<u>Fire Management Activities:</u>	<u>49</u>
Aliso and Wood Canyons Wilderness Park	49
Irvine Regional Park	49
Laguna Coast Wilderness Park	49
Limestone Canyon and Whiting Ranch Wilderness Park	49
Peters Canyon Regional Park	50
Santiago Oaks Regional Park/Weir Canyon Wilderness Park	50
Talbert Nature Preserve (North Coastal Operations)	50
Upper Newport Bay Regional Park	51
<u>Miscellaneous Activities and Management Programs:</u>	<u>51</u>
Aliso and Wood Canyons Wilderness Park	51
Laguna Coast Wilderness Park	51
Limestone Canyon and Whiting Ranch Wilderness Park	51
Peters Canyon Regional Park	52
Santiago Oaks Regional Park/Weir Canyon Wilderness Park	52
Talbert Nature Preserve (North Coastal Operations)	52
Upper Newport Bay Nature Preserve	52
<u>Contact List:</u>	<u>54</u>

Permitted Recreation Uses:

	Aliso and Wood Canyons Wilderness Park	El Modena Open Space (Santiago Oaks Regional Park)	Irvine Regional Park	Laguna Coast Wilderness Park	Limestone Canyon & Whiting Ranch Wilderness Park	Peters Canyon Regional Park	Santiago Oaks Regional Park	Talbert Nature Preserve	Upper Newport Bay Nature Preserve	Weir Canyon Wilderness Park (Santiago Oaks Regional Park)
Outdoor Recreation Facilities										
Hiking trails	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
Multiple-use trails	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
Camping										
Fishing			▲							
Scenic view point	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
Picnic shelters										
Group picnic areas			▲				▲			
Picnic tables	▲		▲		▲	▲	▲	▲		
Barbecues/fire rings			▲				▲			
Ball fields			▲							
Cycling paths	▲				▲			▲		
BMX course										
Fitness/par course										
Disc golf course								▲		
Equestrian arena			▲							
Pony rides			▲							
Restrooms	▲		▲	▲	▲	▲	▲	▲	▲	▲
Community center							▲			
Model sail boating			▲							
Volleyball courts			▲							
Interpretive programs	▲		▲	▲	▲	▲	▲		▲	▲

Recreation Monitoring & Management:

All OCP Operational Facilities		2008 Status	2009 Work Plan
Project, Program, Activity Ranger Citation, Resource Protection Program	Park Rangers authorized to issue civil citations on January 2, 2006.	File third of three program progress reports with Board of Supervisors in February/March 2009. Issue citations as appropriate, monitor program effectiveness and adjust program goals as results are revealed. Return to Board of Supervisors annually as directed with citation program progress report and/or request for program modification.	Review Park Ranger training for effectiveness and function. Currently authorized to participate in OCSD Level III Reserve Academy to meet basic requirements as Peace Officer defined in the CPC 830.31b.
Park Ranger Level III OCSD Reserve Academy Training Requirement	All Park Rangers hired as of October 2005 required to attend training academy to meet POST standards for Peace Officers as defined in CPC 830.31b. Park Rangers hired in 2007 successfully graduated as third OCP academy class to complete training requirement.	Park rangers used several methods to achieve public compliance with park and County regulations including signage, uniformed presence, informational fliers, interpretive programs, static displays, outreach programs, verbal advisements, written warnings and civil citations. Rangers issued 189 civil citations 189 warnings.	Ongoing. Rangers to continue using variety of methods to modify public behavior. Analyze annual citation data as program continues.
User Compliance Programs/Enforcement	Park rangers used several methods to achieve public compliance with park and County regulations including signage, uniformed presence, informational fliers, interpretive programs, static displays, outreach programs, verbal advisements, written warnings and civil citations. Rangers issued 189 civil citations 189 warnings.	Advised during Freeway Complex Fire. Consulted on Nature Reserve of Orange County fire Plan and facility. Researched and consulted on fuel modification issues in OC Parks facilities.	Ongoing. Continue working with land management partners on fire planning and response and development of resource documents.
Wildland Resource Advisor Position	Newly created position to support	Continue to develop position. Initiate resource-related contracts for	
Restoration Ecologist Position			

	<p>habitat restoration and resource protection activities in all OC Parks facilities. Duties include coordinating, providing consistency, monitoring and acting as a liaison with regulatory agencies in regards to habitat enhancement and exotic plant control as well as processing NCCP/HCP reports, administering contracts and training volunteers and staff.</p>	<p>FY 2009-10. Work with park staffs and OC Parks administration to increase and improve amount and quality of habitat enhancement activities and programs. Obtain Pest Control Advisor certification and Qualified Applicator license. Participate in mitigation, restoration and research planning and oversight. Work with land management partners (e.g., Nature Reserve of Orange County, Irvine Ranch Conservancy, Laguna Greenbelt, state parks, etc.) to expand scope of work. Work with administration to establish Balanced Scorecard criteria for habitat enhancement activities in context of County Strategic Plan.</p>
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Aliso and Wood Canyons Wilderness Park

Project, Program, Activity	2008 Status	2009 Work Plan
Cross-country Race Event	<p>West Ridge part of Laguna Beach High School cross-country race course-CPP in place and allows input from staff; minimal impact to natural resources.</p>	<p>County Property Permit required and prior approval required by staff. Two massive marathon races were denied due to the numbers of racers, vehicles, and interior canyon markers.</p>
Illegal Trail Use/Activities	<p>Utilized tactics to prevent illegal trail use including brushing/blocking and signing trails, elevated enforcement and foot/mountain bike patrols and stings.</p>	<p>New back-country ranger position to patrol unauthorized trails and maintain presence after sunset. Involve community, conduct TAV patrols and use passive enforcement tactics such as bulletin boards and interpretive hikes.</p>
Trail Assistance Volunteers	<p>Consolidated Aliso and Wood Canyons Wilderness Park and Laguna Coast Wilderness Park bike patrols. Shared members performed trail maintenance at both facilities.</p>	<p>To form a consolidated patrol that reports on conditions and unlawful activities, encourages compliance, and provides information on those activities which are not permitted ("passive enforcement").</p>
Saddleback Memorial 5K Marathon	<p>Marathon occurred; however, organizer's lack of planning and communication with park staff created several last-minute issues.</p>	<p>Hold meetings prior to event to discuss placement of services, ingress and egress and emergency routes.</p>
Mountain Bike Events	<p>Held 3 demonstrations, interscholastic training day and proposed Fireman's Olympics race.</p>	<p>Proposed races may be cancelled due to 10mph trail speed limit and trail etiquette issues.</p>
Education Outreach	<p>Conducted scheduled and impromptu tours and talks. Participated in SOKA open house, Aliso Ranch Days and</p>	<p>Ongoing.</p>

	Laguna Canyon Foundation Ranger Ramblings.	
Christmas Bird Count	Identified 74 species.	Annual activity; repeat in December.
Public Information Board	Installed dry-erase board to record wildlife sightings, park information and help locate multiple lost items.	Install board at ASWUT Trail to report unlawful activity.

Irvine Regional Park

		2009 Work Plan
Project, Program, Activity	2008 Status	
Trail Monitoring	Monitored trails for damage and erosion. Also monitored for illegal construction of unauthorized trails.	Ongoing. Continue repairing, grooming or grading trails damaged from rain erosion. Close or disguise unauthorized trails through various methods to prevent reuse.
Cross-country Track Meets	Served as host location for 19 divisional high school and college athletic events and one County-wide Invitational cross-country meet. Events were successful with minimal impact to park.	Anticipate track and cross-country event schedule similar to 2008. Planning and staffing events becoming smoother each year, through utilization of volunteers (Sheriff Explorers, school volunteer adults and OC Parks Ranger Reserves) and development of structured event planning guide prior to each event.
County of Orange-hosted Special Events	Hosted numerous awards presentations and ceremonies, honoring employees and volunteers for time and service to the community.	Ongoing. Continues to work with OC Parks and other County agencies to host similar and new events honoring employees and volunteers.
User Compliance Programs/Enforcement	Used a variety of methods to obtain compliance with park rules and regulations. Biggest issue was parking violations. Regular park patrols and visitor interaction assisted in preventing violations and obtaining voluntary compliance.	Ongoing. Continue to obtain voluntary compliance and use progressive enforcement, using citation authority as "last resort" to obtain compliance with park rules and County regulations.
Educational Outreach	Maintained and staffed (with volunteers) historical interactive nature/interpretive center every weekend and offered interpretive programs when requested by schools and special-interest groups. Also hosted Orange County Department of Education "Inside the Outdoors"	Ongoing. New Outdoor Education Center, owned and operated by the Orange County Council of the Boy Scouts of America is nearing completion. Facility will provide an additional educational and interpretive venue, available to all scouting youths (Boys and Girls). Continue to work cooperatively and collectively with BSA personnel to provide efficient system for ingress and egress to new scout "camp." Access to the camp is gained exclusively

	<p>program, servicing thousands of elementary school children from throughout Southern California.</p> <p>Irvine Park houses the Orange County Zoo. Although an internally-managed entity, zoo and park staff worked cooperatively to provide educational programs and special events to community.</p>	<p>through front entrance of Irvine Park.</p> <p>Ongoing. Park and Zoo staffs continue to network and collaborate on special events, including zoo-related special educational programs. Park staff to also assist with distributing zoo information through park attendants and provide and maintain directional signage throughout park offering easy access to the zoo.</p>
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Laguna Coast Wilderness Park

Project, Program, Activity	2008 Status	2009 Work Plan
General Public Access	<p>Attendance almost tripled over two years to approximately 70,000.</p> <p>Nix Nature Center and all of Laguna Coast Wilderness Park now open to public seven days a week from 7 a.m. to sunset.</p> <p>Park staffing increased from 3 to 7 in response to increased park hours and opening of Nix Center, including addition of Resource Specialist.</p> <p>New programs initiated include volunteer mountain bike patrol and volunteer trail maintenance crew.</p>	<p>Partner with Crystal Cove State Park for enforcement/citations.</p> <p>Increase volunteer trail patrols to inform and educate park visitors, including expanding new mountain bike patrol starting with 12 members. Expand mountain bike trail patrol to “connect” bikers to park and provide visitor assistance and resource protection.</p> <p>Engage OC deputy sheriff mountain bike patrol to assist with unauthorized after-hours park use by bikers.</p>
Illegal Trails	<p>No new unauthorized trails noted this year although citations for off-trail use increased.</p>	<p>No change in procedure. More details of cited visitors to be captured in the database.</p>
Visitor Data Collection	<p>Research electronic trail counters.</p>	<p>Install and monitor electronic trail counters to more accurately quantify visitor numbers. Target Ridge Park Rd. access for pilot project.</p>
Educational Outreach	<p>40% increase in interpretive program attendance from 2007: 877 programs with 67,166 participants, including “First Weekends at the Nix,” “Trailside Chat,” “Wilderness Access,” inner-city school</p>	<p>Ongoing. Expand current outreach programs and activities and monitor existing programs through Laguna Canyon Foundation grants. Target Ridge Park Rd. area homeowner’s associations with educational outreach activities. Park Resource Specialist to continue expanding outreach activities, including “First Weekend</p>

	<p>programs and ongoing weekly thematic public programs. Developed outreach strategies to address enforcement issues at Ridge Park Rd. access (dogs, weapons, illegal trail use, after-hours use, litter).</p>	<p>at the Nix," educational outreach brochures and classroom workshops.</p>
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Limestone Canyon & Whiting Ranch Wilderness Park

Project, Program, Activity	2008 Status	2009 Work Plan
Reduce Off-trail Use in Whiting and Trespassing in Limestone	<p>Since the October 2007 Santiago Fire, posted more Stay on Trail signs and installed motion-triggered cameras in key areas to better track trespassing and off-trail usage trends.</p>	<p>Ongoing. Continue to close and monitor unauthorized use of fire-damaged areas with patrols in problem areas and issuance of citations to gain compliance when necessary.</p>

Peters Canyon Regional Park

Project, Program, Activity	2008 Status	2009 Work Plan
Reduce Off-trail Use	<p>Installed new fencing and signage posting County ordinances along trails.</p>	<p>Ongoing. Continue to monitor trail use and plan special events to educate and engage general public.</p>

Santiago Oaks Regional Park/Weir Canyon Wilderness Park/EI Modena Open Space

Project, Program, Activity	2008 Status	2009 Work Plan
Interim Operations Plan (IOP) Update II	<p>Board of Supervisors approved updated IOP that officially lists 28 authorized park trails.</p>	<p>Create trail name sign posts and install for all 28 trails. Produce new trail map (GIS Mapping Unit) and produce new glossy color trail maps as approved for the 2009-2010 budget.</p>
OC Dept. of Education/Inside the Outdoors School Field Trip Programs	<p>Hosted Orange County Department of Education "Inside the Outdoors" during school year for field trips with a "habitat" theme.</p>	<p>Ongoing. Staff to meet with OC Department of Education programmers to incorporate watershed education into the curriculum.</p>
Trail Patrols	<p>Primarily addressed incidents of hikers, bikers, equestrians and dogs-off leash going off-trail.</p>	<p>Continue to increasingly issue citations instead of advisements and warning notices. Consider after-hours sting patrol is for summer. SHARE mountain bike club to assign volunteer Trail Monitor to the</p>

Special Events	Friends of Harbors, Beaches & Parks sold special framed pictures of the Historic Oak Tree that burned in fire to raise funds.	park. Park will celebrate 6 th Anniversary of Barham Ranch with special guided trail use day and barbecue.
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Talbert Nature Preserve (North Coastal Operations)

Project, Program, Activity	2008 Status	2009 Work Plan
Trail Signage at North and South Talbert	Planned Eagle Scout to construct and install information kiosk at South Talbert.	Continue to work with Eagle Scouts to construct and install second information kiosk and trail sign posts at South Talbert Nature Preserve. Plan to recruit another Eagle Scout to install trail sign posts at the North Talbert Nature Preserve entrance, Gate #1 and the Canyon Park entrance.

Upper Newport Bay Nature Preserve

Project, Program, Activity	2008 Status	2009 Work Plan
Enforce Preserve Rules	Continued increasing visitor contact and <u>gaining compliance through education and progressive enforcement.</u> Volunteers utilized in the field as “ambassadors to the Bay.” Documented multiple violations with digital photographs and logs.	Ongoing. Establish informal outreach tables at key locations to educate park visitors on trail use, designations and importance of facility regulations. Communicate with local equestrian leaders about trail use issues. Continue to monitor and gain compliance of dog owners violating leash laws.
Enhance Park Signage	<u>Replaced and updated park signage in key locations to provide clear, accurate and consistent information to visitors.</u>	Continue to update and replace signage throughout Preserve, increasing visibility of Preserve regulations and trail use designations, particularly along equestrian and bike trails to protect sensitive areas.

Educate Public about Responsible Recreational Use	Expanded interpretive programs educating primarily elementary-aged students about conservation of sensitive habitats and wildlife needs. Conducted total of 385 programs/tours led by staff and volunteers with total attendance of 13,467. Initiated two new interpretive programs specifically focused on habitat restoration. Held three special events to highlight preservation and stewardship of the Bay, drawing 3,020 visitors.	Ongoing. Assess programming needs through evaluations and attendance. Research and establish new programs for intermediate- and high school-aged students.
Close Unauthorized Trails	Continued prioritizing and targeting areas for closure and rehabilitation, incorporating appropriate signage, public input and, where applicable, permits. Created "trails project" board to document trail repairs and closures.	Ongoing. Work with park design to create trail map identifying legal trails, designated uses and closures. Close illegal trails utilizing signs, slash piles, barricades and/or native plantings.

Recreation Facility Construction & Maintenance:

Aliso and Wood Canyons Wilderness Park		2009 Work Plan
Project	2008 Status	
Ranger Office Building Improvements	Conducted feasibility to evaluate sewer/potable water connection.	Project postponed pending funding.
Drainage Maintenance	Checked and maintained culverts and drainages.	Obtain regulatory permits to scour unnamed drainage with heavy equipment to reduce ponding and sedimentation. Project complete; no further action.
SOCWA Cul-de-sac Gate Installation	Installed electronic gate to control vehicle access to park/SOCWA plant and support resource protection and public safety.	Obtain regulatory permits and finalization of CEQA document.
FEMA Site Repairs: Mathis, Wood Canyon Trail bank, Wood Creek dip crossing and Valico Trail	Draft Mitigated Negative Declaration and draft regulatory agency permits completed.	

Irvine Regional Park

Project	2008 Status	2009 Work Plan
Park Entrance Improvements	Completed new park entrance construction in late 2008. Construction involved roadway entrance improvements, new Park Attendant ticket booth, new monument sign, architectural façade and landscaping. Funding of \$539,000 provided by OC Boy Scouts of America (BSA). No adverse biological impacts.	Purchase new entry gates, new gate arm mechanisms and fee collection equipment.

Laguna Coast Wilderness Park

Project	2008 Status	2009 Work Plan
Public Access on Serrano Ridge Loop Trail	Opened existing 6-mi. loop trail to public access, working collaboratively with City of Irvine to expand trail system in north park.	OC Fire Authority to grade approximately 10 mi. of trail annually for emergency access.
Laguna Canyon Road	County/Cal Trans Wetlands Mitigation Project neared completion. Installing container plants in late 2008 / early 2009.	Installation of mitigation plantings and seeding to be completed in Feb. 2009. Project has 120 day plant establishment period and 5 year maintenance and monitoring period.
Completion of Laguna Lakes Trail (SCE utility road)	Completed SCE utility road/public trail completed by Lake #1.	Install mitigation.

Limestone Canyon & Whiting Ranch Wilderness Park

Project	2008 Status	2009 Work Plan
Installation/Replacement of Trail Service Structures	Replaced all structures within Whiting Fire. Completed reroute of trail damaged by massive erosion for resource protection and visitor safety.	Ongoing. Continue improving park signage.
Cactus Hill Trail Reroute	Regraded all park roads, post-fire.	Continue maintenance and removal of old trail.
Annual Road/Trail Repairs	Brushed trail vegetation throughout year	Ongoing. Continue road maintenance and erosion control.
Annual Brushing of Roads/Trails		Ongoing. Continue brushing fire-damaged roads and trails.

	with exclusion of trails with intermediate mariposa lilies during flowering and seeding period.	
Emergency Road Repair	Graded primary access roads to provide emergency vehicle access.	Continue grading primary access roads to provide emergency vehicle access.
FEMA Site Repairs: Site 8 PW#2853, Creek Washout at Hangman's Tree Road and parking area	Obtained regulatory permits and initiated construction for repairs.	Continue work until complete.

Peters Canyon Regional Park

Project	2008 Status	2009 Work Plan
Trail Maintenance	Completed general maintenance on trail system.	Host several trail maintenance special events with SHARE mountain bike group and general public.
Willow Grove Footbridge Repair	Completed rebuilding damaged bridge. Incorporated upkeep into annual maintenance plan.	No further action to be taken.
Replace Office Deck	Replaced wood deck.	Incorporate upkeep into annual maintenance plan.
Restroom Construction	Coordinate exact location of restroom with Nature Reserve of Orange County and other agencies.	Continue project until completion.

Santiago Oaks Regional Park/Weir Canyon Wilderness Park/EI Modena Open Space

Project	2008 Status	2009 Work Plan
Arizona Crossing Repair (Arizona Crossing Trail concrete dip)	Phase I Cultural and Paleontological Resource Assessment by consultant firm PCR completed. Draft Mitigated Negative Declaration, draft F&G Section 1600 application, draft COE Sections 404 permit application and 401 certification forwarded to Parks Design for review.	Obtain regulatory permits and finalization of CEQA document.
New Bridge at Santiago Creek Trailhead	City of Orange proposed installation of new bridge.	Inspect proposed site and submit comments to City of Orange.

Talbert Nature Preserve (North Coastal Operations)

Project	2008 Status	2009 Work Plan
Irrigation at North Talbert	Irrigation bubblers remained active for sycamores suffering from continued drought conditions.	Continue existing watering schedule; no further action to be taken.

Upper Newport Bay Nature Preserve

Project	2008 Status	2009 Work Plan
Santa Ana Heights Equestrian Arenas and Trail Connection (includes removal of unauthorized trails/arena and restoration of damaged coastal sage scrub habitat in the Upper Mesa area)	Resource Management Plan was prepared and a previous environmental Initial Study revised. Mitigated Negative Declaration re-circulated Sept. 3, 2008. Santa Ana RWQCB raised concerns about temporary use of Orange County Flood Control District property that is otherwise committed to future flood control improvements and associated wetland creation.	City to work with Orange County Flood Control District to resolve issues related to mitigation requirements associated with Santa Ana-Delhi Channel improvement project.
Maintain Trails	Placed multiple "geologs" (gravel sandbags) along trails to decrease erosion during heavy rains. Trail vegetation maintained by County trails crew and City of Newport Beach.	Ongoing. Schedule trail grading and repair following rainy season.
Improve Trails	Eagle Scouts completed trail improvement projects including: foot bridge over 23 rd street channel, Indian Springs boardwalk, Node 1 stairs installation and Node 5 trail grading with shade shelters. Cleared and widened Horse Loop Trail for equestrians to encourage proper trail use. Added multiple informational kiosks.	Install bench seating along West Bluff and new walking path through Conservation Club garden. Repair and reopen Constellation Trail (pending construction completion) and repair trails as needed.
San Diego Creek Bike Path Resurfacing	Resurfaced approximately three miles of bikeway with asphalt and add curbs along sloped sides. Removed geologs to facilitate work. New curbs appear to be effective in reducing soil erosion.	Monitor erosion on slopes adjoining bikeway. Sandbag during heavy rains as needed.
Address Back Bay Drive Slope	New project: Steep slopes below	Contact County Design to assess slope stability. If stable, assess

Erosion	development are currently tarped annually. Slopes are covered with non-native, invasive plant species. Desired outcome is slope stabilization and revegetation with native plants.	possible invasive removal and native planting/seeding. Research permitting requirements and applicable reporting procedures.
Determine Management of 23 rd Street Spring	Continued to monitor spring activity. Closed trails leading to the area. Noted increased plant growth and establishment of healthy habitat. Area informally assessed by geologist who suggested area was spring fed from Indian Springs Lake across Irvine Blvd. City of Newport Beach inspectors informally suggested moisture may be due to broken waterlines under Irvine Blvd. Eagle scouts installed boardwalk to allow visitors to safely traverse area whilst reducing resource impacts.	Continue monitoring spring activity. Consider permanently closing trail to protect fragile habitat establishing itself within spring area.
Boardwalk Project	No action on installation of new Boardwalk Trail.	County awaits plans from City of Newport Beach.
Upgrade Trail Use Designation Signs	Installed new trail designation signage at several locations throughout Preserve.	Continue installing new trail designation signage at key locations throughout Preserve.
FEMA Site Repairs: Site 1, PW# 2916 Storm Repair Project 2004/05, Bayview Bridge Erosion Repair	Cultural and Paleontological Resource Phase I Survey Report completed. Draft F&G Section 1600 application and COE 404 permit / 401 certification completed.	Project is now on hold. Need to complete Draft Mitigated Negative Declaration.

Infrastructure Construction & Maintenance:

Aliso and Wood Canyons Wilderness Park		
Project	2008 Status	2009 Work Plan
South Coast Water District Laguna Sur Sewerline Repairs	Repairs of St. Tropez to Alta Loma line completed with revegetation installed.	Annual mitigation monitoring report due at end of spring season 2009.
Main Parking Lot Resurface	Added 5 inches to surface, obtained quote and budgeted for project.	Completion expected in 2009.

Maintenance Yard Improvements	Added Tuff shed and shade roof to enhance function and maximize available space. Cleared trail, planted and mulched.	Move wood shed, redeploy vehicles and move the work area for optimum production.
Trail Construction: Discovery Trail		Post signs identifying plants, refresh bulletin board display and create trail guide. Install mitigation plantings.
South O. C. Wastewater Authority Coastal Treatment Plant Access Bridge Protection	Construction completed Dec. 2008. Areas of disturbance hydroseeded. Removal of 0.6 acres of Arundo.	

Irvine Regional Park

Project	2008 Status	2009 Work Plan
Irvine Company Santiago Hills Phase II Storm Drain Improvements and Basin	Construction completed Oct. 2008. Mitigation plantings installed Dec. 2008.	Annual mitigation monitoring will begin in 2009, and continue through 2014.
Trail Closure Signs	Eagle Scout completed design, construction and installation of eight "Trail Closed to All Users" message boards. Boards can be flipped down to indicate trail closures at trail heads. Signs can be secured with locks, to prevent vandalism and tampering. Project will increase user compliance and reduce resource and trail impacts.	No further action to be taken.
Message Boards	Constructed and installed 25 "message boards" for public to post party/event notices at key locations throughout park.	Continue replacing older, decayed message boards with new boards with park staff or new Eagle Scout recruits.
Visitor Information Kiosk	Two Eagle Scout candidates replaced two visitor information kiosks to display park map, park information and upcoming special events and provide shelter for visitors at the Ranger Station and the termination of Roadrunner Loop Trail.	Continue replacing decaying kiosks.
"Tennis Hill" Restroom	Replaced outdated, rodent- and insect-infested restroom in disrepair with new modern restroom themed similar to the	No further action to be taken.

	original historic building. Restroom completed and in-service in Sept. 2008.	
Trail Signage	Placed of trail makers on all park hiking/biking/equestrian trails.	All official park paths and trails have been signed using approved trail marking posts and reflective signs. This project was completed through the efforts of two different Eagle Scout Community Service Projects, wherein 44 trail markers signs and posts were installed.

Laguna Coast Wilderness Park

Project	2008 Status	2009 Work Plan
Park Kiosks	Installed information kiosks at Willow and Little Sycamore staging areas.	No further action. Annually inspect kiosks for maintenance.
Border Fencing	Installed split-rail fencing along park boundary at Little Sycamore entrance	No further action. Annually inspect fencing for maintenance.
Control Gates	Installed 3 control access gates to deter off-road vehicle entrance.	No further action. Annually inspect gates for maintenance.

Limestone Canyon & Whiting Ranch Wilderness Park

Project	2008 Status	2009 Work Plan
Whiting Spur Road	Closed and blocked due to landslide potential.	Repair budgeted for FY 2009-10.
Park Office Sewer System	Budgeted to update office sewer system. Ordered new tank; waiting on permits.	Continue project until completion.

Peters Canyon Regional Park

Project	2008 Status	2009 Work Plan
Remove and Replace Existing Erosion Control (V-ditches located on park property along the western slope of Jamboree)	Monitored restoration of 1/5 th acre for 3 years. Implemented NCCP/construction mitigation measures.	Continue monitoring restoration.
Construction and Improvements of Four Channels (northeast corner of park)	No action; not a project at this time. Desired outcome is improved conveyance of storm flows to Upper Peters Canyon Reservoir. See Mitigation Matrix.	See Mitigation Matrix.

Metropolitan Water District Easement Maintenance	MWD conducted annual maintenance of existing easement along park roads including clearing around manholes.	Ongoing.
Santiago Hills Phase II Drainage Improvements	No action; project on hold.	No action in 2009; work may begin in 2012.

Santiago Oaks Regional Park/Weir Canyon Wilderness Park/EI Modena Open Space

Project	2008 Status	2009 Work Plan
Mountain Goat Trail Enhancement at Santiago Oaks Regional Park	Assessed trail for equestrian use. Trail considered too rocky.	Enhance trail using professional trail building company funded through Trails4All.
Silt Removal from Storm Channels	No action. Corrugated metal pipes filled with silt after winter rains.	Hand-remove silt with Orange County Conservation Corps.
V-ditch Cleaning at EI Modena Open Space	V-ditch at the EI Modena Open Space not cleaned in 2008.	Clean V-ditch with volunteers and/or JWP crews.
Irvine Ranch Water District Emergency Repair to Santiago Waterline	Re-installation of temporary pipeline completed, after initial location was deemed unworkable.	Begin Phase I restoration.

Talbert Nature Preserve (North Coastal Operations)

Project	2008 Status	2009 Work Plan
Native Plant Nursery	Determined alternate location for nursery outside of Talbert Nature Preserve.	No further action to be taken.

Habitat Restoration & Enhancement:

Aliso and Wood Canyons Wilderness Park

Project, Program, Activity	Funding Source	2008 Status	2009 Work Plan
Manual Removal of Non-native, Invasive Plants	OC Parks	Removed 112 black mustard, 21 castor bean, 7 Pampas grass, 89 tree tobacco, 27 Italian thistle, 21 puncture vine, 132 artichoke thistle, 3 palms, 12 milk thistle, 12 ox tongue, 6 sweet fennel, 5 Russian thistle. Mowed approximately 200 acres of non-native grasses, fennel and thistle.	Ongoing. Continue to terminate non-native plants opportunistically.

Herbicide Treatment of Non-native, Invasive Plants	OC Parks	County Operations & Maintenance treated two large areas of Italian, milk and artichoke thistle according to Nature Reserve of Orange County guidelines.	Ongoing.
	Nature Reserve of Orange County	Contractor Nakae treated 27 patches of artichoke, Italian and milk thistles. Map and summary located in Ranger Station for reference.	Continue treatment; possibly expand application area within Nature Reserve of Orange County park boundaries.
Restoration Sites	OC Parks	Installed barbed wire and cholla cacti from Tree of Life Nursery behind Gate 9.	Restore Wood Canyon shortcuts/bike obstacles by brush, blocking, signing and planting.

Irvine Regional Park

Project, Program, Activity	Funding Source	2008 Status	2009 Work Plan
Children's Native Plant Garden	OC Parks	Maintained 0.2-acre native plant site near park entrance. Site originally designed and constructed as butterfly garden by Eagle Scout candidate in 2007.	Continue to maintain and enhance garden, with labor and materials provided by volunteer groups and local scouts.
Non-native, Invasive Plant Species Treatment in Santiago Creek Riverbed	Santa Ana Watershed Association Grant	Chemically and manually removed Arundo, saltcedar and castor bean.	Continue with past practice of chemical and manual removal of these species in the boundaries of Santiago Creek riverbed.
Ground Squirrel/Gopher Population Control	OC Parks	Contracted with pest control operator to limit and control rodent pest population.	Continue with population control of rodent pest species, using industry-accepted methods to minimize erosion and bio-hazard diseases.

Laguna Coast Wilderness Park

Project, Program, Activity	Funding Source	2008 Status	2009 Work Plan
Manual Removal of Non-native, Invasive Plants	OC Parks, Volunteers	Continued monitoring. Conducted hand and mechanical removal of target species: mustard, filaree, European grasses, pigweed, tocalote, poison hemlock, Russian thistle, lamb's quarters, Pampas grass, artichoke, Italian and milk thistles, Arundo and veldt grass over approximately 15.87 acres.	Ongoing. Continue monitoring and conducting remedial mechanical removals of target species utilizing OC Parks staff and Laguna Canyon Foundation volunteers and Nature Reserve of Orange County contractor.

Habitat Restoration: Nix Center (.75 ac), Willow Canyon and Rattlesnake Canyon (2 ac)	OC Parks, Volunteers, Irvine Ranch Conservancy	Installed 800 plants seeded at Nix Center. Installed 200 container plants and seeded at Willow. Installed container plants and mowed and seeded at Rattlesnake.	Ongoing. Continue monitoring.
Laguna Canyon Rd. Wetland Mitigation Project	OC Parks, Volunteers	Seeded and planted approximately 14 acres. See Mitigation Matrix for details.	Ongoing. Contractor to monitor for 5-year period.

Limestone Canyon & Whiting Ranch Wilderness Park

Project, Program, Activity	Funding Source	2008 Status	2009 Work Plan
Aliso Creek Bikeway Habitat Enhancement (approx. 1 acre of native grassland-coastal sage scrub)	OC Parks	Monitored site. Plantings maturing and seeding.	No further action to be taken.
Upper Pond-Stables Habitat Enhancement (approx. 0.5 acres of native grassland-coastal sage scrub)	OC Parks	Site burned in 2007 Santiago Fire. Monitored site; observed post-fire resprouting in some plantings.	No further action to be taken.
Lower Serrano Habitat Enhancement (1 acre of coastal sage scrub, native grassland, and riparian woodland)	OC Parks	Site burned in 2007 Santiago Fire. Monitored site; observed post-fire resprouting in some plantings.	No further action to be taken.
Manual Removal of Non-native, Invasive Plants	OC Parks Federation National Emergency Grant	Controlled approximately 2 acres of tocalote, tree tobacco, castor bean and Italian and milk thistle with hand-pulling and mowing along park roads and trails. Removed 4 palm trees.	Ongoing. Continue using staff, OC Conservation Corp, Probation and JWP crews for treatment.
Herbicide Treatment of Non-native, Invasive Plants	OC Parks Nature Reserve of Orange County	County Operations & Maintenance treated approximately 100 acres of artichoke thistle in May with Transline-Telar herbicide solution. 4th year of treatment. Nature Reserve of O. C. contractor PRG treated approximately 106 acres of artichoke thistle in burn areas, including re-walking areas treated by County in June/July with Transline-Telar or	No treatment by County in Spring 2009. Treatment will initiate with County contract in Spring 2010. Monitor artichoke thistle cover and density in established plots to determine treatment success. Ongoing. Retreat areas using contract crews hired by Nature Reserve of Orange County.

Native Seed Collection and Propagation	OC Parks	Roundup-Telar herbicide in solution. Collected seed from grassland, sage scrub and chaparral species, for use in restoration projects.	Continue to enhance habitat in fire-damaged areas.
Transplantation of Cactus from Upper Chiquita Reservoir	Santa Margarita Water District (SMWD)	Work with SMWD to determine types and quantities of cactus available for transplantation.	SMWD to transplant cactus impacted by Reservoir construction to Whiting Ranch burn area, identifying recipient sites for both rooted prickly pear and cholla plants and unrooted segments, and including mitigation and monitoring after plant re-establishment period.

Peters Canyon Regional Park

Project, Program, Activity	Funding Source	2008 Status	2009 Work Plan
Herbicide Treatment of Non-Native, Invasive Plants	OC Parks	No action.	On-hold, pending assignment of permanent Park Ranger.
Manual Removal of Non-Native, Invasive Plants	OC Parks	No action.	On-hold, pending assignment of permanent Park Ranger.
The Nature Conservancy Grassland Restoration Project	The Nature Conservancy	Seed dispersal took place spring of 2005. Monitoring program conducted by the TNC. Monitoring in 2007 not coordinated with OCP.	TNC to continue monitoring and documenting cover for exotic species.
Butterfly Garden	OC Parks	Removed non-native plants and mulched.	Continue garden maintenance.
Eucalyptus Tree Removal	OC Parks- Contract	No action; new project.	Professional arborist to remove 30+ Eucalyptus trees at south end of park between Overhill Dr. and reservoir.

Santiago Oaks Regional Park/Weir Canyon Wilderness Park/EI Modena Open Space

Project	Funding Source	2008 Status	2009 Work Plan
Native Flora Planting	OC Parks	Purchased 100 container plants from Tree of Life Nursery to revegetate bare school field trip staging area with native plants.	Plant area using park staff and volunteers.
Manual Removal of Non-native, Invasive Plants	OC Parks	Identified and used hand tools to remove isolated castor bean, artichoke and Italian thistle, fennel, periwinkle and Pampas grass using staff and JWP crews.	Ongoing. Continue removing non-native plants opportunistically.

Herbicide Treatment of Non-native, Invasive Plants	OC Parks	Met with new OC Parks Restoration Ecologist to identify areas of invasive plants to be treated in 2009.	Ongoing. Treat identified locations and species.
Invine Ranch Water District Pipeline Project at El Modena Open Space	IRWD	IRWD contractor caused major damage to sensitive habitat including mature cholla and prickly pear cacti in attempt to repair water line break and reinstall pipeline.	Harmsworth Associates to implement five-year restoration project to repair damage. IRWD intends to eventually reroute water line around El Modena Open Space.

Talbert Nature Preserve (North Coastal Operations)

Project, Program, Activity	Funding Source	2008 Status	2009 Work Plan
South Talbert Wetland Enhancement Project	South Talbert – TNPWEP (Wetland Enhancement Project) California Resources Agency, Coastal Impact Assistance Program (CIAP), TNPRP	Removed 13 acres of Pampas grass. Replanted portion of site with native wetland and upland plant material. Minimal regrowth of Pampas grass from roots; 70% survival rate of planted materials.	Monitor site and continue Pampas grass removal.
Removal of Non-native, Invasive Plants at South Talbert	OC Parks	Removed castor bean, Pampas grass and Myoporium opportunistically, mulching material when possible.	Ongoing. Continue removing non-native plants opportunistically. Initiate mulching experiment on 20 acres of poison hemlock.
Removal of Non-native, Invasive Plants at North Talbert	OC Parks	Continued removal of exotics from Dunes 1 and 2.	Ongoing. Continue removal of exotics from Dunes 1 and 2.
Weed Reduction	OC Parks	Mowed of dead weed material.	Ongoing. Continue mowing exotic plants prior to seed set; coordinate timing with nesting bird regulations.
Restoration of Old Santa Ana River Project Staging Areas 1 and 2 in North Talbert	OC Parks	Developed habitat restoration plan for Staging Areas 1 & 2 consistent with Fairview /Talbert Restoration & Enhancement Plan.	Complete plans and specs for 8 acres of alluvial woodland for Staging Area 1 and 10 acres of grassland and border plantings in Staging Area 2. Project includes service road and trail. Award contract and start construction 4th quarter of 2009. Maintenance contract will follow plant establishment.

Upper Newport Bay Nature Preserve

Project, Program, Activity	Funding Source	2008 Status	2009 Work Plan
San Diego Creek Watershed Restoration: Santa Ana Delhi	None Identified	No action; new project in conceptual phase.	OC Public Works/Watershed and Coastal Resources to determine implementation schedule.
Westbay Habitat Restoration: Six-Acre Coastal Sage Scrub and Native Grassland Habitat Restoration	American Oil Trader Spill Settlement (\$400,000)	Awarded contract and initiated work in late 2008 after Ultra Systems conducted sensitive species surveys focused on southern tarplant, burrowing owls, etc. Project to take approximately 100 days and include 60-day plant establishment period. Contractor fenced and signed area, installed storm drain and stabilized slopes with wattles, sandbags, hydro seeding and planting. Project oversight by County Design.	No follow up contracted maintenance or monitoring provided. Staff to set up monitoring to determine success of project.
Native Plant Revegetation	OC Parks, California Coastal Commission (ROOTS)	Remove non-native species and plant ~5acres of coastal sage scrub / estuary species in areas adjacent to existing native habitat (Mansa Meadows, Marsh Loop, Constellation, rooftop, Plateau and Parking Lot).	Ongoing. Maintain sites with weed removal and first-year monthly summer watering. Use volunteers to expand planting sites to an additional 5 acres.
Manual Removal of Non-native, Invasive Plants	OC Parks, California Coastal Commission (ROOTS)	County and ROOTS staff and volunteers removed ~12 acres of non-native species including ice plant, fennel, castor bean, garland chrysanthemum, mustard, radish, horehound, tocalote, Spanish sunflower, Pampas grass, and white bladder-flower.	Ongoing. Continue utilizing volunteer events and JWP/CRP crews to remove invasive species. Treat and remove Arundo re-invading Westbluff drainage.
Herbicide Treatment of Non-native, Invasive Plants	OC Parks	County Operations & Maintenance treated Pampas grass individuals and approximately 2 acres of acacia, Myoporium and Brazilian pepper trees by chemically girdling trunks. County contractor UPS removed approximately 200 dead acacias and	Ongoing. Follow up with spring treatment of Pampas grass regrowth and seedlings. Use staff and County contractor to remove 300+ additional acacia, Myoporium, Brazilian pepper trees and palm trees throughout Preserve.

<p><u>Improve Butterfly Garden</u></p>	<p>Board Family Foundation, OC Parks</p>	<p>Brazilian pepper trees (treated by County) from Eastbluff and hauled material off-site.</p>	
<p>Bayview Watering Experiment</p>	<p>California Coastal Commission (ROOTS)</p>	<p>Improved irrigation, mulched, and installed interpretive elements including butterfly tiles, botanical markers and signage. Installed ~400 pollinator-attracting plants. Performed regular weeding and pruning maintenance. Maintained plots testing variety of watering methods in final year of experiment. Installed interpretive signage explaining experiment and value of habitat.</p>	<p>Install additional botanical markers and interpretive signage as well as map boxes with handouts. Continue improving irrigation and garden design. Continue mulching and annual maintenance. Recruit Master Gardeners to perform regular maintenance. Analyze data and apply to other restoration sites. Expand plantings throughout site to increase habitat value.</p>
<p>Tool Trailer Grant</p>	<p>State Street</p>	<p>Received \$10,000 grant for restoration tool trailer as grant co-applicant with NBNF and California Coastal Commission. Worked with NBNF and Coastal Commission to select and buy trailer.</p>	<p>Work with NBNF and Coastal Commission to outfit trailer and stock with tools.</p>
<p>Increase Environmental Outreach Programs</p>	<p>OC Parks, California Coastal Commission (ROOTS)</p>	<p>Worked with Early College High School freshman on year-long Service Learning Project, performing habitat restoration at Upper Newport Bay for third year. Worked with adjacent Homeowner's Associations (HOAs) on California-friendly planting palette for lands bordering Preserve.</p>	<p>Work with new freshman class, presenting in classroom and expanding 2006-09 restoration site. Continue providing input for additional HOAs surrounding Preserve.</p>
<p>Increase Volunteer Participation</p>	<p>OC Parks, California Coastal Commission (ROOTS)</p>	<p>Held monthly volunteer event, 2nd Sundays, attracting 458 people who contributed 1,400 hours. Hosted additional volunteer groups totaling 467 people with 1,245 hours.</p>	<p>Continue working with Angeline Santiago, Coastal Commission and volunteers to improve quality and productivity of 2nd Sundays volunteer events. Continue taking additional volunteer groups when schedule permits.</p>

Fire Management Activities:

Aliso and Wood Canyons Wilderness Park

Fuel Treatment	2008 Status	2009 Work Plan
Emergency and Routine Access Improvements	Graded all named and authorized hiking/biking and equestrian trails prior to fire season.	Ongoing. Maintain park, fire and law enforcement personnel and vehicle access, correcting deficiencies as soon as practical. Weather permitting, drive and evaluate all remote trails weekly. Continue monitoring.
City of Laguna Beach Contracted Fuel Modification	Worked with City and contractor to apply stricter controls over goat grazing fuel modification adjacent to park boundaries to prevent encroachment.	
Maintain Fuel Modification Zones	J&J Landscape contractor conducted fuel modification in identified areas in compliance with staff specifications.	Ongoing. Continue refining fuel modification practices.

Irvine Regional Park

Fuel Treatment	2008 Status	2009 Work Plan
Maintain Existing Fuel Breaks	Performed weed abatement along paved roads up to a 5ft. setback.	Ongoing. Continue fuel break maintenance with no change to current levels.

Laguna Coast Wilderness Park

Fuel Treatment	2008 Status	2009 Work Plan
Manual Removal of Non-native Invasive Plants	Conducted remedial mechanical removal of target species: mustard, filaree, European grasses, pigweed, tocalote, poison hemlock, Russian thistle, lamb's quarters, Pampas grass, artichoke, Italian and milk thistles and Arundo over 9 acres in key areas.	Ongoing. Continued monitoring and removing non-native plants.
Nix Nature Center Grassland Re-Vegetation Plan	Plant OC Fire Authority-approved plants and maintain according to recommendations in Nix Center fuel modification zone.	Ongoing.

Limestone Canyon & Whiting Ranch Wilderness Park

Fuel Treatment	2008 Status	2009 Work Plan
Santiago Fire Damage Control (Approximately 90% of park burned October 21, 2007)	Contractor Geosyntec identified areas susceptible to damage associated with fire impacts and identified runoff, erosion and sediment control measures (BMPs) to provide interim protection for burned areas. Implemented BMPs at high priority sites. Completed recommended sand bagging for runoff control. Completed Hydro mulching sites for 2007-08 and removed debris from existing V-ditches.	Continue implementation of recommended BMPs and monitor channels and slopes after extreme weather events.

Peters Canyon Regional Park

Fuel Treatment	2008 Status	2009 Work Plan
Maintain Fuel Modification Zones along Western Park Property Line	Completed mowing with park staff, JWP crews and OC Parks equipment operators.	Ongoing. OC Parks assumed mowing responsibilities. Schedule annually recurring for early spring.

Santiago Oaks Regional Park/Weir Canyon Wilderness Park/EI Modena Open Space

Fuel Treatment	Accomplished 2008	Proposed for 2009
Fuel Modification Zones	Weeded all zones identified by OCFA for fuel modification with park staff and contractor.	Ongoing. Perform annual fuel modification after receiving annual notification from OCFA.
Post- Windy Ridge Fire Response Plan	Geosyntec plan from 2007 continued in 2008.	Continue implementing plan.

Talbert Nature Preserve (North Coastal Operations)

Fuel Treatment	2008 Status	2009 Work Plan
Management of Fuels and Fire Access, South Talbert	Manually removed exotic plants in specific locations to reduce fire potential. OCFA brushed back vegetation along dirt roads for emergency vehicle access. Mowed fire access road with brush mower (approximately 200 yards).	Ongoing. Continue manual and mechanical removal of exotics and maintenance of road access.

Upper Newport Bay Nature Preserve

Fuel Treatment	2008 Status	2009 Work Plan
Upper Newport Bay Nature Preserve has no Fuel Modification Zones within Preserve Boundaries	Closely monitored and removed non-native vegetation in specific locations to reduce fire potential.	Continue monitoring and removing non-native vegetation where needed. Increase monitoring of park boundaries to decrease instances of encroachment. Cite and document violations as needed.

Miscellaneous Activities and Management Programs:

Aliso and Wood Canyons Wilderness Park

Project, Program, Activity	2008 Status	2009 Work Plan
Aliso Wood Resource Management Plan	Public comments due and public review. Complete Resource Agency review of Draft RMP.	Present final draft RMP to CGA and OC Parks Commission. Board of Supervisors to consider draft RMP and CEQA document.
Back-country Ranger II Position	Position approved to work out of Aliso and Wood Canyons Wilderness park and also patrol Laguna Coast Wilderness Park back-country.	Hire position to benefit public, staff and natural resources.

Laguna Coast Wilderness Park

Project, Program, Activity	2008 Status	2009 Work Plan
Land Acquisitions	Muddy Canyon, 219.02 acres, added to initial conveyance.	Add approx. 230 acres along Laguna Canyon Road to park. Area purchased by California Coastal Conservancy; agreement pending.
Studies/Research	CSU Fullerton Barbara's Lake Sedimentation Study completed. Irvine Ranch Conservancy Cactus Wren Artificial Nest Study initiated. Nature Reserve of O.C./Nature Conservancy Cactus Wren Study planned.	Begin Nature Reserve of Orange County / The Nature Conservancy Cactus Wren Study. Irvine Ranch Conservancy to continue Cactus Wren Artificial Nest Study. U.S. Geological Survey to initiate Western Spadefoot Toad Study.

Limestone Canyon & Whiting Ranch Wilderness Park

Project, Program, Activity	2008 Status	2009 Work Plan
Katellaris Encroachment	District Attorney issued letter in 2006 with items that Mr. Katellaris must	Continue monitoring for encroachments; respond as needed.

	address. County Operations & Maintenance secured gate and fencing along property boundary to prevent goats from entering park. No action; new encroachment.	Resurvey park boundary.
Eastern Limestone Canyon Boundary Encroachment		

Peters Canyon Regional Park Project, Program, Activity

2009 Work Plan

2008 Status

Reclaimed Water Storage in Peters Canyon Reservoir

No action.

IRWD to submit plans for construction of inlet/outlet line, hookup to sanitary sewer and other storage. License, easement and agreement in place for 50 years.

Santiago Oaks Regional Park/Weir Canyon Wilderness Park/EI Modena Open Space

Project, Program, Activity	2008 Status	2009 Work Plan
El Modena Open Space Encroachments	Staff inspected several encroachments (Fong, Murrleta and Gregory properties) under the direction of Harry Huggins.	Install fence in accordance with official Record of Survey that divides park property from residential properties.
Santiago Oaks Regional Park Encroachments	Progressed toward resolution of encroachments at Chen and Bunk properties.	Conclude Chen and Blunk property encroachment issues.

Talbert Nature Preserve (North Coastal Operations)

Project, Program, Activity	2008 Status	2009 Work Plan
Repair Corroded Street Drain and V-ditch, South Talbert	Repaired drain.	Monitor willow grove that formed due to water supply from drain.

Upper Newport Bay Nature Preserve

Project, Program, Activity	2008 Status	2009 Work Plan
Bobcat Monitoring	U.S. Geological Survey continued monitoring radio-collared individuals and presented results of study to Nature Reserve of Orange County. Volunteers with project conducted outreach presentation to Newport Bay Naturalists & Friends and public at Muth	Staff and volunteers to continue assisting with documentation of sightings, location and behaviors of bobcats in Preserve. Continue utilizing information to education public.

	Interpretive Center. Project began in 2006.	
Bat Monitoring	Conducted by contracted researchers. Bat monitoring began in summer 2006.	Continue to assist with documenting location and behavior of bats located below the Jamboree Bridge. Utilize information to educate public about conservation.
Dredging	Continued dredging sediment from Bay. Project halted due to lack of funding, but continued in late 2008. Project began in 2006.	Continue project to completion, including creating new Tern Island to replace current island that will be removed to improve water circulation in Bay.

Contact List:

Park Facility	Contact	Phone
General Contact: O.C. Community Resources, O.C. Parks, Park Operations Division	Primary: Mark Denny, OC Parks Director Secondary: Michael Brajdic, OC Parks Deputy Director Additional: Jennifer Naegele, Resource Specialist	714-973-6860 714-973-6868 949-923-3742
Aliso and Wood Canyons Wilderness Park	Primary: Ed Bridges, Senior Park Ranger Secondary: John Gannaway, Parks District Supervisor Additional: Steve Jax, Park Ranger II	949-923-2201 714-973-6864 949-923-2299
Irvine Regional Park	Primary: John Robinson, Supervising Park Ranger Secondary: Linda Mayer, Parks District Supervisor, Central District Additional: Kevin McKeown, Park Ranger II Steve Aleshire, Park Ranger II	714-973-6834 714-973-6861 714-973-6836 714-973-6837
Laguna Coast Wilderness Park	Primary: Barbara Norton, Senior Park Ranger Secondary: John Gannaway, Parks District Supervisor Additional: Jacky Velasquez, Park Ranger II Laura Cohen, Resource Specialist	949-923-2233 714-973-6864 949-923-2234 949-923-3701
Limestone Canyon & Whiting Ranch Wilderness Park	Primary: Vicky Malton, Senior Park Ranger Secondary: John Gannaway, Parks District Supervisor Additional: Raul Murillo, Park Ranger II	949-923-2244 714-973-6864 949-923-2298
Peters Canyon Regional Park	Primary: Raul Herrera, Senior Park Ranger Secondary: Linda Mayer, Parks District Supervisor Additional: Jamie Montgomery, Park Ranger II	714-973-6612 714-973-6861 714-973-6639
Santiago Oaks Regional Park/Weir Canyon Wilderness Park/EI Modena Open Space	Primary: Jim Simkins, Senior Park Ranger Secondary: Linda Mayer, Parks District Supervisor Additional: Maureen Beckman, Park Ranger II	714-973-6621 714-973-6861 714-973-6623
Talbert Nature Preserve	Primary: Sara Girard, Senior Park Ranger Secondary: Leslie Ray, Parks District Supervisor	949-923-2252 714-973-6863
Upper Newport Bay Nature Preserve	Primary: Bill Reiter, Senior Park Ranger Secondary: Leslie Ray, Parks District Supervisor Additional: Portia Arutunian, Park Ranger II Sue Stoffel, Resource Specialist	949-923-2291 714-973-6863 949-923-2294 949-923-2293

8.4 The Irvine Company

NATURAL COMMUNITY CONSERVATION PLAN HABITAT CONSERVATION PLAN IMPLEMENTATION AGREEMENT

2008 ANNUAL PROGRESS REPORT 2009 WORK PROGRAM



Limestone Post-Burn 2008

Prepared by:
 **IRVINE COMPANY**
 Since 1864
January 29, 2009

TABLE OF CONTENTS	Page
ACKNOWLEDGEMENT	2
INTRODUCTION.....	3
2008 ANNUAL PROGRESS REPORT and 2009 WORK PLAN.....	5
EXHIBIT A – IRVINE COMPANY-OWNED NCCP LAND	43
Figure 1.....	44
Figure 2.....	45
Figure 3.....	46
APPENDIX I.....	47

ACKNOWLEDGEMENT

The Irvine Company would like to recognize Jutta Burger, John Graves, Megan Lulow, Adam Maywhort, and David Raetz of the Irvine Ranch Conservancy for their land-manager efforts and significant contributions to this report.

INTRODUCTION

The Irvine Company is a signatory to the Natural Community Conservation Plan/Habitat Conservation Plan (NCCP/HCP) and associated Implementation Agreement (IA). The Irvine Company has prepared this annual progress report and annual work program in accordance with the requirements of Section 4.4.5, of the NCCP/HCP Implementation Agreement (IA). Section 4.4.5 requires “Individual Reserve Owners/Managers” of the NCCP/HCP to prepare an annual progress report for its ownership describing completed activities for the prior calendar year (January-December) and provide an annual work program for the activities planned in the upcoming calendar year. This annual report covers activity completed for calendar year 2008 and those planned for 2009.

Irvine Company land within the NCCP Reserve is a component of the larger wildland and parks of the historic Irvine Ranch. The wildland and parks are a priceless natural and community resource – over 50,000 acres in the heart of urban Orange County. The open space land is composed of 78 square miles of parks and wilderness areas set aside for permanent protection for the benefit and enjoyment of the public. The Nature Reserve of Orange County (NROC) is the non-profit organization that provides oversight of the lands within the NCCP/HCP.

Several **voluntary** enhancement/restoration activities are performed on Irvine Company-owned NCCP lands that are part of the Irvine Ranch wildlands. The Irvine Company established an Environmental Enhancement Fund of \$7,000,000 in 2001 to enhance/restore wildlands on the Irvine Ranch including NCCP lands. This document summarizes these voluntary activities that occur on Irvine Company-owned NCCP lands.

In addition to NCCP adaptive management and voluntary Irvine Ranch Conservancy activities, the Irvine Company completed several restoration and enhancement projects within the NCCP Reserve pursuant to project development permits issued by Resource Agencies. These projects are consistent with the NCCP restoration and enhancement program and compliment the NCCP reserve. These projects are reported herein in summary form in Appendix I.

Ownership of several wildland parcels within the NCCP Reserve transferred from the Irvine Company to the City of Irvine in 2008, and are now part of the City of Irvine's Open Space Preserve North. A map of Irvine Company's land within the NCCP Reserve is shown on Exhibit A.

An Interim Resource and Recreation Management Plans for the Irvine Company's NCCP Reserve land north of Portola Parkway (excluding the City of Irvine's Open Space Preserve North), is in preparation and will be submitted for wildlife agency review and approval in 2009.

3

Document Organization

The annual progress report and annual work program was prepared following the guidelines provided by the U.S. Fish and Wildlife Service and California Department of Fish & Game "Recommended Outline for Reserve Owner/Manager Annual Work Programs", dated February 10, 2003 using the NROC recommended table format.

NOTE: All 2009 research, monitoring, and management projects summarized below that require NCCP compliance determinations (specifically, projects directly related to the conservation and management of NROC Target Habitat and Species, namely, sage scrub (CSS), California Gnatcatcher, Cactus Wren, and Orange-Throated Whiptail) or those projects requested by the NROC Technical Advisory Committee (TAC) for review, will be developed as full proposals using the format recommended by USFWS and CDFG (project justification, methods [hypotheses, approach, methodology, sites, analysis], timeline, project outputs, evaluation of potential impacts, investigators, literature cited & reviewed, tables or figures). These proposals will be submitted for review by the TAC as they are developed prior to the initiation of each project. The NROC review period is 45 days, after which projects may be initiated if no comments are received. All CDFG, USFWS, and NROC nesting bird and exotic species control guidelines will be followed. Highest priority issues include fire prevention and control, rapid landscape-scale restoration of native habitats, and landscape connectivity for wildlife. Projects initiated by NROC on TIC-owned land are not included in this reporting or work plan (e.g., Suding et al. native grassland restoration study, Suding et al. artichoke control program evaluation, NROC cowbird trapping, NROC cactus wren dispersal), although we look forward to continuing to coordinate and collaborate with these efforts.

Recreation Use, Monitoring & Management

Program, Project, Activity	2008 Progress Report	2009 Work Plan
CURRENT USE POLICIES		
	Docent-led hiking, mountain biking, and equestrian tours for the public. Limit is 20 participants with a minimum of 2 docents and/or trail guides.	No change anticipated.

Recreation Use, Monitoring & Management

Program, Project, Activity	2008 Progress Report	2009 Work Plan
RECREATION MONITORING		
<p>Recreational Use & Access Guided Public Access managed by the Irvine Ranch Conservancy January 1, 2008 to December 31, 2008</p>	<p>The following Public Programs were offered from January 1 through Dec. 31, 2008. Some programs were cancelled due to the Santiago Fire, Red Flag Alerts, Rain Closure and Santa Ana Wind events.</p> <p>Total Programs Offered: 243 Total Programs Implemented: 209 Total volunteers: 806 Total volunteer hours: 2960.5 Actual public participants: 1842 Number of programs per NCCP Location: Limestone = 140, Weir = 48, Fremont = 27.</p>	<p>Up to 90 guided tours per quarter will be conducted on The Irvine Company-owned NROC lands during 2009, with a total potential of 7,200 visitors.</p> <p>Limestone Canyon proper area may be closed to public tours during the raptor-breeding season. The closure period may extend from February 15 until May 15, or a period based on consultations with raptor specialists.</p>
	<p>Limestone Canyon proper area was not closed to public tours during the raptor-breeding season (February 15 until May 15). Biologist Pete Bloom evaluated the raptor nesting post Santiago Fire and determined that there were no nesting pairs in the area therefore the closure was unnecessary.</p>	<p>Public access will be cancelled for 72 hours following a rainfall greater than 1/2 inch, or in response to other special conditions.</p> <p>All public access will be suspended during Red Flag Alert and/or Santa Ana wind conditions as determined by the OCFA.</p> <p>Human access management project studies will continue, including: camera trapping surveys for developing disturbance profiles and access landscapes, disturbance profile observational studies on target species, and unauthorized access benchmark assessments.</p>

	<p>Public access was cancelled for 72 hours following each rainfall greater than 1/2 inch.</p> <p>Managed self-guided wilderness access in Limestone and Weir Canyons were not implemented in 2008 because the Resource and Recreation Management Plans were not yet submitted or approved.</p> <p>Public access was suspended during Red Flag Alert conditions and/or Santa Ana Winds as determined by the Orange County Fire Authority. This occurred five times during 2008. Volunteer efforts were shifted from leading tours to fire watch during these events (fire prevention).</p> <p>All Limestone Canyon public tours were cancelled for 3 months following the Santiago Fire.</p> <p>Human access management project studies initiated by IRC continued and included: camera trapping surveys, disturbance profile observational studies on target species, and unauthorized human access benchmark assessments.</p> <p>The Irvine Ranch Access Website was not completed in 2008 because of the shift in focus towards fire recovery and fire management.</p>	<p>Managed self-guided wilderness access in Limestone and Weir Canyons may be implemented in 2009 following submittal and approval of the Resource and Recreation Management Plan. The Resource and Recreation Management Plan will address all of the Irvine Company land within the NCCP Reserve (excluding land that will be part of the City of Irvine's Open Space Preserve North).</p> <p>Development and launching of Irvine Ranch Access Website will be evaluated in 2009. This website will provide online, real-time access to information about trail locations, schedules, closures, rules and regulations, and other information for public access.</p>
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Recreation Use, Monitoring & Management

Program, Project, Activity	2008 Progress Report	2009 Work Plan
<p>USER COMPLIANCE PROGRAMS</p> <p>Access Monitoring Unauthorized Access Monitoring Program</p>	<p><i>Monitoring, Research & Management</i> Camera traps, video surveillance, trail counters and patrols were conducted to identify and monitor levels of illegal access and illegal trail use. This allowed the Irvine Ranch Conservancy to establish unauthorized use patterns and focus resources to manage the issue. This also allowed the Irvine Ranch Conservancy to get a more accurate count of public use of the wildlands – by combining authorized with unauthorized access.</p> <p>In an effort to reduce unauthorized public access, targeted enforcements were implemented based on use patterns of unauthorized public access. Enforcement activities included patrols, visual deterrence, citation and arrest of individuals.</p>	<p><i>Monitoring, Research & Management</i> Continued use of camera traps, video surveillance, trail counters and patrols to identify and monitor levels of authorized and unauthorized access and trail use.</p> <p><i>Management</i> Aggressively deter unauthorized access through a number of means and use through closures of unauthorized trails, gate and fence management, increased patrols, and other enforcement activities.</p>

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Recreation Use, Monitoring & Management

Program, Project, Activity	2008 Progress Report	2009 Work Plan
EDUCATIONAL OUTREACH		
<p>Education & Outreach Orange Unified School District participation in the Inside the Outdoors Science Program at Limestone Canyon</p>	<p><i>Management</i> Students to attend the first two weeks of December. The number of students was increased to 1060 to accommodate the 7th grade students for this year and the 8th grades students that were cancelled last year. A Santa Ana Unified school was also added with approx. 98 students.</p>	<p><i>Management</i> Program is scheduled to continue again in 2009.</p>

Recreation Use, Monitoring & Management


Program, Project, Activity	2008 Progress Report	2009 Work Plan
EDUCATION OUTREACH (cont.)		
Private Programs, Outreach Programs and Patrols	<p><i>Management</i> Total organized group programs offered: 68 Total organized group programs implemented: 68 Actual group participants: 853 Total number of volunteers (Jan 1 – Nov. 30): 196 Total number of volunteer hours: 970 Number of group programs per NCCP Location: Limestone = 44, Weir = 13, Fremont = 12.</p>	<p><i>Management</i> Will continue to offer programs to organized groups and volunteer patrols upon request.</p>

Recreation Use, Monitoring & Management

Program, Project, Activity	2008 Progress Report	2009 Work Plan
EDUCATION OUTREACH (cont.)		
Discovery Science Center & Irvine Ranch Conservancy Paleontology Program	<p><i>Management</i> Discovery Science Center brought 729 students to experience the wildlands and study paleontology. Located at Augustine Staging Area in Limestone Canyon which is adjacent to NCCP areas.</p>	<p><i>Management</i> Will be offered to Orange County public schools in 2009. Presented at Augustine Staging Area in Limestone Canyon – inside historic corral – no contact with habitat areas.</p>
<p><i>Citizen Science & Lead Land Stewards</i> Irvine Ranch Conservancy Citizen Science Program</p>	<p><i>Research</i> The Irvine Ranch Conservancy developed and deployed a Citizen Science program to implement scientific research by trained and supervised volunteers. Total Programs Offered: 99 Total Programs Implemented: 94 Citizen Science Volunteers: 92 Volunteer Hours: 628</p>	<p><i>Research</i> The Irvine Ranch Conservancy will expand the Citizen Science program to include more involvement with studies identified in this document.</p>

<p><i>Citizen Science & Lead Land Stewards</i> Irvine Ranch Lead Land Steward Program</p>	<p><i>Management</i> The Irvine Ranch Conservancy developed and deployed a Lead Land Steward program to implement restoration and invasive control work by trained and supervised volunteers.</p> <p>Total Programs Offered: 35 Total Programs Implemented: 35 Lead Land Steward Volunteers: 162 Volunteer Hours: 442</p>	<p><i>Management</i> The Irvine Ranch Conservancy will expand the Lead Land Steward program to include more involvement with restoration work and invasives removal as identified in this document.</p>
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Recreation Facility Construction and Maintenance

Project	2008 Progress Report	2009 Work Plan
NEW CONSTRUCTION OR EXPANSION		
Irvine Ranch Conservancy Repeater Pad 	A 4' x 4' concrete pad and radio repeater equipment was installed on Loma Ridge to provide radio communication for IRC staff and docents in support of the public programs, field monitoring, and fire watch activities. No native habitat was impacted.	N/A for 2009
Orchard Hills Loop Trail	A multi-use trail, located within an existing avocado orchard, was incorporated into an existing perimeter service road to facilitate docent-led access. No native habitat was impacted.	N/A for 2009

MAINTENANCE OF EXISTING FACILITIES		
<p>Existing ranch roads, trails, private drives (Hicks Haul Road), and perimeter fencing/gates</p>	<p>Continuation of minor road maintenance and perimeter fencing/gates to maintain authorized access. Efforts included the clearing of fallen trees across the roads in Limestone and Weir Canyons damaged from fires or Santa Ana winds. Materials from native trees were left in place at the roadside edge. Also, the center line of existing ranch roads were mowed and minor erosion repaired to maintain safe access by authorized vehicles and docent-led public programs. Perimeter fencing and gates were repaired when damaged from use or vandalism.</p>	<p>Minor maintenance of existing roads, trails, private drives, and perimeter fencing/gates.</p> <p>Planting of native prickly pear cactus plants at selected perimeter fence locations in Weir Canyon which are adjacent to public parkland and experiencing repeated unauthorized use with the purpose of creating natural barriers to human access.</p>
FACILITY REPLACEMENT/ REPAIR		
<p>Avocado Orchards and Perimeter Windrows – North Irvine (Orchard Hills)</p>	<p>Dead eucalyptus trees, burned in the Santiago Fire, were removed from the perimeter windrows of several avocado orchards in the northern section of Orchard Hills. In addition, dead avocado trees were removed and replanted with new avocado tree stock in existing orchards.</p>	<p>Removal of dead or damaged avocado orchards and eucalyptus trees in perimeter windrows in the north Irvine area are anticipated to continue in 2009.</p>
<p>UCI Climate Research Installation</p>	<p>UCI repaired fire damage to their climate field research facilities located on Loma Ridge, next to the Hicks Haul Road.</p>	<p>Continued maintenance of facility by UCI.</p>

Infrastructure Construction & Maintenance

Project	2008 Progress Report	2009 Work Plan
<p>CONSTRUCTION OF NEW FACILITIES THAT HAVE BEEN COORDINATED WITH RESERVE OWNER/MANAGER</p>		
<p>Orange County Rain Gauge</p>	<p>The County of Orange installed an automated, real-time radio reporting rain gauge (a 12" diameter vertical metal pipe), adjacent to the Hicks Haul Road, on the northern slope of Loma Ridge. No native habitat was impacted.</p>	<p>None anticipated for 2009.</p>
<p>IRWD Reservoir north of Portola Parkway and 241 Interchange</p>	<p>Construction by IRWD of a covered reservoir and access drive.</p>	<p>N/A for 2009</p>
<p>OPERATION & MAINTENANCE</p>		
<p>Post-fire erosion control</p>	<p><i>Management</i> Monitored erosion control along the paved Hicks Haul Road completed after the Santiago Fire. No seeding or mulching conducted and impacts to natural habitat were negligible.</p>	<p><i>Management</i> Continue monitoring erosion control along the paved Hicks Haul Road and perform minor repairs as needed to maintain drainage facilities. No seeding or mulching will be conducted and impacts to natural habitat are to be negligible.</p>

Habitat Restoration & Enhancement

Project	Funding Source	2008 Progress Report	2009 Work Plan
EXOTIC PLANT ERADICATION			
<p>Exotic Species Control Assessment</p>	<p>IRC</p>	<p><i>Management & Research</i> A riparian invasive prioritization plan was established for targeted invasive species removal in major drainages based on a weed survey conducted along canyon bottoms in Agua Chionon, Limestone, Fremont, and Gypsum Canyons. Tamarisk and castor bean have been considered first priority for removal across all drainages. Arundo and perennial pepperweed were not observed on the Reserve but were documented nearby, in Santiago Canyon.</p>	<p><i>Management & Research</i> Further weed surveys will be conducted and combined with 2008 riparian survey data to develop a reserve-wide prioritization plan for invasive species control. Maps of areas dominated by mustard have been digitized and will be used to help identify areas where exotic species control will be achieved by restoration. Some site preparation of restoration sites will begin (see Habitat Restoration).</p>
<p>Targeted Eradication</p>	<p>IRC</p>	<p><i>Management</i> Invasive species were removed/ treated across 1261 acres within TIC NCCP (Fig. 1). Of these, 811 acres</p>	<p><i>Management</i> Larger remaining artichoke thistle populations will again be sprayed by a contractor. These include populations along Loma Ridge West and East and along the slopes and ridges south of Limestone</p>

		<p>containing artichoke thistle were spot-treated with Transline by Pacific Restoration Group on contract with IRC. Treatment was applied early in the season (in early/mid February) to maximize the chance of finding post-fire thistle regrowth and to minimize harassment of nesting birds. An additional 54 acres near Hicks Haul and Loma Ridge East were spot-treated for artichoke thistle with 3% Roundup by a trained volunteer supervised by IRC staff. Nesting bird surveys were conducted wherever thistles were being controlled in sensitive bird habitat during the breeding season.</p> <p>Milk and Italian thistle were manually removed across 77 acres of oak woodland, primarily in Weir and Limestone Canyons by IRC volunteers, staff, and Pacific Restoration Group.</p> <p>Approximately 20 acres of black mustard were cut</p>	<p>Canyon. Smaller populations and individual plants identified through other surveys (riparian and grassland) will again be treated by properly trained volunteers teamed up with IRC staff.</p> <p>Remaining castor bean and tamarisk populations recorded from riparian surveys will be cut/treated. Previously controlled areas will be revisited and treated as needed.</p> <p>Fennel and tree tobacco will be removed locally where their removal is of clear benefit. Tree tobacco removal will be a high priority in Santiago Basin and Fremont Canyon, where native cover is common and tree tobacco stands are small.</p> <p>Milk and Italian thistle populations in major canyons and by Hangman's Tree will be cut or pulled with the help primarily of volunteer (land steward and public) labor. Priority populations are those under extensive oak cover in Weir and Limestone Canyons. Bull thistle occasionally occurs in these same areas and will be removed where seen. At least one large stewardship event is planned in March 2009 to pull milk and Italian thistle in oak woodland habitat in Weir Canyon.</p> <p>Palm trees and pampas grass growing in Fremont Canyon will be treated/removed. Yellow starthistle will again be removed in Gypsum Canyon and at any other location that it has been identified. Sahara mustard and any other emerging weed populations will be recorded as they are found and removed if possible.</p> <p>Spanish sunflower will be removed locally at upstream</p>
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		<p>within three trapdoor spider colonies, along 2 miles of roadside (at Agua Chinon), and in two otherwise high quality grasslands.</p> <p>All observed castor bean and tamarisk and some tree tobacco were cut and stumped in Agua Chinon, Fremont Canyon, and the Santiago Basin by volunteers and IRC staff supervision. Fennel was also removed across ca. 15 acres.</p> <p>A single population of yellow star thistle was located and pulled in Gypsum Canyon by IRC staff with volunteer help.</p>	<p>sites. Survey data suggest that it is a serious and entrenched weed.</p> <p>Mustard will be cut along roadsides where necessary, at three otherwise high-quality grasslands, and at marked trapdoor spider colonies.</p>
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Habitat Restoration & Enhancement

Project	Funding Source	2008 Progress Report	2009 Work Plan
EXOTIC PLANT ERADICATION (cont.)			
<p>Exotic Species Control (cont.) Monitoring</p>	<p>IRC</p>	<p><i>Monitoring</i> Experimental artichoke thistle treatment plots previously established by TNC in 2005-2007 were disbanded because results were sufficient to inform management decisions. Baseline invasive species monitoring data were compiled from a 2008 riparian weed survey, in which GPS coordinates of each of 15 major weeds were recorded, along with population size, level of site degradation, surrounding habitat cover and area occupied.</p>	<p><i>Monitoring</i> Occurrences of exotic species surveyed in 2008 (riparian survey) will be updated as they are treated in a GIS database currently being developed. A minimum of two successive surveys with no plants observed will be necessary to declare a species gone from a site. Thereafter, at least one additional survey will be conducted within five years to assess any further germination from dormant seeds left in the seed bank.</p> <p>As additional survey data are acquired, IRC's GIS-based monitoring database will be expanded to identify, prioritize, and track specific weed species/populations and their treatment. If possible, aerial survey data will be added to construct a more comprehensive database. Exotic control projects from 2006-2008 are being digitized and will be updated with new survey and control information.</p> <p>A follow-up survey will be conducted in Agua Chinon and Santiago Basin/lower Fremont Canyon to provide a canyon-wide update on exotic control progress.</p>

Habitat Restoration & Enhancement

Project	Funding Source	2008 Progress Report	2009 Work Plan
EXOTIC ANIMAL CONTROL			
Exotic Animal Monitoring	IRC	Exotic animals were not observed persisting in the Reserve. A single domesticated/feral cat was recorded by a remote camera in Weir Canyon in summer 2008 and a stray dog was collected in Limestone Canyon in March. The former was not seen again; the latter was captured and removed.	Exotic animals will continue to be monitored with remote cameras and those that that persist will be removed if possible.
HABITAT RESTORATION / VEGETATION			
Habitat Restoration & Enhancement Pre & Post Santiago Fire Oak Woodland Surveys and Restoration Trial	IRC	<i>Management & Research</i> Surveys were conducted to determine natural recruitment patterns of coast live oak (<i>Quercus agrifolia</i>) in Limestone and Weir Canyon (Fig. 2). Results from a 2007 survey (June-October) of natural	<i>Management & Research</i> A report on oak seedling occurrence and recruitment is in progress.

		<p>recruitment patterns revealed that seedlings are negatively correlated with light availability and that seedlings occurred primarily under or on the edge of mature oak trees. A report is in progress.</p> <p>Oak age and size distribution was recorded in Limestone Canyon before the Santiago fire and mortality was estimated thereafter in November 2007 and July 2008 (Fig. 3). The fire had a dramatic and significant negative impact. Ten percent of mature oaks and nearly all small seedlings failed to survive the fire. A report is in progress.</p> <p>A field experiment was initiated in Spring 2008 evaluate the success of different acorn planting techniques. Only one of four sites was located on NCCP land (Fig. 2). Techniques were designed to minimize acorn seed predation, herbivory, and mediate microclimate. Results</p>	
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<p>Windy Ridge Fire Native Grass Plug Planting</p>	<p>IRC</p>	<p>suggest that microclimate effects from the tree tubes and brush piles significantly increased survival of seedlings. In addition, underground mesh cages reduced levels of seed predation. Tree tubes resulted in the highest survival across treatments. A report is in progress.</p> <p>In response to the 2007 Windy Ridge fire, fire crews bulldozed through a population of an uncommon native grass, <i>Nassella cernua</i>. In an attempt to mitigate this impact, seed from the population was collected and transplants were grown. Approximately 200 individual transplants were planted in January and February 2008. Additionally, approximately 200 <i>Nassella lepida</i> plugs were planted, a species that is more common, but was also impacted. Survival of transplants will be assessed January 2009.</p>	<p>Grass plugs will be surveyed for survival in Spring/Summer 2009.</p>
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<p>Windy Ridge Fire Dozer Line Seeding</p>	<p>IRC</p>	<p>After the Windy Ridge fire, dozer lines were seeded with a mix of native species in March 2007 in an attempt to keep invasive species from colonizing these disturbed areas. Sections of six of the dozer lines were left unseeded in order to determine the benefit of seeding. Preliminary results indicate no significant difference either non-native species' cover, seeded native species, or unseeded native species among treatments. A report is in progress.</p>	<p>The IRC will complete a report of the significance of the Windy Ridge dozer line seeding during the winter of 2009. Pending availability of seed and time, some additional areas that have not yet recovered may be seeded in Spring 2009.</p>
<p>Grassland Mapping</p>	<p>IRC, RLF</p>	<p>A grassland survey was conducted from March – May 2008, in which polygons containing both degraded habitat and native grassland were visited and categorized (Fig. 3). The region surveyed had not previously been mapped for native grassland. This survey, along with previously mapped weed polygons, were used to determine candidate polygons for restoration. Future surveys will be able</p>	<p>Aerial photo mapping conducted by AIS revealed additional previously unidentified grasslands. These, as well as a small fraction of previously mapped grasslands in Loma, Limestone, and Agua Chinon watersheds will be surveyed in Spring 2009. Upon completion, a map of all grassland habitat across TIC-owned NCCP and adjacent Easement lands will be constructed.</p>

<p>Restoration Site Prioritization Using a Return on Investment Model</p>	<p>IRC</p>	<p>to determine trends in grassland over time based on the data collected.</p> <p>The IRC began collaboration with researchers at the University of Queensland to prioritize candidate restoration sites based on a return on investment model. Inputs into the model included a cost function, a likelihood of success function, and a benefits function. The model assists with prioritization when multiple factors need to be considered concurrently and can be rerun after each successive set of restoration actions have been completed. This model is being applied to restoration actions in the IRC-managed portions of the Central Reserve and adjacent Easement lands.</p>	<p>We will continue to work on the model and anticipate completion in March 2009 at which time highest priority restoration sites will be determined.</p>
<p>Post-Fire Rare Plant Survey</p>	<p>IRC</p>	<p>A field-based floristic survey was led by Fred Roberts from March-December 2008 for the areas burned in the 2007 Windy Ridge and Santiago fires within the</p>	<p>Data from Roberts et al. floristic survey will be compiled and entered into a spatial database. A report summarizing the survey, methodology, and patterns of rare plant occurrences will be completed in the spring of 2009 and made available to partners on the ranch wildlands.</p>

<p>Updated vegetation map of the northern Irvine Ranch Wildlands</p>	<p>IRC</p>	<p>Irvine Ranch wildlands (approximately 12,000 acres within Limestone, Weir, and Loma Ridge; Fig. 3). Rare plants had not been surveyed in this area for 15 years. A general floristic survey was also conducted across the same area. Special attention was given to species of local concern, i.e., as those once far more widely distributed. All CNPS-listed rare species were mapped, photographed and given a habitat description. Three to five locations were mapped for species of local concern. All other species were recorded as an annotated list. Sample herbarium specimens were collected in triplicate, when possible. Specimens are housed at the UC Riverside and Rancho Santa Ana herbariums. A report is in progress.</p> <p>The IRC contracted with Aerial Information Systems to create a georeferenced, digital vegetation map using the current standard</p>	<p>AIS vegetation polygons will be compiled and used to inform management strategies and restoration priorities. With the incorporation of the final grassland surveys in the spring of 2009, the vegetation map will be made available to interested partners on the ranch</p>
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<p>Structures</p>		<p>The IRC, in collaboration with Robb Hamilton, constructed tall artificial cholla structures from PVC piping and barbed wire in order to determine if Cactus Wren nesting habitat can be artificially supplemented (Fig. 2). This study was funded by the Department of Fish and Game through Local Assistance Grant funds. Artificial cactus structures, if utilized, could serve as bridge nesting habitat as cacti regrow after a fire. Models of structures were established at two sites on TIC-owned NCCP land during late summer 2008. Structures were monitored by Hamilton and IRC staff. Results will be presented upon completion of the study (2010).</p>	<p>artificial cactus structures by Cactus Wren monthly during the late spring and early summer of 2009 and again at three-month intervals beginning July. Additional structures will potentially be designed and placed into occupied scrub habitat in late spring.</p>
<p>Pilot Cactus Scrub Restoration Study</p>	<p>IRC</p>	<p>A pilot cactus restoration study was initiated in the winter of 2008 to determine the effect of microsite on cactus propagule establishment. Four sites were selected, of which one occurs on TIC NCCP (Loma</p>	<p>Survival and growth will be compared between propagules and plants planted within formerly intact cactus scrub and adjacent degraded habitat.</p>

<p>Large-scale Cactus Scrub Restoration</p>	<p>IRC, LAG</p>	<p>area; Fig.2). Both propagules and 2-year-old transplants of <i>Opuntia oricola</i> were planted at each site in December 2008.</p>	<p>Funding was awarded through the CDFG Local Assistance Grant Program to implement cactus scrub restoration in an effort to off-set habitat losses caused by the Santiago and Windy Ridge fires. Cactus (<i>Opuntia oricola</i>) populations that show little to no signs of recovery and that are located near Cactus Wren territories will be the highest priority. Connectivity of cactus wren populations will also be considered. Approximately 40 cactus scrub restoration sites will be planted during the fall/winter of 2009. Both propagules and 2-3 year old cactus transplants will be used. The project also includes monitoring of planted cactus growth and the response of cactus wrens to restoration.</p>
<p>Large-Scale Coastal Sage Scrub and Native Grassland Restoration Project (Site Prep)</p>	<p>TBD</p>		<p>Pending external funding IRC will initiate site preparation for approximately 100 acres of coastal sage scrub and native grassland restoration on the Irvine Ranch wildlands. Candidate restoration sites will be identified based on results from the return on investment restoration prioritization model (see description under 2008 projects). Once candidate sites are identified, a site evaluation and restoration plan will be developed. Site preparation in 2009 would involve mowing and targeted spot spraying of invasive species.</p>

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Habitat Restoration & Enhancement

Project	Funding Source	2008 Progress Report	2009 Work Plan
HABITAT RESTORATION / REVEGETATION (cont.)			

<p>Habitat Restoration & Enhancement (cont.) Native Seed Collection</p>	<p>IRC</p>	<p><i>Management</i> Native seed was collected by Noll Seeds over the course of 2008. A revised seed collection agreement was developed between Noll Seeds and the IRC allowing for more documentation of both collection amounts and locations. IRC will consequently be better able to keep records of collections and track populations such that certain areas are not over-collected.</p>	<p><i>Management</i> Limited and targeted seed collection by Noll Seeds will occur to obtain source material for local restoration efforts. Sensitive species will not be collected. Seeds from these collections have been used by TIC, IRC, and NROC, OC, State Parks, COI, and private groups for restoration projects and conservation efforts throughout area and region.</p>
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Habitat Restoration & Enhancement

Project	Funding Source	2008 Progress Report	2009 Work Plan
HABITAT RESTORATION / REVEGETATION (cont.)			

Habitat Mitigation	TIC	<p>TIC implements and manages several mitigation sites within the NCCP. These mitigation sites compliment the NROC restoration and enhancement program. Annual monitoring reports are submitted to Resource Agencies and NROC describing in detail the progress of habitat restoration. A summary of the mitigation sites within or near the Reserve and Special Linkage areas is provided in Appendix I.</p>	TIC will continue to monitor and maintain mitigation sites listed in Appendix I, as required.
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Fire Management Activities

Project	2008 Progress Report	2009 Work Plan
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PRESCRIBED BURNS OR OTHER FUELS MANAGEMENT PROJECTS

<p>Fire Prevention</p>	<p><i>Management</i> Trained (by OCFA), outfitted and deployed over 50 volunteers and staff to monitor “high risk” areas on wildlands edges through Irvine Ranch Conservancy Fire Watch Program. This program was conducted in conjunction with the Greater Laguna Canyon Fire Safe Council, Inter-Canyon League Fire Safe Council, Trabuco Canyon Defense Against Wildfire, Modjeska Canyon Fire Watch, the Orange County Fire Authority, OC Parks and Crystal Cove State Park to create a network of Fire Watch programs.</p> <p>Fire prevention plan drafted that outlines key high-ignition risk areas and proposes key actions that should reduce the chance of fire ignitions and their spread (see proposed activities)</p> <p>Meetings and field tours with OCFA, transportation agencies, local communities, Edison, wildlife agencies, Santa Monica NRA, and fire specialists to discuss fire prevention actions and planning.</p>	<p><i>Management</i> Further meetings and field tours with OCFA, state and local transportation agencies, SCE and fire specialists to discuss fire prevention/management actions and planning. Activities to be assessed and potentially initiated include:</p> <ul style="list-style-type: none"> • Removal of exotic trees along wildland edges, including along Santiago Canyon Road when within wildland boundaries. • Low-barriers to prevent fire ignition at strategic locations along transportation corridors, in collaboration with OCFA, Caltrans, TCA, Orange County, CHP. • Re-configuration of low-visibility roadside pullouts to reduce arson and fire ignition risk. • Re-discing of previously disced Santiago Canyon Road-adjacent firebreak within Limestone Canyon wildland area, keeping it to bare ground. • Video-surveillance of Santiago Canyon Road, with associated public awareness program. • Remote camera surveillance of all wildland entry points. • Strategic reduction of fuel on road edges, where feasible and consistent with regulations and mitigation terms. • Fuel reduction in strategic corridors and bottlenecks identified through fire modeling analyses. • Modification of permanent paved and unpaved roads to enhance firebreak and fire control efficacy, where consistent with NCCP guidelines. Possible road closures, where appropriate and possible.
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		<ul style="list-style-type: none">• Rapid restoration of fire-prone non-native habitats back to native-habitat structure using native species.• Strategic control of invasive plant species in fire hotspot sites and hotspot conditions.• Strategic fuel reduction around selected, vulnerable habitats and populations.• Enforce strict adherence to Use Policies and Fire Prevention and Response and Entry Permit protocols by all wildland users.• Removal of non-native trees from wildlands. <p>Deployment of volunteers and staff on OCFA-determined Red Flag Alert conditions to deter fire ignition.</p>
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Fire Management Activities

Project	2008 Progress Report	2009 Work Plan
PRESCRIBED BURNS OR OTHER FUELS MANAGEMENT PROJECTS		
<p>Post-Fire Management</p>	<p><i>Management</i> Windy Ridge Fire (Weir Canyon, March 11, 2007): Dozer lines were seeded in some previously unseeded sites and seedling success was tracked. Two hundred needlegrass seedlings were planted at a dozer line on Windy Ridge. Santiago fire (Limestone Canyon and beyond, October 21, 2007): Roadside and wildland weed control was implemented in burned areas (Fig. 3; see Invasive Species Control). Burned water troughs were repaired. Wildlife recovery and human access after the fire was monitored through remote wildlife cameras. Erosion issues were evaluated and controlled where possible.</p>	<p><i>Management</i> Recovery of dozer lines from the Windy Ridge fire will continue to be monitored. Roadside and wildland invasive weed control will be continued in high priority areas to reduce fuel load and improve habitat health (see Invasive Species Control). Restorations of areas degraded by frequent fire will be prioritized as part of a restoration prioritization plan to enhance resilience to disturbance such as fire (see Habitat Restoration). Post-fire impact, recovery, and monitoring of small mammals will be continued for Limestone, Weir, and Fremont Canyons (San Diego Natural History Museum).</p>

Fire Management Activities

Project	2008 Progress Report	2009 Work Plan
PRESCRIBED BURNS OR OTHER FUELS MANAGEMENT PROJECTS (cont.)		
Fire Research	<p><i>Research & Management</i> Post-fire rare plant and community surveys were conducted by Fred Roberts and other Botanists for Santiago and Windy Ridge Fire areas (Fig. 3).</p> <p>Oak and sycamore woodland fire impact surveys were conducted in Limestone Canyon (Fig. 3).</p> <p>Post-fire mapping of native grasslands was conducted in the Santiago and Windy Ridge Fire burn areas (Fig. 3).</p> <p>Post-fire surveys for Cactus Wren, raptors, and other bird species were conducted by NROC within the Santiago and Windy Ridge Fire areas, in collaboration with NROC, CDFG, USFWS, Audubon, Sea & Sage, and others.</p> <p>Post-fire cactus restoration activities in Santiago Fire and Windy Ridge Fire areas were initiated along Loma Ridge as part of a cactus restoration pilot project (see Habitat Restoration; Fig. 2).</p>	<p><i>Research & Management</i> IRC will continue analyses of fires and their impacts on ecosystems.</p> <p>IRC will obtain 2008 post-fire Cactus Wren Survey and subsequent data from NROC in order to inform management decisions.</p> <p>IRC will continue to monitor pilot experiments and expand cactus scrub restoration through a DFG Local Assistance Grant and in collaboration with NROC.</p> <p>Small and large mammal activity will continue to be monitored in burned areas.</p> <p>Trapdoor spider colony recovery will continue to be monitored.</p>

	<p>A post-fire study of trapdoor spider mortality and demography is currently underway.</p> <p>Freeway Complex Fire (Coal and Gypsum Canyon, November 15, 2008): This fire did not affect areas described in this report.</p> <p>IRC, in collaboration with OCFA, UCLA, Santa Monica NRA, and other partners, initiated analyses of fire frequencies, fire ignition and spread patterns, and impact on the ecology of the wildlands.</p>	
MAINTENANCE OF FUEL BREAKS OR FUEL MODIFICATION ZONES		
<p>Fuel Modification</p>	<p>OCFA provided fuel modification of non-native vegetation around the County's Emergency Communication Facility on Loma Ridge.</p>	<p>OCFA will perform fuel modification of non-native vegetation around the County's Emergency Communication Facility in 2009.</p>

Miscellaneous Activities and Management Programs

Project	2008 Progress Report	2009 Work Plan
Species Restoration	<p><i>Management, Research & Monitoring</i> IRC awaited scheduling of meetings for the Tecate Cypress working Group.</p> <p>Artificial nest structures for Cactus Wren were placed in key locations and are being monitored (See Habitat Restoration).</p> <p>Coast Horned Lizard distribution in relation to roads has been assessed by USGS. Key hot-spots for lizards include the road in Agua Chinon Canyon.</p> <p>Three trap-door spider colonies that survived the Santiago Fire were surveyed in spring 2008 (Fig. 2). Some weed control was implemented to improve local habitat.</p> <p>A few known potential Checkerspot Butterfly habitat patches were assessed by field visits. Host plant and nectar source abundance were recorded for the purpose of future experimental reintroduction.</p> <p>Due to seasonal and agency constraints, a collaboration with USGS to construct spadefoot toad ponds was delayed until</p>	<p><i>Research & Management</i> IRC will coordinate with the Tecate Cypress Working Group for activities related to this species. IRC will work with partners to initiate genetic resource management, post-fire recruitment studies, fire prevention actions, and fire refugia studies for Tecate cypress.</p> <p>Artificial nest structures will continue to be monitored for Cactus Wren activity. Additional models may be placed in habitat (See Habitat Restoration).</p> <p>Hotspots for Coast Horned Lizard roadkill will be assessed to determine if road and trail closures are warranted for this species.</p> <p>Trap-door spider colonies will be revisited and measured in spring 2009 (Fig. 2). Monitoring will be non-invasive. Passive restoration at sites will be facilitated and some supplemental seeding may occur to replace weed- with native cover.</p> <p>Potential Checkerspot Butterfly habitat quality will be assessed by field visits to known potential habitat patches. Host plant and nectar source abundance will be assessed. Suitable high quality sites may be suggested as reintroduction sites.</p> <p>IRC will continue to collaborate with USGS and wildlife agencies to enhance spadefoot toad habitat, with a focus on creation of breeding habitat and reduction in road-based</p>

	<p>2009.</p>	<p>depressions. White-tailed Kite distribution and nesting sites will be determined and human access will be modified accordingly, if deemed necessary.</p>
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Miscellaneous Activities and Management Programs

<p>Project</p>	<p>2008 Progress Report</p>	<p>2009 Work Plan</p>
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<p>Miscellaneous Scientific Research & Monitoring</p>	<p><i>Research & Monitoring</i> IRC established 23 cameras throughout the north ranch (including NCCP lands owned by TIC) to assess long-term trends in mammal populations in response to drought, public access, fire, and natural variation. A subset of these cameras was used to monitor managed and unauthorized access in the Reserve.</p> <p>Northern Santa Ana Range wildlife crossing study was conducted by USGS in collaboration with IRC, as well as TAC, Caltrans, Orange County, Colorado State University, and wildlife agencies. A report is being drafted that identifies short and long-term conservation actions.</p> <p>Bobcat research by USGS, contracted with IRC, continued in 2008. A bobcat movement and connectivity report for the North Ranch and adjacent areas has been drafted. A final report will be available in Sprint 2009.</p> <p>IRC began working with IRWD and wildlife biologist Winston Vickers to test the efficacy of cellulose-molasses rat baits as an alternative to traditional rat bait that can be toxic to wildlife.</p> <p>IRC assisted SDMNH with small mammal trapping in the TIC Central Reserve to assess the impact of fire and vegetation</p>	<p><i>Research, Management & Monitoring</i> IRC will continue acquiring and synthesize wildlife camera trapping and human access data to inform public access decisions and management of wildlife. Mule deer numbers will be estimated and bobcat and coyote individuals will be identified as best possible from photographs. Research will be conducted in coordination and collaboration with adjacent and other appropriate agencies.</p> <p>IRC is conducting a long-term vegetation change study in collaboration with M. Goulden based on aerial photos from the Central Reserve and adjacent areas spanning 50-years. To further understand causes for vegetation change or lack thereof, IRC will compile past grazing and fire records for areas of interest.</p> <p>USGS will begin trapping bobcats in portions of the Central Reserve to better estimate movement, health, and population trends of bobcats.</p> <p>USGS will present a wildlife crossing report for the Northern Santa Ana Range.</p> <p>IRC is continuing to work with IRWD and wildlife biologist Winston Vickers to test the efficacy of cellulose-molasses rat baits as an alternative to traditional rat bait that can be toxic to wildlife.</p> <p>SDMNH will again trap small mammals to follow population changes as vegetation recovers after the Santiago Fire. Trapping will occur in April-June 2009 and a final report will be submitted.</p> <p>J. Schenk (Cal State Fullerton) will continue the black sage</p>
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	<p>cover on rodents. A final report was written and submitted to IRC.</p> <p>A manuscript on predicted climate change on the North Ranch and conservation response to it was submitted by IRC to Natural Areas Journal.</p> <p>J. Schenk (Cal State Fullerton) collected black sage for a plant physiological response to drought study in a black sage community. Proposal was submitted to IRC and NROC.</p> <p>– Raptors were monitored by Pete Bloom and Scott Thomas In spring 2008.</p> <p>Grassland bird habitat use was reviewed by J. Goerrison and the report submitted to IRC.</p> <p>Suding-Larios (UCI) resource impact study on native and non-native grasses along Loma Ridge continued through 2008.</p> <p>UCI Climate Change Project replaced materials damaged by the Santiago Fire and continued with their study at the same site. Sites were seeded with native seed mixes in Fall 2008.</p> <p>Christmas Bird Count and quarterly Point Count surveys were conducted by Sea</p>	<p>study.</p> <p>Raptor monitoring by Bloom et al. will continue.</p> <p>Suding-Larios (UCI) resource impact study along Loma Ridge will continue through 2009.</p> <p>UCI Climate Change Project by Goulden and Suding (UCI) will continue. Goulden will continue the project as Principal Investigator.</p> <p>Christmas Bird Count and quarterly Point Count surveys will continue to be conducted by Sea and Sage Audubon.</p> <p>Beginning Christmas 2008, Audubon is providing IRC with count data for Reserve areas.</p> <p>California State University-Fullerton (E. Bobich) may initiate cactus regrowth surveys.</p>
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	<p>and Sage Audubon. Beginning Christmas 2008, Audubon is providing IRC with count data specifically for Reserve areas.</p>	
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Miscellaneous Activities and Management Programs

<p>Project</p>	<p>2008 Progress Report</p>	<p>2009 Work Plan</p>
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<p>Conservation Capacity</p>	<p>Management, Monitoring & Research IRC completed several activities intended to enhance the collaboration of the management community. These include:</p> <ol style="list-style-type: none"> 1. Developing a central repository for data to be accessible to all interested parties. 2. Standardizing research and monitoring regulations, guidelines, and an application & tracking system for all IRC managed lands. 3. Clarifying and formalizing review and consultation protocols. 4. Coordinating research, monitoring & management activities among local land managers, researchers, and conservation practitioners. Promoting and supporting a landscape-level Conservation Action Plan. 5. Providing opportunities for collaboration, internships, scholarships & research grants. 	<p>Management, Monitoring, & Research IRC will continue to enhance the collaboration of the management community identified in 2008. Goals for 2009 include:</p> <ol style="list-style-type: none"> 1. Continuing compilation of all available biological survey data for the Reserve into a GIS-based database. 2. Working closely with agencies and OC Fire authority to minimize communication gaps and facilitating cooperation for the purpose of improving landscape-level conservation actions and land management. 3. Participating in the NROC Land Managers Council and taking on an advisory role where appropriate. 4. Continuing to provide opportunities for collaboration, internships, scholarship, and research on the Reserve. 5. Working with collaborators to obtain funding for important conservation actions.
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Miscellaneous Activities and Management Programs

Project	2008 Progress Report	2009 Work Plan
Map Corrections or Adjustments	None to report.	None planned at this time.
Coastal Sage Scrub (CSS) Take Activity	<p>Original take authorization 2 acres 2007 Balance 1.6019 acres 2008 take 0.5484 acre Remaining take 1.0535 acres</p> <p>The Irvine Regional Park outlet structure was installed in 2008 in accordance with agency approved plans and used 0.5485 acres of CSS take authorization.</p>	None planned at this time.

8.5 City of Irvine Open Space

The City of Irvine 2008 NCCP Annual Report & 2009 Work Plan Central & Coastal NCCP Wildlands



The City of Irvine (COI) owns over 4,000 acres of open space lands, comprised of Bommer Canyon, portions of Shady Canyon, Quail Hill and other components of the adjacent San Joaquin Hills. The land was transferred by Deed from The Irvine Company (TIC) to the COI as part of the Open Space Ballot initiative and the Memorandum of Understanding (MOU) established in 1988. With this transfer, the City became the land owner/manager and is required to submit an annual report to the Nature Reserve of Orange County (NROC). Through a phased

land dedication process, COI has assumed ownership of additional land in 2008, including 941 acres in Preservation Areas A and B in the north.

The following information reflects the activities for the City of Irvine's Southern Open Space Preserve for the 2008 calendar year and the work plan activities for the 2009 calendar year.

Recreation Use, Monitoring & Management		
Project, Program, Activity	2008 Status	2009 Work Plan
<p>Recreational Use & Access January 1, 2008 to December 31, 2008</p>	<p>Management Managed recreational use and public access programs are operated and monitored by COI's Community Service Department; COI's contracted Land Manager, Irvine Ranch Conservancy (IRC); and COI's Public Safety Department. Permitted uses are passive recreation including: hiking, mountain biking, and equestrian uses on open space trails, as well as activities, camps and events at Bommer Canyon Cattle Camp and Turtle Rock Nature Center.</p> <p>Public trail access was cancelled for a minimum of 72 hours following a rainfall event greater than one-half inch. Prolonged rainfall periods or major rainfall events in excess of one inch canceled access for extended periods of time.</p> <p>Signage for management of the open space was installed at all perimeter entry points to educate the public on the managed access status.</p> <p>COI and IRC require program participant registration and waivers, and a staff person(s) and/or trained volunteer (s) in attendance at all times. Programs are designed to provide participants with the best possible experience and minimize the overall impact on the habitat.</p>	<p>Management The COI plans to continue to offer the same recreational access configurations through the COI and IRC with the addition of open access seven days, dawn to dusk, on part of Serrano Ridge that connects to Laguna Coast Wilderness Park.</p> <p>Per the approved Resource and Recreation Management Plan, the existing Ridge Route Trail will be re-established as an authorized multi-use trail for monitored public access programs.</p> <p>Per the approved Resource and Recreation Management Plan, approved signage will be procured and placed at the respective trailheads throughout the City of Irvine Open Space Preserve – South, and maps will be made available for public program participants.</p>
<p>PROGRAMS OFFERED BY IRVINE RANCH CONSERVANCY</p>	<p>IRC's public access programs included: Docent-led hiking, mountain biking, trail running, equestrian tours, and once per month open access days. The maximum</p>	<p>IRC continues to offer docent-led recreational opportunities, open-access days, citizen scientist research and restoration activities, and Land</p>

<p><i>Offered in the Irvine Open Space Preserve</i></p>	<p>limit for docent-led activities is 25 participants with a minimum of 2 docents. Public access days are managed with IRC staff and an array of docent/trail guide volunteers.</p> <p>Total public programs offered: 199 Total implemented: 156 Total volunteers: 570 Total volunteer hours: 2231 Actual participants: 2566</p> <p>Unlike the other recreational programs, the Hick's Canyon Wilderness Walk trail is closed to public programs from February-August each year for California gnatcatcher and cactus wren breeding season. In 2008, use of this trail included:</p> <p>Total programs offered: 3 Total implemented: 2 Volunteer hours: 15 Total volunteer: 4 Actual attendance: 84</p> <p>Citizen Scientist Volunteer hours: 319</p> <p>IRC trained volunteers to act as Lead Land Stewards. They could lead general public volunteers on stewardship projects.</p> <p>IRC also hosted land stewardship volunteer work days, which include: invasive species removal, restoration planting and maintenance, and trail maintenance activities.</p>	<p>Stewardship programs.</p> <p>In 2009, IRC will continue to consider suggestions from the public and develop new programs based on demand and interest.</p>
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	<p>Total Land Steward days: 29 Total Lead Land Steward Volunteers: 44 Total Lead Land Steward Volunteer Hours: 434</p> <p>Spring Volunteer Appreciation Event – Approximately 50 people including volunteers and staff attend a catered breakfast in Bommer Canyon’s Cattle Camp.</p> <p>Earth Day Event – Approximately 200 participants attended the 2008 Earth Day event in Bommer Canyon. Themed displays were featured at this event. The California Natural Landmark designation was held at Bommer Canyon Cattle Camp on the actual Earth day. Approximately 400 participants attended and limited hiking occurred around the Cattle Camp.</p> <p>COI offered a number of programs in 2008. Programs included: classes, summer camps, badge programs, family campouts, and outreach. These Open Space programs offered opportunities for participants of all age levels to learn about and experience nature.</p> <p>Total public programs offered: 480 Total implemented: 474 Actual participants: 2662</p> <p>Youth Day Camps provided themed activity weeks such as “Insect Safari,” “Jr. Naturalist,” and “Animal Science Investigator.”</p> <p>In addition, the Kids and Nature nine-month kindergarten education and enrichment program was once again offered in 2008. This program meets during the school year, five days a week, two hours a</p>	
<p>PROGRAMS OFFERED BY CITY OF IRVINE</p> <p><i>Offered at the Nature Center and Bommer Canyon Cattle Camp</i></p>		<p>COI anticipates offering the same types and numbers of general open space programs in 2009 as well as continued group reservations at Bommer Canyon Cattle Camp picnic/event site under COI staff supervision for group picnics, weddings, and special events as permitted use under the Natural Community Conservation Plan (NCCP).</p>

	day, and serves a full class of twenty-four children.	
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2008 General Open Space Programs offered by City of Irvine			Total Participants
Activity	Program	# Sessions Offered (Sessions Implemented)	
Bommer Canyon	Jammin in the Canyon	4 (4)	15
	Buggy Brigade	5 (5)	34
	Bommer Canyon	3 (3)	277
	Campout		
	Summer Camp Eco-Explorers	35 Days (35)	192
	Summer Camp Jr.	25 Days (20)	48
	Naturalists		
	Lounge Chair Theater	1 (1)	220
	Starry Nights	2 (2)	239
	Pumpkin Pickin' & Carvin	1 (1)	135
Leaders In Training	35 Days (35)	13	
Nature Center	Scouts Badge Programs	9 (9)	22
	Early Childhood Classes	9 (9)	87
	Nature Center Tours	3 (3)	29
	Birthday Parties	8 (8)	350
	Nature Adventure	2 (2)	5
	Making Messy Nature Fun	1 (1)	8
	Moonlit Marshmallows	8 (8)	216
	Kids Only Night Hikes	10 (10)	86
	Open Space 101	4 (3)	50
	Solstice Night Hike	1 (1)	40
	Nature Center Fire Ring	2 (2)	100
	Fire Ring Extravaganza	8 (8)	193
	Second Saturdays	12 (12)	248
	Bugs, Birds, and	1 (1)	9

Butterflies			
Nature Trekkers	1 (1)		14
Birding Basics Walk	3 (3)		9
Scouts Badge Day	1 (1)		18
Total	199 (98)		2287
Other	Kids and Nature AM	180 days (180)	24 children a day
	Kids and Nature PM	180 days (180)	6 children a day
Total	288 (288)		30
Grand Total	480 (474)		2662

<p>Education & Outreach</p>	<p>Management Total organized group programs offered: 18 Total organized group programs implemented: 18 Actual group participants: 102 Total number of volunteers: 23 Total number of volunteer hours: 93.4</p> <p>COI provided various school groups and Boy/Girl Scout with educational opportunities.</p>	<p>Management The IRC will continue its work to educate the public about stewardship activities and public access opportunities in the Irvine's open space.</p>
<p>Monitoring & Patrols</p>	<p>Monitoring Trail Counter test monitoring. A monitoring site was implemented to test the effectiveness of an electro-magnetic/seismic trail counter to monitor unauthorized use of non-sanctioned trails. A buried trail counted was installed on the non-sanctioned "Reservoir Drop" trail to obtain accurate unauthorized use patterns.</p> <p>Research & Monitoring Camera traps were established in seven sites in summer 2007 to monitor human access and wildlife behavior of the Open Space Preserve - South. This project is ongoing.</p>	<p>Monitoring Additional Trail Counters will be implemented and rotated throughout Irvine's Open Space to compile user pattern data for unauthorized use of both the sanctioned and non-sanctioned trails. Some of these counters may be placed at camera trap sites to obtain the most accurate possible data about unauthorized use.</p> <p>The acquired data will be compiled into a matrix to be distributed to the City of Irvine Open Space Patrol personnel to help keep them informed of use patterns in NCCP areas outside of the scheduled docent-led programs, the operating hours of the area, the use of any non-authorized trails, and entry of dogs into the area.</p> <p>Research & Monitoring IRC's Citizen Scientists will continue to collect camera trap data to monitor human access, assess the type and level of unauthorized access, track trends in wildlife diversity and abundance over time and space, and further develop disturbance profiles</p>

		<p>for wildlife species in the City of Irvine Open Space. The land manager will continue to work with UCLA and CSLB to develop disturbance profiles for target wildlife species through literature review and low-impact field studies.</p> <p>The Irvine Police Open Space Patrol is a group of non-sworn officers that patrol the open space during scheduled programs and other times of need (when possible).</p>
Recreation Facility Construction & Maintenance		
2009 Work Plan		
<p>Project</p> <p>New Construction or Expansion</p>	<p>2008 Status</p> <p>New Construction or Expansion</p> <p>Quail Hill Trailhead: Construction was completed on the Open Space monument markers and benches to create an interpretive entry point celebrating the dedication of the City of Irvine Open Space Preserve.</p> <p>Existing trail alignment improvements were completed per the approved Recreation and Resource Management Plan as follows:</p> <p>Cattle Crest Trail: Enhancements were performed at the existing Cattle Crest Trail to prepare the trail for use on public programs. A single 2' wide by 1.1 mile long, sustainable trail alignment was established by</p>	<p>Management</p> <p>COI will continue with implementation of trails approved for public use and infrastructure improvements via the approved Recreation and Resource Management Plan</p> <p>New Construction or Expansion</p> <p>Bommer Canyon Trailhead: On November 7, 2007, discretionary approval (i.e. Park Design 00442018-PPD) and environmental clearance were granted. Construction level drawings were prepared and currently are under building plan check review.</p> <p>ADA Nature Walk Trail: Final completion of the "Accessible Grades" Nature Trail system, inclusive of way-finding and interpretive signage.</p> <p>Bommer Meadows Trail: Final completion of the Bommer Meadows trail bypass connector to the</p>

	<p>physical closure of multiple unauthorized alignments, and installation of erosion prevention devices were installed at selected locations throughout the trail length.</p> <p>Bommer Meadows Trail: Construction was initiated on a 3/4 mile natural surface 8' wide multi-use trail that will ultimately connect the revised Bommer Canyon Trailhead to the existing West Fork Trail, creating the approved bypass around the City of Irvine Cattle Camp facilities.</p> <p>ADA Nature Walk Trail: Construction was completed on the initial phase of the "Accessible Grades" Nature Loop and Cultural Loop per the approved Recreation and Resource Management Plan. The trails consist of an 8' wide Stabilized Decomposed Granite trail-bed with grades less than 5% to accommodate mobility challenged visitors. The Nature and Cultural Loop trails will be limited to pedestrian and mobility assistance devices only. (No equestrian or bicycle traffic)</p> <p>Trail Bridges: Six engineered trail bridges were installed to provide sustainable access to the network of approved trails. The bridges provide linkages of multiple trail segments.</p> <ul style="list-style-type: none"> • Cattle Crest Trail Bridge: 70' long 5' wide engineered wood bridge, designed for pedestrian, bike, equestrian and light maintenance vehicle traffic. 	<p>West Fork trail.</p> <p>Fabrication and installation of the final way finding signage as needed.</p> <p>Fabrication and installation of a puncheon bridge at the lower section of the Fox Run Trail, per the approved Recreation and Resource Management Plan.</p>
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	<ul style="list-style-type: none"> • Rabbit Run/Fox Run Link Trail Bridge: 60' long 5' wide engineered wood bridge, designed for pedestrian, bike, equestrian and light maintenance vehicle traffic. • Shady Oaks Trail Bridge: 60' long 5' wide engineered wood bridge, designed for pedestrian, bike, equestrian and light maintenance vehicle traffic. • Bommer Meadows Trail Bridge #1: 56' long 5' wide engineered wood bridge, designed for pedestrian, bike, equestrian and light maintenance vehicle traffic. • Bommer Meadows Trail Bridge #2: 20' long 5' wide engineered wood bridge, designed for pedestrian, bike, equestrian and light maintenance vehicle traffic. • Nature Loop Trail Bridge: 80' long 8' wide engineered wood bridge, designed for pedestrian, wheel chair, and light maintenance vehicle traffic. <p>Fabrication and installation of all trail way-finding signage was completed throughout the entire City of Irvine Open Space Preserve with the exception of the Nature Loop, Cultural Loop and Bommer Meadows Trails.</p> <p>Trail posts were installed using impact posts from X-Potential Products, which are fabricated from 100% recycled products from recycled automobiles, and contain no carcinogens, creosote, or other undesirable agents.</p> <p>Signs were installed using backing plates fabricated</p>	
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<p>Maintenance of Existing Facilities</p>	<p>from recycled aluminum and affixed with digitally printed vinyl that can be easily repaired or replaced as needed.</p> <p>Management Performed mowing maintenance of the natural surface road centerlines to reduce the fire-risk from maintenance vehicle traffic.</p> <p>Maintained the fuel modification width of the Serrano Ridge natural surface road by mowing the pre-graded sidelines and safety turn-outs. Mowing was the desired method for 2008 in lieu of grading due to the lack of adequate rainfall and moisture levels in the road substrate.</p> <p>Continued with the removal of interior abandoned fence lines along natural surface roads and trails to visually improve the user experience and improve wildlife movement through the area.</p> <p>Performed routine maintenance of existing, and installation of new erosion prevention devices at various locations throughout the existing trails and ranch roads. Processes included: modified grade dips, water bars, out-sloping of existing trails, and rock-armorings.</p> <p>Completed the closure of a 2 mile section of existing natural surface road (Shady Oaks Road), that traverses from the northern end of Serrano Ridge through Shady Canyon and exiting at the intersection of Shady Oaks and Butterfly Valley (Three Sisters Rock formation). This road was permanently closed and fenced at both ends to allow it to re-establish itself</p>	<p>Management IRC will continue to perform preventative and general maintenance.</p> <p>Begin the replacement of all perimeter and interior gates with the pre-approved gate designs as outlined in the approved Recreation and Resource Management Plan. The gate systems will include all required messages for the Open Space Preserve managed access programs and interpretive information regarding the protected area.</p> <p>Ongoing monitoring will be maintained on closed non-sanctioned trails that are currently undergoing restoration processes. Monitoring includes ongoing brushing of the trail entrances to create entry deterrents, signage when necessary, camera monitoring, and buried trail counter monitoring.</p> <p>Ongoing monitoring will continue at all roads and trails with respect to erosion prevention to include monitoring and maintenance of all existing erosion control devices.</p>
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	back to native habitat. Performed routine weed abatement at the perimeter entry gates, and trailhead gathering areas.	
Facility Replacement/Repair	N/A	N/A
Removal of Inactive Field Research Materials	Management No removal initiated.	Management IRC will evaluate all active and inactive field studies and mitigation sites and remove field markers no longer deemed active or necessary.

Habitat Restoration & Enhancement		
Project	Funding Source	2008 Status
Exotic Species Control	COI, IRC	<p>Management Substantial stands of artichoke thistle were cut at Quail Hill, along Quail Trail, and in Bommer Canyon over the course of several volunteer Stewardship Days under supervision of IRC staff.</p> <p>Castor bean re-growth was removed in Bommer Canyon with volunteer help as a follow-up after 2007 eradication efforts. 10 tree tobacco trees were also removed and treated in Bommer Canyon.</p> <p>Mustard was manually removed with volunteer help at otherwise high-quality native grassland in Bommer Canyon.</p>
		<p>Management IRC intends to coordinate its invasive species control program with NROC, whereby NROC contracts out artichoke thistle, fennel, veldt-grass, and garland chrysanthemum treatment within the Irvine Open Space Reservation areas. IRC targets other exotics, such as castor bean, mustard, fennel, tamarisk, tree tobacco. IRC will also continue to take appropriate action to manage artichoke thistles missed by NROC within Bommer Canyon and adjacent to the Reserve where the species has potential to spread further.</p> <p>Future planned targeted control activities include: 1. Locate and remove castor bean re-sprouts/seedlings in Bommer Canyon as a follow-up to 2007 and 2008 control efforts (investment:</p>

		<p>Fennel and Tamarisk were cut around Quail Hill / Quail Trail by IRC staff and volunteers.</p> <p>The bicycle trail intersection at Bommer Canyon was weeded and visibility for non-motorized traffic improved with volunteer help.</p> <p>Two volunteer-led trial invasive species patrols were conducted in the greater Bommer Canyon area. Thistles and castor bean located during patrols were immediately removed.</p> <p>COI contracted IRC to conduct a minimum of 12 stewardship work days per year. 29 work days, involving from 2 to 20 volunteers, were held in 2008. Of these, 17 were organized to cut back an artichoke thistle infestation at Quail Hill and Quail Trail areas directly adjacent to the Nature Reserve. The remaining 12 days included restoration and invasive species control within the Reserve, primarily in the Bommer Canyon area. A total of 434 volunteer work hours were contributed toward stewardship.</p> <p>Management & Monitoring Dr. K. Suding (UCI) is completing an NROC-funded study on the effectiveness of artichoke thistle herbicide control in facilitating passive restoration and the effects of herbicide control on local biota. IRC has used preliminary results to inform its invasive</p>	<p>one stewardship day).</p> <p>2. Cut artichoke thistle in portions of the Open Space Preserve (investment: several stewardship days). Control plots, in which only seed heads are removed, may be established at Quail Hill to document effectiveness of removal by repeated cutting.</p> <p>3. Continue invasive removal at Bommer Canyon native grassland to improve local habitat quality (investment: two stewardship days).</p> <p>4. Weed and restore natives to bicycle trail intersection at Bommer Canyon (investment: one stewardship day).</p> <p>5. Cut mustard stands at select intact habitat edges to observe the rate of passive restoration into degraded habitats. If time permits, mowing efforts will be implemented as an experiment, in which control plots are left unmowed and pre- and post-native and non-native vegetation cover will be estimated using vegetation quadrats to measure efficacy of mowing.</p> <p>6. Implement small-scale targeted control of invasives, such as castor bean, mustard, tamarisk, tree tobacco, and pampas grass. Following NCCP guidelines, bird surveys will be conducted prior to any invasive species removal activity (if removal occurs during the breeding season) to ensure no impacts to sensitive species.</p> <p>Stewardship work days will primarily be used for the above listed tasks. In addition, an "Invasive Species Patrol", using trained volunteers, will be expanded to involve the public in understanding land management issues and to find and remove</p>
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		control plan.	<p>new populations of invasive weeds efficiently.</p> <p>IRC will coordinate with the City's Animal Control in the event that feral dogs and other invasive animal species need to be removed from the Reserve.</p> <p>Management & Monitoring IRC will use monitoring information from Dr. K. Suding's invasive species control and passive restoration studies on the Irvine Open Space Preserve as they become available.</p> <p>IRC will begin to collect data for a long-term GIS-based monitoring database to identify and prioritize weed populations for removal/ treatment. This database will be updated as weed populations are surveyed, treated, and revisited. When needed, short-term weed control efficacy trials will be initiated. Control measures may be coordinated with revegetation efforts. Permanent plots for long-term vegetation monitoring may be established. We anticipate coordinating with NROC in regards to data sharing for this purpose.</p> <p>A comprehensive priority-setting analysis for action on non-native and natural communities highly impacted by invasive species will be initiated for COI wildlands.</p>
<p>Habitat Restoration/ Revegetation/ Monitoring</p>	<p>COI, IRC</p>	<p>Management Approx. 200 salvaged many-stemmed dudleya (<i>Dudleya multicaulis</i>) individuals, donated by Irvine Company, were planted in two appropriate receiver sites in Bommer Canyon within the NCCP reserve.</p>	<p>Management Approx. 200 planted many-stemmed dudleya (<i>Dudleya multicaulis</i>) will be monitored throughout the spring season (particularly during the blooming period from March through June) to determine survival and any necessary adaptive management</p>

		<p>Past survey data for <i>Dudleya multicaulis</i> have been compiled as part of a transplantation project.</p> <p>An illegal trail leading to Ridge Route and Serrano Ridge was closed by planting potted native shrubs again using volunteer stewardship participation.</p> <p>Monitoring</p> <p>Maintenance and monitoring of 2006 and 2007 restoration projects were continued.</p> <p>Wildlife and human activity has been monitored by XX remote infra-red-triggered camera traps, operated by volunteer citizen scientists and IRC staff. Data on activity patterns are being compiled.</p> <p>Spade-foot toad and western painted turtle populations were monitored by USGS (see Misc. Research below).</p> <p>California Gnatcatcher, Cactus Wren, and Orange-throated Whiptail populations monitoring are currently under NROC jurisdiction.</p>	<p>activities.</p> <p>Large-scale cactus scrub restoration will begin in an effort to off-set significant losses caused by the Santiago and other fires. A total of 40 restoration plots will be implemented over a two year period. Both propagules and larger cactus will be used. Funding has been secured through the CDFG Local Assistance Grant Program. A pilot program is being implemented in the winter of 2008-09 to determine the best restoration methods for accelerating restoration of cactus scrub.</p> <p>Land manager plans to identify priority restoration areas and make plans to restore these areas to native grassland, CSS, and oak woodlands, as appropriate, using Return on Investment strategy. Any restoration activities will involve the evaluation of existing habitat and restoration methods through review of technical literature and NROC's Habitat Restoration and Enhancement Plan, discussions with specialists, and field trials.</p> <p>Spadefoot toad habitat enhancement (USGS) may be expanded after consultation with specialists. Such efforts may be coordinated with volunteers at Quail Hill.</p> <p>Maintain or revegetate unsuccessful sites seeded or planted in 2007 and 2008.</p> <p>Land manager may assist with additional cholla and prickly pear cactus salvage (if deemed appropriate) and restoration and will continue</p>
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maintenance, if necessary.

Land manager plans to initiate oak woodland restoration program on appropriate non-native habitats and within degraded woodlands.

Monitoring

Land manager will continue to work with USFW, NROC, and the County to obtain existing information on, and synthesize updated maps for NCCP-covered and other listed species as well as of the current distribution of key vegetation types.

Land Manager plans to continue to coordinate with NROC, USGS, CDFG, USFWS, County of Orange, and State Parks to implement habitat and species monitoring in the Southern Open Space.

Land manager may initiate a long term monitoring study targeted at evaluating passive recruitment in areas previously treated for invasive control and to evaluate the need for active restoration. Areas would include: North Laguna Canyon, 4-corners, Butterfly Valley, and SW Bommer Canyon. In addition, a mowing treatment on portions of some of the borders may be applied to evaluate its effect on recruitment.

Fire Management Activities		
Fire Management	Accomplished 2008	Proposed for 2009
<p>Maintenance of fuel breaks or fuel modification zones</p>	<p>Management A portion of the Serrano Ridge firebreak was regraded and widened by OCFA.</p> <p>Center lines of roads and trails were mowed to reduce fire risk from vehicles.</p>	<p>Management, Research & Monitoring In collaboration with City agencies, OCFA, transportation agencies, and academic partners, IRC will initiate an evaluation of wildland edges and internal localities for potential actions that may reduce fire ignitions (e.g., roadside barriers, fuel breaks, and removal of alien plants).</p> <p>Land manager will conduct fire modeling for San Joaquin Hills to identify ignition hotspots and fire bottlenecks where fuel modification may reduce fire spread. A similar analysis has been conducted by the Santa Monica National Recreation Association, who will be engaged as partners along with OCFA, UCLA, etc.</p>
<p>Fire Prevention: Irvine Ranch Conservancy Fire Watch Program</p>	<p>Management Trained, outfitted and deployed approximately 100 volunteers and staff to monitor "high risk" areas on the border of the wildlands. There were 10 "high risk" days in 2008 that required Fire Watch deployment. This program is performed in conjunction with the Greater Laguna Coast Fire Safe Council, Inter-Canyon League Fire Safe Council, Trabuco Canyon Defense Against Wildfire, Modjeska Canyon Fire Watch, and Orange County Fire Authority.</p>	<p>Management Deployment of volunteers and staff on Red Flag Alert days and or Santa Ana (Santana) wind conditions to deter fire ignition.</p> <p>Continued expansion of the "Fire Watch" program by increasing the number of trained volunteers and engaging the services of other volunteer organizations such as the CERT programs (Community Emergency Response Teams).</p>

Miscellaneous Activities and Management Programs		
Project	2008 Status	2009 Plan
Volunteer Program	<p>Management In 2008 the IRC recruited and trained volunteers both in the spring and in the fall.</p> <p>The Open Space Preserve South Volunteer Program currently consists of 141 trained volunteers.</p>	<p>Management IRC will continue to recruit and train new volunteers as needed.</p> <p>IRC will continue to expand the role of volunteers in the management and stewardship of the land.</p> <p>IRC will continue to supply volunteers with the necessary tools to be successful, knowledgeable and competent volunteers.</p> <p>IRC will offer volunteers new opportunities for training and continuing education.</p>
Scientific Research	<p>Research, Monitoring & Management Surveys for western pond turtles, western spadefoot toads, and removal of African clawed frog. Monitoring of created spadefoot toad breeding depressions (2006 project) in Bommer Canyon by USGS and Harmsworth Associates. Contact: Adam Backlin, USGS</p> <p>USGS study on San Joaquin Hills bobcat abundance, densities, habitat use, mortality, and connectivity completed. Final report is available upon request from TNC.</p> <p>Cactus Wren artificial nest structure: Thirteen artificial cholla were installed at six locations within the Irvine Open Space Preserve in summer 2008 to test their utility in providing</p>	<p>Research, Monitoring & Management All proposed projects summarized in this section will be developed as full proposals for review and will require COI approval, NCCP compliance, Wildlife Agencies', and NROC approvals as required.</p> <p>COI, as the landowner, will continue to review and support academic research projects that fit the goals of the NCCP/HCP and have received a research access permit approved by COI.</p> <p>A Pacific pocket mouse survey for San Joaquin Hills (collaboration with State Parks, USFWS, SDNHM) is planned for the Spring 2008. A portion of the COI wildlands will be surveyed.</p>

	<p>nesting habitat for cactus wren. Structures included two types of models: one of each was planted at each site. Structures have been and will continue to be surveyed for evidence of cactus wren nest construction.</p> <p>Approximately 200 cholla and 200 prickly pear joints were collected from roadside locations in the Open Space Preserve. They were planted in two degraded cactus scrub sites in Quail Hill, by Strawberry Farms, as a pilot study for a proposed larger restoration planting of cactus scrub for the declining Cactus Wren.</p> <p>A collaborative restoration study with Dr. K. Suding was initiated in November 2008 at Quail Hill. The study represents another replicate of similar plots established at other localities. The focus of this restoration study is to determine the extent of and factors important to the recruitment of seeded strips of species commonly found in native coastal sage scrub and grasslands. Implementation has been funded by IRC. The study is not in, but near to NCCP.</p>	<p>Human access management project studies will continue to be carried out or initiated by IRC Science including: camera trapping surveys for developing disturbance profiles and access landscapes, disturbance profile observational studies on target species, and unauthorized access benchmark assessments.</p> <p>A Cactus Wren artificial nest structure study will be initiated for the San Joaquin Hills in partnership with NROC, CDFG, and USFWS. This will involve field testing of artificial nest prototypes followed by placement of optimal structures in priority areas. The full proposal has been reviewed by the TAC.</p> <p>Initiation of small mammal monitoring surveys is planned for 2008.</p> <p>A mule deer population estimate for the San Joaquin Hills is planned for 2008, in collaboration with USFWS, CDFG, and USGS.</p> <p>Hotspots for Coast Horned Lizard road kills will be investigated to determine if road and trail closures may be warranted.</p> <p>Construction of white-tailed kite perching and nesting habitat within Southern Open Space is planned. Provisioning of perches may be initiated if deemed appropriate.</p> <p>The restoration study at Quail Hill established in November 2008 will be monitored in Spring 2009. Additional plants will be transplanted into the study</p>
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		<p>plots in February 2009. The study is not in, but near to NCCP.</p> <p>Based on results from initial artificial cactus planting, IRC plans to design, build, and install new prototype artificial cactus wren nesting structures for placement in existing cactus scrub patches. This pilot study will determine whether cactus wren use and show interest in any of the prototypes.</p>
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8.6 City of Newport Beach

NROC Annual Report 2008

City of Newport Beach Buck Gully

Recreation Use, Monitoring & Management:

Project, Program, Activity	2008 Status	2009 Work Plan
Fire Season Restricted Use	Access restricted during fire season.	Access likely to be restricted during fire season again.

Recreation Facility Construction & Maintenance:

Project	2008 Status	2009 Work Plan
Buck Gully Trail Improvements	Planned within RRMP in 2008.	If funding available and following permits, possible construction of recreational trail in Buck Gully.

Infrastructure Construction & Maintenance:

Project	2008 Status	2009 Work Plan
Maintenance of V-Ditches, Upper Gully area.	Debris cleared from V-ditches, includes trimming of brush that extends into the V-ditches.	More debris clearance from V-ditches planned for 2009, includes trimming of brush that extends into the V-ditches.
Water Quality, Erosion Protection near 5 th Ave (Lower Buck Gully).	Completed erosion control structure and water quality wetlands construction in 2008.	Limited maintenance on erosion control structure.

Habitat Restoration & Enhancement:

Project	Funding Source	2008 Status	2009 Work Plan
Some exotic plant eradication, habitat restoration in Lower Gully.	Proposition 13, Prop 40 grants.	Some habitat restored in conjunction with Erosion Control Structure	To be determined, based in part on funding, permitting, and approval of RRMP.

Fire Management Activities:

Fuel Treatment	Accomplished 2008	Proposed for 2009
Hazard Reduction – West Gully near Spyglass Hill	Minor hazard reduction activities (removal of dead & dying material between structures and 100’ from structures).	Continued hazard reduction where appropriate. City continues to study whether to incorporate residential properties adjacent to West Gully into Fuel Modification Zones, like the East Gully (Newport Coast).
Consideration of Fuel Management Ordinance	City Council discussed the adoption of a special fire clearance zone in Lower Buck Gully, and into the area south of 5 th and Poppy.	More discussion, possible adoption of new ordinance allowing more extensive fire clearance in 2009.

Miscellaneous Activities and Management Programs:

Project	2008 Status	2009 Plan
Recreation and Resource Management Plan (RRMP)	Completed draft of RRMP (Irvine Ranch Conservancy completed work under contract with the City).	Agency review, public review, and possible finalization of RRMP in mid-2009.
Basic Land Management activities.	Underway via IRC in 2008	Continuation in 2009.

8.7 University of California, Irvine

January 31, 2009

Ms. Lyndine McAfee, Executive Director
Nature Reserve of Orange County
15600 Sand Canyon Avenue
Irvine, California 92618

RE: Annual Report (2008) for the University of California, Irvine to the Nature Reserve of Orange County (NROC) for land enrolled in the Natural Community Conservation Plan (NCCP)

Dear Ms. McAfee:

This is the Sixth Annual Report submitted by The University of California, Irvine (UCI) to the Nature Reserve of Orange County. UCI has lands enrolled in the NCCP including an area on the North Campus that is a closed landfill, the 63 acre UCI Ecological Preserve on the main campus, and a strip adjacent the San Joaquin Hills Transportation Corridor (SR-73) along the southwestern campus edge from the UCI Ecological Preserve to the terminus of campus lands on the western side of Bison Drive. This report follows the general guidelines recommended by US Fish and Wildlife Service (USFWS) and California Department of Fish and Game (CDFG) (FWS/CDFG-OR-2257.5) where applicable, although these guidelines were intended for much larger areas with different use patterns.

To provide some background about the three areas that compose the UCI NROC lands, we wanted to mention a few features of our enrolled habitats that distinguish them from most of the other NROC lands. The landfill is an historic County landfill that was closed in 1960 and is fenced, posted, and closed to the public. The biological corridor (strip) along the San Joaquin Hills Transportation Corridor consists of a steep slope with no trails or public access. The UCI Ecological Preserve has a trail system and is open to the public. The UCI Office of the University of California Natural Reserve System manages it through the School of Biological Sciences, and UCI's Open Space Committee considers any special uses.

At present, a landfill gas recovery system (LGRS) is being installed on the landfill site to address potential methane migration, therefore no habitat restoration or other activities have occurred on the landfill site. The LGRS will likely operate for several years until such time as regulatory agencies determine that the system can be removed. UCI hopes to eventually pursue habitat restoration (creation) to produce coastal sage scrub and perhaps other native habitat to replace the ice plant cover that dominates this disturbed site. In addition to being an aesthetic upgrade, it would reduce erosion, and would provide habitat linkage along the San Joaquin Creek Corridor. UCI will seek partners in funding this endeavor, including the NROC. Significant and successful habitat restoration has occurred on the biological corridor adjacent the Toll Road. The Ecological Preserve has seen extensive habitat restoration efforts, as well as artichoke

eradication, and it is used for teaching and research. The Preserve is a treasured UCI asset, appreciated by the UCI and broader community.

Management strategy and conditions within UCI enrolled lands have remained the same during the past year and no changes are anticipated during 2009, thus, there is no need to provide work plans for the various categories of NROC concern (Recreation use, monitoring and management; recreation facility construction and maintenance; infrastructure construction and maintenance; habitat restoration and enhancement; fire management activities; and miscellaneous activities and management programs). The following summary addresses the issues identified in the USFWS/CDFG template where applicable to the three UCI areas of NROC:

I. Recreation Use, Monitoring and Management

Current Use Policies

- UCI Ecological Preserve: The UCI Ecological Preserve is open to the public, with five access points through walk-in gates. Access is permitted throughout the year, and the trail system is used by the University and surrounding community.
- Biological Corridor: There are no public access, trails or access points on the steep, narrow biological corridor adjacent the SR-73.
- Landfill: Public access is not allowed on the landfill on North Campus. The landfill is fenced and posted.

Proposed Recreation Monitoring

- UCI Ecological Preserve: The access gates are all linked to existing trails and the public stays on them. There is no need to monitor the trails in a formal way, however, if a new trail is detected, it will be closed. Special events are not permitted in the Ecological Preserve. The Open Space or Ecological Preserve Committee, Chaired by Dr. Peter Bowler considers any special uses.
- Biological Corridor and Landfill: This does not apply to the habitat strip along SR-73 or the landfill, neither of which has public access or use.

User Compliance Programs

- This does not apply to the UCI NROC areas. There has been occasional trespass from equestrians and joggers on the landfill. The landfill fencing is repaired and posting re-established following discovery of trespass damage. These areas are not patrolled on a regular basis and no citations have been given, although police reports are filed when fences are cut or other vandalism occurs.

Educational Programs/Outreach

- UCI Ecological Preserve: There are no special outreach or educational programs conducted on the relatively small (60 acre) UCI Ecological Preserve, though some University classes visit the site.
- Biological Corridor and Landfill: This does not apply to the strip along the SR-73 or the landfill on North Campus.

II. Recreation Facility Construction and Maintenance

Construction of New Recreational Facilities or Expansion of Existing Facilities

- This does not apply to UCI's three sites, none of which has existing or planned recreational facilities.

Maintenance of Existing Recreation Facilities

- This does not apply to UCI NPPC lands.

III. Infrastructure Construction and Maintenance

- Does not apply to UCI lands.

IV. Habitat Restoration and Enhancement

Proposed Landowner/Reserve Manager funded/coordinated restoration and enhancement activities

Exotic Plant Eradication

- UCI Ecological Preserve: Over the past ten years extensive artichoke eradication using sprayer-applied Roundup has reduced *Cynara cardunculus* from a severe problem to a minor one in the UCI Ecological Preserve. These efforts have been funded by grants and by the NROC/CDFG grants to The Nature Conservancy.
- Biological Corridor: The biological corridor restoration along SR-73 has been spot treated for artichoke each spring since the site's creation, and artichoke is not a problem.
- Landfill: The landfill has a dense population of ice plant, which should be eradicated as a part of future habitat restoration (creation).

Habitat Restoration/Revegetation

- UCI Ecological Preserve: Restoration has been underway on the UCI Ecological Preserve for many years. Several acres of sage scrub have been created, replacing dense artichoke. It is anticipated that additional sage scrub restoration will be undertaken in future years. There was no restoration activity during 2008.
- Biological Corridor: Nine acres of coastal sage scrub have been created in the biological corridor, and the primary activity on this strip along the 73 is spot treatment of artichoke when plants are discovered.
- Landfill: The University anticipates creating coastal sage scrub on the landfill, pending the completion of methane migration studies and securing funding to implement the restoration. Other potential plans will be addressed as the 2008 Long Range Development Plan is implemented in the future.

Proposed NROC funded restoration and enhancement activities

Exotic Plant Eradication

- UCI Ecological Preserve: The UCI Ecological Preserve has a black mustard problem, and UCI would like to work with the NROC in continued weed abatement on the Preserve. In addition, UCI would like to seek funding for artichoke eradication on areas adjacent to the Preserve to avoid reintroduction.
- Biological Corridor: Exotics are not a problem on the biological corridor strip at this time. If a problem emerges, treatment will be incorporated with other eradication efforts on the NCCP lands. It is hoped that the NROC will continue to assist in weed eradication efforts at UCI. UCI requires notification well in advance so that residents can be alerted and educated prior to application of herbicides.
- Landfill: The landfill has a large ice plant problem, and ice plant is the dominant vegetative cover. The ice plant will need to be eradicated prior to creation of coastal sage scrub and UCI would like to coordinate with the NROC on the entire process of exotic removal and creation of native habitat on the landfill.

Exotic Animal Control

- UCI Ecological Preserve and Biological Corridor: The primary potential exotic animal problem for the sage scrub habitats on the UCI Ecological Preserve and the biological corridor is the possible intrusion of brown-headed cowbirds. The TCA has conducted very effective cowbird removal using traps in the San Joaquin Marsh and Bonita Canyon. It is possible that feral cats could hunt these sites, but none have been seen. The exotic landsnail *Helix aspersa* escapes from irrigated landscaping into both of the sage scrub habitats, but in general this species does not do well far from wet habitats. The Spanish milk snail, *Otala lactea*, occurs on the UCI Ecological Preserve, but does not appear to be a significant problem at this time. This mollusk can tolerate much more xeric conditions than *H. aspersa*. Both of these exotic mollusks seem to inhabit microhabitats different from the native *Helminthoglypta tudiculjata* that is associated with sage scrub.
- Landfill: The Spanish milk snail has a very, very large population at the San Diego Creek facing side of the landfill and also on the top of the landfill where there are places where one cannot walk without crushing dozens of these exotic snails. Because there is no native habitat on the landfill, it is nearly devoid of animal life.

Proposed Restoration and Enhancement Activities Funded by Others

- At present there are no proposed exotic plant eradication, habitat/restoration, or exotic animal control programs planned during the next year through extra-mural funding.

Fire Management Activities

- UCI Ecological Preserve: The UCI Ecological Preserve is surrounded entirely by roads or landscaped areas. At present the eastern side abuts the recently developed Irvine Company Research Park, and there is a cleared break between the urban interface and the habitat. There is a cleared break of ca. 15-20 feet between the Ecological Reserve and University Hills, a faculty and staff housing development, that is heavily landscaped with green vegetation. Vegetation has been thinned 100 feet from structures to provide a defensible space zone in conformance with OCFA guidelines. The patchy nature of shrub fuel loads is such that mostly grass and herbaceous exotics abut the housing development. There are no proposed burns or other fuel management projects for the UCI Ecological Preserve.
- Biological Corridor: The CSS strip along the 73 lies between the Toll Road and parking lots, greatly reducing any threat a fire along this narrow strip might pose for structures. There is no proposed burn or fuel management proposal for the habitat strip along the Toll Road.
- Landfill: There is no fuel load at all on the ice plant covered/barren landfill.

Maintenance of Existing Fuel Breaks or Fuel Modification Zones

- This does not apply to UCI NCCP habitats, though a narrow zone along the University Hills facing edge is mowed or timed.

VI. Miscellaneous Activities and Management Programs


A list of the published and unpublished studies, including theses, undertaken at the UCI Ecological Preserve and the adjacent UCNRS San Joaquin Freshwater Marsh Reserve may be accessed at <http://nrs.ucop.edu/>. All research on the Preserve or other

campus lands must be reviewed and approved by the UCI Open Space Committee. The UCI 2008 Long Range Development Plan does not include an extension of California Drive through the UCI Ecological Preserve, which significantly enhances the long-term ecological integrity of the Preserve. During 2009, the University plans to remove an old barbed wire fence from the eastern side of the UCI Ecological Preserve, and a few native trees (*Quercus agrifolia*, *Heteromeles arbutifolia*, and *Sambucus mexicana*) will be planted in NCCP enrolled land below Housing Development Area 9 on the eastern edge of the Preserve.

Thank you for your consideration. If you have any questions regarding activities on UCI's NCCP sites, please do not hesitate to forward them to us.

Sincerely,

Wendell C. Brase
Vice Chancellor
Administrative and Business Services

A handwritten signature in cursive script that reads "Peter A. Bowler".

Peter A. Bowler
Department of Ecology and Evolutionary Biology

Cc.: Richard Demerjian, UCI Campus and Environmental Planning; Tim Bradley, Department of Ecology and Evolutionary Biology and UCI Natural Reserve System Campus Director; W. L. Bretz, Natural Reserve System Manager of the UCI Reserves

8.8 Transportation Corridor Agencies

NROC Annual Report 2008

Transportation Corridor Agencies

Recreation Use, Monitoring & Management:

Project, Program, Activity	2008 Status	2009 Work Plan
Siphon Reservoir	Spring Tour on burn recovery.	Spring Tour on burn recovery.
Limestone Canyon	None.	None.
Coyote Canyon Landfill	OC Land Stewards Tour	None.
Bonita Channel	Use of public trail; Annual Spring Tour; Conducted an onsite workshop for OC Teachers, and conducted a classroom workshop for the teachers using the Bonita Creek Interactive Classroom educational website posted at www.bonitacreekclassroom.com .	Use of public trail; Annual Spring Tour; Second annual onsite workshop for OC Teachers.

Recreation Facility Construction & Maintenance:

Project	2008 Status	2009 Work Plan
Siphon Reservoir	None.	None.
Limestone Canyon	None.	None.
Coyote Canyon Landfill	None.	None.

Bonita Channel	Trail maintenance to cut back saltbush along the public bike path	Trail maintenance to cut back saltbush along the public bike path
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Infrastructure Construction & Maintenance:

Project	2008 Status	2009 Work Plan
Siphon Reservoir	Erosion control in runoff basins and burn area.	Erosion control in runoff basins and burn area.
Limestone Canyon	None.	None.
Coyote Canyon Landfill	None.	None.
Bonita Channel	None.	None.

Transportation Corridor Agencies

Habitat Restoration & Enhancement:

Project	Funding Source	2008 Status	2009 Work Plan
Siphon Reservoir	TCA	Site burned in October 2007 fires. Conducted spot weeding for noxious exotic species only, and conducted photo documentation of habitat recovery from the fire. Protected runoff basins from sediment after the fire. Performed post-fire rare plant surveys in the spring and summer.	Monitor burn recovery and perform weeding as needed. Approximately 10 acres will be re-seeded in the fall of 2009.
Limestone Canyon	TCA	Vegetation monitoring. Site	Monitor burn recovery and perform weeding as

Coyote Canyon Landfill	GRS	burned in October 2007 fires. Site tour to inspect condition of the habitat.	necessary. None.
Bonita Channel	TCA	None.	Remove eucalyptus saplings along the northwest portion of the creek.

Fire Management Activities:

Fuel Treatment		Accomplished 2008	Proposed for 2009
Siphon Reservoir	None.		None.
Limestone Canyon	None.		None.
Coyote Canyon Landfill	None.		None.
Bonita Channel	None.		None.

Miscellaneous Activities and Management Programs:

Project		2008 Status	2009 Plan
Siphon Reservoir		Cowbird trapping.	Cowbird trapping.
Limestone Canyon		Cowbird trapping.	Cowbird trapping.
Coyote Canyon Landfill		None.	None.
Bonita Channel		None.	Develop a docent program for restoration sites and education programs.

8.9 Orange County Integrated Waste Management Department

**2008 ANNUAL COASTAL SAGE SCRUB
TAKE REPORT**

**COUNTY OF ORANGE
OC WASTE & RECYCLING
CENTRAL REGION**

**NATURAL COMMUNITY CONSERVATION PLAN
CENTRAL/COASTAL SUB REGION**



County of Orange-OC Waste & Recycling
February 3, 2009

**2008 ANNUAL COASTAL SAGE SCRUB
TAKE REPORT**

**COUNTY OF ORANGE
OC WASTE & RECYCLING
CENTRAL REGION**

**NATURAL COMMUNITY CONSERVATION PLAN
CENTRAL/COASTAL SUB REGION**

Submitted to:
Lyndine McAfee, Executive Director
Nature Reserve of Orange County
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Irvine, CA 92618

Prepared by:
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County of Orange-OC Waste & Recycling
February 3, 2009

TABLE OF CONTENTS

SECTION

PAGE

I	INTRODUCTION	1
II	LANDFILL FACILITIES	1
III	TAKE AUTHORIZATION	2
IV	2008 LANDFILL ACTIVITIES	3
V	2008 HABITAT RESTORATION AND ENHANCEMENT ACTIVITIES	4

TABLES

Table 1: Status of CSS Take at FRB Landfill, 1996-2008	4
Table 2: Habitat Management Site Matrix for FRB Landfill	6

FIGURES

Figure 1: Central and Coastal Sub region Landfill Locations	7
Figure 2: 2008 FRB Landfill Take Activities	8
Figure 3: Habitat Management Sites at FRB Landfill	9

SECTION I INTRODUCTION

The County of Orange, OC Waste & Recycling (formerly Integrated Waste Management Department) owns and operates three active solid waste landfills within Orange County; Frank R. Bowerman (FRB), Olinda Alpha and Prima Deshecha Landfills. OC Waste & Recycling is also responsible for the maintenance and monitoring of closed landfills within Orange County. This document represents the 2008 Annual Coastal Sage Scrub (CSS) Take Report for landfill operational and maintenance activities that occurred at the active Frank R. Bowerman (FRB) Landfill and two closed sites; Santiago Canyon and Coyote Canyon Landfills.

The NCCP/HCP Implementation Agreement and specific correspondence from the Nature Reserve of Orange County (NROC) requires participating landowners and agencies to develop an Annual Take Report that documents all activities associated with CSS take, identifies impacts to other identified target species, and provides accounting of remaining CSS acres for future activities. The purpose of the Annual Take Report is to confirm that all activities undertaken during the previous year are consistent with NCCP/HCP land use policies, and to ensure that the authorized take amount is not exceeded. The County of Orange is responsible for monitoring CSS take by each County department and then submitting this information to NROC in an annual report.

This 2008 Annual CSS Take Report:

- Provides a summary of all landfill infrastructure and landfill operations/maintenance activities that resulted in impacts to CSS and other identified target species covered by the NCCP/HCP;
- Provides an accounting of remaining authorized CSS take, based on impacts to CSS associated with infrastructure, operations and maintenance activities that occurred at the active FRB Landfill and the closed Santiago Canyon and Coyote Canyon Landfills during 2008 as a result of OC Waste & Recycling activities; and
- Documents ongoing maintenance and monitoring activities performed in 2008 by OC Waste & Recycling at existing habitat management sites at the FRB and Santiago Canyon Landfills. (The Transportation Corridor Agencies [TCA] is responsible for all habitat maintenance and monitoring activities at Coyote Canyon Landfill.)

SECTION II LANDFILL FACILITIES

FRB Landfill (active)

Owned and operated by OC Waste & Recycling, the FRB Landfill, located in unincorporated Orange County, north of the City of Irvine, is an active Class III landfill facility that is permitted to receive only municipal solid waste. The location of the FRB Landfill is shown on **Figure 1**. The landfill property boundary encompasses 725 acres, of which 341 acres are currently permitted for disposal. The landfill is currently permitted to accept a maximum daily tonnage of 11,500 tons per day. As of June 30, 2008, the landfill had a remaining airspace capacity estimated at 64.38 million cubic yards. The current permitted closure date for the landfill is in the year 2053.

Santiago Canyon Landfill (closed)

Owned, maintained and monitored by OC Waste & Recycling, the closed Santiago Canyon Landfill is located in unincorporated Orange County, east of the City of Orange, and west of Irvine Lake. The location of the closed Santiago Canyon Landfill is shown on **Figure 1**. The landfill encompasses approximately 112 acres, and accepted only municipal solid waste from 1968 – 2001. The Local Enforcement Agency (LEA) issued a closure permit on behalf of the California Integrated Waste Management Board (CIWMB) for

Santiago Canyon Landfill on November 22, 2005. OC Waste & Recycling is responsible for maintenance and monitoring of this facility in conformance with CIWMB, California Regional Water Quality Control Board (RWQCB), South Coast Air Quality Management District (SCAQMD) and LEA standards.

Coyote Canyon Landfill (closed)

Owned, maintained and monitored by OC Waste & Recycling, the closed Coyote Canyon Landfill is located in the City of Newport Beach, immediately south of the San Joaquin Hills Transportation Corridor, east of the San Joaquin Reservoir, and north of San Joaquin Hills Road. The location of the closed Coyote Canyon Landfill is shown on **Figure 1**. This landfill consists of three former fill areas that include the main, east and south canyons. The main canyon is located immediately west of Newport Coast Drive, and the east and south canyons are located immediately east of Newport Coast Drive. The landfill property boundary encompasses approximately 335 acres, and accepted only municipal solid waste from 1963-1990. OC Waste & Recycling is responsible monitoring at this facility in conformance with California Integrated Waste Management (CIWMB), Regional Water Quality Control Board (RWQCB), South Coast Air Quality Management District (SCAQMD) and Orange County's Local Enforcement Agency (LEA) regulatory standards. Gas collection, recovery and monitoring is performed by Gas Recovery Systems (GRS) under an assigned contract to OC Waste & Recycling by The Irvine Company (TIC). The TCA used portions of the landfill for CSS mitigation as a result of transportation corridor construction, and has sole responsibility for maintaining these mitigation areas.

SECTION III TAKE AUTHORIZATION

The FRB and Santiago Canyon Landfills are located in the Central Subregion NCCP/HCP Subarea and the Coyote Canyon Landfill is located in the Coastal Subregion NCCP/HCP Subarea. As a participating landowner subject to the terms and conditions set forth in the NCCP program and associated Implementation Agreement, the County of Orange is authorized for incidental take of CSS under the following three categories:

- (1) Incidental take related to permitted uses within the Reserve System,
- (2) Incidental take on land located within Special Linkage areas, and
- (3) Incidental take resulting from activities outside the Reserve System and Special Linkage areas.

The FRB, Santiago Canyon and Coyote Canyon Landfills are an "Existing Use" and a "Permitted Use" within the Reserve System pursuant to Section 5.11 of the NCCP/HCP which authorizes these facilities to operate as they have historically. Any new infrastructure must comply with the new infrastructure siting policies contained in Section 5.9 of the NCCP/HCP.

The initial CSS take authorized by the NCCP/HCP for OC Waste & Recycling was 66 acres for FRB and Santiago Canyon Landfills. An additional 15 acres of CSS take was added in 2004 for the FRB Landfill through the use of County of Orange CSS take authorization. Likewise, an additional 45 acres of County of Orange CSS take authorization were transferred to OC Waste & Recycling in 2006, and another 80 acres in 2008. As shown in **Table 1**, OC Waste & Recycling currently has a CSS take authorization of 96.96 acres.

SECTION IV 2008 LANDFILL ACTIVITIES

FRB Landfill (active)

Drainage 1

In preparation for the Landslide Backcut project construction, CSS vegetation needed to be removed for heavy equipment haul roads. Approximately 6.04 acres of CSS were impacted. Vegetation was removed in January 2008, prior to the start of the California gnatcatcher breeding season. All CSS vegetation removal was monitored by the site biologist Weena Dalby.

Landslide Backcut Project

Construction on the Landslide Backcut project began 2007 and continued through all of 2008. All CSS take for this project was documented in the 2007 CSS Take Report for FRB Landfill. Therefore, no additional CSS is to be reported for this project. **Figure 2** summarizes CSS take activities for 2008.

East Flank Landslide Geotechnical Drilling

Investigatory geotechnical drilling for the proposed East Flank Landslide stabilization project began in December 2008. Approximately six drilling locations are occurring within native vegetation comprised of coastal sage scrub. Three of these drilling locations are immediately off site on OC Parks property. Although the drilling may lightly impact small areas of CSS, the impacts will be reseeded and some individual CSS species are expected to resprout in time. These disturbed areas will also be monitored for weed control. Since the CSS impacts will be brief and temporary, impacts were not included in the CSS take table.

Santiago Canyon Landfill (closed)

OC Waste & Recycling activity at the closed Santiago Canyon Landfill consisted of routine post-closure maintenance and monitoring to ensure both landfill environmental control system and waste prism integrity. These routine post-closure maintenance and monitoring activities did not result in any take of CSS during 2008.

Coyote Canyon Landfill (closed)

OC Waste & Recycling activity at the closed Coyote Canyon Landfill consisted of routine post-closure maintenance and monitoring of the landfill cover to ensure both landfill environmental control system and waste prism integrity. These routine post-closure maintenance and monitoring activities did not result in any disturbance of CSS during 2008.

TABLE 1 – STATUS OF CSS TAKE AT FRB LANDFILL, 1996-2008

Infrastructure and Operations/Maintenance Activities			Authorized CSS Take		
Year of Take	Activity	Impact Acres	Authorized Acres of CSS Take (Initial 66 Ac., 1996)	Additional Acres of Authorized CSS Take	Total Remaining Acres of Authorized CSS Take
1996 to 2008 ACTIVITIES					
1996	No Activity	0.00	66.00	0.00	66.00
1997	No Activity	0.00	66.00	0.00	66.00
1998	Phase V-A Liner Project	16.50	66.00	0.00	49.50
1999	Phase V-B/C Liner Project	13.10	49.50	0.00	36.40
2000	No Activity	0.00	36.40	0.00	36.40
2001	Phase V-D	16.00	36.40	0.00	20.40
2002	Emergency Landslide Remediation	13.04	20.40	0.00	7.36
2003	Phase VII A	5.20	7.36	0.00	2.16
2003	Desilting Basin	2.40	2.16	0.00	-0.24
2004	County Take Authorization	0.00	-0.24	15.00	14.76
2004	Phase V-D Stockpile	1.19	14.76	0.00	13.57
2005	Phase VII-B	13.85	13.57	0.00	-0.28
2005	Canyon II Stockpile	1.56	-0.28	0.00	-1.84
2005	Fuel Modification Program	0.48	-1.84	0.00	-2.32
2006	No Activity	0.00	-2.32	45.00	42.68
2007	Landslide Backcut Project	19.68	42.68	0.00	23.00
2007	County Take Authorization	0.00	23.00	80.00	103.00
2008	Drainage 1	6.04	103.00	0.00	96.96
TOTAL CSS TAKE THROUGH 2008		0.00			
2008	Remaining County Take Authorization	0.00	96.96	0.00	96.96

SECTION V 2008 HABITAT RESTORATION AND ENHANCEMENT ACTIVITIES

FRB Landfill (active)

Ongoing maintenance occurred at two existing CSS mitigation sites and one riparian mitigation site at the FRB Landfill. The CSS mitigation sites include the Bee Canyon Access Road, and Desilting Basin. The riparian site is the West Channel mitigation site. OC Waste & Recycling submitted annual monitoring reports for each of these habitat mitigation sites to both the U.S. Fish and Wildlife Service and NROC, at varying times throughout 2008. Due to the Santiago Fire that burned the Bee Canyon Access Road, Desilting Basin,

and West Channel, U.S. Fish and Wildlife and California Department of Fish and Game excused the submission of 2007 annual reports for these mitigation sites.

The monitoring period for the Front Face, Phase V-D, and Phase VII-A mitigation sites ended in 2008. No further reports will be submitted for these three sites. **Figure 3** shows the locations of all existing mitigation sites at the FRB Landfill. The status of all habitat management sites is detailed in **Table 2**.

For the CSS habitat management sites, OC Waste & Recycling will strive to accomplish the following qualitative goals:

- Be consistent with existing native surroundings with regard to plant species composition;
- Establish vegetative cover that provides habitat for the California gnatcatcher;
- Achieve 75 percent CSS plant species coverage.

To achieve these goals, maintenance is required that may include but not be limited to the following activities:

- (1) Herbivore and erosion control,
- (2) Weed removal,
- (3) Supplemental planting,
- (4) Seeding, and
- (5) Irrigation, if necessary.

As required by the NCCP/HCP, no CSS vegetation shall be disturbed during the gnatcatcher nesting season occurring February 15 through July 15 of each year. Special care must be taken during weed removal to avoid disturbing nesting birds throughout the nesting season.

The Bee Canyon Access Road CSS mitigation site and the West Channel riparian mitigation site were initiated by OC Waste & Recycling prior to the establishment of the NCCP/HCP. Therefore, mitigation requirements and restoration goals for these sites are specific to individual permits.

OC Waste & Recycling has a Biological Resources Monitor (BRM) at FRB Landfill. The BRM is responsible for monitoring and overseeing maintenance performed Habitat Restoration Sciences (HRS) on all FRB and Santiago Canyon Landfill habitat mitigation sites. HRS employs a dedicated labor force that performs maintenance (i.e., weeding, intermittent watering, litter removal) at biological mitigation sites located OC Waste & Recycling Central Region landfills. The continued maintenance by HRS and OC Waste & Recycling staff is expected to increase the success of these sites.

Intermediate Mariposa Lily and Many-stemmed Dudleya Mitigation Program

OC Waste & Recycling implemented an Intermediate Mariposa Lily (IML) mitigation program at the FRB Landfill, beginning in 2004. The purpose of the program is to collect IML seeds and transplant IML bulbs, for those plants located within the future disturbance limits for the landfill operation. Of the 297 harvested IML bulbs, 234 were successfully transplanted to previously approved on-site receptor locations in 2004. The remainder the harvested IML bulbs, along with the collected seed were sent to Tree of Life nursery for propagation and experimentation. IML seeds will continue to be propagated and bulbs will be transplanted to previously approved on-site receptor locations.

A program similar to the IML mitigation program was initiated with Many-stemmed Dudleyas. The purpose of the program is to transplant dudleya corms and successfully establish 555 plants in advance of disturbance from landfill operations.

**TABLE 2 – HABITAT MANAGEMENT SITE MATRIX
for FRB LANDFILL**

Mitigation Site	Installation Year	Impacts	Restoration Activity	Status
Bee Canyon Access Road Mitigation Site	1996	<u>Desilting Basins @ Santiago Canyon</u> ¹ Coastal Sage Scrub: 4.5 Ac. <u>Phase IV-C Liner</u> ¹ Coastal Sage Scrub: 3.7 Ac.	Coastal Sage Scrub: 9 Ac.	Maintenance and monitoring period: Year 12., Requested buy-off in 2008.
West Channel Mitigation Site	1997	<u>West Channel Construction</u> ² Riparian Scrub: 0.42 Ac. Sycamore Woodland: 0.40 Ac. Oak Woodland: 0.49 Ac.	Riparian Scrub: 0.14 Ac.; Sycamore Woodland: 1.31 Ac.; Oak Woodland: 0.84 Ac.; Coastal Sage Scrub: 0.41 Ac.	Recovering from Santiago Fire. Requesting buy-off in 2009
Phase V-D Mitigation Site	2002	<u>Phase V-D Construction</u> ³ Coastal Sage Scrub: 16 Ac.	Coastal Sage Scrub: 10.8 Ac.	Completed; a final annual report was submitted in 2007.
Front Face Mitigation Site	2002	<u>Emergency Landslide Repair</u> ³ Coastal Sage Scrub: 13.04 Ac.	Coastal Sage Scrub: 12.3 Ac.	Completed; a final annual report was submitted in 2008.
Desilting Basin Mitigation Site	2004	<u>Desilting Basin Construction</u> ³ Coastal Sage Scrub: 2.4 Ac.	Coastal Sage Scrub: 2.4 Ac.	Maintenance and monitoring period: Year 4. Replanted plants burned in the Santiago Fire
Phase VII-A Mitigation Site	2004	<u>Phase VII-A Construction</u> ³ Coastal Sage Scrub: 5.2 Ac. <u>V-D Stockpile</u> ³ 1.19 Ac.	Coastal Sage Scrub: 4.3 Ac.	Completed; a final annual report was submitted in 2007
Intermediate Mariposa Lily	2004	<u>Phase VII-B/Phase VIII</u> 315 Intermediate Mariposa Lilies	Establish 45 flowering Intermediate Mariposa Lilies	Maintenance and monitoring period: Year 4
Many-stemmed Dudleya	2007	<u>Phase VII</u> 1,850 Many-stemmed Dudleya corms	Establish 555 Many-stemmed Dudleya plants	Maintenance and monitoring period: Year 2

- 1) Performed under Interim Habitat Loss Mitigation Plan (IHLMP) and not subject to use of CSS take authorization
- 2) The West Channel Mitigation Site was must comply with requirements set forth in the following U.S. Army Corps of Engineers (ACOE) and California Department of Fish and Game (CDFG) permits:
 - 404 Permit No. 96-00159-LTM
 - 1601 Streambed Alteration Agreement 5-055-96
- 3) These acres of impacted CSS were authorized with OC Waste & Recycling Central-Coastal NCCP take authorization, and thus, no further mitigation was required. However, in a good faith effort to enhance the habitat value of temporary slopes, and to prevent an infestation of invasive weeds, OC Waste & Recycling voluntarily utilized the CSS duff material harvested at these project sites for implementation of CSS habitat restoration.

Santiago Canyon Landfill (closed)

OC Waste & Recycling does not maintain any CSS mitigation sites at the Santiago Canyon Landfill. Side slopes of this landfill have been hydrosseeded with a CSS seed mix, with the intention of pre-mitigation credits. The vegetation is currently being maintained for weed control and slope protection/erosion control measures.

Coyote Canyon Landfill (closed)

OC Waste & Recycling does not maintain any CSS mitigation sites at the Coyote Canyon Landfill. As stated previously, the TCA used portions of the landfill for CSS mitigation as a result of transportation corridor construction, and has sole responsibility
Please see Appendix A for the full IWMD report, which is attached under separate cover.

2009 ANNUAL WORK PROGRAM

**COUNTY OF ORANGE
INTEGRATED WASTE MANAGEMENT DEPARTMENT
CENTRAL REGION**

**NATURAL COMMUNITY CONSERVATION PLAN
CENTRAL/COASTAL SUB REGION**



County of Orange-OC Waste & Recycling
February 3, 2009

2009 ANNUAL WORK PROGRAM

**COUNTY OF ORANGE
OC WASTE & RECYCLING
CENTRAL REGION**

**NATURAL COMMUNITY CONSERVATION PLAN
CENTRAL/COASTAL SUB REGION**

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County of Orange-OC Waste & Recycling
February 3, 2009

TABLE OF CONTENTS

<u>SECTION</u>	<u>Page</u>
I INTRODUCTION	1
II LANDFILL FACILITIES	1
III TAKE AUTHORIZATION	2
IV ANTICIPATED 2009 TAKE	3
V HABITAT MANAGEMENT SITES	4

TABLES

Table 1: Status of CSS Take at FRB Landfill – 1996 Through Planned 2009 Activities	4
Table 2: Habitat Management Site Matrix for FRB Landfill	6

FIGURES

Figure 1: Central and Coastal Subregion Landfill Locations	8
Figure 2: 2009 FRB Landfill Take Activities	9
Figure 3: Habitat Management Sites at FRB Landfill	10

SECTION I INTRODUCTION

The County of Orange, OC Waste & Recycling (formerly Integrated Waste Management Department) owns and operates three active solid waste landfills within Orange County: Frank R. Bowerman (FRB), Olinda Alpha and Prima Deshecha Landfills. OC Waste & Recycling is also responsible for the maintenance and monitoring of closed landfills within Orange County. This document represents the 2008 Annual Work Program for landfill operational and maintenance activities that are planned to occur at the active Frank R. Bowerman (FRB) Landfill and the two closed Santiago Canyon and Coyote Canyon Landfills. The Coyote Canyon Landfill is owned by the Irvine Company, with postclosure maintenance performed by OC Waste & Recycling. These three landfills are within the planning area boundary for the Natural Community Conservation Plan/Habitat Conservation Plan (NCCP/HCP) for the Central and Coastal Subregion.

The NCCP/HCP Implementation Agreement and specific correspondence from the Nature Reserve of Orange County (NROC), requires participating landowners and agencies to develop an annual work program that documents all activities for the upcoming year associated with coastal sage scrub (CSS) take, identifies impacts to other identified target species, and provides accounting of remaining CSS acres for future activities. The purpose of the annual work program is to confirm that all activities undertaken during the upcoming year are consistent with NCCP/HCP land use policies, and to ensure that the authorized take amount is not exceeded. The County of Orange is responsible for monitoring CSS take by each County department and then submitting this information to NROC in an annual report.

This 2009 annual work program provides the following:

- A summary of all landfill infrastructure and landfill operations/maintenance activities that will likely result in impacts to CSS and other target species covered by the NCCP/HCP;
- An accounting of remaining authorized CSS take, based on impacts to CSS associated with infrastructure, operations and maintenance activities that occur at the active FRB Landfill and the closed Santiago Canyon and Coyote Canyon Landfills during 2009;
- Ongoing maintenance that will be performed in 2009 by OC Waste & Recycling at existing FRB Landfill habitat mitigation site and potential Santiago Canyon Landfill habitat pre-mitigation site.

SECTION II LANDFILL FACILITIES

FRB Landfill (active)

Owned and operated by OC Waste & Recycling, the FRB Landfill, located in unincorporated Orange County, north of the City of Irvine, is an active Class III landfill facility that is permitted to receive only municipal solid waste. The location of the FRB Landfill is shown on **Figure 1**. The landfill property boundary encompasses 725 acres, of which 341 acres are currently permitted for disposal. The landfill is currently permitted to accept a maximum daily tonnage of 11,500 tons per day. As of June 30, 2008, the landfill had a remaining airspace capacity estimated at 64.38 million cubic yards. The current permitted closure date for the landfill is in the year 2053.

Santiago Canyon Landfill (closed)

Owned, maintained and monitored by OC Waste & Recycling, the closed Santiago Canyon Landfill is located in unincorporated Orange County, east of the City of Orange, and west of Irvine Lake. The location of the closed Santiago Canyon Landfill is shown on **Figure 1**. The landfill encompasses approximately 112 acres, and accepted only municipal solid waste from 1968 – 2001. The Local Enforcement Agency (LEA) issued a closure permit on behalf of the California Integrated Waste Management Board (CIWMB) for Santiago Canyon Landfill on November 22, 2005. OC Waste & Recycling provides maintenance and monitoring of this facility in conformance with CIWMB, California Regional Water Quality Control Board (RWQCB), South Coast Air Quality Management District (SCAQMD) and LEA standards.

Coyote Canyon Landfill (closed)

Owned by The Irvine Company (TIC), the closed Coyote Canyon Landfill is located in the City of Newport Beach, immediately south of the San Joaquin Hills Transportation Corridor, east of the San Joaquin Reservoir, and north of San Joaquin Hills Road. The location of the closed Coyote Canyon Landfill is shown on **Figure 1**. This landfill consists of three former fill areas that include the main, east and south canyons. The main canyon is located immediately west of Newport Coast Drive, and the east and south canyons are located immediately east of Newport Coast Drive. The site encompasses approximately 335 acres, and accepted only municipal solid waste from 1963-1990. OC Waste & Recycling is responsible for monitoring landfill cover maintenance and groundwater monitoring at the site. Gas collection, recovery and monitoring are performed by Gas Recovery Systems (GRS) under contract with TIC. The Transportation Corridor Agencies (TCA) used portions of the landfill for CSS mitigation as a result of transportation corridor construction, and has sole responsibility for maintaining these mitigation areas.

SECTION III TAKE AUTHORIZATION

The FRB and Santiago Canyon Landfills are located in the Central Subregion NCCP/HCP Subarea and the Coyote Canyon Landfill is located in the Coastal Subregion NCCP/HCP Subarea. As a participating landowner subject to the terms and conditions set forth in the NCCP program and associated Implementation Agreement, the County of Orange is authorized for incidental take of CSS under the following three categories:

- (1) Incidental take related to permitted uses within the Reserve System,
- (2) Incidental take on land located within Special Linkage areas, and
- (3) Incidental take resulting from activities outside the Reserve System and Special Linkage areas.

The FRB, Santiago Canyon and Coyote Canyon Landfills are an “Existing Use” and a “Permitted Use” within the Reserve System pursuant to Section 5.11 of the NCCP/HCP which authorizes these facilities to operate as they have historically. Any new infrastructure must comply with the new infrastructure siting policies contained in Section 5.9 of the NCCP/HCP.

The initial CSS take authorized by the NCCP/HCP for OC Waste & Recycling was 66 acres for FRB and Santiago Canyon Landfills. An additional 15 acres of CSS take was added in 2004 for the FRB Landfill through the use of County of Orange CSS take authorization. Likewise, an additional 45 acres of County of Orange CSS take authorization were transferred to IWMD in 2006, and another 80 acres in 2007. As shown in **Table 1**, IWMD currently, has a CSS take authorization of 96.96 acres.

SECTION IV ANTICIPATED 200 TAKE

FRB Landfill (active)

Construction and/or operational activity anticipated for 2009 would result in approximately 6.04 acres of CSS take at the FRB Landfill. The take would occur in the northern portion of the landfill as shown on **Figure 2**.

Santiago Canyon Landfill (closed)

OC Waste & Recycling activity at the closed Santiago Canyon Landfill will consist of routine post-closure maintenance and monitoring to ensure both landfill environmental control system and waste prism integrity. These routine post-closure maintenance and monitoring activities are not anticipated to result in any disturbance or take of CSS during 2009.

Coyote Canyon Landfill (closed)

OC Waste & Recycling activity at the closed Coyote Canyon Landfill will consist of routine post-closure maintenance and monitoring to ensure both landfill environmental control system and waste prism integrity. These routine post-closure maintenance and monitoring activities are not anticipated to result in any disturbance or take of CSS during 2009.

As a result of this use of CSS take authorization, OC Waste & Recycling will have a remaining balance of 96.96 acres as shown in **Table 1**.

**TABLE 1
STATUS OF CSS TAKE AT FRB LANDFILL
1996 THROUGH PLANNED 2009 ACTIVITIES**

Infrastructure and Operations/Maintenance Activities			Authorized CSS Take		
Year of Take	Activity	Impact Acres	Authorized Acres of CSS Take (Initial 66 Ac., 1996)	Additional Acres of Authorized CSS Take	Total Remaining Acres of Authorized CSS Take
1996 to 2007 ACTIVITIES					
1996	No Activity	0.00	66.00	0.00	66.00
1997	No Activity	0.00	66.00	0.00	66.00
1998	Phase V-A Liner Project	16.50	66.00	0.00	49.50

1999	Phase V-B/C Liner Project	13.10	49.50	0.00	36.40
2000	No Activity	0.00	36.40	0.00	36.40
2001	Phase V-D	16.00	36.40	0.00	20.40
2002	Emergency Landslide Remediation	13.04	20.40	0.00	7.36
2003	Phase VII A	5.20	7.36	0.00	2.16
2003	Desilting Basin	2.40	2.16	0.00	-0.24
2004	County Transfer of Take Authorization	0.00	-0.24	15.00	14.76
2004	Phase V-D Stockpile	1.19	14.76	0.00	13.57
2005	Phase VII-B	13.85	13.57	0.00	-0.28
2005	Canyon II Stockpile	1.56	-0.28	0.00	-1.84
2005	Fuel Modification Program	0.48	-1.84	0.00	-2.32
2006	No Activity	0.00	-2.32	0.00	-2.32
2006	County Transfer of Take Authorization	0.00	-2.32	45.00	42.68
2007	Landslide Backcut Project	19.68	19.68	0.00	23.00
2007	County Transfer of Take Authorization	0.00	23.00	80.00	103.00
2008	Drainage 1	6.04	103.00	0.00	96.96
PLANNED 2009 ACTIVITIES					
2009	No Planned Activity	.000	0.00	0.00	96.96

SECTION V HABITAT MANAGEMENT SITES

FRB Landfill (active)

Ongoing maintenance will continue at two existing CSS mitigation sites and one riparian mitigation site at the FRB Landfill. The CSS mitigation sites include the Bee Canyon Access Road, and Desilting Basin. The riparian site is the West Channel mitigation site. OC Waste & Recycling is required, and will continue to prepare annual monitoring reports for these habitat mitigation sites, which will be submitted to both the U.S. Fish and Wildlife Service and NROC at varying times throughout 2009. OC Waste & Recycling expects to complete the Bee Canyon Access Road and West Channel mitigation sites this year. The location of existing habitat management sites at the FRB Landfill are shown on **Figure 3**. The status of all of these habitat management sites are specifically detailed in **Table 2**.

For the CSS habitat management sites, the CSS within the site must accomplish the following qualitative goals:

- Be consistent with existing native surroundings with regard to plant species composition;
- Establish vegetative cover that provides habitat for the California gnatcatcher;

- Achieve 75 percent CSS plant species coverage.

To achieve these goals, maintenance is required that may include but not be limited to the following activities:

- (1) Herbivore and erosion control,
- (2) Weed removal,
- (3) Supplemental planting,
- (4) Seeding, and
- (5) Irrigation, if necessary.

As required by the NCCP/HCP, no CSS vegetation will be disturbed during the gnatcatcher nesting season occurring February 15 through July 15 of each year. Special care will be taken during weed removal to avoid disturbing nesting birds throughout the nesting season.

The Bee Canyon Access Road CSS mitigation site and the West Channel riparian mitigation site were initiated by OC Waste & Recycling prior to the establishment of the NCCP/HCP. Therefore, the mitigation requirements and restoration goals for these sites are specific to the individual permits. These requirements and restoration goals are delineated in **Table 2**.

OC Waste & Recycling has a Biological Resources Monitor (BRM) at the FRB Landfill. The BRM is responsible for monitoring and overseeing maintenance performed by Habitat Restoration Sciences (HRS) on all FRB and Santiago Canyon Landfill habitat mitigation sites. HRS employs a dedicated labor force that performs maintenance (i.e., weeding, intermittent watering, litter removal) at biological mitigation sites located at OC Waste & Recycling Central Region landfills. The continued maintenance by HRS and OC Waste & Recycling staff is expected to increase the success of these sites.

Intermediate Mariposa Lily and Many-stemmed Dudleya Mitigation Program

OC Waste & Recycling implemented an Intermediate Mariposa Lily (IML) mitigation program at the FRB Landfill, beginning in 2004. The purpose of the program is to collect IML seeds and transplant IML bulbs, for those plants located within the future disturbance limits for the landfill operation. Of the 297 harvested IML bulbs, 234 were successfully transplanted to previously approved on-site receptor locations in 2004. The remainder the harvested IML bulbs, along with the collected seed were sent to Tree of Life nursery for propagation and experimentation. IML seeds will continue to be propagated and bulbs will be transplanted to previously approved on-site receptor locations.

A program similar to the IML mitigation program was initiated with Many-stemmed Dudleyas. The purpose of the program is to transplant dudleya corms and successfully establish 555 plants in advance of disturbance from landfill operations.

**TABLE 2 – HABITAT MANAGEMENT SITE MATRIX
for FRB LANDFILL**

Mitigation Site	Installation Year	Impacts	Restoration Activity	Status
Bee Canyon Access Road Mitigation Site *	1996	<u>Desilting Basins @ Santiago Canyon</u> Coastal Sage Scrub: 4.5 Ac. <u>Phase IV-C Liner</u> Coastal Sage Scrub: 3.7 Ac.	Coastal Sage Scrub: 9 Ac. Riparian Scrub: 0.14 Ac.	Maintenance and monitoring period: Year 12. Partially burned in October 2007 Santiago Wildfire.
West Channel Mitigation Site	1997	<u>West Channel Construction</u> Riparian Scrub: 0.42 Ac. Sycamore Woodland: 0.40 Ac. Oak Woodland: 0.49 Ac.	Sycamore Woodland: 1.31 Ac. Oak Woodland: 0.84 Ac. Coastal Sage Scrub: 0.41 Ac.	Maintenance and monitoring period: Year 11. Partially burned in October 2007 Santiago Wildfire.
Desilting Basin Mitigation Site	2004	<u>Desilting Basin Construction</u> Coastal Sage Scrub: 2.4 Ac.	Coastal Sage Scrub: 2.4 Ac.	Maintenance and monitoring period: Year 4. Partially burned in October 2007 Santiago Wildfire.
Intermediate Mariposa Lily Mitigation Site	2004	<u>Phase VII-B/Phase VIII</u> 315 Intermediate Mariposa Lilies	Establish 45 successfully flowering Intermediate Mariposa Lilies	Maintenance and monitoring period: Year 4. Partially burned in October 2007 Santiago Wildfire.
Many-stemmed Dudleya	2007	<u>Phase VII</u> 1,850 Many-stemmed Dudleya corms	Establish 555 Many-stemmed Dudleya plants	Maintenance and monitoring period: Year 2

* Performed under Interim Habitat Loss Mitigation Plan (IHLMP) and not subject to use of CSS take authorization

Santiago Canyon Landfill (closed)

OC Waste & Recycling does not maintain any CSS mitigation sites at the Santiago Canyon Landfill. Side slopes of this landfill have been hydroseeded with a CSS seed

mix, with the intention of pre-mitigation credits. The vegetation is currently being maintained for weed control and slope protection/erosion control measures.

Coyote Canyon Landfill (closed)

OC Waste & Recycling does not maintain any CSS mitigation sites at the Coyote Canyon Landfill. As stated previously, The Transportation Corridor Agencies (TCA) used portions of the landfill for CSS mitigation as a result of transportation corridor construction, and has sole responsibility for maintaining these mitigation areas.

9.0 CONCLUSION

The many and varied activities being conducted in the Nature Reserve of Orange County reserve system not only serve to protect, preserve and enhance native habitat and wildlife, but also provide an opportunity for the public to enjoy and learn about our natural resources.