5 Biological Resources

Biological resources, both flora and fauna, have been the focus of local, state, and federal protection efforts for more than four decades. Within the RCW, these efforts have been consolidated and focused into two initiatives: City of San Diego Multiple Species Conservation Plan and the MCAS Miramar Integrated Natural Resource Management Plan. Both programs are focused on providing protections to habitats that provide food and shelter to umbrella Threatened or Endangered species. In some cases the focus of habitat protection includes specific legal protections, such as the no net loss of wetlands. As such, not all habitats and associated species of flora and fauna are provided the same level of protection from these programs. This leaves room for additional protections to be added from ecological and watershed management perspectives. The following section describes these programs and the resources they are striving to protect and conserve.

5.1 Planning Efforts

Multiple Species Conservation Plan: The Multiple Species Conservation Program (MSCP) is a comprehensive habitat conservation program for southwestern San Diego County. The MSCP is intended to preserve a network of open space and habitats for protecting biodiversity and enhancing the region's quality of life. Economic benefits should also be realized by the reduction of constraints on future development and the decrease in costs for compliance with federal and state laws protecting biological resources. Many entities have cooperatively participated in the development of the MSCP including the City of San Diego, wildlife agencies, special districts, property owners and representatives of the development industry. The MSCP was created to preserve native vegetation and meet the habitat needs for multiple species rather than focusing on individual species. Sensitive biological resources are typically abundant within the core areas, which if lost or fragmented, could not be replaced or mitigated elsewhere. A component of the MSCP was the Biological Core and Linkage Areas (BCLA), which were developed to prioritize preservation and to maximize the conservation value of the preserve to efficiently use funds and to identify less environmentally valuable land for development (Figure 5-1). The MSCP was developed in 1996 and has yet to be updated. The current status of the MSCP within the RCW is based on the 1996 data with some areas being changed due to land acquisition, jurisdiction and development.

Within the RCW, 2,138 acres have been identified as BCLAs or 9% of the entire watershed. University and Clairemont Mesa each have over 20% of their area as a Biological Core (Table 5-1). MCAS

Miramar does not participate in the MSCP but instead has its own conservation plan as described later in this section. According to the data, there are no Linkage Areas within the boundaries of the watershed.

Table 5-1: Multiple Species Conservation Plan (MSCP) Biological Core & Linkage Areas

BCLA	Clairemont Mesa	Kearny Mesa	La Jolla	MCAS Miramar	Mira Mesa	Mission Bay Park	Pacific Beach	Scripps Miramar Ranch	University City	Totals
Core Resource Areas	635	112			14			117	1,260	2,138
Outside BCLA	2,405	757	823	12,201	71	53	522	705	3,754	21,290
Totals	3,040	869	823	12,201	85	53	522	821	5,014	23,428
Percent of the community within the BCLA	21%	13%	0%	0%	17%	0%	0%	14%	25%	9%

Figure 5-1: MSCP Biological Core & Linkage Areas

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As the MSCP program evolved the BCLAs were refined, augmented, and prioritized. The resulting targeted conservation areas were termed Multiple Habitat Planning Areas (MHPA) and are the areas in which preserves will be assembled and managed for their biological resources. The MHPA were designed to act as formal guidance for the construction of the MSCP preserve system as a partnership with the U.S. Fish and Wildlife Service and the California Department of Fish and Game. Military property and some special districts are being planned separately. MHPAs are defined by both physical area with mapped boundaries for conservation, as well as areas with quantitative criteria for conservation of vegetation communities tied to criteria for preservation design (Figure 5-2).

Six percent of the RCW is occupied by a MHPA (Table 5-2), with all of the communities (except MCAS Miramar and Mission Bay Park) contributing. The size and location of Mission Bay Park limits its contribution to the overall preservation of the watershed. The communities of University, Scripps Miramar Ranch and Clairemont Mesa hold the highest acreage of MHPA within the watershed with Clairemont Mesa having 363 acres, Scripps Miramar Ranch having 431 acres, and University having 473 acres. Although University boasts the highest acreage of land within the MHPA, its percentage relative to its community plan area is only 8% compared to Clairemont Mesa at 12% and Scripps Miramar Ranch at 47%. The undeveloped land associated with Rose Canyon and San Clemente Canyon make up most of the MHPA within University and Clairemont Mesa. As mentioned previously, the planned land use dataset shows 222 acres of the MHPA in Scripps Miramar Ranch as being slated to be converted to a junkyard / landfill.

Table 5-2: MSCP Multiple Habitat Planning Areas

MHPA (Percent)	Clairemont Mesa	Kearny Mesa	La Jolla	MCAS Miramar	Mira Mesa	Mission Bay Park	Pacific Beach	Scripps Miramar Ranch	University City	Totals
Outside MHPA	2,677	840	603	12,201	85	53	515	390	4,542	21,905
75			120				1	43	32	195
94	363	29	101				6	388	441	1,327
Totals	3,040	869	823	12,201	85	53	522	821	5,014	23,428

Integrated Natural Resource Management Plan: MCAS Miramar is implementing its own habitat management efforts through its Integrated Natural Resource Management Plan. The purpose of the INRMP is to integrate MCAS Miramar's land use needs (in support of the military mission) with the management and conservation of natural resources. The INRMP establishes MCAS Miramar's

approach and guidelines in relation to natural resources to accomplish its mission. The INRMP summarizes the baseline information which ensures compliance with regulatory and planning processes such as those by the National Environmental Policy Act, Endangered Species Act (ESA) and the Clean Water Act. The INRMP also fulfills other responsibilities with regards to the Department of Defense (DOD) and Marine Corps Policies and legal requirements regarding natural resource planning.

The INRMP is intended to be a technical document to be used by persons planning and/or preparing MCAS Miramar approvals, management actions, instructions, guidelines as well as the integration of natural resource issues. MCAS Miramar's overall strategy for conservation and management is to limit activities; avoid conflicting development; perform mitigation actions in areas supporting high densities of vernal pools and other wetlands, threatened or endangered species. Regardless of sensitivity, all of MCAS Miramar is subject to natural resource management and conservation. The station uses the concept of Management Areas to aid in the management and conservation of its resources. Management Area delineations define the distribution of regulated and sensitive natural resources on MCAS Miramar warranting special attention. The entire land area has been placed into Management Areas (Figure 5-3). These five Management Areas fall within the boundaries of the RCW study area. Level I (2,625 acres) target vernal pools, Level II (1,352 acres) targets non-vernal pool threatened and endangered species, Level III (1,159 acres) targets riparian areas, wetlands and movement corridors. Level IV (4,999 acres) encompasses the remaining undeveloped areas and Level V (2,483 acres) includes the developed areas. Currently the INRMP management areas are in the process of revision as is the entire document. The management area boundaries are being changed to reflect new information and developments. The revised INRMP is scheduled to be completed in the Fall of 2005 and will display new Management Area boundaries.

Mitigation is used to lessen adverse effects of a project that may cause impacts to natural resources. Mitigation can include avoiding the impact altogether; limiting the magnitude of the action; repairing; rehabilitating or; restoring the affected resources. Other types of mitigation can include reducing or eliminating the effect over time by conservation and maintenance operations during the course of the action and/or compensating for the effect by providing substitute resources or environments. On MCAS Miramar, one typical form of mitigation is the restoration or revegetation of disturbed areas for creating additional habitat for sensitive species such as the California Gnatcatcher. Regulatory

agency approval of restoration/mitigation plans is usually required as a condition of the Endangered Species Act and Clean Water Act permit approvals. Techniques used to restore disturbed areas can also include the use of herbicide, planting of container stock, soil mitigation, hand seeding, irrigation, prescribed burning and imprinting. The use of Management Area designations will be given careful consideration when siting proposed actions and potential compensation for mitigation. As part of MCAS Miramar's ongoing efforts to avoid and/or minimize impacts on sensitive species, vernal pools, other wetlands and habitat linkages, first consideration will be given to the use of Management Area Level V, the Level IV. This will assist planners in avoiding areas supporting the existing resources in Level I, II and III (Figure 5-3).

Within MCAS Miramar, there are ten species of plants and wildlife receiving federal protection under the Endangered Species Act. Six species protected by the ESA are present in vernal pools. A large portion of the known vernal pools remaining in San Diego County are within the station boundaries. At a minimum, MCAS Miramar supports eight species of amphibians, twenty-one species of reptiles and thirty-one species of mammals. In addition, well over 200 species of birds have been sited on station.

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Figure 5-2: MSCP Multiple Habitat Planning Areas

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Figure 5-3: MCAS Miramar INRMP Management Areas

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5.2 Vegetative Resources

Vegetation communities depicted within the project boundary provide an insight to the potential species present and habitat richness and diversity. Specific habitat types also give perspective on site-specific biological assessments necessary for review during the watershed management planning process.

The vegetation across the RCW is sharply delineated based on jurisdictional boundaries, particularly between MCAS Miramar and its adjacent communities. Based on the regional vegetation mapping available from SANDAG (augmented by more detailed mapping provided by MCAS Miramar,) MCAS Miramar clearly contains the majority of Diegan Coastal Sage Scrub and Chaparral (Figure 5-4). Of the 2,264 acres of Diegan Coastal Sage Scrub, approximately 1,250 acres can be found on MCAS Miramar or 55% of the total. Eight-two percent of Chaparral can be found on MCAS Miramar as well. Non-Native Grasslands are also found almost exclusively within MCAS Miramar where 93% of this habitat resides. Other habitats that can be found almost exclusively within MCAS Miramar are Mima Mounds and vernal pool complexes. Riparian Scrub is predominantly found within Rose Canyon and San Clemente Canyon in an east-west orientation. The Sycamore Riparian Woodland that runs along its tributary distinguishes San Clemente Canyon. The Chaparral that can be found west of MCAS Miramar typically follows finger canyons that protrude their way into developed mesas. North of the military installation, Chaparral can be found in Scripps Miramar Ranch within MHPA boundaries. Urban and developed land is the most prevalent land cover encompassing 43% of the total RCW (Table 5-3). Based on closer review of the regional vegetation mapping available through SANDAG, it was noted that the overall mapping resolution and accuracy level of the boundaries between vegetation communities was unacceptable for the more detailed analyses and recommendations expected during later phases of this project. As such, additional field mapping was conducted as part of this assessment within the natural areas yet outside the jurisdiction of MCAS Miramar. The results of this field mapping effort are not yet available and will be incorporated into the later phases of this assessment as soon as they are complete.

Table 5-3: Vegetation Communities

Vegetation	Clairemont Mesa	Kearny Mesa	La Jolla	MCAS Miramar	Mira Mesa	Mission Bay Park	Pacific Beach	Scripps Miramar Ranch	University City	Totals
Chamise Chaparral				20					45	65
Chaparral	95	41	45	183	3			540	81	986
Coast Live Oak Woodland				4						4
Coastal Sage-Chaparral Scrub				196				1		197
Coastal and Valley Freshwater Marsh				28			5	1	0	34
Dense Coast Live Oak Woodland	35			1						37
Diegan Coastal Sage Scrub	394	21	209	1,252			26	26	336	2,264
Disturbed Habitat	117	36	46	2,222				4	231	2,656
Disturbed Wetland				1					3	4
Eucalyptus Woodland				20				25	39	83
Freshwater				40						40
Freshwater Seep				56				1	1	58
Mule Fat Scrub										0
Non-Native Grassland				1,718				13	109	1,841
Non-Vegetated Channel				11					1	12
Scrub Oak Chaparral				8					7	15
Shallow Bay						9	3			12
Southern Arroyo Willow Riparian Forest				11						11
Southern Coast Live Oak Riparian Forest				2						2
Southern Coastal Salt Marsh							4			4
Southern Maritime Chaparral			15							15
Southern Mixed Chaparral		23		3,913				13	26	3,975
Southern Riparian Forest									18	18
Southern Riparian Scrub	61	4					1		25	91
Sycamore-Alder Riparian Woodland	118	4		80					88	290
Southern Willow Scrub				23						23
Urban-Developed	2,146	735	478	2,270	83	43	469	182	3,750	10,156
Valley Needlegrass Grassland		7		140					15	161
Valley and Foothill Grassland	74		29				14	16	242	374
Totals	3,040	869	823	12,201	86	53	522	821	5,014	23,428

Figure 5-4: Vegetation Communities

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5.3 Sensitive Species

Sensitive species (both flora and fauna) are at the heart of the both the MSCP and the INRMP. They are the focus of additional local, state, and federal regulations that provide specific protections for these species and the habitats they depend on for various portions of their life cycles. The sensitive species that have been sighted within the RCW (as documented by the California Department of Fish and Game's Natural Diversity Database (CNDDB), SANDAG's regional sensitive species database, or MCAS Miramar's sensitive species database) are shown in Figure 5-5. Table 5-4 documents additional sensitive species that have been documented to exist within the RCW through other studies or are likely to occur based on habitat conditions that appear conducive to their occurrence.

5.3.1 Sensitive Flora

Sensitive flora species, either currently known to occur, or ones that have a potential to occur in the Rose Creek Watershed, are listed by habitat associations because of the large quantity of species: riparian habitats, San Diego sagewort (*Artemisia palmeri*), and willowy monardella (*Monardella linoides viminea*); vernal pools, Orcutt's brodiaea (*Brodiaea orcuttii*), San Diego button celery (*Eryngium aristulatum parishii*), San Diego golden star (*Muilla clevelandii*), spreading navarretia (*Navarretia fossalis*), prostrate navarretia (*Navarretia prostrata*), California adder's tongue fern (*Ophioglossum californicum*), California Orcutt grass (*Orcuttia californica*), and San Diego Mesa Mint (Pogogyne abramsii); sage scrub, San Diego barrel cactus (*Ferocactus viridescens*), Palmer's grappling hook (*Harpagonella palmeri*), decumbent goldenbush (*Isocoma menziesii decumbens*), Coulter's goldfields (*Lasthenia glabrata coulteri*), Golden-rayed pentachaeta (*Pentachaeta aurea*), ashy spike-moss (*Selaginella cinerascens*), and western dichondra (*Dichondra occidentalis*); chaparral, Otay Mountain ceanothus (*Ceanothus otayensis*), wart-stemmed ceanothus (*Ceanothus verrucosus*), summer-holly (*Comarostaphylis diversifolia diversifolia*), and Nuttall's scrub oak (*Quercus dumosa*); and grasslands, purple needlegrass (*Nassella pulchra*) and graceful tarplant *(Holocarpha virgata*).

5.3.2 Sensitive Fauna

Sensitive fauna species either currently known to occur or ones that have a potential to occur in the Rose Creek Watershed includes invertebrates, San Diego fairy shrimp (*Branchinecta sandiegonenis*), Hermes copper (*Lycaena hermes*), and wandering skipper, (*Panoquina errans*); an amphibian, western spadefoot toad (*Spea hammondii*); reptiles, San Diego horned lizard (*Phrynosoma coronatum blainvillii*), orange-throated whiptail (*Aspidoscelis hyperythra*), California legless lizard (*Anniella*

pulchra), coastal rosy boa (*Lichanura trivirgata roseofusca*), San Diego ring-necked snake (*Diadophis punctatus similes*), California glossy snake (*Arizona elegans occidentalis*), two-striped gartersnake (*Thamnophis hammondii*), and the red diamond rattlesnake (*Crotalus ruber*); birds, brown pelican (*Pelecanus occidentalis*), white-faced ibis (*Plegadis chihi*), northern harrier (*Circus cyaneus*), Cooper's hawk (*Accipiter cooperii*), elegant tern (*Sterna elegans*), California least tern (*Sterna antillarum browni*), California gnatcatcher (*Polioptila californica*), western bluebird (*Sialia mexicana*), and the burrowing owl (*Speotyto cunicularia*); and a mammal, mule deer (*Odocoileus hemionus*).

Many of the sensitive species within the RCW are under the federal classification status for Special Status Species. Candidate Species are classified as species for which there is sufficient information on biological vulnerability and threats to support proposals to list them as endangered or threatened. Proposed Species are any species that has been proposed for listing as a threatened or endangered species. Threatened species are likely to become and endangered species within the foreseeable future throughout all or significant portions of its range. Endangered species are in danger of extinction throughout all or a significant portion of its range. It is important to know the habitat and distribution of Threatened and Endangered species to understand the effects natural and manmade disturbance can have on their existence. The following describes the Federal and State Threatened and Endangered species that can be found within the RCW.

Threatened and Endangered Flora

San Diego Button Celery (*Eryngium aristulatum* var. *parishii*)

Listing – USFWS, Endangered; CDFG, Endangered

Distribution – Riverside County; San Diego County; Baja California, Mexico

Habitat – The San Diego Button Celery occurs in vernal pools but can also tolerate the peripheral mima mound areas. This annual/perennial herb blooms from April through June.

Status – This species is declining due to loss of vernal pools.

San Diego Button Celery can be found on the southern edge of the watershed south of State Route 52 and west of State Route 163 in Kearny Mesa. Another site can be found in the community of University City.

Spreading Navarretia (*Navarretia fossalis*)

Listing – USFWS; Threatened

Distribution – This species is found in Riverside County, San Diego County; and Baja California, Mexico.

Habitat – Spreading Navarretia occurs in shallow freshwater habitats such as marshes, swamps, playas and vernal pools. This annual herb blooms April through June.

Status – Spreading Navarretia is severely declining throughout its range.

Spreading Navarretia can be found just outside the watershed on MCAS Miramar south of State Route 52.

California Orcutt Grass (*Orcuttia californica*)

Listing – USFWS; Threatened

Distribution – Riverside County, San Diego County, Ventura County, Los Angeles County; Baja California, Mexico.

Habitat – California Orcutt Grass is found in vernal pools. This annual blooms April through August.

Status – California Orcutt Grass is slowly declining throughout its range primarily due to urban development and grazing.

One site of California Orcutt Grass can has been identified in the area between the State Route 52 and State Route 163 interchange and west of Interstate 15.

Willowy Mondardella (Monardella linoides viminea)

Listing – CDFG, Endangered

Distribution – This species can be found in San Diego County in the coastal hills from Poway to the Mexican Border and are concentrated in riparian creeks.

Habitat – Willowy Monardella can be found in riparian scrub usually in seasonal dry washes.

Status – Willowy Monardella is severely declining in total numbers throughout San Diego County.

Willowy Monardella can be found in the riverwash of San Clemente Canyon. The CalTrans mitigation site in San Clemente Canyon for plants lost during the State Route 52 expansion showed virtually all tagged specimens dead when the site was last visited in 1987. The surrounding habitat for the Willowy Monardella is quickly being engulfed by urban development throughout San Diego County.

Short-leaved Dudleya (*Dudleya blochmaniae*)

Listing – CDFG, Endangered

Distribution – Within Chamise Chaparral in San Diego County

Habitat – Short-leaved Dudleya can be found in then open areas of Chamise Chaparral on Torrey sandstone with soils mapped as Carlsbad gravelly loamy sand. A healthy population can be found in the Torrey Pines Preserve.

Status - Short-leaved Dudleya is presently stable in San Diego County but endangered due to proposed urban development near its location.

Not typically found in the Rose Canyon Watershed, a small colony can be found just west of Interstate 805 and north of La Jolla Village drive.

San Diego Mesa Mint (*Pogogyne abramsii*)

Listing – USFWS, Endangered; CDFG, Endangered

Distribution – San Diego County, Baja California and Mexico

Habitat – This small annual is restricted to vernal pools. Oftentimes this mint blooms profusely following heavy inundation and standing water in pools and may bloom late into the summer.

Status – San Diego Mesa Mint is declining in San Diego County predominantly due to impacts from urban development pressures. Loss of watershed for individual pools is a concern.

San Diego Mesa Mint can be found in MCAS Miramar and is locally common at the Miramar Mounds. The majority of the distribution can be found east in the block area of Interstate 805, north of State Route 52, west of Interstate 15 and south or Miramar Road. A few colonies can be found east of Interstate 15.

Threatened and Endangered Fauna

San Diego Fairy Shrimp (*Branchinecta sandiegoensis*)

Listing – USFWS, Federally Endangered

Distribution – Coastal southern California, in Orange and San Diego Counties, and has also been recorded in northwestern Baja California, Mexico.

Habitat – Shallow vernal pools and ephemeral basins that range in depth from two to 12 inches (Hathaway and Simovich 1996).

Status – Declining due to loss of habitat as a result of pool filling or draining, or destruction due to urban development.

San Diego Fairy Shrimp can be found predominantly in the vernal pool complexes of MCAS Miramar.

California Brown Pelican (Pelecanus occidentalis californicus)

Listing – State Federally Endangered

Distribution – Nesting is restricted to islands in the Gulf of California and along the outer coast from Baja California, Mexico, to West Anacapa and Santa Barbara Islands in Southern California. Non-breeding California brown pelicans range northward along the Pacific Coast from the Gulf of California to Washington and southern British Columbia.

Habitat – Roosting and loafing sites provide important resting habitat for breeding and non-breeding birds. Important roosting sites include offshore rocks and islands, river mouths with sand bars, breakwaters, pilings, and jetties along the Pacific Coast and San Francisco Bay

Status – Pelicans are sensitive to bioaccumulation of the pesticide DDT, which causes reproductive failure. Although California breeding populations have rebounded since the elimination of DDT use, persistent residues in the coastal regions continue to cause chronic reproductive problems.

Brown pelican can be spotted near the mouth of Rose Creek and in Mission Bay.

California Least Tern (*Sterna antillarum browni*)

Listing – USFWS, Endangered

Distribution – The California Least Tern is a migratory bird that remains on their breeding grounds from late April until August. The historic range for this species includes coastal areas from Monterey County, California to Southern Baja California (Grinnell and Miller 1944) with the majority of birds

nesting between Santa Barbara south through San Diego County. Their decline has been blamed on habitat loss mainly due to human related activities.

Habitat – The California Least Tern nests in dense colonies along open sandy beaches with little or no vegetation. They prefer areas close to rivermouths and estuaries where they forage on small fish such as northern anchovy, topsmelt, various surf-perch, killifish, mosquitofish and various other species (USFWS 1980).

California Least Terns can be spotted near the mouth of Rose Creek and in Mission Bay.

California Gnatcatcher (Polioptila californica californica)

Listed – USFWS, Threatened

Distribution – The California Gnatcatcher is restricted to coastal southern California in areas below 3,000 feet, from Ventura and San Bernardino Counties to El Rosario in northwestern Baja California. This is a year-round resident that breeds between late February through July.

Habitat – The California Gnatcatcher is a resident that typically occurs in sage scrub habitat. In California it can be found the Venturan, Diegan coastal sage scrub as well as maritime succulent scrub, alluvial fan scrub, southern coastal bluff scrub and coastal sage-chaparral scrub (USFWS 2000). They often use adjacent chaparral, grassland, and riparian habitats for foraging.

Status – This species is declining due to habitat loss. In 1944, this species was recorded by Grinnell and Miller as abundant within areas of suitable habitat. It is estimated by USFWS, at the time of listing that only 2,562 pairs remain within their entire range in the United States.

Gnatcatchers are concentrated in the sage scrub habitats MCAS Miramar and are protected within the military installation. They can also be found in Stevenson Canyon, Rose Canyon and San Clemente Canyon.

Table 5-4: Special Status Species and Potential for Occurrence

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Figure 5-5: Sensitive Species

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5.4 Invasive Exotic Species

Invasive exotic species have been identified as posing one of the greatest threats to the conservation of biological diversity on a global scale. An "invasive exotic species" is defined as a species that is: 1) non-native (or alien) to the ecosystem under consideration *and*; 2) whose introduction causes or is likely to cause economic or environmental harm or harm to human health. Invasive species can be plants (flora), animals (fauna), and other organisms (e.g., microbes). Invasive exotic plant species infestations can significantly alter hydrology, erosion and sedimentation, and water quality conditions within affected areas. Invasive exotic plants species are often early colonizers of disturbed habitats and can often out-compete native species for space and resources. Impacts to natural communities by invasive exotic faunal species include unbalanced predation of native species, competition for limited resources, and introduction of vectors for novel pathogens and parasites. At the heart of the problem is the fact that human actions are the primary means of invasive species introductions.

5.4.1 Invasive Exotic Plant Species

Several invasive exotic floral species occurring within the Rose Creek Watershed include, giant reed (*Arundo donax*), ice plant (*Carpobrotus edulis*), pampas grass (*Cortaderia selloana*), tamarisk (*Tamarix* spp.), fennel (*Foeniculum vulgare*), Brazilian pepper tree (*Schinus terebinthifolius*), and castor-bean (*Ricinus communis*), as well as weedy grasses, including but not limited to annual beard grass (*Polypogon monspeliensis*), ripgut grass (*Bromus diandrus*), black mustard (*Brassica nigra*) and slender wild oat (*Avena barbata*). Of these species the two most highly invasive wetland plants that occur within the watershed are giant reed (*Arundo donax*) and tamarisk (*Tamarix* spp.). These wetland associated species in particular have an adverse affect on the hydrology and geomorphology, habitat diversity, and ecological integrity along drainages.

5.4.2 Invasive Exotic Animal Species

Established exotic animal populations occurring within the Rose Creek Watershed include, Argentine ant (*Iridomyrmex humilis*), crayfish (*Procambrus clarki*), mosquitofish (*Gambusia affinis*), bullfrog (*Rana catesbeiana*), African clawed-frog (*Xenopus laevis*), European starling (*Sturnus vulgaris*), house sparrow (*Passer domesticus*), roof rat (*Rattus rattus*), house mouse (*Mus musculus*), and Virginia opossum (*Didelphis virginiana*).

Table 5-5: Invasive Exotic Plant Species

Common Name	Scientific Name	Habitat
Giant Reed	*Arundo Donax*	Riparian
Ice Plant	*Carpobrotus edulis*	Coastal areas, hillsides and riparian
Pampas Grass	*Cortaderia selloana*	Coastal areas and riparian
Jubatagrass	*Cortaderia jubata*	Coastal uplands
Artichoke Thistle	*Cynara cardunculus*	Grassland and riparian
Tamarisk, Salt cedar	*Tamarix ramosissima*	Riparian
Perennial Pepperweed	*Lepidium latifolium*	Riparian
Cape Ivy	*Senecio mikanioides*	Riparian and Uplands
Yellow Star Thistle	*Centaurena solstitialis*	Coastal Sage Scrub and grasslands
Spanish Broom	*Spartium junceum*	Coastal Sage Scrub and grasslands
Fennel	*Foeniculum vulgare*	Grassland, riparian and Coastal Sage Scrub
Eucalyptus	*Eucalyptus sp.*	Riparian and Uplands
Tocalote	*Centaurena melitensis*	Grasslands and Coastal Sage Scrub
Brazilian Pepper	*Schinus terebinthifolius*	Riparian
Italian Thistle	*Carduus pycnocephala*	
Castor Bean	*Rinicus communis*	Riparian
Garland chrysanthemum	*Chrysanthemum coronarium*	Disturbed areas and Coastal Sage Scrub
Rabbit's Foot Grass	*Polypogon monspeliensis*	Vernal pools
Brass buttons	*Cotula coronopifolia*	Vernal pools and Salt marsh
Bristly Ox tongue	*Pichris echioides*	Coastal Sage Scrub and grasslands
Common teasel	*Dipsacus sativus*	Disturbed areas and Coastal Sage Scrub
Red brome	*Bromus madritensis ssp.*	
Black mustard	*Brassica nigra*	Coastal Sage Scrub, grasslands and hillsides

5.4.3 Mitigations Sites on MCAS Miramar

The three types of mitigation areas on MCAS Miramar are vernal pool restoration, coastal sage scrub mitigation and riparian mitigation. See Figure 5-6 for the general location of these mitigation sites on MCAS Miramar. Currently, MCAS Miramar is restoring about 5 acres of vernal pool habitat, 88 acres of coastal sage scrub and 2.4 acres of riparian wetland.

5.4.4 Restoration, Enhancement and Mitigation Efforts

Documenting where restoration, enhancement, or mitigation efforts have occurred throughout the RCW is important in determining where future efforts can be appropriately planned and implemented. Figure 5-6 shows the restoration, enhancement, or mitigation efforts that the project team are aware of to date. These represent efforts undertaken by MCAS Miramar, various City of San Diego Departments, private developers, and volunteers.

Figure 5-6: Mitigation Sites

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