



## Appendix A: Acronyms and Abbreviations

*Table A-1. Acronyms and abbreviations used in this Integrated Natural Resources Management Plan.*

Acronym/Abbreviation	Definition
°F	degree(s) Fahrenheit
ANS	Aquatic Nuisance Species
APE	Area of Potential Effects
ASN	Assistant Secretary of the Navy
BASH	Bird/Animal Strike Hazard
BMPs	Best Management Practices
BO	Biological Opinion
BP	before present
Cal-IPC	California Invasive Plant Council
CDFG	California Department of Fish and Game
CDFW	California Department of Fish and Wildlife
CDTSC	California Department of Toxic Substances Control
CECOS	Naval Civil Engineer Corps Officers School
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
CESA	California Endangered Species Act
CFR	Code of Federal Regulations
CIRPAS	Center for Interdisciplinary Remotely-Piloted Aircraft Studies
CNDDDB	California Natural Diversity Database
CNIC	Commander, Navy Installations Command
CNO	Chief of Naval Operations
CNPS	California Native Plant Society
CNRSW	Commander, Navy Region Southwest
CO	Commanding Officer
CSP	California State Parks
CSPCSC	California State Parks Central Service Center
CSUMB	California State University of Monterey Bay
CUS	Commander Undersea Surveillance
CWA	Clean Water Act
CWAP	California Wildlife Action Plan
CZMA	Coastal Zone Management Act
DoD	U.S. Department of Defense
DoDD	DoD Directive
DoDI	DoD Instruction
DUSD	Deputy Under Secretary of Defense
EA	Environmental Assessment
ED	Environmental Division
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
EISA	Energy Independence and Security Act of 2007

*Table A-1. Acronyms and abbreviations used in this Integrated Natural Resources Management Plan.*

Acronym/Abbreviation	Definition
EMS	Environmental Management System
EOs	Executive Orders
EPA	U.S. Environmental Protection Agency
EPR	Environmental Program Requirements
EPRWeb	Environmental Program Requirements System
ERL	Environmental Readiness Level
ESA	Endangered Species Act
ESD	Ecological Site Description
FEMA	Federal Emergency Management Agency
FNMOCC	Fleet Numerical Meteorology and Oceanography Center
FONSI	Finding of No Significant Impact
FR	Federal Register
FY	Fiscal Year
GIS	Geographic Information Systems
GOCO	Government Owned Contractor Operated
I&E	Installations and Environment
IAP	Installation Appearance Plan
ICRMP	Integrated Cultural Resource Management Plan
INRMP	Integrated Natural Resources Management Plan
IPMP	Integrated Pest Management Plan
IR	Installation Restoration
LEED	Leadership in Energy and Environmental Design
LID	Low Impact Development
MBNMS	Monterey Bay National Marine Sanctuary
MBTA	Migratory Bird Treaty Act
MMPA	Marine Mammal Protection Act
MOU	Memorandum of Understanding
MPAs	Marine Protected Areas
MWR	Morale, Welfare and Recreation Program
NABCI	North American Bird Conservation Initiative
NANCPA	Nonindigenous Aquatic Nuisance Prevention and Control Act
NAVFAC	Naval Facilities Engineering Command
NAVFAC WESTDIV	Naval Facilities Engineering Command Western Division
Navy	U.S. Department of the Navy
NDAA	National Defense Authorization Act
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NIROP	Naval Industrial Reserve Ordnance Plant
NISC	National Invasive Species Council
NISMP	National Invasive Species Monitoring Plan
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NPMOSSP	Naval Program Management Office Strategic Systems Program
NPS	Naval Post Graduate School
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places

*Table A-1. Acronyms and abbreviations used in this Integrated Natural Resources Management Plan.*

Acronym/Abbreviation	Definition
NSA	Naval Support Activity
O&MN	Operations and Maintenance Navy
OAO	Ocean Acoustics Observatory
OPNAVINST	Naval Operations Instruction
OSD	Office of the Secretary of Defense
OUSD	Office of Undersecretary of Defense
PG&E	Pacific Gas and Electric Company
PIF	Partners In Flight
PL	Public Laws
PWD	Public Works Department
RCRA	Resource Conservation and Recovery Act of 1976
RV	recreational vehicle
RWQCB	Regional Water Quality Control Board
SECNAV	Secretary of the Navy
SOSUS	Sound Surveillance System
TDI	Tierra Data
USACE	U.S. Army Corps of Engineers
USC	U.S. Code
USCG	U.S. Coast Guard
USDA	U.S. Department of Agriculture
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WFMP	Wildland Fire Management Plan

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# Appendix B: Laws, Regulations, Instructions, and Directives

## B.1 Planning Jurisdictions

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### B.1.1 U.S. Fish and Wildlife Service

The USFWS is a cooperative partner in the endangered species program at the NSA Monterey's properties and is a signatory participant in approving the INRMP in accordance with the Sikes Act (as amended). The USFWS has been a very active partner in the endangered species program at NSA Monterey. The USFWS has an informal agreement with NSA Monterey to provide technical assistance on federally endangered, threatened and species of special concern and wetlands-related management issues, as necessary.

### B.1.2 California Department of Fish and Wildlife

The CDFW is responsible for management of most fish and wildlife within the state, including those on federal lands. The CDFW is a required signatory participant for this INRMP. The CDFW is the primary state agency responsible for managing fish and wildlife in California. Monterey interaction with CDFW involves nuisance wildlife and management for endangered species.

## B.2 Laws, Regulations, Instructions, and Directives

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Descriptions of the most relevant federal, state, and local laws and regulations as well as EOs, DoDIs, and Navy Instructions and manuals are included in this Appendix in order to give an overview of the most influential laws, regulations, EOs, instructions, and manuals that can pertain to all types of projects occurring on NSA Monterey. Natural resources consultation requirements, including any current or planned consultations, consistency with ESA Recovery Plans, RWQCB Basin Plans, and with Essential Fish Habitat (EFH) permit and consultation processes are all discussed in this Appendix. The laws, regulations, instructions, and directives included in this Appendix are identified below in Table B-1.

*Table B-1. Laws, regulations, instructions, and directives.*

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Section	Topic
B.3	Federal Laws
B.3.1	Federal Natural Resource Laws

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Table B-1. Laws, regulations, instructions, and directives.

Section	Topic
<b>B.3.1.1</b>	<b>Environmental Laws</b>
	Community Environmental Response Facilitation Act
	Comprehensive Environmental Response, Compensation, and Liability Act of 1980 as amended by the Superfund Amendments and Reauthorization Act of 1986
	Conservation Programs on Military Reservations
	Conservation and Rehabilitation Program on Military and Public Lands
	Energy Independence and Security Act 2007
	Federal Insecticide, Fungicide, and Rodenticide Act
	National Environmental Policy Act of 1969
	Noise Control Act
	Oil Pollution Prevention Act of 1990
	Resource Conservation and Recovery Act of 1976 as amended by the Hazardous and Solid Waste Amendments of 1984
	Sikes Act (Fish and Wildlife Conservation and Military Reservations Act) of 1960 as amended by the Sikes Act Improvement Act of 1997
	Sikes Act as Amended by PL 108-136, the National Defense Authorization Act of 2004
	Youth Conservation Corps Act
<b>B.3.1.2</b>	<b>Air Resource Laws</b>
	Clean Air Act, as amended
<b>B.3.1.3</b>	<b>Water Resource Laws</b>
	Clean Water Act (Federal Water Pollution Control Act) of 1972 as amended
	Clean Water Act: Section 401 Water Quality Certification
	Clean Water Act: Section 404 Permits for Dredged or Fill Material and the Rivers and Harbors Act of 1899
	Federal Water Pollution Control Act Amendments
	Safe Drinking Water Act
<b>B.3.1.4</b>	<b>Soil Resource Laws</b>
	Soil Conservation Act
<b>B.3.1.5</b>	<b>Terrestrial and Aquatic Habitat Laws</b>
	Coastal Zone Management Act of 1972
	Emergency Wetlands Resources Act of 1986
	Federal Flood Disaster Prevention Act
	Land and Water Conservation Act of 1965
	Legacy Resource Protection Program Act
	North American Wetlands Conservation Act
	Watershed Protection and Flood Prevention Act
<b>B.3.1.6</b>	<b>Wildlife Population Laws</b>
	Animal Damage Control Act
	Fish and Wildlife Conservation Act of 1980
	Fish and Wildlife Coordination Act of 1934
	Magnuson Stevens Fishery Conservation and Management Act, as amended
	Marine Mammal Protection Act of 1972
	Migratory Bird Treaty Act of 1918, as amended
	Migratory Bird Treaty Act as amended by the National Defense Authorization Act of 2003
<b>B.3.1.7</b>	<b>Species of Concern Laws</b>
	Bald and Golden Eagle Protection Act
	Endangered Species Act of 1973, as amended
	Federal Noxious Weed Act of 1974
	Noxious Plant Control Act
<b>B.3.2</b>	<b>Federal Cultural Resource Laws</b>
	American Antiquities Act of 1906
	American Indian Religious Freedom Act of 1978
	Archeological and Historic Preservation Act (Moss-Bennett Act) of 1974
	Archeological Resources Protection Act of 1979
	Historic Sites Act of 1935

*Table B-1. Laws, regulations, instructions, and directives.*

Section	Topic
	National Historic Preservation Act of 1966
	Native American Graves Protection and Repatriation Act of 1990
<b>B.3.3</b>	<b>Other Federal Laws</b>
	Americans with Disabilities Act of 1990
	Anti-Deficiency Act
	Data Quality Act
	Defense Appropriation Act
	Disabled Sportsman Access Act
	Emergency Planning and Community Right-to-Know Act
	Federal Facilities Compliance Act
	Military Construction and Authorization Act
	Military Construction Authorization Act - Leases; Non-excess property
	Military Construction Authorization Act - Military Reservation and Facilities-Hunting, Fishing and Trapping
	National Trails System Act
	Outdoor Recreation-Federal/State Program Act
<b>B.4</b>	<b>Executive Orders</b>
<b>B.4.1</b>	<b>Executive Orders Relevant to Natural Resources</b>
<b>B.4.1.1</b>	<b>Environmental Executive Orders</b>
	Strengthening Federal Environmental, Energy, and Transportation Management (EO 13423)
	Federal Leadership in Environmental, Energy, and Economic Performance (EO 13514)
<b>B.4.1.2</b>	<b>Terrestrial and Aquatic Executive Orders</b>
	Floodplain Management (EO 11988)
	Marine Protected Areas (EO 13158)
	Off-Road Vehicles on Public Lands (EO 11989)
	Protection of Wetlands (EO 11990)
<b>B.4.1.3</b>	<b>Wildlife Population Executive Orders</b>
	Migratory Birds (EO 13186)
<b>B.4.1.4</b>	<b>Species of Concern Executive Orders</b>
	Environmental Safeguard for Animal Damage Control on Federal Lands (EO 12342)
	Invasive Species (EO 13112)
<b>B.4.1.5</b>	<b>Cultural Resources Executive Orders</b>
	Indian Sacred Sites (EO 13007)
	Protection and Enhancement of the Cultural Environment (EO 11593)
<b>B.5</b>	<b>Federal Regulations, Directives, and Instructions</b>
<b>B.5.1</b>	<b>Federal Regulations</b>
	10 CFR 436. Federal Energy Management and Planning Programs
	15 CFR 923. National Oceanic and Atmospheric Administration Coastal Zone Management Program Development and Approval Regulation
	15 CFR 930. Federal Consistency with Approved Coastal Management Programs
	15 CFR 990. NOAA Regulations on Natural Resources Damage Assessment
	18 CFR 1312. Archeological Resource Protection Act Regulations
	29 CFR 1910. Occupational Safety and Health Standards
	29 CFR 1910.1200. Hazard Communication Standard
	29 CFR 1910.120. Hazardous Waste and Emergency Response
	32 CFR 172. DoD Regulations for the Disposition of Proceeds from Sales of Surplus Property
	32 CFR 188. Environmental Effects in the U.S. of DoD Actions
	32 CFR 190. Natural Resources Management Program
	32 CFR 229. Protection of Archeological Resources: Uniform Regulations
	32 CFR 650. Environmental Effects Abroad of Major Federal Actions - Environmental Protection and Enhancement: Subpart H, Historic Preservation
	32 CFR 775. Navy Procedures for Implementing NEPA
	33 CFR 154. Oil Pollution Prevention Regulations for Marine Oil Transfer Facilities
	33 CFR 156. USCG Regulations for Universal Waste Management Standards

*Table B-1. Laws, regulations, instructions, and directives.*

Section	Topic
	33 CFR 320-330. Regulatory Programs of the Corps of Engineers
	33 CFR 330. Dredge and Fill Nationwide Permit Program
	36 CFR 60. National Register of Historic Places
	36 CFR 63. Determination of Eligibility for Inclusion in the National Register of Historic Places
	36 CFR 65. National Historic Landmarks Program
	36 CFR 67. Historic Preservation Certificates
	36 CFR 68. The Secretary of Interior's Standards for Historic Preservation Projects
	36 CFR 78. Waiver of Federal Agency Responsibility under Section 110 of the National Historic Preservation Act
	36 CFR 79. Curation of Federally Owned and Administered Archaeological Collections
	36 CFR 800. National Historic Preservation Act Regulations for the Protection of Historic Properties
	40 CFR 6. EPA Regulations on Implementation of NEPA Procedures
	40 CFR 7. Archeological Resources Protection Act of 1979: Uniform Regulations
	40 CFR 50. EPA Regulations on National Primary and Secondary Ambient Air Quality Standards
	40 CFR 51-52. EPA Requirements for Preparation, Adoption, Submittal, Approval, and Promulgation of Implementation Plans
	40 CFR 53. EPA Regulations for Ambient Air Monitoring Reference and Equivalent Methods
	40 CFR 55. Outer Continental Shelf Air Regulations
	40 CFR 56. EPA Regulations on Regional Consistency under the Clean Air Act
	40 CFR 58. EPA Ambient Air Quality Surveillance Regulations
	40 CFR 60. EPA Regulations on New Source Performance Standards
	40 CFR 61. National Emissions Standards for Hazardous Air Pollutants
	40 CFR 62. EPA Regulations on state Plans for Designated Facilities and Pollutants
	40 CFR 65. EPA Regulations on Delayed Compliance Orders under the Clean Air Act
	40 CFR 66. EPA Regulations for Assessment and Collection of Noncompliance Penalties
	40 CFR 68. Chemical Accident Prevention Provisions
	40 CFR 69. EPA Special Exemptions from Requirements of the Clean Air Act
	40 CFR 70. State Operating Permit Programs
	40 CFR 80. Regulation of Fuels and Fuel Additives
	40 CFR 81. EPA Regulations Designating Areas for Air Quality Planning
	40 CFR 82. EPA Stratospheric Ozone Protection Regulations
	40 CFR 86. Control of Air Pollution from New and In-Use Motor Vehicle Engines: Certification and Test Procedures
	40 CFR 87. EPA Regulations on Control of Air Pollution and Aircraft and Aircraft Engines
	40 CFR 104. EPA Regulations on Public Hearings on Effluent Standards for Toxic Pollutants
	40 CFR 109. EPA Regulations on Criteria for state, Local, and Regional Oil Removal Contingency Plans
	40 CFR 110. EPA Regulations on Discharge of Oil
	40 CFR 112. EPA Regulations on Oil Pollution Prevention
	40 CFR 113. EPA Regulations on Liability for Small Onshore Oil Storage Facilities
	40 CFR 116-117. EPA Regulations on Hazardous Substances
	40 CFR 122. EPA National Pollutant Discharge Elimination System Permit Regulations
	40 CFR 125. EPA Regulations on Criteria and Standards for the National Pollutant Discharge Elimination System
	40 CFR 129. EPA Toxic Pollutant Effluent Standard
	40 CFR 130. EPA Requirements for Water Quality Planning and Management
	40 CFR 141-143. EPA National Drinking Water Regulations
	40 CFR 148. EPA Regulations on Hazardous Waste Disposal Restrictions for Class I Wells
	40 CFR 150-186. EPA Regulations for Pesticide Programs
	40 CFR 162. EPA Regulations on Insecticide, Fungicide, and Rodenticide Use
	40 CFR 220, 227. Ocean Dumping Regulations and Criteria
	40 CFR 230. Guidelines for Specification of Disposal Sites for Dredged or Fill Material
	40 CFR 231. EPA Regulations on Disposal Site Determination under the Clean Water Act
	40 CFR 240-241. EPA Guidelines for Thermal Processing of Solid Wastes and for the Land Disposal of Solid Wastes
	40 CFR 243. EPA Guidelines for Solid Waste Storage and Collection
	40 CFR 244. EPA Guidelines for Solid Waste Management of Beverage Containers
	40 CFR 245. EPA Guidelines for Resource Recovery Facilities



*Table B-1. Laws, regulations, instructions, and directives.*

Section	Topic
	40 CFR 246. EPA Guidelines for Source Separation for Materials Recovery
	40 CFR 247. EPA Guidelines for Procurement of Products that Contain Recycled Materials
	40 CFR 248. EPA Guidelines for Federal Procurement of Building Insulation Products Containing Recovered Materials
	40 CFR 249. EPA Guidelines for Federal Procurement of Cement and Concrete Containing Fly Ash
	40 CFR 250. EPA Guidelines for Federal Procurement of Paper and Paper Products Containing Recovered Materials
	40 CFR 252. EPA Guidelines for Federal Procurement of Lubricating Oils Containing Re-refined Oil
	40 CFR 253. EPA Guidelines for Federal Procurement of Retread Tires
	40 CFR 255. EPA Guidelines for Identification of Regions and Agencies for Solid Waste Management
	40 CFR 257. EPA Regulations on Criteria for Classification of Solid Waste Disposal Facilities and Practices
	40 CFR 259. EPA Medical Waste Regulations
	40 CFR 260-270. EPA Regulations Implementing the Resource Conservation and Recovery Act
	40 CFR 262. EPA Regulations for Hazardous Waste Generators
	40 CFR 264. EPA Regulations for Owners and Operators of Permitted Hazardous Waste Facilities
	40 CFR 268. EPA Regulations on Land Disposal Restrictions
	40 CFR 273. EPA Regulations for Universal Waste Management Standards
	40 CFR 279. Used Oil Management Standards
	40 CFR 280. Technical Standards and Corrective Action Requirements for Owners and Operators of Underground Storage Tanks
	40 CFR 300. National Oil and Hazardous Substance Pollution
	40 CFR 300.600. National Oil and Hazardous Substances Pollution Contingency Plan, Designation of Federal Trustees
	40 CFR 300.615. Responsibilities of Trustees
	40 CFR 302. EPA Designation, Reportable Quantities, and Notification Requirements for Hazardous Substances under CERCLA
	40 CFR 355. EPA Regulations for Emergency Planning and Notification under CERCLA
	40 CFR 370. EPA Hazardous Chemical Reporting and Community Right-to-Know Requirements
	40 CFR 372. EPA Toxic Chemical Release Reporting Regulations
	40 CFR 373. EPA Regulations for Real Property Transactions under CERCLA
	40 CFR 403. General Pretreatment Regulations for Existing and New Sources of Pollution
	40 CFR 413. EPA Effluent Guidelines and Standards for Electroplating
	40 CFR 414. EPA Effluent Guidelines and Standards for Organic Chemicals
	40 CFR 415. EPA Guidelines and Standards for Inorganic Chemicals
	40 CFR 417. EPA Effluent Guidelines and Standards for Soaps and Detergents
	40 CFR 433. EPA Effluent Guidelines and Standards for Metal Finishing
	40 CFR 504. State Sludge Management Programs Regulations
	40 CFR 760-761. EPA Regulations for Controlling Polychlorinated Biphenyls
	40 CFR 1500-1508. CEQ Regulations on Implementing NEPA Procedures
	41 CFR 41-47. Disposal Regulations
	43 CFR 3. Preservation of American Antiquities
	43 CFR 7. Archaeological Resources Protection Act of 1979; Uniform Regulations
	43 CFR 10. Native American Graves Protection and Repatriation Act Regulations
	43 CFR 11. Department of the Interior Regulations on Natural Resource Damage Assessments
	49 CFR 100-199. Department of Transportation Hazardous Materials Regulations
	49 CFR 126. Pesticide Transportation
	49 CFR 194. Oil Pollution Prevention Regulations for Onshore Pipelines
	50 CFR 10. General Provision and Statutes Administered by the USFWS
	50 CFR 10.13 List of Migratory Birds
	50 CFR 18, 216, 218. Regulations Concerning Marine Mammals
	50 CFR 17.11 and 17.12. USFWS List of Endangered and Threatened Wildlife
	50 CFR 402. Interagency Cooperation - ESA of 1973 as amended
<b>B.5.2</b>	<b>Federal Register Documentation</b>
	74 FR 59443. Federal List of Endangered and Threatened Wildlife
<b>B.5.3</b>	<b>Department of the Interior Fish and Wildlife Service Memoranda</b>
	USFWS Memorandum to Regional Directors, Regions 1-8, Delegation of INRMP Concurrence Authority (12 June 2009)
<b>B.5.4</b>	<b>Department of Defense Directives, Instructions, and Memorandums</b>

*Table B-1. Laws, regulations, instructions, and directives.*

Section	Topic
	DoDI 4150.7. (29 May 2008) DoD Pest Management Program
	DoDI 4165.57 (2 May 2011) Air Installations Compatible Use Zones
	DoDI 4700.4. (24 January 1989) Natural Resources Management Program
	DoDI 4715.03. (18 March 2011) Natural Resources Conservation Program
	DoDI 4715.4. (18 June 1996) Pollution Prevention
	DoDI 4715.9. (03 May 1996) Environmental Planning and Analysis
	DoDI 4715.16. (18 September 2008) Cultural Resources Management
	DoDI 6055.6. (10 October 2000) DoD Fire and Emergency Services Program
	DoDI 5000.13. (13 December 1976) Natural Resources: The Secretary of Defense Natural Resources Conservation Award
	DoDD 4001.1.(04 September 1986) Installation Management
	DoDD 4140.1. (04 January 1993) Material Management Policy
	DoDD 4150.7. (22 April 1996) DoD Pest Management Programs
	DoDD 4165.57. (08 November 1977) Air Installation Compatible Use Zones
	DoDD 4165.59. (29 December 1975) DoD Implementation of the Coastal Zone Management Act
	DoDD 4165.60. (27 July 1989) Hazardous Material Pollution
	DoDD 4165.60. (04 October 1976) Solid Waste Management - Collection, Disposal, Resource Recovery, and Recycling Program
	DoDD 4165.61. (09 August 1993) Intergovernmental Coordination of DoD Federal Development Programs and Activities
	DoDD 4700.1. Natural Resources Conservation and Management
	DoDD 4700.2. (15 July 1988) Secretary of Defense Award for Natural Resources and Environmental Management
	DoDD 4700.4. (24 January 1989) Natural Resources Management Program
	DoDD 4705.1. (09 July 1992) Management of Land-based Water Resources in Support of Joint Contingency Operations
	DoDD 4710.1 (21 June 1984) Archeological and Historic Resources Management
	DoDD 4715.DD-R (April 1996) Draft Integrated Natural Resources Management in DoD
	DoDD 4715.1. (24 February 1996) Environmental Security
	DoDD 4715.2. (03 May 1996) DoD Regional Environmental Coordination
	DoDD 4715.4. (18 June 1996) Pollution Prevention
	DoDD 4715.5. (22 April 1996) Management of Environmental Compliance at Overseas Installations
	DoDD 4715.6. (24 April 1996) Environmental Compliance
	DoDD 4715.7. (22 April 96) Environmental Restoration Program
	DoDD 4715.8. (02 February 1998) Environmental Education Training and Career Development
	DoDD 4715.9. (03 May 1996) Environmental Planning and Analysis
	DoDD 4715.10. (24 April 1996) Environmental Education Training and Career Development
	DoDD 4715.11. (24 April 2007) Environmental and Explosive Safety Management on Operational Ranges within the United States
	DoDD 4715.12. (19 August 1999) Environmental and Explosive Safety Management on DoD Active and Inactive Ranges Outside the United States
	DoDD 5030.41. (01 June 1977) Oil and Hazardous Substances Pollution Prevention and Contingency Program
	DoDD 6050.1. (30 July 1979) Environmental Effects in the US of DoD Actions
	DoDD 6050.2. (19 April 1979) Use of Off-Road Vehicles on DoD Lands
	DoDD 6050.4. (16 March 1982) Marine Sanitation Devices for Vessels Owned or Operated by DoD
	DoDD 6050.5. (29 October 1990) DoD Hazard Communication Program
	DoDD 6050.7. (31 March 1979) Environmental Effects Abroad of Major DoD Actions
	DoDD 6050.8. (27 February 1986) Storage and Disposal of Non-DoD Owned Hazardous or Toxic Materials on DoD Installations
	DoDD 6050.10 (20 September 1991) DoD Policy for Establishing and Implementing Environmental Standards at Overseas Installations
	DoDD 6050.15 (14 June 1985) Prevention of Oil Pollution from Ships Owned or Operated by DoD
	DoDD 6050.16. (20 September 1991) DoD Policy for Establishing and Implementing Environmental Standards at Overseas Installations
	DoDD 7000.14-R (18 March 1993) DoD Financial Management Regulations
	Deputy Under Secretary of Defense (Installations and Environment) Memorandum, 10 October 2002
	Assistant Deputy Undersecretary of Defense for Environment, Safety and Occupational Health Policy (01 November 2004 Memo)

Table B-1. Laws, regulations, instructions, and directives.

Section	Topic
	Office of the Under Secretary of Defense Memorandum for Deputy Assistant Secretary of the Army (Environment, Safety and Occupational Health), Deputy Assistant Secretary of the Navy (Environment), Deputy Assistant Secretary of the Air Force (Environment, Safety, and Occupational Health), Director Defense Logistics Agency. Implementation of Sikes Act Improvement Amendments: Supplemental Guidance concerning Leased Lands. 17 May 2005
	Office of the Under Secretary of Defense Memorandum for Deputy Assistant Secretary of the Army (Environment, Safety and Occupational Health), Deputy Assistant Secretary of the Navy (Environment), Deputy Assistant Secretary of the Air Force (Environment, Safety, and Occupational Health), Director Defense Logistics Agency. Integrated Natural Resource Management Plan Template. 14 August 2006
	Memorandum of Understanding Among The U.S. Department of Defense and The U.S. Fish and Wildlife Service and The International Association of Fish and Wildlife Agencies for a Cooperative Integrated Natural Resource Management Program on Military Installations. 31 January 2006
	Memorandum of Understanding to Promote the Conservation of Migratory Birds between the USFWS and the DoD in Accordance with EO 13186. Prepared by the Under Secretary of Defense for Acquisition, Technology, and Logistics in April 2007.
<b>B.5.5</b>	<b>Department of the Navy Manuals, Instructions, and Guidance</b>
	SECNAVINST 4000.35 (17 August 1992) (NOTAL) Department of the Navy Cultural Resources Program
	SECNAVINST 5090.8 (18 December 2000) (ASN(I&E)) Policy for Environmental Protection, Natural Resources, and Cultural Resources Program
	SECNAVINST 6240.6E (18 December 2000) Implementation of DoD Directives under DoDI 4700.4
	SECNAVINST 6401-1A (16 August 1994) Veterinary Health Services
	OPNAVINST 5090.1C CH-1 dtd 18 July 2011 Environmental Readiness Program Manual
	OPNAVINST 5090.1C CH-24 (6I) dtd 18 July 2011 BASH Program
	OPNAVINST 5750.13 (10 November 1975) Historical Properties of the Navy
	OPNAVINST 6250.4B (27 August 1998) Pest Management Programs
	OPNAVINST 8000.16 Environmental Security Management
	OPNAVINST 8026.2A (15 June 2000) Navy Munitions Disposition Policy
	OPNAVINST 11000.17 (17 September 1999) National Preservation Act Consultations Related to Base Realignment and Closure Actions
	OPNAVINST 11010.20F (07 June 1996) Facilities Projects Manual
	NAVFAC P-73 (May 1987) Real Estate Procedural Manual, Volumes I and II; and Natural Resources Management Procedural Manual, Chapter 2 - Integrated Natural Resources Management Plans
	NAVFACINST 6250.3H Applied Biology Program Services and Training
	NAVFACINST 11010.45 (30 June 2002) Comprehensive Regional Planning Instruction (Land Use Module/Regional Shore Infrastructure Plan Links)
	NAVFACINST 11012.111A Land Use Conservation Planning
	NAVFACINST MO-100.4 Guidance on Special Interest Areas
	Office of the Assistant Secretary (Installations and Environment) Memorandum for Commander Navy Installations Command (N45), Director Environmental Readiness Division (N45), Director Facilities and Services Division (CMC-LFL). Department of the Navy Natural Resources Program Metrics. 22 August 2006
	Chief of Naval Operations (N45) Integrated Natural Resources Management Program (INRMP) Guidance. 10 April 2006 (5090 N456K/6U838101)
	Chief of Naval Operations (N45) Policy Letter Preventing Feral Cat and Dog Populations on Navy Property 10 January 2002 (5090 Ser N456M/1U595820)
	Chief of Naval Operations (N45) Navy EMS Policy 06 December 2001 (5090 Ser N451G/1U595831)
<b>B.6</b>	<b>California State Laws</b>
<b>B.6.1</b>	<b>Water Resource Laws</b>
	California Water Code
	Porter-Cologne Water Quality Control Act
<b>B.6.2</b>	<b>Terrestrial and Aquatic Habitat Laws</b>
	California Coastal Act and the Federal CZMA
<b>B.6.3</b>	<b>Species of Concern Laws</b>
	California Endangered Species Act
<b>B.7</b>	<b>State Regulations</b>
	Fish and Game Code and Stream Alteration Controls
	Fish and Game Code and Title 14 California Code of Regulations
<b>B.8</b>	<b>Local Government</b>

The remainder of this Appendix is structured to focus on federal laws first and state laws second. Furthermore, the section on Federal Laws is further segregated into subsections that focus on cultural resources and specific natural resource topics including the environment in general, air resource, water resource, soil resource, terrestrial and aquatic habitats, wildlife populations, and species of concern. These natural resource topics correspond to the natural resource management sections contained within Chapter 3 and Chapter 4 of the NSA Monterey INRMP.

## B.3 Federal Laws

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### B.3.1 Federal Natural Resource Laws

#### B.3.1.1 Environmental Laws

##### Community Environmental Response Facilitation Act

The Community Environmental Response Facilitation Act (42 USC § 9601 note, 9620) amends CERCLA Section 120 (h) to allow expedition of reuse and redevelopment of federal facilities being closed. It was expanded to include federal agency requirements pertaining to the disposal of real property.

Comprehensive Environmental Response, Compensation, and Liability Act of 1980, PL 96-510 (26 USC §§ 9601-9675) as amended by the Superfund Amendments and Reauthorization Act of 1986, PL 99-499 (100 Stat. 1613)

The CERCLA of 1980 (43 USC §§ 9601 *et seq.*), commonly known as Superfund, was enacted by Congress on 11 December 1980 (EPA 2010a). This Act establishes programs for the cleanup of hazardous waste disposal and spill sites to ensure protection of human health and the environment. The Act designates the President as trustee for federally protected or managed natural resources. This law also created a tax on the chemical and petroleum industries and provided broad federal authority to respond directly to releases or threatened releases of hazardous substances that may endanger public health or the environment. Over five years, \$1.6 billion was collected and the tax went to a trust fund for cleaning up abandoned or uncontrolled hazardous waste sites (EPA 2010a). The CERCLA:

- Established prohibitions and requirements concerning closed and abandoned hazardous waste sites;
- Provided for liability of persons responsible for releases of hazardous waste at these sites; and
- Established a trust fund to provide for cleanup when no responsible party could be identified.

The law authorizes two kinds of response actions:

- Short-term removals, where actions may be taken to address releases or threatened releases requiring prompt response; and
- Long-term remedial response actions that permanently and significantly reduce the dangers associated with releases or threats of releases of hazardous substances that are serious, but not immediately life threatening. These actions can be conducted only at sites listed on EPA's National Priorities List.

The CERCLA also enabled the revision of the National Contingency Plan (NCP). The National Contingency Plan provided the guidelines and procedures needed to respond to releases and threatened releases of hazardous substances, pollutants, or contaminants. The National Contingency Plan also established the National Priorities List (EPA 2010a).

The CERCLA was amended by the Superfund Amendments and Reauthorization Act on 17 October 1986 (EPA 2010a).

#### Conservation Programs on Military Reservations

The Conservation Programs on Military Reservations (PL 90-465; 16 USC §§ 670 *et seq.*) amends PL 86-797 to include outdoor recreation programs on military lands.

#### Conservation and Rehabilitation Program on Military and Public Lands

The Conservation and Rehabilitation Program on Military and Public Lands (PL 93-452; 16 USC §§ 670 *et seq.*) amends PL 86-797 by providing for fish and wildlife habitat improvements, range rehabilitation, and control of off-road vehicles on federal lands.

#### Energy Independence & Security Act 2007

The EISA of 2007 established energy management goals and requirements while also amending portions of the National Energy Conservation Policy Act. Signed on 19 December 2007, the EISA aims to: move the United States toward greater energy independence and security; increase the production of clean renewable fuels; protect consumers; increase the efficiency of products, buildings, and vehicles; promote research on and deploy greenhouse gas capture and storage options; improve the energy performance of the Federal Government; and increase U.S. energy security, develop renewable fuel production, and improve vehicle fuel economy.

The EISA reinforces the energy reduction goals for federal agencies put forth in EO 13423, as well as introduces more aggressive requirements. The three key provisions enacted are the Corporate Average Fuel Economy Standards, the Renewable Fuel Standard, and the appliance/lighting efficiency standards. The EISA mandates the implementation of LID for construction projects greater than 5,000 square feet.

Federal Insecticide, Fungicide, and Rodenticide Act, PL 92-516, as amended (7 USC §§ 136-136y)

The Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) governs the use and application of pesticides in natural resource management programs. When the Act was first passed in 1947, it established

procedures for registering pesticides with the USDA and established labeling provisions (EPA 2010b). The law was still primarily concerned with the efficacy of pesticides and did not regulate pesticide use.

The Act was essentially rewritten in 1972 when it was amended by the Federal Environmental Pesticide Control Act. The law has been amended numerous times since 1972, including some significant amendments in the form of the Food Quality Protection Act of 1996. In its current form, the Act mandates that EPA regulate the use and sale of pesticides to protect human health and preserve the environment.

Since the Federal Environmental Pesticide Control Act amendments, EPA is specifically authorized to: (1) strengthen the registration process by shifting the burden of proof to the chemical manufacturer, (2) enforce compliance against banned and unregistered products, and (3) promulgate the regulatory framework missing from the original law.

The Act provides EPA with the authority to oversee the sale and use of pesticides. However, because the Act does not fully preempt state/tribal or local law, each state/tribe and local government may also regulate pesticide use.

National Environmental Policy Act of 1969, PL 91-190 (42 USC 4321-4370d)

The NEPA (PL 91-190; 42 USC §§ 4321 *et seq.*) was signed on 01 January 1970, and became the basic national policy for protection of the environment. Its passage was driven by the broadly felt sentiment that federal agencies should lead the nation in environmental protection. It established a systematic, interdisciplinary framework for agencies to prevent environmental damage, and contains "action-forcing" procedures to ensure that environmental factors are taken into account on major decisions, and to document those decisions. There are four stated purposes of NEPA (42 USC § 4321):

- Declare a national policy which will encourage productive and enjoyable harmony between people and the environment.
- Promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate health and welfare.
- Enrich the understanding of the ecological system and natural resources important to the nation.
- Establish a CEQ.

Activities directly undertaken by, financed by, or requiring approval of federal agencies are subject to NEPA environmental review processes, with only certain specified exceptions. The NEPA is implemented by CEQ regulations (40 CFR § 1500-1508). The most important function of agency compliance with NEPA procedure is to fully disclose and consider environmental information in decision making and to inform the public of potential impacts and alternatives. However, if adverse environmental effects of a proposed action are identified and disclosed to the public, the agency may decide that other factors outweigh environmental impacts and continue with the action.

NEPA has three decisional mechanisms. A proposed federal agency action is first reviewed to see if it can qualify for a categorical exclusion (usually small, routine projects with no potential significant environmental effect; categories are identified in agency NEPA policies) or other exemption to the process. If not, then an EA or EIS is prepared. If an EA is prepared and it concludes that adverse environmental impacts will be insignificant, then the agency can file a FONSI, followed by implementing its preferred alternative. If the proposed project has the potential to "significantly affect the quality of the human environment," then the EIS process must be followed. Briefly, these steps are: Notice of Intent, scoping process, Draft EIS, Agency/Public Review and Comment, Final EIS, Record of Decision, and Agency Action.

Project mitigation is usually used as a means to address adverse environmental impacts through the federal (NEPA) process. However, NEPA establishes no mitigation requirement for adverse environmental impacts. "A solution to an environmental problem" is a simple definition of a mitigation measure (Bass and Herson 1993). To be adequate and effective, mitigation measures should fit in one of five categories defined by the CEQ as:

1. Avoiding the impact by not taking a certain action or parts of an action.
2. Minimizing the impact by limiting the degree or magnitude of the action and its implementation.
3. Rectifying the impact by repairing, rehabilitating, or restoring the affected environment.
4. Reducing or eliminating the impact over time by preservation and maintenance during the life of the action.
5. Compensating for the impact by replacing or providing substitute resources or environments.

An EIS must identify all relevant, reasonable mitigation measures that could lessen impacts to the human environment. However, a federal agency does not have to adopt mitigation measures included in an EIS unless agency-specific NEPA procedures require adoption of mitigation measures or the agency commits to implementing mitigation measures in the Record of Decision.

For Navy projects, the DoD has issued policies and procedures, including a supplement providing policy and assigning responsibilities adopted by Navy (32 CFR § 775). These U.S. Navy procedures meet the NEPA requirement that every federal agency adopt procedures to supplement CEQ regulations. Following the U.S. Navy directive, specific policy for compliance with procedural requirements was issued under 5090.1C CH-1. This document tasks each Naval installation with ensuring that U.S. Navy actions are in accordance with NEPA.

NEPA compliance for INRMPs is specifically addressed by the CNO guidance (CNO Letter 5090 Ser N456F/8U589129 of 30 November 1998). The guidance is intended to be consistent with a SECNAV memorandum (12 August 1998), which stated:

"All projects essential to fulfill the selected alternative (mix of management objectives) must be implemented within a time frame indicated in the INRMP. Any deviation or change from achieving the selected alternative may require supplementation to the EA or EIS and an opportunity for public comment. An installation may add or modify projects for achieving the selected alternative without additional review under NEPA if the projects are consistent with the existing NEPA analysis."

The CNO letter provided the following guidelines:

- The EA for an INRMP should be a separate document, but a case-by-case decision may be made.
- The INRMP and NEPA process should occur concurrently, and an integrated schedule was suggested in which the EA is expected to be 75 percent complete when the INRMP is ready for public comment, and 90 percent complete when letters of concurrence are requested from stakeholders.
- A FONSI is required before an INRMP may be signed.

Table B-2 lists the actions that under normal conditions are categorically excluded from further documentation requirements under NEPA.

#### Noise Control Act

The Noise Control Act of 1972 (42 USC § 4901 *et seq.*) (as amended by the Quiet Communities Act) authorizes establishment of federal noise emission standards for products distributed in commerce and coordinates federal research efforts in noise control.

#### Oil Pollution Prevention Act of 1990, PL 101-380 (33 USC 2701 *et seq.*)

The Oil Pollution Prevention Act established new requirements and extensively amended the Federal Water Pollution Control Act (33 USC §§ 2701 *et seq.*) to provide enhanced capabilities for oil spill response and natural resource damage assessment by the USFWS. The act provides that the National Contingency Plan include planning, rescue, and minimization of damage to fish and wildlife in responding to oil pollution. It requires USFWS consultation on developing a fish and wildlife response plan for the National Contingency Plan, input to Area Contingency Plans, review of Facility and Tank Vessel Contingency Plans, and conducting damage assessments associated with oil spills. One aspect of particular interest to the USFWS involves the identification of ecologically sensitive areas and the preparation of scientific monitoring and evaluation plans. Research conducted by the USFWS is to be directed and coordinated by the National Wetland Research Center (USFWS 2010).



*Table B-2. List of categorical exclusions from further documentation requirements under the National Environmental Policy Act per 5090.1C CH-1.*

Categorical Exclusion

- a. Routine personnel, fiscal, and administrative activities involving military and civilian personnel (i.e. recruiting, processing, paying, and records keeping).
- b. Reductions in force wherein impacts are limited to socioeconomic factors.
- c. Routine movement of mobile assets, such as ships and aircraft, in home port reassignments (when no new support facilities are required) to perform as operational groups, and/or for repair and overhaul.
- d. Relocation of personnel into existing federally owned or commercially leased space that does not involve a substantial change in the supporting infrastructure (an increase in vehicular traffic beyond the capacity of the supporting road network. To accommodate such an increase is an example of substantial change).
- e. Studies, data, and information gathering that involve no physical change to the environment (i.e. topographic surveys, bird counts, wetland mapping, forest inventories, and timber cruising).
- f. Routine repair and maintenance of facilities and equipment to maintain existing operations and activities, including maintenance of improved and semi-improved grounds such as landscaping, lawn care, and minor erosion control measures.
- g. Alteration and additions of existing structures to conform to or provide conforming use specifically required by new or existing applicable legislation or regulations (i.e. hush houses for aircraft engines and scrubbers for air emissions).
- h. Routine actions normally conducted to operate, protect, and maintain military-owned and/or controlled properties (i.e. maintaining law and order; physical plant protection by military police and security personnel; and localized pest management activities on improved and semi-improved lands conducted under applicable federal and state directives).
- i. New construction that is consistent with existing land use and, when completed, the use or operation of which complies with existing regulatory requirements (i.e. a building on a parking lot with associated discharges/runoff that are within existing handling capacities; a bus stop along a roadway; and a foundation pad for portable buildings within a building complex).
- j. Procurement activities that provide goods and support for routine operations.
- k. Day-to-day personnel resource management and research activities under approved plans and inter-agency agreements and designed to improve and/or upgrade military ability to manage those resources.
- l. Decisions to close facilities, decommission equipment, and/or temporarily discontinue use of facilities or equipment (where such equipment is not used to prevent/control environmental impacts). (Note: Does not apply to permanent closure of public roads or to base closures.)
- m. Contracts for activities conducted at established laboratories and plants, to include contractor-operated laboratories and plants, within facilities where all airborne emissions, waterborne effluent, external radiation levels, outdoor noise, and solid and bulk waste disposal practices comply with existing applicable federal, state, and local laws and regulations.
- n. Routine movement, handling and distribution of materials, including hazardous materials and wastes that when moved, handled, or distributed are under applicable regulations.
- o. Demolition, disposal, or improvements involving buildings or structures neither on nor eligible for listing on the National Register of Historic Places and when under applicable regulations (i.e. removal of asbestos, polychlorinated biphenyls, and other hazardous materials).
- p. Acquisition, installation, and operation of utility and communication systems, data processing cable and similar electronic equipment, which use existing rights of way, easements, distribution systems, and/or facilities.
- q. Renewals and/or initial real estate ingrats and outgrants involving existing facilities and land wherein use does not change significantly. This includes, but is not limited to, existing or federally-owned or privately-owned housing, office, storage, warehouse, laboratory, and other special purpose space.
- r. Grants of license, easement, or similar arrangements for the use of existing rights-of-way or incidental easements complementing the use of existing rights-of-way for use by vehicles (not to include significant increase in vehicle loading); electrical, telephone, and other transmission and communication lines; water, wastewater, storm water, and irrigation pipelines, pumping stations, and facilities, and for similar utility and transportation uses.
- s. Transfer of real property from the military to another military department or to another federal agency, and the granting of leases (including leases granted under the agricultural out leasing program where soil conservation plans are incorporated), permits and easements where there is no substantial change in land use or where subsequent land use would otherwise be categorically excluded.
- t. Disposal of excess easement interests to the underlying fee owner.
- u. Renewals and minor amendments of existing real estate grants for use of government-owned real property with no anticipated significant change in land use.
- v. Pre-lease exploration activities for oil, gas or geothermal reserves (e.g. geophysical surveys).
- w. Return of public domain lands to the Department of the Interior.
- x. Land withdrawal continuances or extensions, that merely establish times, and where there is no significant change in land use.
- y. Temporary closure of public access to military property to protect human or animal life.
- z. Engineering effort undertaken to define the elements of a proposal or alternatives sufficiently to assess the environmental effects.
- aa. Actions, which require the concurrence or approval of another federal agency, where the action is a categorical exclusion of the other federal agency.
- bb. Maintenance dredging and debris disposal requiring no new depths, securing of applicable permits, and disposal at an approved disposal site.
- cc. Installation of devices to protect human or animal life (i.e. raptor electrocution prevention devices, fencing to restrict wildlife movement onto airfields, and fencing and grating to prevent accidental entry to hazardous areas).
- dd. Natural resources management actions undertaken or permitted under agreement with or subject to regulation by federal, state, or local organizations having management responsibility and authority over the natural resources in question, including hunting or fishing during hunting or fishing seasons established by state authorities under their state fish and game management laws. Concerning natural resources regulated by another federal agency, the responsible command may cooperate in any environmental analysis that may be required by the other agency's regulations.
- ee. Approval of recreational activities that do not involve significant physical alteration of the environment or increase human disturbance in sensitive natural habitats and that do not occur in or next to areas inhabited by endangered or threatened species.
- ff. Routine maintenance of timber stands, including issuance of down-wood firewood permits, hazardous tree removal, and sanitation salvage.
- gg. Reintroduction of endemic or native species (other than endangered or threatened species) into their historical habitat when no substantial site preparation is involved.

Resource Conservation and Recovery Act of 1976, PL 94-580 (42 USC §§ 6901-6992k) as amended by the Hazardous and Solid Waste Amendments of 1984, PL 98-616

The RCRA (42 USC §§ 692 *et seq.*) gives the EPA the authority to control hazardous waste from the "cradle-to-grave" and establishes a comprehensive program which manages solid and hazardous waste (EPA 2010c). This includes the generation, transportation, treatment, storage, and disposal of hazardous waste. Subtitle C, Hazardous Waste Management, sets up a framework for managing hazardous waste from its initial generation to its final disposal. Waste pesticides and equipment/containers contaminated by pesticides are included under hazardous waste management requirements.

The RCRA also set forth a framework for the management of non-hazardous solid wastes. The 1986 amendments to RCRA enabled EPA to address environmental problems that could result from underground tanks storing petroleum and other hazardous substances (EPA 2010c).

The federal Hazardous and Solid Waste Amendments are the 1984 amendments to RCRA that focused on waste minimization and phasing out land disposal of hazardous waste as well as corrective action for releases. Some of the other mandates of this law include increased enforcement authority for EPA, more stringent hazardous waste management standards, and a comprehensive underground storage tank program (EPA 2010c).

Sikes Act (Fish and Wildlife Conservation and Military Reservations Act) of 1960, PL 86-797 as amended by Sikes Act Improvement Act (SAIA) of 1997, PL 93-452 (16 USC §§ 670-670f)

Under the Fish and Wildlife Conservation and Military Reservations Act of 1960, commonly known as the Sikes Act (PL 86-797) as amended by the SAIA of 1997 (PL 105-85, codified as 16 USC § 670 - 670f [1999]), the Secretary of Defense shall carry out a program for conserving and rehabilitating natural resources on military installations. To facilitate the program, the Secretary of each military department shall prepare and implement an INRMP for each military installation in the U.S. under the jurisdiction of the Secretary. These plans must be consistent with the use of military installations to ensure the preparedness of the Armed Forces.

The Secretaries of the military departments shall carry out the program to provide for the following:

- Conservation and rehabilitation of natural resources on military installations;
- Sustainable multipurpose use of the resources, which shall include hunting, fishing, trapping, and non consumptive uses, subject to safety requirements and military security; and
- Public access to military installations to use natural resources.

The Sikes Act requires Navy facilities to manage their natural resources so as to provide multiple uses and public access, to the extent that the military mission is not jeopardized. The act provides a mechanism whereby DoD and U.S. Department of the Interior and the states cooperate to manage fish and wildlife on military installations.

Personnel charged with natural resources management are to be professionally trained in their fields of responsibility. Section 101 of the Sikes Act authorizes planning programs for developing, maintaining, and coordinating natural resources programs on each military reservation. In compliance with 16 USC § 670a(b), to the extent appropriate and applicable, the INRMP provides for the following:

- Fish and wildlife management, land management, forest management, and fish and wildlife-oriented recreation;
- Fish and wildlife habitat enhancement or modifications;
- Wetlands protection and enhancement where necessary for support of fish, wildlife, and plants;
- Integration of and consistency among the various activities conducted under the plan;
- Establishment of specific natural resource management goals and objectives and time frames for proposed actions;
- Sustainable public use of natural resources to the extent that the use is consistent with the needs of fish and wildlife resources;
- Public access to NSA Monterey that is necessary and appropriate for the use described above, subject to the requirements necessary to ensure public safety and military security;
- Enforcement of applicable natural resource laws and regulations;
- No net loss in the capability of NSA Monterey to support the military mission; and
- Such other activities as SECNAV determines appropriate.

Sikes Act as Amended by Public Law 108-136, The National Defense Authorization Act of 2004

The NDAA for FY 2004 changed the ESA regarding INRMPs, which were justified on the basis of the need to promote military readiness while protecting listed species. Under new Section 4(a)(3)(B)(i) of the ESA, the Secretary of the Interior or the Secretary of Commerce, as appropriate, is precluded from designating Critical Habitat on any areas owned, controlled, or designated for use by DoD where an INRMP has been developed that, as determined by the Interior or Commerce Secretary, provides a benefit to the species for which Critical Habitat designation is proposed.

#### Youth Conservation Corps Act

The Youth Conservation Corps Act of 1972, as amended (PL 93-408 as amended; 16 USC § 1701) expands and makes permanent a Youth Conservation Corps program and establishes objectives for youth employment and conservation work on public lands.

### B.3.1.2 Air Resource Laws

Clean Air Act, as amended (42 USC §§ 7401 et seq.)

The Clean Air Act (as amended) regulates air emissions from area, stationary, and mobile sources. This law authorizes the EPA to establish National Ambient Air Quality Standards to protect public health and the environment.

The legal authority for federal programs regarding air pollution control is based on the 1990 Clean Air Act Amendments. The 1990 Clean Air Act Amendments substantially increased the authority and responsibility of the federal government (EPA 2010d). New regulatory programs were authorized for control of acid deposition (acid rain) and for the issuance of stationary source operating permits. The National Emission Standards for Hazardous Air Pollutants were incorporated into a greatly expanded program for controlling toxic air pollutants. The provisions for attainment and maintenance of National Ambient Air Quality Standards were substantially modified and expanded. Other revisions included provisions regarding stratospheric ozone protection, increased enforcement authority, and expanded research programs (EPA 2010d). These are the latest in a series of amendments made to the Clean Air Act. This legislation modified and extended federal legal authority provided by the earlier Clean Air Acts of 1963 and 1970 (EPA 2010d).

### B.3.1.3 Water Resource Laws

Clean Water Act (Federal Water Pollution Control Act) of 1972, PL 92-500, as amended (33 USC 1251-1387)

The objective of the CWA (PL 92-500, as amended; 33 USC §§ 1251 *et seq.*) is to restore and maintain the chemical, physical, and biological integrity of the Nation's waters (Section 101a). The CWA has three major approaches to water pollution control:

- Construction grants for reducing municipal discharges;
- NPDES permits for control of point source (storm water and waste water) discharges; and
- Water quality management planning for nonpoint source control from diffuse natural origins such as sediment.

In 1972, Congress adopted a "zero-discharge" goal and a focus on "preventable causes of pollution" to emphasize the source of contamination rather than controls at the outfall or water body itself. Water quality standards include a legal designation of the desired use for a given body of water and the water quality criteria appropriate for that use. The criteria are specific levels of water quality which are expected to make a water body suitable for its desired use. Effluent limitations are restrictions on quantities, rates, and concentrations in wastewater discharges measured at the discharger's outfall pipe (Goldfarb 1984).

Administration of the act is delegated to the SWRCB in California. The RWQCB is responsible for setting water quality standards and criteria for water bodies in its regional plan and for issuing and enforcing NPDES permits.

Clean Water Act (Federal Water Pollution Control Act) of 1972, PL 92-500, as amended (33 USC 1251-1387): Section 401 Water Quality Certification, 1986, (33 USC 1341)

Section 401 requires state certification of federal permits that result in actions that discharge into navigable waters. Under Section 401, states have authority to review federal permits that may result in a discharge to wetlands or water bodies under state jurisdiction.

Clean Water Act (Federal Water Pollution Control Act) of 1972, PL 92-500, as amended (33 USC 1251-1387): Section 404 Permits for Dredged or Fill Material, 1977 (33 USC 1344) and the Rivers and Harbors Act of 1899 (33 USC 401 et seq.)

One of the laws most commonly affecting federal projects and properties is Section 404 of the federal CWA, passed in 1972 and jointly administered by the USACE and EPA. This section of the law regulates the discharge of dredged or fill material into the "waters of the United States," which also includes "jurisdictional wetlands." Discharges are any material that results in a change in the bottom elevation of a water body or wetland, including grading, road fills, stream crossings, building pads, and flood and erosion control on stream banks. Vernal pools are considered non-tidal waters that are isolated wetlands under Section 404.

The USACE is responsible for developing regulations for the Section 404 permit process and issuing permits, with the EPA maintaining power to veto the USACE's decisions. The USACE's regulatory jurisdiction for tidal waters at NSA Monterey and all adjacent marshlands or wetlands under Section 404 extends up to the high tide line (higher high water mark). In the coastal zone, the USACE requires permits for certain structures, such as groins, breakwaters, riprap, jetties, and beach nourishment activities. Overlapping with the CWA, below the mean high water line, is authority under Section 10 of the Rivers and Harbors Act of 1899, which gives the USACE jurisdiction over projects involving construction, excavation, and deposition. Tidal and subtidal zone projects such as new marinas, piers, wharves, floats, intake and outfall pipes, pilings, bulkheads, boat ramps, and dredge and fill, require USACE permits.

Comments are provided to the USACE on specific projects by the USFWS and NMFS because of requirements of the Fish and Wildlife Coordination Act. If the USACE supports these comments, then proposals for project mitigation can become conditions of the permit, even though USFWS and NMFS do not have direct regulatory authority under the CWA. Their mitigation concerns may become measures added to permits to ensure marine habitat protection and restoration as a means to protect fish and wildlife populations.

There are 26 more or less generic nationwide permits that preauthorize certain minor discharges as long as they meet certain conditions (e.g. construction of outfall structures, backfill or bedding for utility lines, fill for bank stabilization, and minor road crossings). The nationwide permit system is currently being modified. If a discharge would cause the loss of or substantially modify one to 10 acres of water, including adjacent wetlands, then the nationwide permit may not apply. Work cannot begin until USACE notifies the Navy that the nationwide permit applies.

The individual permit process is much more complex and time-consuming. It requires consultation, an EA prepared by USACE, Public Interest Review and a 404(b)(1) Evaluation. If significant impacts are found, then an EIS must be prepared. These regulations apply to vernal pools. Customarily, the L.A. District Engineer requires an individual permit and an EA for fills in any vernal pool, regardless of the presence or absence of endangered species. The USACE is attempting to formalize requirements particular to vernal pools. A Memorandum of Agreement between USACE and EPA dated 07 February 1990 states that all potential impacts must first be shown to have been avoided, minimized and then compensated for. Compensation is considered a last resort only, which involves the creation of a habitat to replace a similar habitat unavoidably eliminated at a project site. The concerned agencies must be completely convinced that the proposed compensation will completely mitigate the lost habitat. Any activity in a wetland will require at least an EA.

Penalties: A Class I or civil penalty may not exceed \$10,000 per violation, with the maximum amount of \$25,000. Class II civil penalty may not exceed \$10,000 per day as each violation continues, with the maximum amount not to exceed \$125,000.

#### Federal Water Pollution Control Act Amendments

The Federal Water Pollution Control Act Amendments of 1972 (see CWA; PL 92-500; 33 USC §§ 1251 *et seq.*) sets up a federal permit and license system to carry out certain pollution discharge activities in navigable waters. Section 314 of this act established the Clean Lakes Program. The purpose of the Clean Lakes Program is to develop a national program to clean up publicly owned freshwater lakes. In order to receive a grant for in-lake restoration under this program, all point sources of pollution must be treated or have treatment planned under Section 201 and 402 of the CWA.

#### Safe Drinking Water Act

The Safe Drinking Water Act (42 USC §§ 300[f] *et seq.*) prescribes treatment and distribution control strategies for abating contamination of drinking water and also requires the establishment of a permit program to regulate injection of liquids into underground strata.

The Safe Drinking Water Act provides for direct control of underground injection of fluids that may affect groundwater supplies. States may assume the predominant role in executing groundwater protection programs. The EPA has direct responsibility only if a state chooses not to participate in an underground injection control program.

#### B.3.1.4 Soil Resource Laws

##### Soil Conservation Act (16 USC §§ 590a *et seq.*)

The Soil Conservation Act (PL 74-46; 16 USC § 590A) provides for application of soil conservation practices on federal lands. The act requires federal agencies to control and prevent soil erosion and preserve natural resources in managing federal lands.

### B.3.1.5 Terrestrial and Aquatic Habitat Laws

Coastal Zone Management Act of 1972, PL 92-583, (16 USC 1451 et seq.) and its amendments

Two additional federal laws operate in the coastal zone: the Coastal Zone Management Act (CZMA) of 1972 and Coastal Zone Act Reauthorization Amendments of 1990. The CZMA provides that a state that develops a Coastal Zone Management Program that is approved by the Secretary of Commerce (NOAA), is entitled to federal financial support in administering the program and must apply the program to some areas that otherwise would be subject to only federal regulation (16 USC § 1455-1456).

Federal agency activities affecting any land use or water use or natural resource of the coastal zone shall be carried out in a manner "which is consistent to the maximum extent practicable with the enforceable policies of approved state management programs" (16 USC § 1456). The term "enforceable policies" is defined by regulation as those legally binding laws, regulations, land use plans, ordinances, or judicial or administrative decisions that are part of a NOAA approved program. The California Coastal Commission (CCC) has authority to implement provisions of the Coastal Zone Management Program. Although Navy lands are excluded from the CZMA definition of "coastal zone" as "lands held in trust by or which uses are subject solely to the discretion of the federal government," activities on these lands may require a consistency determination if there are coastal zone impacts. According to 5090.1C CH-1: "Federal actions that affect any land or water use or natural resource of the coastal zone must be consistent with the state program to the maximum extent practicable." Federal rules for federal consistency can be found in 15 CFR § 930.35-37. See further discussion on CZMA consistency under state agencies and laws in this Appendix.

Emergency Wetlands Resources Act of 1986, PL 99-645, as amended (16 USC 3901-3932)

This act, PL 99-645 (100 Stat. 3582), approved 10 November 1986, authorized the purchase of wetlands from Land and Water Conservation Fund monies, removing a prior prohibition on such acquisitions (USFWS 2010b). It required the Secretary to establish a National Wetlands Priority Conservation Plan, required the states to include wetlands in their Comprehensive Outdoor Recreation Plans, and transferred to the Migratory Bird Conservation Fund amounts equal to the import duties on arms and ammunition (USFWS 2010b).

It extended the Wetlands Loan Act authorization through 1988 and forgave the previous advances under the act (USFWS 2010b). It also required the Secretary to report to Congress on wetlands loss, including an analysis of the role of federal programs and policies in inducing such losses. In addition, it directed the Secretary, through the Service, to continue the National Wetlands Inventory; to complete by 30 September 1998, mapping of the contiguous U.S.; to produce, as soon as practicable, maps of Alaska and other non contiguous portions of the U.S.; and to produce, by 30 September 1990, and at ten-year intervals

thereafter, reports to update and improve in the September 1982 "Status and Trends of Wetlands and Deepwater Habitat in the Conterminous United States, 1950s to 1970s" (USFWS 2010b).

#### Federal Flood Disaster Prevention Act (42 USC 4001)

The Federal Flood Disaster Prevention Act (PL 93-234; 42 USC §§ 4001 *et seq.*) established the Federal Flood Insurance Program, which has provided some incentives for construction outside flood-prone areas. To a limited degree, this has reduced destruction of riparian vegetation by developments. President Carter issued two executive orders in a related effort: EO 11988 (Floodplain Protection) directed federal agencies to avoid construction in flood-hazard areas and to seek restoration and preservation of the natural and beneficial values of floodplains; EO 11990 (Protection of Wetlands) directed federal agencies to minimize the destruction, loss, or degradation of wetlands.

#### Land and Water Conservation Act of 1965 (16 USC 4601 *et seq.*)

The Land and Water Conservation Act assists in preserving, developing, and assuring accessibility to outdoor recreation resources.

#### Legacy Resource Protection Program Act, PL 101-511

The Legacy Resource Protection Program Act established a program for the stewardship of biological, geophysical, cultural, and historic resources on DoD lands.

#### North American Wetlands Conservation Act, PL 101-233 (16 USC 4401-4414)

North American Wetlands Conservation Act (103 Stat. 1968; 16 USC 4401-4412) - PL 101-233, enacted 13 December 1989, provides funding and administrative direction for implementation of the North American Waterfowl Management Plan and the Tripartite Agreement on Wetlands between Canada, U.S. and Mexico (USFWS 2010c).

The Act converts the Pittman-Robertson account into a trust fund, with the interest available without appropriation through the year 2006 to carry out the programs authorized by the act, along with an authorization for annual appropriation of \$15 million plus an amount equal to the fines and forfeitures collected under the MBTA (USFWS 2010c).

Available funds may be expended, upon approval of the Migratory Bird Conservation Commission, for payment of not to exceed 50 percent of the United States' share of the cost of wetlands conservation projects in Canada, Mexico, or the U.S. (or 100 percent of the cost of projects on federal lands). At least 50 percent and no more than 70 percent of the funds received are to go to Canada and Mexico each year (USFWS 2010c).

A North American Wetlands Conservation Council is created to recommend projects to be funded under the Act to the Migratory Bird Conservation Commission (USFWS 2010c). The council is to be composed of the Director of the Service, the Secretary of the National Fish and Wildlife Foundation, a state fish and game agency director from each flyway, and three representatives of different non-profit organizations



participating in projects under the plan or the act. The Chairman of the Council and one other member serve ex officio on the Commission for consideration of the Council's recommendations (USFWS 2010c).

The Commission must justify in writing to the Council and, annually, to Congress, any decisions not to accept Council recommendations (USFWS 2010c).

Public Law 101-593, approved 16 November 1990 (104 Stat. 2962), provided that the Director is the federal official responsible for compliance with NEPA with respect to Council actions, and that recommendation(s) from the Council to the Commission constitute agency action requiring the preparation of an EA or EIS. The Chairman of the Council is also required to take steps to ensure public notice of Council meetings (USFWS 2010c).

Public Law 103-375, 19 October 1994 (108 Stat. 3494), reauthorized the law through fiscal year 1998 and increased the authorization for appropriations to \$20 million per year for 1995 and 1996 and \$30 million per year through 1998. The amendment also acknowledged the role of Mexico in plan preparation and project selection and implementation and recognized that projects carried out in Mexico could include cash contributions from non-U.S. sources (USFWS 2010c).

Public Law 105-312, 30 October 1998 (112 Stat. 2958), provides for a reauthorization of the law and extends funding authority at the current level of \$30 million per year through fiscal year 2003. An amendment to the law requires the Secretary of the Interior to reappoint Ducks Unlimited to fill one of the non-governmental organization seats on the North American Wetlands Council for a three-year term. It further requires the Secretary to publish a policy on how rotations will be handled in the future (USFWS 2010c).

Watershed Protection and Flood Prevention Act, PL 92-419 (16 USC 1001-1011, 33 USC 701)

The Watershed Protection and Flood Prevention Act (PL 83-566), 04 August 1954, as amended, authorized the NRCS to cooperate with states and local agencies to carry out works of improvement for soil conservation and for other purposes including flood prevention; conservation, development, utilization and disposal of water; and conservation and proper utilization of land (NRCS 2010).

The NRCS implements the Watershed Protection and Flood Prevention Act through three programs:

- Watershed Operations
- Watershed Protection and Flood Prevention Operations
- Watershed Rehabilitation

**Watershed Operations.** Watershed Operations is a voluntary program which provides assistance to sponsoring local organizations of authorized watershed projects, planned and approved under the authority of the Watershed Protection and Flood Prevention Act of 1954 (PL 83-566), and eleven designated watershed authorized by the Flood Con-

trol Act of 1944 (PL 78-534) (NRCS 2010). The NRCS provides technical and financial assistance to states, local governments and Tribes (project sponsors) to implement authorized watershed project plans for the purpose of watershed protection; flood mitigation; water quality improvements; soil erosion reduction; rural, municipal and industrial water supply; irrigation water management; sediment control; fish and wildlife enhancement; and wetlands and wetland function creation and restoration (NRCS 2010).

Watershed Protection and Flood Prevention Operations. The Flood Control Act of 22 December 1944 authorized the Secretary of Agriculture to install watershed improvement measures to reduce flood, sedimentation, and erosion damages; further the conservation, development, utilization, and disposal of water; and the conservation and proper utilization of land (NRCS 2010).

Watershed Rehabilitation. Local communities, with NRCS assistance, have constructed over 11,000 dams in 47 states since 1948 (NRCS 2010).

### **B.3.1.6 Wildlife Population Laws**

Animal Damage Control Act (7 USC 426 §§ et seq.)

The Animal Damage Control Act provides broad authority for investigation, demonstrations and control of mammalian predators, rodents, and birds.

Fish and Wildlife Conservation Act of 1980, PL 96-366 (16 USC §§ 2901-2912)

The Fish and Wildlife Conservation Act of 1980 (PL 96-366; 16 USC §§ 2901 *et seq.*) provides for conservation, protection, restoration and propagation of certain species, including migratory birds threatened with extinction.

Fish and Wildlife Coordination Act of 1934, PL 85-624, as amended (16 USC §§ 661-666c)

The Fish and Wildlife Coordination Act (PL 85-624; 16 USC §§ 661 *et seq.*) is a law which mandates that wildlife conservation receive equal consideration and be coordinated with other features of water resource development. The intent is to prevent loss or damage of wildlife and provide for development and improvement of wildlife in conjunction with water development projects. Federal agencies proposing to impound, divert, or control surface waters are required to consult with the USFWS and CDFW, to include and give full consideration to the recommendations of these agencies, and to provide justifiable means and measures for benefiting wildlife in project plans. The USACE must coordinate permit applications with USFWS and CDFW. Like NEPA, implementation of this act is essentially procedural in that no particular outcome is mandated. The act authorizes project modification, land acquisition, and other measures necessary to protect wildlife.

Magnuson Stevens Fishery Conservation and Management Act, PL 94-265, (16 USC 1801-1884) as amended

The Magnuson Stevens Fishery Conservation and Management Act provides conservation and management of fishery resources, develops domestic fisheries, and phases out foreign fishing activity within the Exclusive Economic Zone. Eight Regional Fishery Management Councils implement the goals of the Act in coordination with the NMFS. The Pacific Fishery Management Council manages the fisheries resources off Washington, Oregon, and California by developing Fisheries Management Plans for the Exclusive Economic Zone. The Pacific Fishery Management Council is funded through the U.S. Department of Commerce.

Management plans adopted and implemented to date include one for the:

- Pacific Coast Groundfish Fishery
- Pacific Coast Salmon Fishery
- Coast Pelagic Species Fishery

A management plan for West Coast Highly Migratory Species (tunas, sharks, billfish/swordfish, and dorado [also known as dolphinfish and mahi-mahi]) was partially approved in 2004. California state fishing regulations (such as the Nearshore Fishery Management Plan as it applies to groundfish species, see below) must be consistent with federal law for species managed by the Pacific Fishery Management Council.

This act assigns to NMFS responsibility for identifying EFH for all species which are federally managed and for determining whether projects or activities adversely impact EFH zones. These zones are broadly defined as those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity.

When projects are planned that can adversely affect EFH, NMFS can recommend conservation measures to minimize problems. While such habitat-related comments (outside of ESA consultations) have had little effect in the past, new requirements for federal agency consultation on activities that may affect EFH have changed that. Once the Navy receives NMFS comments on means to better avoid or minimize habitat damage, it must respond in writing within 30 days, outlining the measures it is proposing to avoid, mitigate, and offset the impact of the activity on EFH. The Navy must also explain any inconsistencies between the avoidance and mitigation actions they propose to take and the recommendations made by NMFS.

Marine Mammal Protection Act of 1972, PL 92-522, (16 USC 1361)

The MMPA was enacted on 21 October 1972. All marine mammals are protected under the MMPA. The MMPA prohibits, with certain exceptions, the "take" of marine mammals in U.S. waters and by U.S. citizens on the high seas and the importation of marine mammals and marine mammal products into the U.S. (NMFS 2010).

Congress passed the 1972 MMPA based on the following findings and policies:

- Some marine mammal species or stocks may be in danger of extinction or depletion as a result of human activities;
- These species or stocks must not be permitted to fall below their optimum sustainable population level ("depleted");
- Measures should be taken to replenish these species or stocks;
- There is inadequate knowledge of the ecology and population dynamics; and
- Marine mammals have proven to be resources of great international significance.

The MMPA was amended substantially in 1994 to provide for:

- Certain exceptions to the take prohibitions, such as permits and authorizations for scientific research;
- A program to authorize and control the taking of marine mammals incidental to commercial fishing operations;
- Preparation of stock assessments for all marine mammal stocks in waters under U.S. jurisdiction; and
- Studies of pinniped-fishery interactions.

The NSA Monterey Natural Resources program complies with the MMPA through requesting LOA permits for the potential harassment of pinnipeds at marine mammal haul out locations during naval readiness training activities at NSA Monterey.

Migratory Bird Treaty Act of 1918, 40 Stat. 755, as amended (16 USC §§ 703-712)

The MBTA (16 USC § 703 *et seq.*) of 1918 is a federal statute that implements four treaties with the U.S. and Canada, Mexico, Japan, and Russia on the conservation and protection of migratory birds. It uses federal permits as a tool to assist in the conservation of migratory birds to authorize otherwise prohibited activities for scientific, educational, cultural, and other purposes.

The number of bird species covered by the MBTA is extensive and is listed at 50 CFR § 10.13. Further, the regulatory definition of "migratory bird" is broad and includes any mutation or hybrid of an identified species and includes any part, egg, or nest of such bird (50 CFR § 10.12). A federal court in Washington, D.C., had ruled in 2002 that the MBTA covers all migratory birds, even if they are invasive aliens. The Migratory Bird Treaty Reform Act of 2004 amended the MBTA to clarify that only species that are native to the U.S. are protected under that act. It clarified, in statute, that the protections and programs outlined in the MBTA of 1916 and the Congressionally approved regulations attached to the Act in 1918 apply only to native birds, not the increasing and increasingly problematic alien or exotic bird populations. As required by the MBTRA, the USFWS has published a List of Bird Species to Which the Migratory Bird Treaty Reform Act Does Not Apply which includes "all non-native, human-introduced bird species..." This list may be found in Volume 70, Number 49, Pages 12710-12716 of the Federal Register dated on 15 March 2005.

The MBTA, which is enforced by the USFWS, makes it unlawful "by any means or in any manner, to pursue, hunt, take, capture [or] kill" any migratory bird, or attempt such actions, except as permitted by regulation. The applicable regulations prohibit the take, possession, import, export, transport, sale, purchase, barter, or offering of these activities, except under a valid permit or as permitted by the implementing regulations (50 CFR § 21.11).

The USFWS migratory bird depredation permits (Title 50 CFR § 21.43) are required before any person may take, possess, or transport migratory birds, except for yellow-headed blackbirds, red-winged blackbirds, rusty blackbirds, Brewer's blackbirds, cowbirds, all grackles, crows, and magpies found committing or about to commit depredations upon ornamental or shade trees, agricultural crops, livestock, or wildlife, or when concentrated in such numbers and manner as to constitute a health hazard or other nuisance. When horned larks, golden-crowned, white-crowned and other crowned sparrows, and house finches are, under extraordinary conditions, seriously injurious to agriculture or other interests, the Commissioner of Agriculture may, without a permit, kill or cause to be killed, under his/her general supervision, such of the above migratory birds as may be necessary to safeguard any agricultural or horticultural crop. No permit is necessary merely to scare or herd depredating migratory birds other than threatened or endangered species or bald or golden eagles.

The USFWS has sole authority for coordinating and supervising all federal migratory bird management activities, including enforcement of statutes regulating the taking of protected species (game and nongame) by individuals and federal agencies. The MBTA provides the USFWS the opportunity to comment on projects potentially affecting bird species, and their habitats, that are not protected under the ESA. Violations of the MBTA can result in criminal and civil penalty. Therefore, if a project has the potential to affect nesting birds or nesting substrate (e.g. trimming nest trees) a qualified biologist from the Natural Resources Office must be contacted to determine if there will be any violations.

There have been recent developments regarding implementation of the MBTA and DoD. Following a U.S. District Court decision which granted an injunction on live fire military training on behalf of a private party, Congress enacted the 2003 NDAA, which authorized an interim period during which the prohibitions on incidental take of migratory birds would not apply to military readiness activities. During this interim period, Congress also directed the Secretary of Interior to, not later than one year after enactment of the NDAA, promulgate a regulation to deal with the incidental take of migratory birds in conjunction with military readiness activities from the take prohibition of the MBTA. Under the 2003 NDAA, the House Armed Services Committee authorized a set of initiatives intended to "restore a balance between protecting the environment and military readiness." One of these initiatives, regarding the MBTA, stated:

"The Migratory Bird Treaty Act allows federal agencies to obtain permits to remove migratory birds for economic or safety reasons, such as clearing geese from a golf course or runway. However, a federal court ruled in March 2002 that Navy activities at a training range

near Guam violated the MBTA because the court felt that the law does not allow for permits for the accidental taking of birds during military readiness activities. As a result, the court temporarily shut down military training at the facility. In order to ensure that DoD can operate all of its facilities without further interruptions of this nature, the conferees provided the DoD with authority under which the MBTA would not apply to the incidental taking of a migratory bird by DoD during an authorized military readiness activity. In addition, the conferees directed the Secretary of the Interior, with the concurrence of DoD, to exercise its authority within one year to initiate regulations that would exempt DoD from the MBTA for incidental takings of migratory birds during authorized military readiness activities."

### *DoD Migratory Bird Rule and Guidance*

The new Migratory Bird Rule relates to military readiness activities and was established in accordance with Section 315 of the NDAA for FY 2003. The final rule, "Migratory Bird Permits: Take of Migratory Birds by the Armed Forces", was published as 50 CFR Part 21 in the 28 February 2007 FR (pg. 8931-8950). It authorizes the military to "take" migratory birds under the MBTA without a permit, but if the military determines that the activity will "significantly" affect a population of migratory birds, they must work with the USFWS to implement conservation measures to minimize/mitigate the effects.

This is different from the USFWS-DoD MOU (FR 30 August 2006) which addresses the conservation of migratory birds on military lands in relation to all activities except readiness. Key to implementing the MBTA Rule and guidance documents on the MOU between the USFWS and DoD are the wording of the authorization for take that requires an understanding of the definition of the following terms:

Population, as used in Section 21.15, a group of distinct, coexisting (conspecific) individuals of a single species, whose breeding site fidelity, migration routes, and wintering areas are temporally and spatially stable, sufficiently distinct geographically (at some time of the year), and adequately described so that the population can be effectively monitored to discern changes in its status.

Significant adverse effect on a population, used in Section 21.15, means an effect that could, within a reasonable period of time, diminish the capacity of a population of migratory bird species to sustain itself at a biologically viable level. A population is "biologically viable" when its ability to maintain its genetic diversity, to reproduce, and to function effectively in its native ecosystem are not significantly harmed. This effect may be characterized by increased risk to the population from actions that cause direct mortality or a reduction in fecundity. Assessment of impacts should take into account yearly variations and migratory movements of the impacted species. Due to the significant variability in potential military readiness activities and the species that may be impacted, estimates of significant measurable decline will be determined on a case-by-case basis.

In April 2007, guidance was issued by the OUSD (Acquisition, Technology and Logistics) on implementing the MOU to Promote the Conservation of Migratory Birds between the USFWS and DoD in

accordance with EO 13186 (17 January 2001). This guidance covers all activities on Navy property including natural resources management, routine maintenance and construction, industrial activities, and hazardous waste cleanups.

The guidance emphasizes interdisciplinary collaboration within the framework of North American Bird Conservation Initiative (NABCI) Bird Conservation Regions, collaborative inventory and long-term monitoring. Many questions remain about how to implement the Migratory Bird Rule and the new guidance on the USFWS-DoD MOU. For example, how the evaluation of significance needs to be addressed in decision documents is still being worked out. Since the impact assessment must be conducted on populations of migratory birds, there may be a need to collect better population baseline data. Conservation measures undertaken under the Migratory Bird Rule require monitoring and record-keeping for five years from the date the Armed Forces commence their conservation action. During INRMP reviews, the Armed Forces must report to the USFWS migratory bird conservation measures implemented and the effectiveness of the conservation measures in avoiding, minimizing, or mitigating take of migratory birds.

#### *DoD Migratory Bird MOU and Executive Order 13186*

For DoD activities other than military readiness, migratory bird concerns are addressed through an MOU (July 2006) developed in accordance with EO 13186 "Responsibilities of Federal Agencies to Protect Migratory Birds," signed 10 January 2001 (66 FR 3853). The USFWS-DoD MOU (FR 30 August 2006) that evolved out of the requirements of the EO addresses the conservation of migratory birds on military lands in relation to all activities except readiness. The MOU is a guidance document on how the DoD will conserve migratory birds and does not authorize any take. In April 2007, further guidance was issued by the OUSD (Acquisition, Technology and Logistics) on implementing the MOU to Promote the Conservation of Migratory Birds between the USFWS and DoD in accordance with EO 13186. This guidance covers all activities at NSA Monterey, including natural resources management, routine maintenance and construction, industrial activities, and hazardous waste cleanups. The guidance emphasizes interdisciplinary collaboration within the framework of NABCI Bird Conservation Regions, collaborative inventory and long-term monitoring. The EO directs executive departments to take certain actions regarding the protection of migratory birds. In the interim period until the MOU is signed, the EO encourages federal agencies "to begin immediately implementing the conservation measures" identified in the EO, "as appropriate and practicable." The ASN(I&E), in a 19 January 2001 memorandum to the CNO and Commandant of the Marine Corps, issued guidance on EO compliance. This guidance provides that U.S. Navy activities should comply with the "intent" of the EO until the EO required MOU is completed.

A Council for the Conservation of Migratory Birds was established to help agencies implement the EO. The EO requires NEPA evaluations to include effects on migratory birds and that advance notice or annual reports must be made to the USFWS concerning actions that result in the taking of migratory birds. The EO also requires agencies

to control the establishment of exotic species that may endanger migratory birds and their habitat. Pursuant to its MOU, each agency shall, to the extent permitted by law and subject to the availability of appropriations and within administration budgetary limits, and in harmony with agency missions:

- Support the conservation intent of the migratory bird conventions by integrating bird conservation principles, measures, and practices into agency activities and by avoiding or minimizing, to the extent practicable, adverse impacts on migratory bird resources when conducting agency actions;
- Restore and enhance the habitat of migratory birds, as practicable;
- Prevent or abate the pollution or detrimental alteration of the environment for the benefit of migratory birds, as practicable;
- Design migratory bird habitat and population conservation principles, measures, and practices, into agency plans and planning processes (natural resource, land management, and environmental quality planning, including, but not limited to, forest and rangeland planning, coastal management planning, watershed planning, etc.) as practicable, and coordinate with other agencies and nonfederal partners in planning efforts;
- Within established authorities and in conjunction with the adoption, amendment, or revision of agency management plans and guidance, ensure that agency plans and actions promote programs and recommendations of comprehensive migratory bird planning efforts such as PIF, U.S. National Shorebird Plan, North American Waterfowl Management Plan, North American Colonial Waterbird Plan, and other planning efforts, as well as guidance from other sources, including the Food and Agricultural Organization's International Plan of Action for Reducing Incidental Catch of Seabirds in Longline Fisheries;
- Ensure that environmental analyses of federal actions required by the NEPA or other established environmental review processes evaluate the effects of actions and agency plans on migratory birds, with emphasis on species of concern;
- Provide notice to USFWS in advance of conducting an action that is intended to take migratory birds, or annually report to USFWS on the number of individuals of each species of migratory birds intentionally taken during the conduct of any agency action, including but not limited to banding or marking, scientific collecting, taxidermy, and depredation control;
- Minimize the intentional take of species of concern by: (i) delineating standards and procedures for such take; and (ii) developing procedures for the review and evaluation of take actions. With respect to intentional take, the MOU shall be consistent with the appropriate sections of 50 CFR parts 10, 21, and 22;
- Identify where unintentional take reasonably attributable to agency actions is having, or is likely to have, a measurable negative effect on migratory bird populations, focusing first on species of concern, priority habitats, and key risk factors. With respect to those actions so identified, the agency shall develop and use principles, standards,



and practices that will lessen the amount of unintentional take, developing any such conservation efforts in cooperation with the USFWS. These principles, standards, and practices shall be regularly evaluated and revised to ensure that they are effective in lessening the detrimental effect of agency actions on migratory bird populations. The agency also shall inventory and monitor bird habitat and populations within the agency's capabilities and authorities to the extent feasible to facilitate decisions about the need for, and effectiveness of, conservation efforts;

- Within the scope of its statutorily-designated authorities, control the import, export, and establishment in the wild of live exotic animals and plants that may be harmful to migratory bird resources;
- Promote research and information exchange related to the conservation of migratory bird resources, including coordinated inventorying and monitoring and the collection and assessment of information on environmental contaminants and other physical or biological stressors having potential relevance to migratory bird conservation. Where such information is collected in the course of agency actions or supported through federal financial assistance, reasonable efforts shall be made to share such information with USFWS, the USGS-Biological Resources Division, and other appropriate repositories of such data (e.g. the Cornell Laboratory of Ornithology);
- Provide training and information to appropriate employees on methods and means of avoiding or minimizing the take of migratory birds and conserving and restoring migratory bird habitat;
- Promote migratory bird conservation in international activities and with other countries and international partners, in consultation with the Department of State, as appropriate or relevant to the agency's authorities;
- Recognize and promote economic and recreational values of birds, as appropriate; and
- Develop partnerships with non-federal entities to further bird conservation.

#### Migratory Bird Treaty Act as amended by the National Defense Authorization Act of 2003

The NDAA for FY 2003 exempted the DoD from the MBTA for the incidental take of migratory birds as a result of otherwise authorized military readiness activities until the Secretary of Interior prescribes regulations authorizing such take. The DoD shall give appropriate consideration to the protection of migratory birds when planning and executing military readiness activities. As indicated in the proposed rule, migratory bird conservation will be incorporated into INRMPs, where applicable, to mitigate where needed and to protect migratory birds and their habitats.

### B.3.1.7 Species of Concern Laws

#### Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act (Bald and Golden Eagles Act; PL 95-616; 16 USC §§ 668 *et seq.*) of 1979 provides for protection of the bald eagle and the golden eagle by prohibiting taking, possession, and commerce in the birds.

#### Endangered Species Act of 1973, PL 93-205, (16 USC 1531-1534)

Once a species becomes listed as endangered or threatened, regulations to protect the species from illegal "take" become applicable to any project carried out or funded by federal departments such as DoD that may affect an individual animal or its habitat. A "take" is defined as to: "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect" a listed species, or attempt to do so. The USFWS was charged by Congress with overseeing ESA implementation for all species except most marine species, which are under jurisdiction of the NMFS.

Section 7(a)(1) of the ESA states that all federal agencies shall utilize their authorities in furtherance of the purposes of the ESA by carrying out programs for the conservation of endangered species and threatened species listed pursuant to Section 4 of the ESA. "Conservation" is defined in the ESA as "to use...all methods and procedures which are necessary to bring any endangered species or threatened species to the point at which the measures provided pursuant to this [ESA] are no longer necessary. Such methods and procedures include, but are not limited to, all activities associated with scientific resources management such as research, census, law enforcement, habitat acquisition and maintenance, propagation, live trapping, and transplantation, and, in the extraordinary case where population pressures within a given ecosystem cannot be otherwise relieved, may include regular taking."

Under Section 7(a)(2) of the ESA, federal project proponents must consult with USFWS or NMFS if one or more listed species may be affected by an action. Consultation with USFWS or NMFS may range from informal discussions to formal consultation requiring a BA by the project proponent (Figure B-1). For nonfederal project applicants, the USACE takes the lead in this consultation if the issue is within their jurisdiction. Other federal agencies may appropriately be named as the action agency that must conduct the consultation. With the issuance of a BO, "terms and conditions" are stated, which are measures to avoid or minimize the take of any listed species. A BO must include: (1) a summary of the information on which the opinion was based (the information is to be provided by the federal agency), (2) a detailed discussion of the effects of the action on listed species or Critical Habitat, and (3) the USFWS opinion on whether the action is likely to jeopardize the continued existence of a listed species or adversely modify Critical Habitat.

The BO may include an incidental take statement that specifies: (1) the amount of "take" that is allowed, (2) reasonable and prudent measures that the USFWS considers necessary or appropriate to minimize such a "take," and (3) the terms and conditions that must be complied with to implement the reasonable and prudent measures. When an

“incidental take statement” is issued with the BO, the federal project proponent may be excused from incidentally taking a listed species as part of the agency’s otherwise lawful activity as long as the specified taking conditions are met. Section 10 of the ESA also provides for a similar incidental take permit for private, state, and local government projects. To qualify, the project proponent must submit a habitat conservation plan and also seek to minimize and mitigate the impacts of the taking to the “maximum extent practicable.”

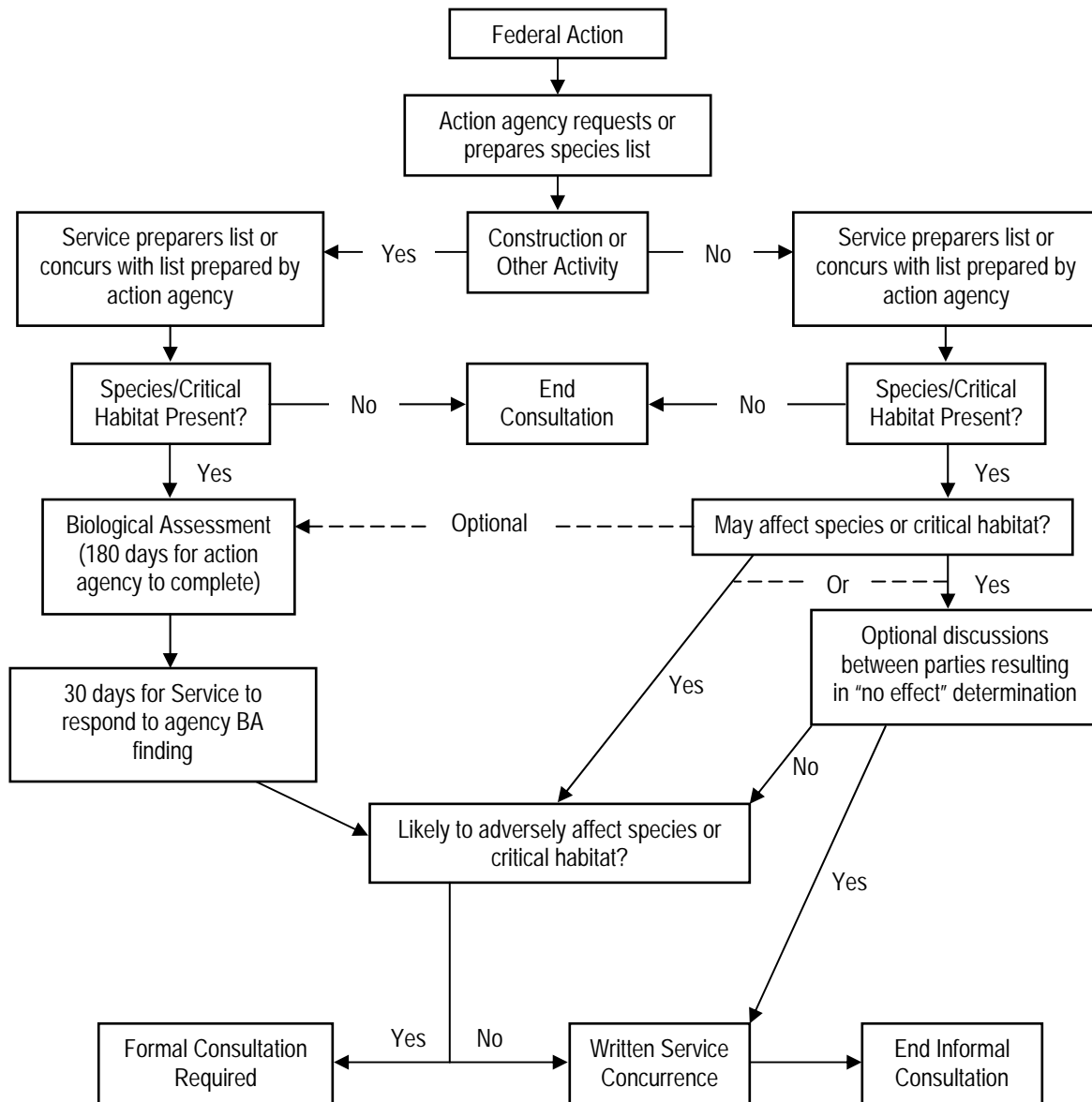


Figure B-1. Informal federal process for Endangered Species Act Consultation (USFWS and NMFS 1998).

Critical Habitat may be designated for a listed species, in which case such habitat may require special management consideration or protection. Section 318(a) of the NDAA for FY 2004 (PL 108-136) made changes to the ESA regarding INRMPs. These changes were justified on the basis of the need to promote military readiness while protecting listed species.

Under new Section 4(a)(3)(B)(i) of the ESA, the Secretary of the Interior or the Secretary of Commerce, as appropriate, may be precluded from designating Critical Habitat on any areas owned, controlled, or designated for use by DoD where an INRMP has been implemented that, as determined by the Interior or Commerce Secretary, provides a benefit to the species for which Critical Habitat designation is proposed.

The Navy must take measures to assure that no irreversible or irretrievable commitment of resources is authorized, funded or carried out by them that will likely jeopardize the continued existence of any threatened or endangered species or destroy or adversely modify designated Critical Habitat, until the consultation process is complete. The Navy is to provide leadership in identifying and protecting habitat that is critical for any threatened or endangered species.

Navy installations are required to carry out the following:

1. Maintain liaison with local governmental agencies and organizations having an interest in endangered and threatened species protection;
2. Delineate boundaries of the habitat areas of endangered and threatened species on maps;
3. Initiate consultation with the USFWS or NMFS per cooperative agreement procedures when a proposed action or program has been identified that may affect listed species or their habitat;
4. Perform a BA for any action that may adversely affect the continued existence of endangered and threatened species or result in the destruction or adverse modification of habitat of such species (the BA should contain the final BO of the USFWS or NMFS following the consultation process);
5. Cooperate with the USFWS or NMFS during development and implementation of a recovery plan for listed species occurring on the installation.

This INRMP must undergo an internal Section 7 review by staff to determine if consultation is needed. In addition, the INRMP must clearly demonstrate a benefit to the species (Appendix K).

ESA Penalties: Civil penalty of up to \$25,000 per violation or criminal penalty of up to \$50,000 and/or one year in prison, knowing violation for a take or damage/destruction of Critical Habitat of an endangered animal.

Federal Noxious Weed Act of 1974, PL 93-629, as amended (7 USC §§ 2801-2814)

The Federal Noxious Weed Act of 1974 (PL 93-629; 7 USC § 2801) provides for the management of undesirable plants and their regulation in interstate and foreign commerce.

Noxious Plant Control Act (43 USC 1241)

The Noxious Plant Control Act (PL 90-583; 43 USC § 1241) provides for the control of noxious plants on lands under control or jurisdiction of the federal government.

## B.3.2 Federal Cultural Resource Laws

American Antiquities Act of 1906, PL 59-209 (16 USC §§ 431-433)

The American Antiquities Act provides for the protection of items of archaeological significance, both historic and prehistoric. The Antiquities Act of 1906 (PL 59-209; 16 USC §§ 431 *et seq.*, 1982) authorizes the President to designate as National Monuments historic and natural resources of national significance located on federally owned or controlled lands. The act further provides for the protection of all historic and prehistoric ruins and objects of antiquity located on federal lands by providing criminal sanctions against excavation, injury, or destruction of such antiquities without the permission of the Department having jurisdiction over such resources. The Secretaries of the Interior, Agriculture, and Defense are further authorized to issue permits for archaeological investigations on lands under their control to recognized educational and scientific institutions for the purposes of systematically and professionally gathering data of scientific value.

American Indian Religious Freedom Act of 1978, PL 95-341, as amended (42 USC §§ 1996-1996a)

The American Indian Religious Freedom Act of 1978 (PL 95-341; 42 USC § 1996) directs consultations with traditional leaders, where appropriate, to ensure continuity in religious practices on federal lands. It requires the federal government to protect the right of American Indian, Eskimo, Aleut, and Native Hawaiian to exercise traditional religious practices.

Archaeological and Historic Preservation Act (Moss-Bennett Act) of 1974, PL 86-532 (16 USC §§ 469-469c)

The Archaeological and Historic Preservation Act of 1974 (Moss-Bennett Act; 16 USC §§ 469 *et seq.*) provides for the protection of historic and archaeological sites threatened by federal or federally funded or assisted construction projects.

Archeological Resources Protection Act of 1979, PL 96-95 (16 USC §§ 470aa-470mm)

The Archaeological Resources Protection Act of 1979 (16 USC §§ 470 *et seq.*, 1982) sets up penalties for destruction or removal of archaeological materials from federal land without the proper permits. Requirements for obtaining these permits are also established by this regulation.

Historic Sites Act of 1935, PL 292 (16 USC §§ 461-467)

The Historic Sites Act of 1935 (PL 74-292; 16 USC §§ 461 *et seq.*, 1982) establishes as national policy the preservation for public use of historic sites, buildings, and objects by giving the Secretary of the Interior the power to make historic surveys and to document, evaluate, acquire, and preserve archaeological and historic sites across the country. This Act led to the eventual establishment within the National Park Service of the Historic Sites Survey, the Historic American Building Survey, the Historic American Engineering Record, and the National Historic Landmarks Program.

National Historic Preservation Act of 1966, PL 89-665, as amended (16 USC §§ 470-470x-6)

The NHPA of 1966 (PL 89-665; 16 USC §§ 470 *et seq.*) provides for the preservation of historic properties throughout the U.S. This Act expanded the National Register of Historic Places (NRHP) and created an Advisory Council on Historic Preservation. Section 106 of the Act requires that federal agencies allow the Council an opportunity to comment whenever their undertakings may affect NRHP resources or resources eligible for listing in the NRHP. Section 110 requires federal agencies to identify, evaluate, inventory, and protect National Register resources or resources eligible for the NRHP on property they control. The NHPA imposes no absolute preservation requirement, as long as the Navy follows and documents mandated procedures for any Navy decision not to preserve.

Native American Graves Protection and Repatriation Act of 1990, PL 101-601 (25 USC §§ 3001-3013)

The Native American Graves Protection and Repatriation Act of 1990 (PL101-601; 25 USC §§ 3001 *et seq.*) gives ownership and control of Native American human remains, funerary objects, sacred objects and objects of cultural patrimony that are excavated or discovered on federal land to federally recognized American Indian tribes or Native Hawaiian organizations. The law also establishes criminal penalties for trafficking in human remains or cultural objects, and requires agencies and museums that receive federal funding to inventory those items in their possession, identify the descendants of and repatriate those items.

### B.3.3 Other Federal Laws

Americans with Disabilities Act of 1990

This Act prohibits discrimination and ensures equal opportunity for persons with disabilities in employment, State and local government services, public accommodations, commercial facilities, and transportation.

Anti-Deficiency Act (31 USC 1341 *et seq.*)

This act places limitations on expending and obligating amounts for an officer or employee of the U.S. Government, including expenditures related to natural resource management efforts.

Data Quality Act

Under the Data Quality Act, which took effect 01 October 2002, federal agencies must ensure that the information it uses and disseminates meets certain quality standards. The Data Quality Act requires federal agencies to issue guidelines ensuring the quality, utility, objectivity and integrity of information that they disseminate and provide mechanisms for affected persons to correct such information by petitioning and challenging the quality of information it has used or disseminated. Two questions that remain unanswered about the Data Quality Act is whether agency information quality guidelines apply to rule-making and whether an agency's denial of a petition to correct information is able to be reviewed by the courts.

## Defense Appropriations Act

The Defense Appropriations Act of 1991 Legacy Program (10 USC § 2701) provides for the stewardship of biological, geophysical, cultural and historic resources on DoD lands.

## Disabled Sportsman Access Act of 1998

The Paralyzed Veterans of America spearheaded the passage of the Disabled Sportsmen's Access Act of 1998 (PL 105-261). This Act establishes a mechanism by which outdoor recreation programs on military installations will be accessible to disabled veterans, dependents with disabilities, and all others with disabilities. These outdoor recreational opportunities will allow access to nearly 30 million acres of military lands for such sports as fishing, hunting, trapping, wildlife viewing, boating, trapping, and camping.

## Emergency Planning and Community Right-to-Know Act

The Emergency Planning and Community Right-to-Know Act of 1986 (42 USC § 11001 *et seq.*) is also known as Title III of the Superfund Amendments and Reauthorization Act. This Act focuses on the hazards associated with toxic chemical releases. Most notably, specific sections of the Act require immediate notification of releases of oil and hazardous substances and CERCLA-defined hazardous substances to state and local emergency response planners. The Act requires state and local coordination in planning response actions to chemical emergencies. The Act requires certain industries to submit information on chemical inventories and fugitive emissions.

## Federal Facilities Compliance Act

The Federal Facilities Compliance Act (42 USC § 6961) of 1992 amends the RCRA. It subjects federal agencies to civil and administrative penalties for noncompliance with federal, state, interstate, or local solid and hazardous waste requirements (Subtitles C and D of RCRA).

## Military Construction and Authorization Act

The Military Construction Authorization Act of 1975 (10 USC § 2665) allows the proceeds from the sale of recyclable material be credited to the installation to cover specified costs.

## Military Construction Authorization Act-Leases; Non-Excess Property

The Military Construction Authorization Act- Leases; Non-excess property (10 USC § 2667) provides for the outleasing of public lands.

## Military Construction Authorization Act - Military Reservation and Facilities-Hunting, Fishing and Trapping

The Military Construction Authorization Act - Military Reservation and Facilities-Hunting, Fishing and Trapping (10 USC § 2671) requires that all hunting, fishing, and trapping on military installations follow Fish and Game laws of the state in which it is located, and be issued appropriate state licenses for these activities.

### National Trails Systems Act

The National Trail Systems Act of 1968 (16 USC § 1271) promotes development of recreational, scenic, and historic trails for persons of diverse interests and abilities.

### Outdoor Recreation-Federal/State Program Act

The Outdoor Recreation-Federal/State Program Act (PL 88-29; 16 USC §§ 460[L] *et seq.*) provides for the management of lands used for outdoor recreation. It requires consultations with the National Park Service regarding management.

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## B.4 Executive Orders

### B.4.1 Executive Orders Relevant to Natural Resources

#### B.4.1.1 Environmental Executive Orders

##### Strengthening Federal Environmental, Energy, and Transportation Management (EO 13423)

EO 13423 "Strengthening Federal Environmental, Energy, and Transportation Management" (24 January 2007) required each DoD component to adopt an EMS. An EMS is a formal management framework that provides a systematic way to review and improve operations, create awareness, and improve environmental performance. Systematic environmental management as an integral part of day-to-day decision making and long-term planning processes is an important step in supporting mission readiness and effective use of resources. The most significant resource for every organization is their senior leadership's commitment and visibility in EMS implementation and sustainability. A robust EMS is essential to sustaining compliance, reducing pollution and minimizing risk to mission. The Navy's EMS has a concerted focus on preventing pollution, consistent regulatory compliance, and reducing environmental impacts, including environmental practice for energy and transportation functions, using "plan-do-check-act" management model (5090.1C CH-1). It conforms to the International Organization for Standardization 14001:2004 EMS standard.

##### Federal Leadership in Environmental, Energy, and Economic Performance (EO 13514), October 5, 2009, (74 No. 194 pg. 52117)

EO 13514 "Federal Leadership in Environmental, Energy, and Economic Performance" was signed on 05 October 2009. It expanded upon the energy reduction and environmental performance requirements of EO 13423. This executive order sets numerous Federal energy requirements in several areas, including: Accountability and Transparency; Strategic Sustainability Performance Planning; Greenhouse Gas Management; Sustainable Buildings and Communities; Water Efficiency; Electronic Products and Services; Fleet and Transportation Management; Pollution Prevention and Waste Reduction.



EO 13514 requires that each federal agency conduct a self audit of pollution prevention practices using an accepted EMS framework. Components of the approach include: advancing the national policy that, whenever feasible and cost-effective, pollution should be prevented or reduced at the source. Funding for regulatory compliance programs shall emphasize pollution prevention as a means to address environmental compliance. Each agency must reduce its use of toxic chemicals and hazardous substances; reduce the toxic release inventory and off-site transfers of toxic chemicals for treatment and disposal; develop a plan to phase out the procurement of Class I ozone-depleting substances for all non-excepted uses; and promote the sustainable management of federal facility lands through the implementation of cost-effective, environmentally sound landscaping practices, and programs to reduce adverse impacts to the natural environment.

#### **B.4.1.2 Terrestrial and Aquatic Executive Orders**

Floodplain Management (EO 11988), 24 May 1977, (42 FR 26951)

This EO states that executive agencies will preserve the natural and beneficial values served by floodplains while managing federal lands. Activities in floodplains must be evaluated for their impacts during project planning, and alternative sites outside the floodplain must be considered. This order includes wetlands that are within the 100-year floodplain and especially discourages filling.

Marine Protected Areas (EO 13158), 26 May 2000, (65 FR 34909)

EO 13158 "Marine Protected Areas" (MPAs) requires each federal agency whose authorities provide for the establishment or management of MPAs to take appropriate actions to enhance or expand protection of existing MPAs and establish or recommend, as appropriate, new MPAs. To the extent permitted by law and subject to the availability of appropriations, the U.S. Department of Commerce and U.S. Department of the Interior, in consultation with DoD, U.S. Department of State, U.S. Agency for International Development, U.S. Department of Transportation, EPA, the National Science Foundation, and other pertinent federal agencies shall develop a national system of MPAs. These pertinent federal agencies will coordinate and share information, tools, and strategies, and provide guidance to enable and encourage the use of the following in the exercise of each agency's respective authorities to further enhance and expand protection of existing MPAs and to establish or recommend new MPAs, as appropriate:

1. Science based identification and prioritization of natural and cultural resources for additional protection;
2. Integrated assessments of ecological linkages among MPAs, including ecological reserves in which consumptive uses of resources are prohibited, to provide synergistic benefits;
3. A biological assessment of the minimum area where consumptive uses would be prohibited that is necessary to preserve representative habitats in different geographic areas of the marine environment;

4. An assessment of threats and gaps in levels of protection currently afforded to natural and cultural resources, as appropriate;
5. Practical, science based criteria and protocols for monitoring and evaluating the effectiveness of MPAs;
6. Identification of emerging threats and user conflicts affecting MPAs and appropriate, practical, and equitable management solutions, including effective enforcement strategies, to eliminate or reduce such threats and conflicts;
7. Assessment of the economic effects of the preferred management solutions; and
8. Identification of opportunities to improve linkages with, and technical assistance to, international marine protected area programs.

#### Off-Road Vehicles on Public Lands (EO 11989)

The Off-Road Vehicles on Public Lands EO (EO 11989) provides for closing areas to use where soil, wildlife, or other resources are adversely affected. Amends EO 11644 by exempting fire, military, emergency, law enforcement, or combat/combat support vehicles.

#### Protection of Wetlands (EO 11990), 24 May 1977, (42 FR 26961)

EO 11990 "Protection of Wetlands," requires federal agencies to provide leadership and take action to minimize the destruction, loss or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands when:

- Acquiring, managing, and relinquishing of federal lands and facilities;
- Providing federally undertaken, financed, or assisted construction and improvements; and
- Conducting federal activities and programs affecting land use, including but not limited to water and related land resources planning, regulating, and licensing activities.

Since the issuance of this EO, the focus of national policy has shifted from "minimizing" destruction, loss, and degradation of wetlands to "no net loss" of wetlands in carrying out the above federal activities.

### B.4.1.3 Wildlife Population Executive Orders

#### Migratory Birds (EO 13186)

The Migratory Birds EO (EO 13186) issued 10 January 2001 directs executive departments to take certain actions regarding the protection of migratory birds. Among these actions is the development and implementation of a MOU with the USFWS within two years of the EO on the protection and conservation of migratory birds. The DoD is currently developing a MOU with USFWS; however, in the interim the EO provides that federal agencies are "encouraged to immediately begin implementing the conservation measures" identified in the EO, "as appropriate and practicable."

#### B.4.1.4 Species of Concern Executive Orders

Environmental Safeguard for Animal Damage Control on Federal Lands (EO 12342), 27 January 1982, (47 CFR 4223)

Environmental Safeguard for Animal Damage Control on Federal Lands (EO 12342) restricts the use of chemical toxicants for mammal and bird control.

Invasive Species (EO 13112), 03 February 1999, (64 CFR 6183)

EO 13112 defines an invasive species as "an alien species whose introduction does or is likely to cause economic or environmental harm or harm to human health" (National Invasive Species Council [NISC] 2008). The definition includes many types of invasive species such as animals, plants, and microorganisms. It focuses upon invasive species which are harmful, rather than focusing on non-native species, most of which are not harmful.

EO 13112 established the NISC. Members of NISC include the Secretaries of Defense, State, Transportation, Homeland Security, Treasury, and Health and Human Services; the Administrators of EPA and the National Aeronautics and Space Administration; as well as the Director of the U.S. Agency for International Development and the U.S. Trade Representative.

Federal activities are now coordinated through NISC (established by the executive order) and the Aquatic Nuisance Species (ANS) Task Force. The ANS Task Force was established by the Nonindigenous Aquatic Nuisance Prevention and Control Act (NANCPA) of 1990 and the NISA of 1996. The NANCPA established a federal framework that promotes and coordinates research to assist state governments. The NANCPA develops and applies prevention and control strategies, establishes national priorities, educates and informs citizens, and coordinates public programs. The act calls upon states to develop and implement comprehensive state management plans to prevent introduction and control the spread of aquatic nuisance species.

The 1996 NISA amended NANCPA to mandate ballast water exchange for all vessels with ballast on board that enter U.S. waters from the outside the Exclusive Economic Zone. The NISA required vessels to submit a report form to the USCG documenting specific ballast water management practices. After voluntary guidelines proved unsatisfactory, the USCG made compliance with ballast exchange guidelines mandatory in 2004. The NISA authorized funding for research on aquatic nuisance species prevention and control. In addition, NISA required a ballast water management program to demonstrate technologies and practices to prevent aquatic non-indigenous species from being introduced into and spread through ballast water in U.S. waters. The mandatory program requires ships to use one of three ballast water management methods: (1) retaining ballast water on board, (2) conducting a mid-ocean exchange, and/or (3) using an approved ballast water treatment method. All vessels are required to submit ballast water management

reports (failure to submit a report can now result in penalties). Federal regulations also require vessels to maintain a ballast water management plan that is specific for that vessel and assigns responsibility to the master or appropriate official to understand and execute the ballast water management strategy for that vessel.

To help coordinate NISC and the ANS Task Force, the U.S. Department of Commerce Policy Liaison to NISC also serves as the representative to the ANS Task Force. In addition, NISC and the ANS Task Force have formed joint working groups on each of the following topics: pathways, risk analysis and screening. The task force and the species council are similar in that they perform coordinating functions but different in their responsibilities: NISC focuses on all invasive species while the ANS Task Force focuses on aquatic invasive species. Although many of the same principles apply to managing aquatic and terrestrial invasive species, many management issues are unique to the aquatic environment and need to be addressed separately.

The goal of the NISC is to provide coordination, planning, and leadership for federal invasive species programs that support state, tribal, local, and private entities. To meet this goal, in 2001 the National Invasive Species Monitoring Plan (NISMP) was developed. The 2008-2012 NISMP is the first revision of the 2001 Plan, as mandated by EO 13112. This 2008-2012 NISMP directs federal efforts (including overall strategy and objectives) to prevent, control, and minimize invasive species and their impacts within a five year period. If necessary, it may be updated more frequently to reflect changes in circumstances, agency plans, and priorities. The 2008-2012 NISMP focuses on five strategic goals (NISC 2008):

- Prevention - preventing introduction and establishment of invasive species
- Early Detection and Rapid Response - a crucial secondary line of defense
- Control and Management - containing and reducing the spread of invasive populations
- Restoration - restore high-value ecosystems across scales
- Organizational Collaboration - maximize collaboration efforts among federal, state, local, tribal, and private groups

To accomplish these strategic goals, critical support for efforts such as research, data and information management, education and outreach, and cooperation are included in pertinent sections of the NISC 2008-2012 NISMP.

The DoD has been tasked to act as a participant in various performance elements that support each of the five strategic goals discussed in the NISC 2008-2012 NISMP. These strategic goals, objectives, implementation tasks, and performance elements are applicable to both terrestrial and aquatic invasive species. Within the context of the NSA Monterey INRMP, the performance elements, that task the DoD

as a participant, and the implementation task and objectives that they support are identified in Section 4.5.3: Invasive Species as management strategies to address invasive species generally. These management strategies to support invasive species efforts have been modified from the federal guidance to specifically address NSA Monterey.

#### **B.4.1.5 Cultural Resources Executive Orders**

Indian Sacred Sites (EO 13007), 29 May 1996, (61 CFR 26771)

Indian Sacred Sites (EO 13007) provides for the protection of and access to Indian sacred sites.

Protection and Enhancement of the Cultural Environment (EO 11593), 13 May 1971, (36 CFR 8921)

Protection and Enhancement of the Cultural Environment (EO 11503) directs federal agencies to take a leadership role in preserving, restoring, and maintaining the historic and cultural environment of the nation. Federal agencies must locate, inventory, and nominate to the NRHP all historic resources under their jurisdiction or control. Until these processes are completed, agency heads must exercise caution to ensure that potentially qualified federal property is not inadvertently transferred, sold, demolished, or substantially altered. When planning projects, agencies are urged to request the opinion of the Secretary of the Interior as to the eligibility for NRHP listing of properties whose resource value is questionable or has not been inventoried. Agencies are directed to institute procedures, in consultation with the President's Advisory Council on Historic Preservation, to ensure that federal plans and programs contribute to the preservation and enhancement of non-federally owned historic resources. Protection of NRHP historic and archaeological sources is achieved by the Marine Corps through implementation of the Historic and Archeological Resources Protection Plan. The plan facilitates compliance by providing management goals, priorities, and standard operating procedures for site protection.

## **B.5 Federal Regulations, Directives, and Instructions**

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### **B.5.1 Federal Regulations**

10 CFR 436. Federal Emergency Management and Planning Programs.

15 CFR 923. National Oceanic and Atmospheric Administration Coastal Zone Management Program Development and Approval Regulation.

15 CFR 930. Federal Consistency with Approved Coastal Management Programs.

15 CFR 990. National Oceanic and Atmospheric Administration Regulations on Natural Resource Damage Assessments.

18 CFR 1312. Archeological Resource Protection Act Regulations.

29 CFR 1910. Occupational Safety and Health Standards.

- 29 CFR 1910.1200. Hazard Communication Standard.
- 29 CFR 1910.120. Hazardous Waste and Emergency Response.
- 32 CFR 172. Department of Defense Regulations for the Disposition of Proceeds from Sales of Surplus Property.
- 32 CFR 188. Environmental Effects in the U.S. of DoD Actions.
- 32 CFR 190. Natural Resources Management Program.
- 32 CFR 229. Protection of Archeological Resources: Uniform Regulations.
- 32 CFR 650. Environmental Effects Abroad of Major Federal Actions-Environmental Protection and Enhancement: Subpart H, Historic Preservation.
- 32 CFR 775. Procedures for Implementing NEPA. Department of the Navy policy to supplement DoD regulations (32 CFR 214) by providing policy and assigning responsibilities to the Navy and Marine Corps for implementing CEQ regulations and implementing NEPA.
- 33 CFR 154. Oil Pollution Prevention Regulations for Marine Oil Transfer Facilities.
- 33 CFR 156. U.S. Coast Guard Regulations for Universal Waste Management Standards.
- 33 CFR 320-330. Regulatory Programs of the USACE.
- 33 CFR 330. Dredge and Fill Nationwide Permit Program.
- 36 CFR 60. NRHP.
- 36 CFR 63. Determination of Eligibility for Inclusion in the NRHP.
- 36 CFR 65. National Historic Landmarks Program.
- 36 CFR 67. Historic Preservation Certificates.
- 36 CFR 68. The Secretary of Interior's Standards for Historic Preservation Projects.
- 36 CFR 78. Waiver of Federal Agency Responsibility under Section 110 of the NHPA.
- 36 CFR 79. Curation of Federally Owned and Administered Archeological Collections.
- 36 CFR 800. National Historic Preservation Act Regulations for the Protection of Historic Properties.
- 40 CFR 6. Environmental Protection Agency Regulations on Implementation of NEPA Procedures.
- 40 CFR 7. Archeological Resources Protection Act of 1979; Uniform Regulations.
- 40 CFR 50. Environmental Protection Agency Regulations on National Primary and Secondary Ambient Air Quality Standards.
- 40 CFR 51-52. Environmental Protection Agency Requirements for Preparation, Adoption, Submittal, Approval, and Promulgation of Implementation Plans.

- 40 CFR 53. Environmental Protection Agency Regulations for Ambient Air Monitoring Reference and Equivalent Methods.
- 40 CFR 55. Outer Continental Shelf Air Regulations.
- 40 CFR 56. Environmental Protection Agency Regulations on Regional Consistency under the Clean Air Act.
- 40 CFR 58. Environmental Protection Agency Ambient Air Quality Surveillance Regulations.
- 40 CFR 60. Environmental Protection Agency Regulations on New Source Performance Standards.
- 40 CFR 61. National Emissions Standards for Hazardous Air Pollutants.
- 40 CFR 62. Environmental Protection Agency Regulations on state Plans for Designated Facilities and Pollutants.
- 40 CFR 65. Environmental Protection Agency Regulations on Delayed Compliance Orders under the Clean Air Act.
- 40 CFR 66. Environmental Protection Agency Regulations for Assessment and Collection of Noncompliance Penalties.
- 40 CFR 68. Chemical Accident Prevention Provisions.
- 40 CFR 69. Environmental Protection Agency Special Exemptions from Requirements of the Clean Air Act.
- 40 CFR 70. State Operating Permit Programs.
- 40 CFR 80. Regulation of Fuels and Fuel Additives.
- 40 CFR 81. Environmental Protection Agency Regulations Designating Areas for Air Quality Planning.
- 40 CFR 82. Environmental Protection Agency Stratospheric Ozone Protection Regulations.
- 40 CFR 86. Control of Air Pollution from New and In-Use Motor Vehicle Engines: Certification and Test Procedures.
- 40 CFR 87. Environmental Protection Agency Regulations on Control of Air Pollution and Aircraft and Aircraft Engines.
- 40 CFR 104. Environmental Protection Agency Regulations on Public Hearings on Effluent Standards for Toxic Pollutants.
- 40 CFR 109. Environmental Protection Agency Regulations on Criteria for state, Local, and Regional Oil Removal Contingency Plans.
- 40 CFR 110. Environmental Protection Agency Regulations on Discharge of Oil.
- 40 CFR 112. Environmental Protection Agency Regulations on Oil Pollution Prevention.
- 40 CFR 113. Environmental Protection Agency Regulations on Liability for Small Onshore Oil Storage Facilities.
- 40 CFR 116-117. Environmental Protection Agency Regulations on Hazardous Substances.
- 40 CFR 122. Environmental Protection Agency NPDES Permit Regulations.

- 40 CFR 125. Environmental Protection Agency Regulations on Criteria and Standards for the NPDES.
- 40 CFR 129. Environmental Protection Agency Toxic Pollutant Effluent Standard.
- 40 CFR 130. Environmental Protection Agency Requirements for Water Quality Planning and Management.
- 40 CFR 141-143. Environmental Protection Agency National Drinking Water Regulations.
- 40 CFR 148. Environmental Protection Agency Regulations on Hazardous Waste Disposal Restrictions for Class I Wells.
- 40 CFR 150-186. Environmental Protection Agency Regulations for Pesticide Programs.
- 40 CFR 162. Environmental Protection Agency Regulations on Insecticide, Fungicide, and Rodenticide Use.
- 40 CFR 220, 227. Ocean Dumping Regulations and Criteria.
- 40 CFR 230. Environmental Protection Agency Interim Regulations on Discharge of Dredged or Fill Material into Navigable Waters.
- 40 CFR 231. Environmental Protection Agency Regulations on Disposal Site Determination under the CWA.
- 40 CFR 240-241. Environmental Protection Agency Guidelines for Thermal Processing of Solid Wastes and for the Land Disposal of Solid Wastes.
- 40 CFR 243. Environmental Protection Agency Guidelines for Solid Waste Storage and Collection.
- 40 CFR 244. Environmental Protection Agency Guidelines for Solid Waste Management of Beverage Containers.
- 40 CFR 245. Environmental Protection Agency Guidelines for Resource Recovery Facilities.
- 40 CFR 246. Environmental Protection Agency Guidelines for Source Separation for Materials Recovery.
- 40 CFR 247. Environmental Protection Agency Guidelines for Procurement of Products that Contain Recycled Materials.
- 40 CFR 248. Environmental Protection Agency Guidelines for Federal Procurement of Building Insulation Products Containing Recovered Materials.
- 40 CFR 249. Environmental Protection Agency Guidelines for Federal Procurement of Cement and Concrete Containing Fly Ash.
- 40 CFR 250. Environmental Protection Agency Guidelines for Federal Procurement of Paper and Paper Products Containing Recovered Materials.
- 40 CFR 252. Environmental Protection Agency Guidelines for Federal Procurement of Lubricating Oils Containing Re-fined Oil.
- 40 CFR 253. Environmental Protection Agency Guidelines for Federal Procurement of Retread Tires.
- 40 CFR 255. Environmental Protection Agency Guidelines for Identification of Regions and Agencies for Solid Waste Management.



- 40 CFR 257. Environmental Protection Agency Regulations on Criteria for Classification of Solid Waste Disposal Facilities and Practices.
- 40 CFR 259. Environmental Protection Agency Medical Waste Regulations.
- 40 CFR 260-270. Environmental Protection Agency Regulations Implementing the RCRA.
- 40 CFR 262. Environmental Protection Agency Regulations for Hazardous Waste Generators.
- 40 CFR 264. Environmental Protection Agency Regulations for Owners and Operators of Permitted Hazardous Waste Facilities.
- 40 CFR 268. Environmental Protection Agency Regulations on Land Disposal Restrictions.
- 40 CFR 273. Environmental Protection Agency Regulations for Universal Waste Management Standards.
- 40 CFR 279. Used Oil Management Standards.
- 40 CFR 280. Technical Standards and Corrective Action Requirements for Owners and Operators of Underground Storage Tanks.
- 40 CFR 300. National Oil and Hazardous Substances Pollution.
- 40 CFR 300.600. National Oil and Hazardous Substances Pollution Contingency Plan, Designation of Federal Trustees.
- 40 CFR 300.615. Responsibilities of Trustees.
- 40 CFR 302. Environmental Protection Agency Designation, Reportable Quantities, and Notification Requirements for Hazardous Substances under CERCLA.
- 40 CFR 355. Environmental Protection Agency Regulations for Emergency Planning and Notification under CERCLA.
- 40 CFR 370. Environmental Protection Agency Hazardous Chemical Reporting and Community Right-to-Know Requirements.
- 40 CFR 372. Environmental Protection Agency Toxic Chemical Release Reporting Regulations.
- 40 CFR 373. Environmental Protection Agency Regulations for Real Property Transactions under CERCLA.
- 40 CFR 403. General Pretreatment Regulations for Existing and New Sources of Pollution.
- 40 CFR 413. Environmental Protection Agency Effluent Guidelines and Standards for Electroplating.
- 40 CFR 414. Environmental Protection Agency Effluent Guidelines and Standards for Organic Chemicals.
- 40 CFR 415. Environmental Protection Agency Guidelines and Standards for Inorganic Chemicals.
- 40 CFR 417. Environmental Protection Agency Effluent Guidelines and Standards for Soaps and Detergents.
- 40 CFR 433. Environmental Protection Agency Effluent Guidelines and Standards for Metal Finishing.

- 40 CFR 504. State Sludge Management Programs and Regulations.
- 40 CFR 760-761. Environmental Protection Agency Regulations for Controlling Polychlorinated Biphenyls.
- 40 CFR 1500-1508. CEQ Regulations on Implementing NEPA Procedures.
- 41 CFR 41-47. Disposal Regulations.
- 43 CFR 3. Preservation of American Antiquities.
- 43 CFR 7. Archaeological Resources Protection Act of 1979; Uniform Regulations.
- 43 CFR 10. Native American Graves Protection and Repatriation Act Regulations.
- 43 CFR 11. Department of the Interior Regulations on Natural Resource Damage Assessments.
- 49 CFR 100-199. Department of Transportation Hazardous Materials Regulations.
- 49 CFR 126. Pesticide Transportation.
- 49 CFR 194. Oil Pollution Prevention Regulations for Onshore Pipelines.
- 50 CFR 10. General Provision and Statutes Administered by the USFWS.
- 50 CFR 10.13. List of Migratory Birds.
- 50 CFR 18, 216, 218. Regulations Concerning Marine Mammals.
- 50 CFR 17.11 and 17.12. U.S. Fish and Wildlife Service List of Endangered and Threatened Wildlife.
- 50 CFR 402. Interagency Cooperation - ESA of 1973 as amended.

### **B.5.2 Federal Register Documentation**

- 74 FR 59443. Federal List of Endangered and Threatened Wildlife.

### **B.5.3 Department of the Interior Fish and Wildlife Service Memoranda**

U.S. Fish and Wildlife Service Memorandum to Regional Directors, Regions 1-8, Delegation of INRMP Concurrence Authority (12 June 2009)

### **B.5.4 Department of Defense Directives, Instructions, and Memorandums**

U.S. Department of Defense Instruction 4150.7. (29 May 2008) DoD Pest Management Program

U.S. Department of Defense Instruction 4700.4. (24 January 1989) Natural Resources Management Program

U.S. Department of Defense Instruction 4715.03. (18 Mar 2011) Natural Resources Conservation Program

DoDI 4715.03 implements policy, assigns responsibilities, and prescribes procedures for the integrated management of natural and cultural resources on property under military control. The instruction states that "all DoD conservation programs shall work to guarantee continued access to [DoD] land, air, and water resources for realistic military training and testing while ensuring that the natural and cultural resources entrusted to DoD care are sustained in a healthy condition for scientific research, education, and other compatible uses by future generations".

DoDI 4715.03 also designates DoD executive agents to lead the military services in implementing key conservation issues, including preparing, maintaining, and monitoring INRMPs on all military installations. The instruction notes that conservation management is a dynamic process yet prescribes that a consistent conservation management approach include those systematic procedures that should be used by each DoD installation, as follows:

- Assess military mission
- Prepare detailed inventory of resources
- Analyze and assess risk to the resources
- Prepare and implement management plans
- Monitor and assess results
- Conduct needs assessment survey
- Reassess inventories
- Reanalyze and reassess risk to resources
- Adjust program as necessary

U.S. Department of Defense Instruction 4715.4. (18 June 96) Pollution Prevention

U.S. Department of Defense Instruction 4715.9. (03 May 96) Environmental Planning and Analysis

U.S. Department of Defense Instruction 4715.16. (18 September 08) Cultural Resources Management

DoDI 4715.16 establishes DoD policy and assigns responsibilities under the authority of DoDD 5134.01, "Under Secretary of Defense for Acquisition, Technology, and Logistics" (09 December 2005), and in accordance with DoDD 4715.1E, "Environment, Safety, and Occupational Health" (19 March 2005), to comply with applicable federal statutory and regulatory requirements, EOs, and Presidential memorandums for the integrated management of cultural resources on DoD managed lands (DoD 2008).

Instruction 4715.6 establishes DoD cultural resources management policy to (DoD 2008):

- Manage and maintain cultural resources under DoD control in a sustainable manner through a comprehensive program that considers the preservation of historic, archaeological, architectural, and cultural values; is mission supporting; and results in sound and responsible stewardship.
- Be an international and national leader in the stewardship of cultural resources by promoting and interpreting the cultural resources it manages to inspire DoD personnel and to encourage and maintain U.S. public support for its military.
- Consult in good faith with internal and external stakeholders and promote partnerships to manage and maintain cultural resources by developing and fostering positive partnerships with federal, tribal, state, and local government agencies; professional and advocacy organizations; and the general public.

U.S Department of Defense Instruction 6055.6. (10 October 2000) DoD Fire and Emergency Services Program

U.S Department of Defense Instruction 5000.13. (13 December 1976) Natural Resources: The Secretary of Defense Natural Resources Conservation Award.

DoDD 4001.1. (04 September 1986). Installation Management.

DoDD 4140.1 (04 January 1993). Material Management Policy.

DoDD 4150.7 (24 October 1983). DoD Pest Management Program.

DoDD 4165.57 (08 November 1977). Air Installations Compatible Use Zones.

DoDD 4165.59 (29 December 1975). DoD Implementation of the Coastal Zone Management Act.

DoDD 4165.60 (27 July 1989). Hazardous Material Pollution.

DoDD 4165.60 (04 October 1976). Solid Waste Management - Collection, Disposal, Resource Recovery, and Recycling Program.

DoDD 4165.61 (09 August 1993). Intergovernmental Coordination of DoD Federal Development Programs and Activities.

DoDD 4700.1 (06 November 1978). Natural Resources Conservation and Management. Provides for management of renewable natural resources on military lands.

DoDD 4700.2 (15 July 1988). Secretary of Defense Award for Natural Resources and Environmental Management.

DoDD 4700.4 (24 January 1989). Natural Resources Management Program.

DoDD 4705.1 (09 July 1992). Management of Land-based Water Resources in Support of Joint Contingency Operations.

DoDD 4710.1 (21 June 1984). Archeological and Historic Resources Management. Establishes policies, procedures, and assigns responsibilities for the management of archeological and historic resources located in and on waters and lands under DoD control. This Directive

implements these guidelines consistent with federal law, Executive orders, and other DoD directives that deal with archeological and historic preservation issues.

DoDD4715.DD-R (April 1996). Draft Integrated Natural Resources Management in DoD.

DoDD 4715.1 (24 February 1996). Environmental Security.

DoDD 4715.2 (03 May 1996). DoD Regional Environmental Coordination.

DoDD 4715.03 (18 March 2011). Natural Resources Conservation Program.

DoDD 4715.4 (18 June 1996). Pollution Prevention.

DoDD 4715.5 (22 April 1996). Management of Environmental Compliance at Overseas Installations.

DoDD 4715.6 (24 April 1996). Environmental Compliance.

DoDD 4715.7 (22 April 1996). Environmental Restoration Program.

DoDD 4715.8 (02 February 1998). Environmental Education Training and Career Development.

DoDD 4715.9 (03 May 1996). Environmental Planning and Analysis.

DoDD 4715.10 (24 April 1996). Environmental Education Training and Career Development.

DoDD 4715.11 (17 August 1999). Environmental and Explosive Safety Management on DoD Active and Inactive Ranges within the U.S.

DoDD 4715.12 (19 August 1999). Environmental and Explosive Safety Management on DoD Active and Inactive Ranges Outside the U.S.

DoDD 5030.41 (01 June 1977). Oil and Hazardous Substances Pollution Prevention and Contingency Program.

DoDD 6050.1 (30 July 1979). Environmental Effects in the U.S. of DoD Actions.

DoDD 6050.2 (19 April 1979). Use of Off-Road Vehicles on DoD Lands. Provides policy for use of off-road vehicles on DoD lands.

DoDD 6050.4 (16 March 1982). Marine Sanitation Devices for Vessels Owned or Operated by DoD.

DoDD 6050.5 (29 October 1990). DoD Hazard Communication Program.

DoDD 6050.7 (31 March 1979). Environmental Effects Abroad of Major DoD Actions.

DoDD 6050.8 (27 February 1986). Storage and Disposal of Non-DoD Owned Hazardous or Toxic Materials on DoD Installations.

DoDD 6050.10 (20 September 1991). DoD Policy for Establishing and Implementing Environmental Standards at Overseas Installations.

DoDD 6050.15 (14 June 1985). Prevention of Oil Pollution from Ships Owned or Operated by DoD.

DoDD 6050.16 (20 September 1991). DoD Policy for Establishing and Implementing Environmental Standards at Overseas Installation.

DoDD 7000.14-R (18 March 1993). DoD Financial Management Regulations.

Deputy Under Secretary of Defense (Installations and Environment) Memorandum (10 October 2002). **Implementation of the Sikes Act (as amended): Updated Guidance with Attachment.** The DUSD (I&E) Memorandum, 10 October 2002, improved coordination external to DoD (USFWS, state agencies, and the public) and internal to DoD (military operators and trainers, cultural resources managers, pest managers). It also added new tracking procedures, called metrics, to ensure proper INRMP coordination occurred and that projects were implemented.

Assistant Deputy Undersecretary of Defense for Environment, Safety and Occupational Health Policy (01 November 2004 Memorandum). **The Supplemental DoD INRMP Guidance (01 November 2004 Memorandum)** further defined the scope of the annual and five-year review, public comment on INRMP reviews, and ESA consultation. A formal review must be performed by “the parties” at least every five years. Informal annual reviews are mandatory to facilitate adaptive management, during which INRMP goals, objectives, and “must fund” projects are reviewed, and a realistic schedule established to undertake proposed actions. The outcome of this joint review should be documented in a memorandum or letter summarizing the rationale for the conclusions the parties have reached. This written documentation should be jointly executed or in some other way reflect the parties' mutual agreement.

Office of the Under Secretary of Defense Memorandum for Deputy Assistant Secretary of the Army (Environment, Safety and Occupational Health), Deputy Assistant Secretary of the Navy (Environment), Deputy Assistant Secretary of the Air Force (Environment, Safety, and Occupational Health), Director Defense Logistics Agency. **Implementation of Sikes Act Improvement Amendments: Supplemental Guidance concerning Leased Lands (17 May 2005).** This Memorandum provides supplemental guidance for implementing Sikes Act Improvement Amendments requirements consistently throughout the DoD. It adds implementing guidance dated 10 October 2002 and 01 November 2004 same subject. The guidance covers lands occupied by tenants or lessees or being used by others pursuant to a permit, license, right of way, or any other form of permission.

Office of the Under Secretary of Defense Memorandum for Deputy Assistant Secretary of the Army (Environment, Safety and Occupational Health), Deputy Assistant Secretary of the Navy (Environment), Deputy Assistant Secretary of the Air Force (Environment, Safety, and Occupational Health), Director Defense Logistics Agency. **Integrated Natural Resource Management Plan Template (14 August 2006).**

Memorandum of Understanding Among the U.S. Department of Defense and the U.S. Fish and Wildlife Service and the International Association of Fish and Wildlife Agencies for a Cooperative Integrated Natural Resource Management Program on Military Installations (31 January 2006).

Memorandum of Understanding to Promote the Conservation of Migratory Birds between the U.S. Fish and Wildlife Service and the U.S. Department of Defense in Accordance with Executive Order 13186. Prepared by the Under Secretary of Defense for Acquisition, Technology, and Logistics in April 2007.

## **B.5.5 Department of the Navy Manuals, Instructions, and Guidance**

SECNAVINST 4000.35A (09 April 2001) (NOTAL). Department of the Navy Cultural Resources Program.

SECNAVINST 5090.8 (18 December 2000) (DASN[I&E]). Policy for Environmental Protection, Natural Resources, and Cultural Resources Program.

SECNAVINST 6240.6E (18 December 2000). Implementation of DoD directives under DoDI 4700.4.

SECNAVINST 6401-1A (16 August 1994). Veterinary Health Services.

5090.1C CH-1. The Navy's Environmental Protection and Natural Resources Manual, termed 5090.1C CH-1, requires that each Navy installation containing natural resources prepare a multiple-use natural resources management plan. 5090.1C CH-1 specifically states that the conservation of natural resources and the military mission need not and shall not be mutually exclusive. 5090.1C CH-1, Chapter 24 - Natural Resources Management, establishes Navy program requirements for ensuring military readiness and sustainability while complying with natural resource protection laws, and conserving and managing natural resources in the U.S., its territories, and possessions for both appropriated and non-appropriated fund activities (Navy 2007). This dual dynamic of Stewardship and Readiness is essential for the long-term maintenance of military and natural resources sustainability (Navy 2007). Navy commands shall accomplish the following when managing natural resources on Navy lands:

- Assign specific responsibility, provide centralized supervision, assign professionally trained personnel to the natural resources management program, and provide natural resources personnel with the opportunity to participate in natural resources management job training activities and professional meetings;
- Protect, conserve, and manage the watersheds, wetlands, natural landscapes, soils, forests, fish and wildlife, prime and unique farmland, and other natural resources as vital elements of an optimum natural resources program;
- Manage natural resources to provide outdoor recreation opportunities;
- Use and care for natural resources in the combination best serving the present and future needs of the U.S.;
- Provide for the optimum use of land and water areas and access thereto while maintaining ecological integrity; and

- Interact with the surrounding community to develop positive and productive community involvement, participation, and educational opportunities.

OPNAVINST 5750.13 (10 November 1975). Historical Properties of the Navy.

OPNAVINST 6250.4B (27 August 1998). Pest Management Programs. Requires Navy and Marine Corps to have a comprehensive Pest Management Plan. Discusses the need to control pest outbreaks which affect the military mission, damage property, or impact the welfare of people.

OPNAVINST 8000.16. Environmental Security Management.

OPNAVINST 8026.2A (15 June 2000). Navy Munitions Disposition Policy.

OPNAVINST 11000.17 (17 September 1999). National Preservation Act Consultations Related to Base Realignment and Closure Actions.

OPNAVINST 11010.20F (07 June 1996). Facilities Projects Manual.

NAVFAC P-73 (May 1987) Real Estate Procedure Manual, Volumes I and II; and Natural Resources Management Procedure Manual, Chapter 2 - Integrated Natural Resources Management Plans. The Navy's Real Estate Manual, referred to as NAVFAC P-73, addresses all CNO natural resources program requirements, guidelines, and standards (Navy 2009). NAVFAC P-73 states that the principles of multiple-use, ecosystem, and adaptive management shall be implemented on Navy facilities that meet the natural resources stipulations outlined in 5090.1C CH-1 (discussed above). The manual provides guidance to Navy environmental personnel on the purpose of and need for INRMPs by outlining that the wise use of natural resources is essential to the continuation of the military mission. NAVFAC P-73 Chapter 2 - INRMPs requires that the following tasks be undertaken to meet the natural resources program objectives:

- Prepare, implement, and maintain, as a current working document, an INRMP for all Navy lands that have suitable habitat for conserving and managing natural resources. Each plan must adequately facilitate mission planning and decision-making to ensure compatibility of natural resources management with local, state, and federal objectives and policies.
- Implement land management practices that reduce grounds maintenance costs, use environmentally and economically beneficial landscaping practices, conserve soil and water, improve real estate values, protect coastal zones, wetlands, and floodplains, abate non point sources of water pollution, control noxious weeds, and prevent erosion.
- Inventory wetlands and manage Navy land to avoid the net loss of size, function, or value of wetlands.
- Identify and protect federally threatened and endangered species on Navy lands, emphasizing mission requirements and inter-agency cooperation during consultation, species recovery planning, and management activities.



- Outlease all lands that are suitable and available for agricultural uses, consistent with operational requirements and long-term ecosystem management goals.
- Reduce the potential for bird and other animal collisions with aircraft in the airfield environment.
- Manage fish, wildlife, and plant resources within ecological limits, maintain appropriate wildlife population levels, and support optimum use of consumptive and nonconsumptive fish and wildlife resources.

NAVFACINST 6250.3H. Applied Biology Program Services and Training. Requires the use of an integrated pest management approach to minimize the use of herbicides.

NAVFACINST 11010.45 (30 June 2002). Comprehensive Regional Planning Instruction (Land Use Module/Regional Shore Infrastructure Plan Links).

NAVFACINST 11012.111A. Land Use Conservation Planning.

NAVFACINST MO-100.4. Guidance on Special Interest Areas.

Office of the Assistant Secretary (Installations and Environment) Memorandum for Commander Navy Installations Command (N45), Director Environmental Readiness Division (N45), Director Facilities and Services Division (CMC-LFL). Department of the Navy Natural Resources Program Metrics (22 August 2006).

Chief of Naval Operations (N45) Integrated Natural Resources Management Plan (INRMP) Guidance (10 April 2006) (5090 N456K/6U838101). The INRMP Guidance was developed to provide natural resource managers at Navy installations with information necessary to prepare, update, and implement INRMPs. The Guidance was revised in close coordination with natural resources staff from Commander, Navy Installation Command and Commander, Naval Facilities Engineering Command. This guidance builds upon previous Navy INRMP guidance and incorporates requirements contained in the DUSD (I&E) Memorandum, dated October 10 2002, which promulgates new DoD SAIA guidance, and other relevant DoD guidance.

CNO (N45) Policy Letter Preventing Feral Cat and Dog Populations on Navy Property (10 January 2002) (5090 Ser N456M/1U595820).

CNO (N45) Navy Environmental Management System Policy (06 December 2001) (5090 Ser N451G/1U595831).

## B.6 California State Laws

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### B.6.1 Water Resource Laws

#### California Water Code

The California Water Code Section 1243 declares the reservation of water for the enhancement and protection of fish and wildlife to be a beneficial use.

#### Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act (California Water Code §§ 13000 *et seq.*) is the state's primary water law. It gives SWRCB and the nine regional water quality control boards substantial authority to regulate water use.

According to this Act, water quality protection at NSA Monterey is the responsibility of the SWRCB and the Central Coast RWQCB. Authority comes from the state's Porter-Cologne Water Quality Control Act and the federal CWA. With the SWRCB setting statewide water quality objectives, the RWQCB carries out specific aspects of surface and coastal water regulations.

Implementation of the groundwater quality objectives occurs through the issuance of permits for waste discharges under the NPDES by the Central Coast RWQCB. Regulations initially focused on controlling "point source" (end-of-pipe) discharges, such as from sewage treatment, industrial, and power plant out falls. With control of point sources improving, emphasis has turned to regulating storm water discharges from various sources through storm drains as well as runoff sources of nonpoint source pollution. As the result of amendments to the CWA (Sec. 402[p]) and to the CZMA (Coastal Zone Act Reauthorization Amendments Sec. 6217), storm drains are being treated as a point source of pollution and are required to come under NPDES permit. Enforcement of NPDES permits by the Central Coast RWQCB is done when monitoring or another source indicates a violation of permit conditions. Cease and Desist Orders and Cleanup and Abatement Orders along with stiff financial penalties can be issued for noncompliance.

The SWRCB and RWQCB also have the authority to designate ASBS for the waters of California. Officially, the term ASBS was changed to "State Water Quality Protection Area" on 01 January 2003 as required under Section 36750 of the California Public Resource Code (SWRCB 2003). The RWQCB is required to recommend to the SWRCB areas suitable for this designation. The ASBS concept was established through the Water Quality Control Plan for Control of Temperature in the Coastal and

Interstate Waters and Enclosed Bays and Estuaries of California (Temperature Plan) and the Water Quality Control Plan for Ocean Waters of California (Ocean Plan). The SWRCB and RWQCB recognize that most beneficial uses of water resources are to some degree mutually antagonistic, waste discharge requirements can at best provide relative protection for all beneficial water resource uses. The concept of "special biological significance" recognizes that certain biological communities because of their value or fragility deserve very special protection consisting of preservation and maintenance of natural water quality conditions to the extent practicable (SWRCB and RWQCB 1970). The following list describes the means by which the SWRCB and RWQCB may accomplish the goal of preserving and maintaining natural water quality conditions to the extent practicable.

- Discharge of elevated temperature wastes in a manner that would alter water quality conditions from those occurring naturally will be prohibited.
- Discharge of discrete, point source sewage or industrial process wastes in a manner that would alter water quality conditions from those occurring naturally will be prohibited.
- Discharge of waste from nonpoint sources, including but not limited to storm water runoff, silt and urban runoff, will be controlled to the extent practicable. In control programs for waste from nonpoint sources, Regional Boards will give high priority to areas tributary to ASBS.
- The Ocean Plan, and hence the designation of ASBS, is not applicable to vessel wastes, the control of dredging, or the disposal of dredging spoil.
- The staff will advise other agencies to whom the list of designated areas is to be provided that the basis for this action by the SWRCB and the RWQCB is limited to considerations related to protection of marine life from waste discharges.

## B.6.2 Terrestrial and Aquatic Habitat Laws

### California Coastal Act and the Federal CZMA

Coastal land use is also controlled by the state of California. The CCA of 1972, and current as of 2010, implements California's Coastal Zone Management Program as required by the federal CZMA of 1972 and the Coastal Zone Act Reauthorization Amendments (CCC 2010). It regulates public access, recreation, marine resources, land resources, and development within the coastal zone. The CCC oversees the implementation of the CCA. The CCC can concur with or object to a Coastal Consistency Determination or Negative Determination submitted by a federal agency concerning a proposed federal action. The CZMA Section 307 specifically provides that each "federal agency activity within or outside the coastal zone shall be carried out in a manner which is consistent to the maximum extent practicable with the enforceable policies of approved state management programs." The CCC also seeks to ensure that local governments within the coastal zone prepare an ade-

quate local coastal plan based on the California Coastal Management Plan. Once an local coastal plan is certified by the CCC, the local government can issue its own development permits for most projects. The CCC has regulatory control over federal activities in the federal Outer Continental Shelf that affect the state's ocean and coastal resources.

For federal lands, all lands that are held in trust by or which uses are subject solely to the discretion of the federal government, are excluded from California's coastal zone. Most Navy projects are reviewed on a case-by-case basis with no specific criteria established to identify which types of Navy activities have no effect on the coastal zone and, therefore, do not require review for federal consistency. A Negative Determination, usually done on a case-by-case basis, avoids formal review.

Projects can get this determination if:

- The project clearly has no impact on the coastal zone; or
- The project is clearly similar to another project that was previously determined by the CCC to have no impact.

Projects that could fall under the "no impact" category can often be determined using the "common sense" rule, which means "if in doubt, ask" the CCC if a similar project has been determined to have no impact, or if in their view the project would clearly have no impact.

### **B.6.3 Species of Concern Laws**

#### California Endangered Species Act

The CESA is very similar to the federal ESA and is administered by CDFW. The term endangered species is defined under CESA as a species of fish, wildlife or plant that is "in serious danger of becoming extinct throughout all, or a significant portion of its range". It is concerned with species and subspecies native to California. CESA prohibits the "taking" of listed species, but in addition to protecting listed species, it also applies the take prohibitions to species that are candidates for listing. Certain listed bird species are further classified by CDFW as "fully protected", wherein possession or taking of animals or parts thereof is prohibited at all times.

The California State Legislature has expressed its intent to protect, preserve and enhance endangered or rare species as issued in the Fish and Game Code (Div. 2, Chpt. 10 Native Plant Protection and Div. 3, Chpt. 1.5 Endangered Species). CESA violations can result in a fine of up to \$5,000 and / or one year in prison. While this law does not apply to federal actions, it does apply to state agencies and private landowners. In the spirit of the law and as a service to state agencies and private landowners, federal agencies operate under these guidelines.

## B.7 State Regulations

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### Fish and Game Code and Stream Alteration Controls

The CDFW's authority over the use of suction dredges (Fish and Game Code, § 5653), alterations of fish spawning areas (Fish and Game Code, § 1505), and alterations of stream beds in general (Fish and Game Code, §§ 1601 *et seq.*) are all useful tools for the protection of instream resources (but generally not for riparian vegetation outside of the stream or overflow areas). The §§ 1601-1603 agreements (§ 1601 covers public projects, while § 1603 addresses private work) do not have the status of state approvals under law, instead providing for a negotiation and agreement process.

### Fish and Game Code and Title 14 California Code of Regulations

The Fish and Game Code consists of the laws passed by the state legislature that pertain to fish and wildlife resources. Under statutes in the Fish and Game Code, the California Fish and Game Commission has the responsibility for the adoption of regulations that provide details on how certain Fish and Game laws are to be implemented.

These regulations are published in Title 14 of the California Code of Regulations. A summary is provided below of Fish and Game Code Sections that address invasive species issues or may relate to control actions.

Fish and Game Code §§ 2080-2089. CDFW regulates the take of species listed under the CESA. In addition to the instructions in the Fish and Game Code, guidelines for this process are located in Title 14, Division 1, Subdivision 3, Chapter 6, Article 1 of the California Code of Regulations. These statutes and regulations should be consulted if AIS control measures have the potential to impact state-listed species.

Fish and Game Code §§ 2118, 2270-2272. The CDFW is responsible for enforcement of importation, transportation, and sheltering of restricted live wild animals; places importation restrictions on aquatic plants and animals; and prohibits nine species of *Caulerpa*.

Fish and Game Code §§ 6400-6403. It is unlawful to place live fish, fresh or saltwater animals or aquatic plants in any waters of this state without a permit from the CDFW.

## B.8 Local Government

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There is a limited direct involvement with the NSA Monterey natural resources program at the local, county, and municipal government levels.

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# Appendix C: Real Estate Agreements

## C.1 List of Ingrants and Outgrants

Table C-1. Real estate agreements for use of real property granted by and to the U.S. Navy at Naval Support Activity Monterey.

NSAM Approximate Total Fee Acreage:	Approximately 594 acres
Naval Postgraduate School Campus Approximate Total:	Approximately 133 acres
USN Monterey Beach Parcel Approximate Total:	Approximately 55 acres
Easements Approximate Total:	Approximately 8 acres

NSA Monterey Ingrant Agreements (Agreements issued by U.S. Navy)		Acreage/Description
Leases		
City of Marina		1.49 acres/Use of Hangar 507 at Monterey Peninsula Airport for CIRPAS Activities
Licenses		
Monterey Regional Water Pollution Control Agency		Navy placement of video equipment on MRWPCA bldg.
Crown Castle		Use of cell site known as Bryant Canyon
County of Monterey		Access to communication site known as MT Toro Repeater Site
PG&E		Use of 8 PG&E poles
Easements		
Monterey Peninsula Airport		Construction, Installation, maintenance of portions of Golf Course
City of Marina		Operation of Doppler Radar Wind Profiler Facility
Use Agreements		
Southern Pacific Trans		Pipe and cable barricades
PG&E /PT&T /FIRE ALARM		Fire alarm equipment
PG&E /PT&T		Fire alarm circuit attached to poles
PG&E /PT&T		Fire alarm equipment
Permits		
Dept. of Army		Use of space at Lockwood Army Communication Facility
U.S. Coast Guard		Ingress/Egress pedestrian access to Finger Pier
Dept of Army		Installation of wireless equipment at Bald Mountain on FT Hunter Liggett
U.S. Coast Guard		Use of building for storage and communication training
NSA Monterey Outgrant Agreements (Agreements issued by U.S. Navy)		Acreage/Description
Licenses		
City of Monterey		Maintenance and repair of vehicle detection apparatus to traffic signal
NPS Foundation		Use of storage space
Monterey Peninsula Unified School District		Use of classroom facilities
SES		Use of Communication systems at numerical Oceanography Center
City of Monterey		Walkway for recreational purposes
Navy Federal Credit Union		Use of bldg 303 & 1 ATM outside of Del Monte Entrance Gate

*Table C-1. Real estate agreements for use of real property granted by and to the U.S. Navy at Naval Support Activity Monterey.*

PG&E	Pole/Wire Electric transmission line
<b>Easements</b>	
Community Hospital Monterey Peninsula	0.39 & 1.47 acres/Construction, installation, operation, maintenance repair of a waterline
RWPCA	Construction, installation, operation, maintenance repair of sewer facilities
City of Monterey	4.28 acres/Construction, installation, operation, maintenance replacement of storm drain
City of Monterey	0.03 acres/Pipeline
Community Hospital Monterey Peninsula	1.47 & 0.01 acres/ Construction, installation, operation, maintenance and replacement of utility corridor
Monterey Peninsula Unified School District	0.87 acres/ Construction, installation, operation, maintenance and replacement of a road
Monterey Peninsula Airport (#38 on RES)	7.61 acres/Facilities at NPS Golf Course
Community Hospital Monterey Peninsula	1.47 & 0.01 acres/ Construction and installation of sanitary sewer line
City of Monterey	14.83 & 13.86 acres/ Construction and installation of roadway widening
MRWPCA	5.54 acres/Replacement of sewer facilities
<b>Use Agreements</b>	
NOAA	0.72 acres/Use agreement for facility for Weather Forecast Office
FAA	0.08 acres/Servicing the Monterey Peninsula Airport
DRMI	1.31 acres/Use of Bldg 234 and use of Rm 400 in bldg 232
TRADOC	HTREA use of first floor in Bldg 246
<b>Permits</b>	
PG&E	Pole/Wire Electric transmission line

## C.2 Real Estate Agreements by Properties

### C.2.1 Monterey Area Properties

#### C.2.1.1 Main Grounds

N/A

#### C.2.1.2 Monterey Dune/Research Area

MOU with City of Monterey for use of staging of beach combing equipment.

#### C.2.1.3 C.2.1.3 Laboratory/Recreation Area

N/A

#### C.2.1.4 Annex

N/A

#### C.2.1.5 La Mesa Village

Lease agreement with U.S. Army for facilities use and natural resources management.



## **C.2.2 CIRPAS Marina Airport Facility**

Lease agreement with City of Marina Municipal Airport.

## **C.2.3 Point Sur Facility**

Agreement with California Department of Parks and Recreation allowing access.

Easement allowing cable access to ocean.

## **C.2.4 NIROP Santa Cruz**

Facilities management agreement with Lockheed Martin Corp.

License to use pump house, storage tanks, and related facilities.  
DATE: 3/10/1959.

Quitclaim Deed with PG&E Resolution attch. DATE: 1/11/57.

A.G. Letter. DATE: 4/8/1958.

Request for opinion on title. DATE: 3/7/1958.

Request for opinion on title. DATE: 3/24/1959.

Certificate of inspection and possession. DATE: 3/24/1959.

Certificate of non-interference. DATE: 3/24/1959.

Plat. DATE: 3/24/1959.

Warranty Deed (11/19/1957) with DPWO Counsel Letter (6/26/1958).

Final Certificate of Title. DATE: 2/26/1959.

Attorney General Letter. Date: 5/5/1959.

## **C.2.5 NPMOSSP Mountain View**

Facilities management agreement with Lockheed Martin Corporation.

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2 December 2010

## **Naval Industrial Reserve Ordnance Plant, Santa Cruz Real Estate Concerns**

**SUBJECT:** Naval Industrial Reserve Ordnance Plant, Santa Cruz Real Estate Concerns and Timber Management Implications

1. Background: In 2009 a lightning strike fire, know as the Lockheed Fire, spread quickly across the Lockheed Martin property contiguous to the Naval Industrial Reserve Ordnance Plant (NIROP), Santa Cruz (aka Naval Detachment Santa Cruz). The fire came up short of reaching the 270 acre NIROP Santa Cruz property. In the years since the Navy first took control of this property in 1957, has been managed as a Government-Owned, Contractor-Operated (GOCO), facility and has had very little forest management. As a result the heavily wooded property now has a very high forest fuel load, creating a considerable risk of uncontrolled and uncontrollable wildfire. To prevent a fire from spreading through the property certain actions need to be taken. These actions include forest thinning and deadwood removal. This should be accomplished in conjunction with limited control burning in some areas.

2. Issue: In discussions with Terry Oldfather (NIROP Santa Cruz Facility and Lockheed Martin Facility Manager) there is a question based on a title search that Lockheed Martin conducted on the Lockheed property as to whether the timber rights on NIROP Santa Cruz were part of the initial land purchase in 1957 and if they are subsequently a real estate component. Currently the only cutting of timber that occurs on NIROP Santa Cruz is related to safety (trees interfering with power lines/trees in facility blast areas/trees with potential to fall on roads, etc)

3. Current Condition: With the questionable timber rights of the NIROP Santa Cruz Facility, the Facility Manager has been instructed that until a determination has been made, no timber will be cut on the NIROP Santa Cruz facility that is not directly related to safety. The issue of safety includes the thinning and/or removal of trees, associated within blast zones of magazines, or that threaten personnel or property.

4. Way Forward: Naval Support Activity Monterey is responsible for the overall management of the NIROP Santa Cruz Facility. As such, it is in the best interest to the Navy and Naval Support Activity Monterey that:

a. Review of real estate documents and potential ground truthing to determine if the current property line is accurate

b. NAVFAC SW conduct a review of real estate documents related to the facility that is in their possession

c. A title search be planned, funded and carried out to determine timber rights and potential other issues as to ownership that may arise

SANTA CRUZ, CALIF - NIROP TEST BASE  
D01/4  
LICENSE - 3/10/59 (Use of pump house,  
storage tanks & related  
FROM: LOCKHEED AIRCRAFT CORP. fac.

341

341

06-8601-3201

<u>DOCUMENT</u>	<u>DATE</u>	<u>SERIAL</u>
LICENSE	3/10/59	2338

6A

2014  
NIRAP  
Santa Cruz

LICENSE TO USE PUMP HOUSE,  
STORAGE TANKS AND RELATED FACILITIES

LOCKHEED AIRCRAFT CORPORATION, a California corporation, (hereinafter called "LICENSOR") hereby grants to the UNITED STATES OF AMERICA, Department of the Navy, (hereinafter called the "GOVERNMENT") licenses and rights to make nonexclusive use of certain electric power, water pumping and water storage facilities owned by LICENSOR in the vicinity of Mill Creek Dam, Santa Cruz County, California, as follows:

A. A non-exclusive license and right to enter that certain pump house owned by LICENSOR and located 8716.33 feet south and 1622.82 feet west of the common section corner of Sections 16, 17, 20 and 21, Township 9 South, Range 3 West, Mount Diablo Base and Meridian, County of Santa Cruz, State of California; to install, maintain and use in said pumphouse an electric pump with a standby power supply; to connect said pump to existing electric power facilities and an existing six inch (6") water line owned by LICENSOR; to pump water through said water line to and into two existing water storage tanks owned by LICENSOR, and to make a connection between said water storage tank and a booster pumping station owned by the GOVERNMENT, the location of LICENSOR'S water line and water storage tank being described as follows:

"COMMENCING at the common corner of Sections 16, 17, 20 and 21 of Township 9 South, Range 3 West, Mount Diablo Base and Meridian, Santa Cruz County, California, and running thence South 8716.33 feet and west 1622.82 feet to the true point of beginning of this description; thence North 17° 00' 00" East, 4.36 feet to a point; thence North 0° 22' 30" West, 37.55 feet to a point; thence North 21° 56' 00" East, 144.00 feet to a point; thence North 6° 01' 30" West, 49.38 feet to a point; thence North 11° 15' 30" East, 74.10 feet to a point; thence North 3° 33' 00" East, 132.55 feet to a point; thence North 2° 31' 30" West, 224.34 feet to a point; thence North 14° 41' 30" West, 118.44 feet to a point; thence North 2° 42' 50" West, 57.85 feet to a point; thence North 5° 33' 10" East, 139.20 feet to a point; thence North 50° 35' 40" East, 281.08 feet to a point; thence North 53° 36' 40" East, 153.99 feet to a point; thence North 71° 51' 40" East, 223.46 feet to a point; thence North 60° 56' 10" East, 498.61 feet to a point; thence North 59° 15' 10" East, 481.49 feet; thence North 0° 28' 20" West, 431.12 feet to a point; thence North 9° 34' 20" West, 72.51 feet to a point; thence North 25° 05' 50" West, 379.90 feet to a point; thence North 18° 11' 10" West 77.89 feet to the beginning of a tangent curve to the left having a radius of 1000 feet; thence continuing along said curve through an angle of 10° 30' 00", an arc length of 183.26 feet to a point; thence tangent to said curve North 28° 41' 10" West 78.51 feet to a point; thence North 2° 18' 50" East 266.82 feet to a point; thence North 35° 26' 20" East, 479.25 feet to the beginning of a tangent curve to the left having a radius of 1000 feet; thence continuing along said curve through an angle of 9° 00' 00" an arc length of 157.08 feet; thence tangent to said curve North 26° 26' 20" East 158.42 feet to the beginning of a tangent curve to the left having a radius of 1000 feet; thence continuing along said curve to an angle of 4° 59' 20", an arc length of 87.07 feet; thence tangent to said curve North 21° 27' 00" East 239.87 feet to the beginning of a tangent curve to the right having a radius of 750 feet; thence continuing along said curve through an angle of 23° 30' 10", an arc length of 307.65 feet; thence tangent to said curve North 44° 57' 10", West 1147.69 feet to the beginning of a tangent curve to the right having a radius of 750 feet;

Doc. 2338 P/A. 1-8000  
Cov. 2014 File 3H  
Encl. AttyGen Opinion of 2-8000.1 thru  
Micro. ToNAVFEC 2-8000.4

2014

thence continuing along said curve through an angle of 13° 59' 30", an arc length of 183.15 feet to a point of compound curvature, having a radius of 616.91 feet; thence continuing along said curve through an angle of 26° 50' 20", an arc length of 288.98 feet; thence tangent to said curve North 85° 47' East 275.30 feet to a point; thence South 68° 6' 50" East 63 feet to a point; thence at right angles South 21° 53' 10" West 10 feet to the center line of 100,000 gallon water tank Number 2; thence North 44° East 49 feet to the center of 100,000 gallon water tank Number 1; said center of tank Number 1 bears South 3966.90 feet and East 1029.76 feet from the corner common to Sections 16, 17, 20 and 21 of Township 9 South, Range 3 West, Mt. Diablo Base and Meridian, Santa Cruz County, California;" *Jan 5-400 SF 842-10 Non P.*

B. A non-exclusive license and right of ingress and egress and the right to install, operate, use and maintain a booster pump, connected to existing electric power facilities, and an underground water line upon and beneath that certain parcel of land situated in the County of Santa Cruz, State of California, described as follows:

"COMMENCING at the common section corner of Sections 16, 17, 20 and 21 of Township 9 South, Range 3 West, Mount Diablo Base and Meridian, Santa Cruz County, California, and running thence South 3966.90 feet and East 1029.76 feet; thence South 48° 36' 30" East, 15.40 feet to the true point of beginning of this description; thence North 41° 23' 30" East, 26.00 feet to a point; thence South 48° 36' 30" East, 26.00 feet to a point; thence South 41° 23' 30" West, 40.00 feet to a point; thence North 48° 36' 30" West, 26.00 feet to a point; thence North 41° 23' 30" East, 14.00 feet to the true point of beginning of this description;" *1090 SF*

C. A non-exclusive license and right of ingress and egress and the right to install, operate, use and maintain an underground water line beneath that certain parcel of land, 20 feet wide, situated in the County of Santa Cruz, State of California, the centerline of which is described as follows:

"COMMENCING at the common section corner of Sections 16, 17, 20 and 21 of Township 9 South, Range 3 West, Mount Diablo Base and Meridian, Santa Cruz County, California, and running thence South 3966.90 feet and East 1029.76 feet to a point; thence South 48° 36' 30" East, 41.40 feet to the true point of beginning of this description; thence South 48° 36' 30" East, 26.00 feet to a point; thence South 52° 33' 15" East, 32.00 feet to its intersection with the centerline of the 20 foot easement for a water line granted to the Government by Licensor by separate instrument." *1160 SF*

Said licenses and rights are granted hereunder for the benefit of that Government-owned property described as follows:

"THAT PORTION of Township 9 South, Range 3 West, Mount Diablo Base and Meridian, situated in Santa Cruz County, California, described as follows:

BEGINNING at a 1-1/2 inch iron pipe in a rock mound at the intersection of the Northerly line of Section 28 of the aforementioned Township and Range with the Northwesterly line of the Rancho San Vicente, and running thence along said Rancho line the following courses and distances:

South 11° 04' 40" West 1315.96 feet; South 10° 59' 30" West 591.62 feet; and South 10° 59' 10" West 3468.53 feet to a 1-1/2 inch iron pipe in a rock mound, thence North 89° 51' 50" West 1738.00 feet to a 1-1/2 inch iron pipe in a rock mound; thence North 0° 09' 35" East 5263.47 feet to a 1-1/2 inch iron pipe in a rock mound set in the said Northerly line of Section 28; thence along the said Northerly line of Section 28, North 89° 48' 0" East 2750.00 feet to the point of beginning, and CONTAINING THEREIN 271.37 acres of land.

Said licenses and rights shall terminate and be of no force and effect one (1) year after the date of termination of LICENSOR'S right to use and occupy the next above described Government-owned property.

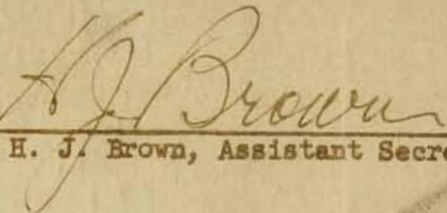
LICENSOR shall not be obligated to enlarge, repair, operate or maintain any of its electric power facilities, pumps, pump houses, water lines or water storage facilities, which are the subject hereof, solely by reason of the licenses and rights granted herein.

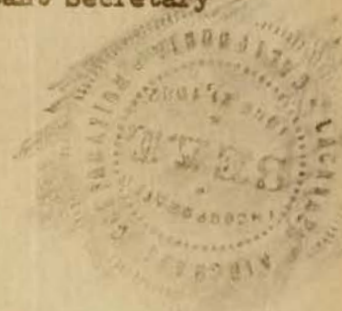
Title to any improvements which may be installed or constructed by the GOVERNMENT under this license agreement shall remain in the GOVERNMENT and may be removed by the GOVERNMENT upon termination of this license agreement, provided the affected premises are restored to LICENSOR'S satisfaction, or at its option the GOVERNMENT may abandon such improvements in place.

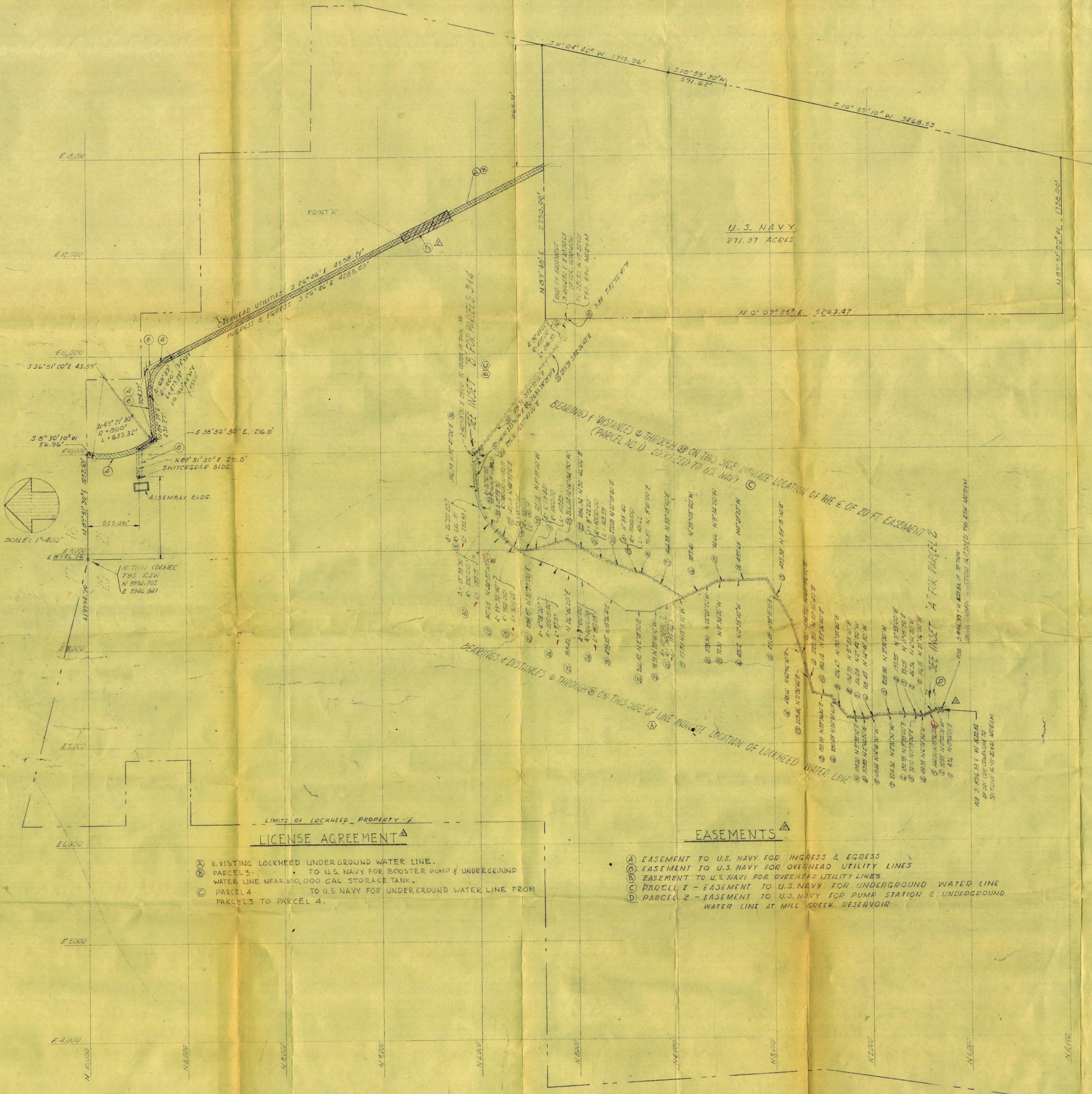
IN WITNESS WHEREOF, the LICENSOR has executed this license agreement this 10th day of March, 1959.

LOCKHEED AIRCRAFT CORPORATION

By

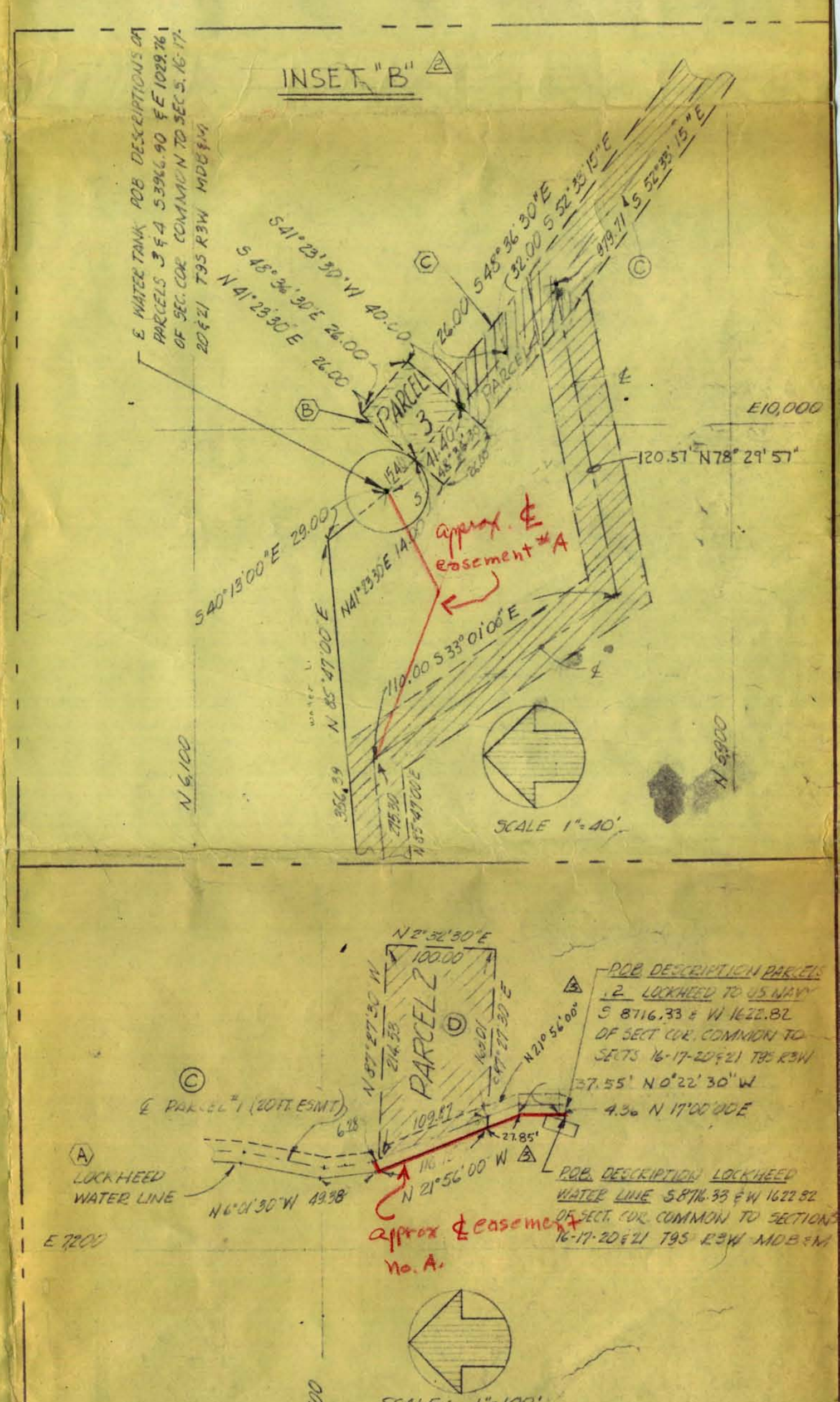
  
H. J. Brown, Assistant Secretary





- LICENSE AGREEMENT**
- (A) EXISTING LOCKHEED UNDERGROUND WATER LINE.
  - (B) PARCEL 3 - TO U.S. NAVY FOR BOOSTER PUMP & UNDERGROUND WATER LINE NEAR 100,000 GAL STORAGE TANK.
  - (C) PARCEL 4 - TO U.S. NAVY FOR UNDERGROUND WATER LINE FROM PARCEL 3 TO PARCEL 4.

- EASEMENTS**
- (A) EASEMENT TO U.S. NAVY FOR INGRESS & EGRESS
  - (B) EASEMENT TO U.S. NAVY FOR OVERHEAD UTILITY LINES
  - (C) EASEMENT TO U.S. NAVY FOR OVERHEAD UTILITY LINES
  - (D) PARCEL 1 - EASEMENT TO U.S. NAVY FOR UNDERGROUND WATER LINE
  - (E) PARCEL 2 - EASEMENT TO U.S. NAVY FOR PUMP STATION & UNDERGROUND WATER LINE AT MILL GREEK RESERVOIR



REFERENCE DRAWINGS		REVISION RECORD		APPROVALS		DEPT. DATE		LOCKHEED AIRCRAFT CORPORATION		DEPT. DATE	
DRWG. NO.	DESCRIPTION	NO.	DATE	DESCRIPTION	BY	APPROVED	DATE	MISSILE SYSTEMS DIVISION - MANUFACTURING ENGINEERING DIVISION	DESIGN	DATE	DATE
		3-16-51	ADDED 29.85' SECTION		D.J.M.			7701 WOOLLEY AVENUE	DRAWN	4-7-51	
		2-5-51	GENERAL REVISION		D.J.M.			VAN NUYS, CALIFORNIA	CHECKED		
		1-27-51	REVISE EASEMENT 'B' NEAR SWITCHGEAR BLDG. MEASUREMENT						APPROVED		
		0-4-51	RELEASE TO CLIENT		END						

PREPARED BY		APPROVALS		DEPT. DATE		LOCKHEED AIRCRAFT CORPORATION		DEPT. DATE	
CREEGAN & D'ANGELO		[Signatures]		MISSILE SYSTEMS DIVISION - MANUFACTURING ENGINEERING DIVISION		7701 WOOLLEY AVENUE		DESIGN	
CIVIL ENGINEERS				VAN NUYS, CALIFORNIA				DRAWN	
SAN JOSE CALIFORNIA SARATOGA								CHECKED	
								APPROVED	
								E-0101	

Revised 10/1/54 341-1 E 2326-3



SANTA CRUZ, CALIF - NIROP TEST BASE D01/4  
TITLE PAPERS -(271.37 acres & an Easement  
Appurtenant thereto )  
DEED -11/19/57 from LOCKHEED AIRCRAFT CORP.

2A1

06-8601-6301

GA

2A1

<u>DOCUMENT</u>	<u>DATE</u>	<u>SERIAL</u>
QUITCLAIM DEED with PG&E Resolution attech.	1/11/57	1238
A.G. LTR with	1/23/59 ✓	929
A.G. LTR	4/ 8/58 ✓	930
REQUEST FOR OPINION ON TITLE	3/ 7/58 ✓	931
REQUEST FOR OPINION ON TITLE with (final)	3/24/59	932
CERTIFICATE OF INSPEC.& POSS.	3/24/59	933
CERTIFICATE OF NON-INTERFERENCE	3/24/59	934
PLAT		935
WARRANTY DEED with	11/19/57	1236 ✓
DPWO COUNSEL LTR	6/26/58	
EASEMENT DEED FOR ROAD & UTILITY LINES	11/19/57	2370 ✓
FINAL CERTIFICATE OF TITLE	2/26/59	2371 ✓
A.G. LTR	5/5/59	2464 ✓

WARRANTY DEED

THIS INDENTURE, between the undersigned LOCKHEED AIRCRAFT CORPORATION, a California corporation, (hereinafter called "VENDOR"), and the UNITED STATES OF AMERICA (hereinafter called the "GOVERNMENT"),

WITNESSETH:

VENDOR, for and in consideration of the sum of One Dollar (\$1.00), receipt of which is hereby acknowledged, does hereby grant, bargain, sell, convey and confirm unto the GOVERNMENT and its assigns that certain parcel of land described as follows:



"THAT PORTION of Township 9 South, Range 3 West, Mount Diablo Base and Meridian, situated in Santa Cruz County, California, described as follows:

'BEGINNING at a 1-1/2 inch iron pipe in a rock mound at the intersection of the Northerly line of Section 28 of the aforementioned Township and Range with the Northwesterly line of the Rancho San Vicente and running thence along said Rancho line the following courses and distances:



'South 11° 04' 40" West, 1315.96 feet; South 10° 59' 30" West, 591.62 feet; and, South 10° 59' 10" West, 3468.53 feet to a 1-1/2 inch iron pipe in a rock mound; thence North 89° 51' 50" West, 1738.00 feet to a 1-1/2 inch iron pipe in a rock mound; thence North 0° 09' 35" East, 5263.47 feet to a 1-1/2 inch iron pipe in a rock mound set in the said Northerly line of Section 28; thence along the said Northerly line of Section 28, North 89° 48' 0" East, 2750.00 feet to the point of beginning, and containing therein 271.37 acres of land;'"

subject to all covenants, conditions and restrictions of record and excepting and reserving from this conveyance unto VENDOR and its assigns a non-exclusive easement and right of ingress and egress and the right to install, operate, use and maintain a roadway, power, gas and telephone lines and related equipment upon, over, above and beneath the following portion of the above-described parcel of land together with such additional areas adjacent thereto as may be required to provide for cut and fill slopes adequate for the construction of said roadway:



"A strip of land fifty feet wide, the center line of which is described as follows:



'COMMENCING at a 1-1/2 inch iron pipe in a rock mound set at the intersection of the Northerly line of Section 28 of Township 9 South, Range 3 West, Mount Diablo Base and Meridian, Santa Cruz County, California, with the Northwesterly line of the Rancho San Vicente and running thence along the said Northerly line of

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Code. 2014 FILE 291  
Encl. AttyGen Opinion of MICRO BY BUDOCKS  
Micro.....To BUDOCKS.....

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2014 (a)

'Section 28, South 89° 48' West 1165.71 feet to the true point of beginning of this description; thence South 26° 46' East 25.60 feet to the beginning of a tangent curve to the left, having a radius of 500 feet; thence continuing along said curve through an angle of 45° 21' 20", an arc length of 395.80 feet; thence tangent to said curve South 72° 07' 20" East 116.52 feet to the beginning of a tangent curve to the right, having a radius of 200 feet; thence continuing along said curve through an angle of 78° 54' 40" an arc length of 275.45 feet; thence tangent to said curve South 6° 47' 20" West 840.36 feet to the beginning of a tangent curve to the right, having a radius of 1000 feet, thence continuing along said curve through an angle of 14° 20' 40" an arc length of 250.36 feet; thence tangent to said curve South 21° 08' West 134.43 feet to a point of intersection with a nontangent curve to the right having a radius of 598.00 feet, a radial line of said curve through said point of intersection bearing North 9° 32' 56" West; thence continuing along said curve through an angle of 13° 37' 26" an arc length of 142.19 feet; thence tangent to said curve North 85° 55' 30" West 239.14 feet to the beginning of a tangent curve to the left having a radius of 200 feet; thence continuing along said curve through an angle of 113° 19' 30" an arc length of 395.58 feet; thence tangent to said curve South 19° 15' East 214.50 feet to the beginning of a tangent curve to the right having a radius of 400 feet; thence continuing along said curve through an angle of 26° 50' 40" an arc length of 187.41 feet; thence tangent to said curve South 7° 35' 40" West 596.78 feet to the beginning of a tangent curve to the right having a radius of 1000 feet; thence continuing along said curve through an angle of 12° 38' 50" an arc length of 220.74 feet; thence tangent to said curve South 20° 14' 30" West 452.57 feet to a point; thence South 19° 15' East 200.18 feet to a point; thence South 22° 46' 30" West 216.00 feet to a point; thence South 15° 43' East 420.34 feet to a point; thence South 4° 22' 10" West 251.65 feet to a point; thence South 30° 09' 20" East 234.20 feet to a point; thence South 0° 37' 50" East 211.60 feet to a point; thence South 17° 06' 50" West 226.30 feet to a point, from which point the said point of commencement at the intersection of the Northerly line of Section 28 with the Northwesterly line of the San Vicente Rancho bears North 5276.12 feet and East 1472.87 feet.'"

7.1712 AC

Said easement and right are reserved by VENDOR and its assigns for the benefit of and appurtenant to the remaining property of VENDOR lying Northerly and Southerly of the first above-described property.

(The land conveyed hereunder is acquired by the GOVERNMENT on the request of the Department of the Navy.)

TO HAVE AND TO HOLD the land conveyed hereunder unto the GOVERNMENT and its assigns forever; and VENDOR does hereby warrant that said land is free from all taxes, liens

and encumbrances, except taxes, liens and encumbrances of record, and that VENDOR will, and its successors and assigns shall, warrant and defend the same for the GOVERNMENT, and its assigns, forever against the just and lawful claims and demands of all persons whomsoever.

IN WITNESS WHEREOF, the VENDOR has executed this conveyance this 19<sup>th</sup> day of November, 1957.

LOCKHEED AIRCRAFT CORPORATION

By [Signature]  
H. J. Brown  
Assistant Secretary



ACKNOWLEDGMENT

STATE OF CALIFORNIA )  
COUNTY OF SANTA CLARA ) SS.

On this 19<sup>th</sup> day of November, 1957, before me, Norman J. Vuckan a Notary Public in and for the County of Santa Clara, State of California, residing therein, duly commissioned and sworn, personally appeared H. J. Brown known to me to be the person who executed the within instrument on behalf of the corporation therein named, and acknowledged to me that such corporation executed the same.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal the day and year first-above written.

[Signature]  
Notary Public in and for the County  
of Santa Clara, State of California



My Commission expires: 12-31-60

3620

RECORDED AT REQUEST OF

CALIFORNIA PACIFIC TITLE CO.

FEB 26 11 00 AM 1959

VOL 1232 PAGE 21

OFFICIAL RECORDS SANTA CLARA COUNTY

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DEPARTMENT OF THE NAVY  
OFFICE OF THE GENERAL COUNSEL

COUNSEL FOR THE  
DISTRICT PUBLIC WORKS OFFICE  
TWELFTH NAVAL DISTRICT  
SAN BRUNO, CALIFORNIA

D50-JM/hl

26 June 1958

Mr. E. L. Nichols, Division Counsel  
Lockheed Aircraft Corporation  
Missile Systems Division  
Sunnyvale, California

Dear Mr. Nichols:

I enclose copy of California Pacific Title Insurance Company's letter of June 25, 1958, which notes recording data, as of June 24, 1958, covering the conveyance from Lockheed to the Government of 36.364 acres of land and 5 appurtenant easements at Sunnyvale. Upon return of the recorded originals, you will be furnished with a photostatic copy of each deed.

With respect to the conveyance by Lockheed to the Government of 271.37 acres of land at Santa Cruz, the Attorney General has directed that the deed may not be recorded until the Government has instituted a condemnation proceeding against the owners of reserved timber rights and removed this cloud on title. In the meantime, I understand that Lockheed will deliver the necessary easements for roads, utilities, tank-site and water line and assignment of water rights for the Santa Cruz property.

Very truly yours,

  
JAMES L. McNALLY  
Counsel

Encl:

- (1) Cpy CalPac Title Ins.  
Co. ltr of 6/25/58

Copy to:

John E. Cavanaugh, Esq.  
Ass't Counsel  
Lockheed Aircraft Corporation  
Missile Systems Division  
Sunnyvale, California  
DC200  
DC220  
→ DC230

*001/4*

14 AUG 1973

Mr. Paul Lohaus  
Agreements and Exports Branch  
Fuels and Materials  
Directoriate of Licensing  
U. S. Atomic Energy Commission  
Washington, D. C. 20545

Sir:

Reference is made to your informal request of Miss Marlow of this Command on 13 August 1971 for information relative to the status of jurisdiction over certain property in California of the Lockheed Missiles and Space Company, conveyed to the U. S. Government for use by the Department of the Navy by deed dated February 26, 1959, from Lockheed.

The property in which you are interested is currently indentified on our records as the Naval Industrial Reserve Ordnance Plant, Sunnyvale, California, DOD #484. Lockheed Missile and Space Company is the present operator. The specific area of your inquiry is further identified as the Santa Cruz Test Base. The Navy-owned portion of the Santa Cruz area comprises 271.37 acres of land, conveyed by Lockheed Aircraft Corporation to the United States of America in fee by deed dated November 19, 1957, recorded on February 26, 1959 among the land records of Santa Cruz County in Volume 1232 at page 21.

In response to your request for information as to the status of jurisdiction this letter will confirm information previously provided to you by phone. The United States of America exercises a proprietorial interest only in the 271.37 acres of Government-owned land at the Santa Cruz site. No action has been taken to accept Federal Legislative Jurisdiction on behalf of the United States of America. Attached for your information is a print of Real Estate Summary Map, NAVFAC Drawing No. 745135, on which the area is delineated and jurisdictional information provided.

Sincerely,

F. G. MATTISON  
Acting Director  
Utilization Division

Enclosure (1)

EASEMENT DEED FOR ROAD AND UTILITY LINES

THIS INDENTURE, between the undersigned LOCKHEED AIRCRAFT CORPORATION, a California corporation (hereinafter called "VENDOR"), and the UNITED STATES OF AMERICA (hereinafter called the "GOVERNMENT"),

WITNESSETH:

VENDOR, for and in consideration of the sum of One Dollar (\$1.00), receipt of which is hereby acknowledged, does hereby grant, bargain, sell, convey and confirm unto the GOVERNMENT and its assigns the following easements:

A. A non-exclusive easement and right to construct, use and maintain a road for purposes of ingress and egress over and upon that certain strip of land 50.00 feet wide, situated in the County of Santa Cruz, State of California, the center line of which is described as follows:

"COMMENCING at the common section corner of Sections 16, 17, 20 and 21 of Township 9 South, Range 3 West, Mount Diablo Base and Meridian, Santa Cruz County, California, and running thence North 89° 51' 30" East, 1052.69 feet to the true point of beginning of this description; thence South 8° 30' 10" West, 56.96 feet to the beginning of a tangent curve to the left, having a radius of 800 feet; thence continuing along said curve through an angle of 45° 21' 30", an arc length of 633.32 feet; thence tangent to said curve South 36° 51' 20" East, 43.55 feet; thence North 84° 35' East, 431.27 feet to the beginning of a tangent curve to the right having a radius of 400 feet; thence continuing along said curve through an angle of 68° 39', an arc length of 479.27 feet; thence tangent to said curve South 26° 46' 00" East, 4285.09 feet; to a point on the northerly line of Section 28 of the aforementioned township and range from which point a 1-1/2 inch iron pipe in a rock mound set at the intersection of said northerly line of Section 28 with the northwesterly line of the Rancho San Vicente bears North 89° 48' East, 1165.71 feet;"

together with a like non-exclusive easement and right over such additional areas adjacent thereto as may be required for construction and maintenance of cut and fill slopes for said road.

B. A non-exclusive easement and right to install, operate, use and maintain overhead utility lines over that certain strip of land 50.00 feet wide, situated in the County of Santa Cruz, State of California, the center line of which is described as follows:

"COMMENCING at the common section corner of Sections 16, 17, 20 and 21 of Township 9 South, Range 3 West, Mt. Diablo Base and Meridian, Santa Cruz County, California and running thence South 525.06 feet and East 830.58 feet to the true point of beginning of this description; thence North 89° 51' 30" East 271.00 feet to a point, thence South 38° 36' 30" East, 216.00 feet to a point; thence North 84° 35' East 704.39 feet to a point; thence South 26° 46' East 2,653.00 feet to a point herein for convenience called point "A"; thence South 26° 46' East 1,905.21 feet to a point on the Northerly line of Section 28 of the aforementioned township and range from which point a 1-1/2

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inch iron pipe in a rock mound, set at the intersection of the said Northerly line of Section 28 with the Northwesterly line of the Rancho San Vicente bears North 89° 48' East, 1,165.71 feet;"

such power line to be installed in such location and in such a manner as not to obstruct any road constructed on the easement described in paragraph A.above.

B.1. A non-exclusive easement and right to install, operate, use and maintain overhead utility lines over that certain strip of land situated in the County of Santa Cruz, State of California, which is described as follows:

"COMMENCING at a point "A" as described in B.above and running North 63° 14' East 45 feet to a point; thence at right angles South 26° 46' East 532.00 feet to a point; thence at right angles South 63° 14' West 90 feet to a point; thence at right angles North 26° 46' West 532 feet to a point; thence at right angles North 63° 14' East 45 feet to point "A" and the true point of beginning of this description,"

1.099± ac.

such power line to be installed in such location and in such a manner as not to obstruct any road constructed on the easement described in paragraph A. above.

C. A non-exclusive easement and right of ingress and egress and the right to install, operate, use and maintain an underground water line and overhead utility lines upon, over, above and beneath that certain strip of land 20 feet in width situated in the County of Santa Cruz, State of California, the center line of which is described as follows:

"COMMENCING at the common section corner of Sections 16, 17, 20 and 21 of Township 9 South, Range 3 West, Mount Diablo Base and Meridian, Santa Cruz County, California, and running thence South 8716.33 feet and West 1622.82 feet to the true point of beginning of this description; thence North 17° 00' 00" East, 4.36 feet to a point, thence North 0° 22' 30" West, 37.55 feet to a point; thence North 21° 56' 00" West, 27.85 feet to a point; thence North 68° 04' 00" East, 10.00 feet to a point; thence North 21° 56' 00" West, 116.15 feet to a point; thence North 6° 01' 30" West, 46.56 feet to a point thence North 11° 15' 30" East, 73.25 feet to a point; thence North 3° 33' 00" East, 133.75 feet to a point; thence North 2° 31' 30" West, 225.92 feet to a point; thence North 14° 41' 30" West, 118.47 feet to a point; thence North 2° 42' 50" West, 56.09 feet to a point; thence North 5° 33' 10" East, 134.33 feet to a point; thence North 50° 35' 40" East, 276.67 feet to a point; thence North 53° 36' 40" East, 152.12 feet to a point; thence North 71° 51' 40" East, 222.80 feet to a point; thence North 60° 56' 10" East, 499.72 feet to a point; thence North 59° 15' 10" East, 487.38 feet to a point; thence North 0° 28' 20" West, 437.68 feet to a point; thence North 9° 34' 20" West, 74.66 feet to a point; thence North 25° 05' 50" West, 387.41 feet to a point; thence North 33° 18' 10" East, 464.28 feet to a point; thence North 9° 41' 00" East, 33.87 feet to the beginning of a tangent curve to the right having a radius of 500.00 feet; thence continuing along said curve through an angle of 11° 38' 40", an arc length of 101.62 feet; thence tangent to said curve North 21° 19' 40" East, 270.23 feet to the beginning of a tangent curve to the right having a radius of 1000.00 feet; thence continuing along said curve through an angle of 9° 22' 20", an arc length of 163.58 feet; thence tangent to



said curve North 30° 42' 00" East, 286.94 feet to a point; thence North 16° 04' 50" West, 266.04 feet to the beginning of a tangent curve to the right having a radius of 1000.00 feet; thence continuing along said curve through an angle of 6° 09' 40", an arc length of 107.53 feet; thence tangent to said curve North 9° 55' 10" West, 121.18 feet to a point on a non-tangent curve to the right having a radius of 740.00 feet, the bearing of the radial line at said point being South 58° 59' 51" East; thence continuing along said curve through an angle of 13° 57' 01", an arc length of 180.17 feet; thence tangent to said curve North 44° 57' 10" East, 147.69 feet to the beginning of a tangent curve to the right having a radius of 740.00 feet; thence continuing along said curve through an angle of 13° 59' 30", an arc length of 180.71 feet to a point of compound curvature; thence continuing along a curve having a radius of 606.91 feet, through an angle of 26° 50' 20", an arc length of 284.29 feet; thence tangent to said curve North 85° 47' 00" East, 275.30 feet to a point; thence South 33° 01' 00" East, 110 feet to a point; thence North 78° 29' 57" East, 120.57 feet to a point; thence South 52° 33' 15" East, 979.71 feet to a point; thence South 52° 06' 45" East, 289.78 feet to the beginning of a tangent curve to the left having a radius of 475.00 feet; thence continuing along said curve through an angle of 35° 49' 00", an arc length of 296.93 feet; thence tangent to said curve South 87° 55' 45" East, 3.89 feet to a point on the westerly boundary line of the 271.37 acre parcel of land conveyed from Lockheed Aircraft Corporation to the Government by Warranty Deed executed on the 19th day of November, 1957, which has not been recorded as of this date; said point bears South 0° 09' 35" West, 208.99 feet from the northwesterly corner of said 271.37 acre parcel, and said point also bears South 4904.50 feet and East 2390.68 feet from the common section corner to Sections 16, 17, 21 and 20 of Township 9 South, Range 3 West, Mount Diablo Base and Meridian, Santa Cruz County, California;"

3.765+00

D. A non-exclusive easement and right of ingress and egress and the right to construct, install, operate, use and maintain a pump house, water line, and overhead utility lines upon, over, above and beneath that certain parcel of land situated in the County of Santa Cruz, State of California, described as follows:

"COMMENCING at the common section corner of Sections 16, 17, 20 and 21 of Township 9 South, Range 3 West, Mount Diablo Base and Meridian, Santa Cruz County, California, and running thence South 8646.35 feet and West 1622.39 feet to the true point of beginning of this description; thence South 87° 27' 30" East, 169.01 feet to a point; thence North 2° 32' 30" East, 100.00 feet to a point; thence North 87° 27' 30" West, 214.53 feet to a point; thence South 21° 56' 00" East, 109.87 feet to the true point of beginning of this description;"

Subject to all covenants, conditions and restrictions of record.

0.440 = 2.2.

Said easements and rights are granted hereunder for the benefit of and appurtenant to that property of the GOVERNMENT described as follows:

"THAT PORTION of Township 9 South, Range 3 West, Mount Diablo Base and Meridian situated in Santa Cruz County, California, described as follows:

BEGINNING at a 1-1/2 inch iron pipe in a rock mound at the intersection of the Northerly line of Section 28 of the aforementioned Township and Range with the Northwesterly line of the Rancho San Vicente, and running thence along said Rancho line the following courses and distances:

South 11° 04' 40" West 1315.96 feet; South 10° 59' 30" West 591.62 feet; and South 10° 59' 10" West 3468.53 feet to a 1-1/2 inch iron pipe in a rock mound; thence North 89° 51' 50" West 1738.00 feet to a 1-1/2 inch iron pipe in a rock mound; thence North 0° 09' 35" East 5263.47 feet to a 1-1/2 inch iron pipe in a rock mound set in the said Northerly line of Section 28; thence along the said Northerly line of Section 28, North 89° 48' 0" East 2750.00 feet to the point of beginning, and CONTAINING THEREIN 271.37 acres of land."

(The above-described easements and rights are acquired by the GOVERNMENT on the request of the Department of the Navy.)

TO HAVE AND TO HOLD SAID easements and rights unto the GOVERNMENT and its assigns forever, and VENDOR will, and its successors and assigns, shall, warrant and defend the same for the GOVERNMENT and its assigns, forever, against the just and lawful claims and demands of all persons whomsoever.

IN WITNESS WHEREOF, the VENDOR has executed this conveyance as of the 19th day of November, 1957.

LOCKHEED AIRCRAFT CORPORATION

By

*H. J. Brown*  
H. J. Brown, Assistant Secretary

\* \* \*

STATE OF CALIFORNIA ) ss  
COUNTY OF SANTA CLARA)

On this 29th day of January, 1959, before me, Marian G. Lockwood, a Notary Public in and for the County of Santa Clara, State of California, ~~residing therein~~, duly commissioned and sworn, personally appeared H. J. Brown, known to me to be the person who executed the within instrument on behalf of the corporation therein named, and acknowledged to me that such corporation executed the same.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal the day and year first above written.

*Marian G. Lockwood*  
Notary Public in and for the County of Santa Clara, State of California

My commission expires:

April 16, 1962

REQUEST FOR OPINION ON TITLE  
 NAVDOCKS 2398, (14-56)

TO

Assistant Attorney-General,  
 Lands Division  
 Department of Justice  
 Washington 25, D. C.

It is requested that an opinion on the title to be acquired by the United States be furnished covering the land hereinafter identified.

PROPERTY IDENTIFICATION

NUMBER OF ACRES (More or Less)	PARCEL NO.	CITY	COUNTY	STATE
271.37	--	--	Santa Cruz	California

PROPERTY IS DESCRIBED MORE PARTICULARLY IN (Specify enclosure)

**Deeds and title report herewith**

NAVAL ACTIVITY <b>Naval Industrial Reserve Ordnance Plant (Santa Cruz Test Annex)</b>	VENDOR <b>Lockheed Aircraft Corporation</b>
--	--

REQUEST FOR PRELIMINARY OPINION

REQUEST FOR FINAL OPINION

It is requested that this opinion be furnished to the official whose title and address is shown below.

It is requested that this opinion be furnished to the Chief of the Bureau of Yards and Docks, Department of the Navy, Washington 25, D. C.

AUTHORIZATION ACT

PUBLIC LAW NO. <b>85-241</b>	CONGRESS NO. <b>85</b>	DATE APPROVED <b>Aug. 30, 1957</b>
---------------------------------	---------------------------	---------------------------------------

PRELIMINARY OPINION RENDERED (DATE) <b>Jan 23, 1959</b>	JUSTICE DEPT. FILE NO. <b>33-5-2051</b>	DATE OF DEED <b>Nov. 19, 1957</b>
--	--	--------------------------------------

APPROPRIATION ACT

PUBLIC LAW NO. <b>85-170</b>	CONGRESS NO. <b>85</b>	DATE APPROVED <b>Aug. 28, 1957</b>
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RECORDATION

STATE & COUNTY <b>California Santa Cruz County</b>	DEED BOOK NO. <b>1232</b>
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CONGRESSIONAL COMMITTEES ON ARMED SERVICES APPROVALS

SENATE (Date) <b>Not Required</b>	HOUSE (Date) <b>Not Required</b>
--------------------------------------	-------------------------------------

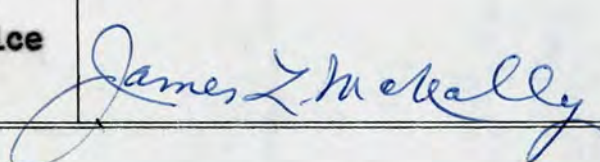
PAGE NO. <b>21 - 27</b>	DATE <b>February 26, 1959</b>
----------------------------	----------------------------------

ENCLOSURE (LIST)

- a) Original of Warranty Deed conveying title to subject land
- b) Original of Easement Deed for road and utility lines serving subject land
- c) Original of California Pacific Title Company's Final Certificate of Title, Order No. 58026, dated February 26, 1959
- d) Certificate of Inspection and Possession dated March 24, 1959
- e) Certificate of Non-Interference dated March 24, 1959
- f) Plat of property acquired

ADDITIONAL COMMENTS

Doc. 932 P/A.....  
 Code 2014 FILE 241  
 Encl. AttyGen Opinion of..MICRO-BY-BUDOCKS  
 Micro.....To BUDOCKS.....

NAME, TITLE & ADDRESS <b>JAMES L. McNALLY, Counsel District Public Works Office Twelfth Naval District San Bruno, California</b>	SIGNATURE 	DATE <b>24 MAR 1959</b>
---	---	----------------------------

*2014*

CERTIFICATE OF INSPECTION AND POSSESSION

I, H. L. MILLER, an employee of the Department of the Navy, hereby certify that on the 24th day of March, 1959, I made a personal examination and inspection of that certain tract or parcel of land situate in the County of Santa Cruz, State of California, containing 271.37 acres, acquired from Lockheed Aircraft Corporation for a Naval Industrial Support Facility.

1. That I am fully informed as to the boundaries, lines and corners of said tract; that I found no evidence of any work or labor having been performed or any materials having been furnished in connection with the making of any repairs or improvements on said land; and that I made careful inquiry of the above-named vendor and ascertained that nothing had been done on or about said premises within the past 12 months that would entitle any person to a lien upon said premises for work or labor performed or materials furnished.

2. That I also made inquiry of the above-named vendor as to its rights of possession and the rights of possession of any person or persons known to it, and neither found any evidence nor obtained any information showing or tending to show that any person had any rights of possession or other interest in said premises adverse to the rights of the above-named vendor or the United States of America.

3. That I was informed by the above-named vendor that to the best of its knowledge and belief there is no outstanding unrecorded deed, mortgage, lease, contract, or other instrument adversely affecting the title to said premises.

4. That to the best of my knowledge and belief after actual and diligent inquiry and physical inspection of said premises there is no evidence whatever of any vested or accrued water rights for mining, agricultural, manufacturing, or other purpose; nor any ditches or canals constructed by or being used thereon under authority of the United States, nor any exploration or operations whatever for the development of coal, oil, gas, or other minerals on said lands; and that there are no possessory rights now in existence owned or being actively exercised by any third party under any reservation contained in any patent or patents heretofore issued by the United States for said land.

5. That to the best of my knowledge and belief based upon actual and diligent inquiry made there is no outstanding right whatsoever in any person to the possession of said premises nor any outstanding right, title, interest, lien, or estate, existing or being asserted in or to said premises except such as are disclosed and evidenced by the public records.

Date: March 24, 1959

*H. L. Miller*

H. L. MILLER

Title:

Manager, Naval Industrial Reserve Facilities Branch  
Real Estate Division  
District Public Works Office  
Twelfth Naval District  
San Bruno, California

Doc. 933 P/A.....  
Code 2014 FILE 291  
Encl. AttyGen Opinion of..... MICRO BY BUDOCKS  
Micro.....To BUDOCKS.....

CERTIFICATE OF NON-INTERFERENCE

I hereby certify that I have made a personal examination and inspection of the 271.37 acres of land in Santa Cruz County, California, which land was acquired by the United States of America from Lockheed Aircraft Corporation by deed dated November 19, 1957; that I have examined the report on title to said land which was issued by the California Pacific Title Company of Santa Cruz, California (Order No. 58026, dated February 26, 1959); that I have also examined the document entitled "Agreement Respecting Timber Rights" which is noted as item No. 2 in said title report and I am fully advised with respect to the conditions and limitations on the exercise of reserved timber rights as set forth in said agreement. I certify that the exception to title relating to timber rights has not interfered with the Navy Department's use of the land as a Naval Industrial Reserve Ordnance Plant nor will it interfere with future use of the land for Governmental purposes.

I further certify that item No. 1 of the preliminary title report on this property, which relates to a quitclaim of mineral rights with reservation of royalties, will not interfere with the Government's use of the land.

Dated this 24th day of March, 1959.

*H. L. Miller*

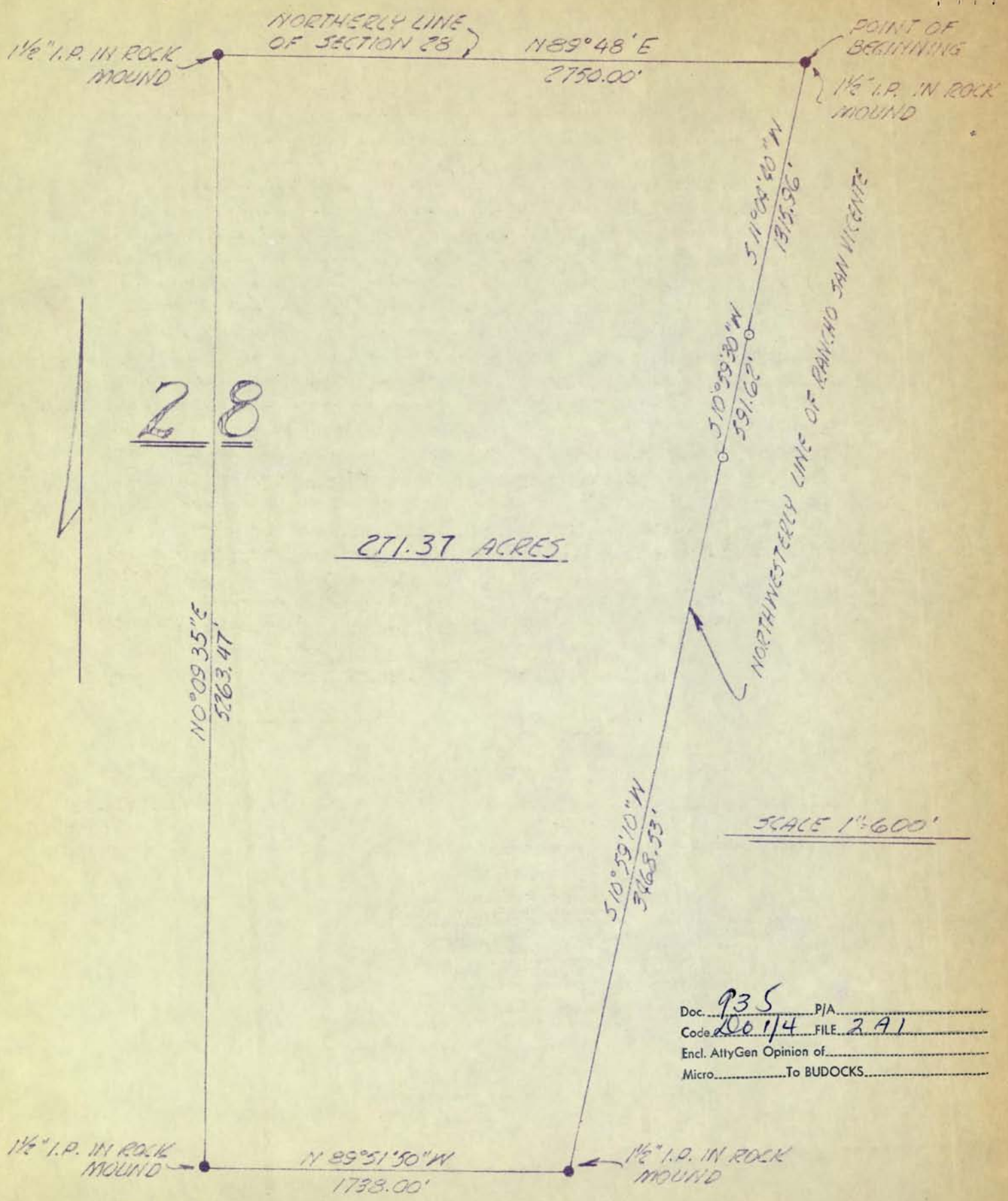
H. L. MILLER

Manager, Naval Industrial Reserve  
Facilities Branch,  
Real Estate Division,  
District Public Works Office,  
Twelfth Naval District  
San Bruno, California

Doc. 934 P/A.....  
Code 201/4 FILE 2 A 1  
Encl. AttyGen Opinion of..... MICRO BY BUDOCKS  
Micro.....To BUDOCKS.....

*201/4 (e)*

4/15/57



Doc. 935 P/A  
 Code 2001/4 FILE 291  
 Encl. AttyGen Opinion of \_\_\_\_\_  
 Micro \_\_\_\_\_ To BUDOCKS \_\_\_\_\_

PLAT OF 271.37 ACRE PARCEL - BEING A PORTION  
OF SECTION 28, T95, R3W  
MDE & M

Dooly (f)



# Office of the Attorney General

Washington, D. C.

May 5, 1959

Honorable Thomas S. Gates, Jr.  
Secretary of the Navy  
Washington, D. C.

My dear Mr. Secretary:

A re-examination has been made of the title relating to certain land in connection with the Naval Industrial Reserve Ordnance Plant Project in Santa Cruz County, California. This land, containing 271.37 acres, more or less, and an easement appurtenant thereto, were conveyed to the United States of America under the provisions of existing legislation by Lockheed Aircraft Corporation under deeds dated November 19, 1957, filed for record on February 26, 1959, and recorded among the land records of the county in Volume 1232 at pages 21 and 24. The file number of this Department is 33-5-2051.

The land is described in the aforesaid deeds.

The certificate of title, No. 58026, dated as of February 26, 1959, was prepared by California Pacific Title Company, and is satisfactory.

The certificate, recorded deeds, and accompanying data disclose valid title to be vested in the United States of America, subject to:

1. Easements for public roads, rights of way and utilities, if any, not shown of record.
2. Reservation of all petroleum, gas, asphaltum and other hydrocarbons contained in the deed, referred to at item 1, Schedule B of the certificate.

Doc. 2464 PIA 1-00013 3. Timber rights, noted at item 2, Schedule B of the certificate.  
 Code 2014 FILE 2A1  
 Encl. AttyGen Opinion of... MICRO-BY-BUDOCKS  
 Micro.....To BUDOCKS.....

TRACT SHEET  
NOTED

*24*

**2464**

NIRSF SUNNYVALE, CAL.

*2014*

*MP 6-12*

Your Department has advised that objections 1, 2 and 3 will not interfere with the contemplated use of the land.

The certificate of title, deeds and related papers are enclosed.

Sincerely yours,

*William P. Rogers*  
Attorney General





**AFFILIATED OFFICES**

**Alameda County**

Oakland Title Insurance Company  
Fifteenth at Franklin Street, Oakland  
1164 A Street, Hayward

**Contra Costa County**

Richmond Martinez Title Company  
Main at Court Street, Martinez  
2566 Macdonald Avenue, Richmond

**Marin County**

San Rafael Land Title Company  
1017 Fourth Street, San Rafael

**Monterey County**

Monterey County Title and Abstract Company  
16 West Gabilan Street, Salinas  
496 Alvarado Street, Monterey

**Sacramento County**

Capital City Title Company  
801 J Street, Sacramento  
2212 K Street, Sacramento  
2442 Fulton Avenue, North Sacramento

**San Francisco**

California Pacific Title Insurance Company  
148 Montgomery Street, San Francisco  
1501 Noriega Street, San Francisco

**Santa Clara County**

California Pacific Title Insurance Company  
66 North First Street, San Jose 13  
414 South Bascom Avenue, San Jose 28  
460 Ramona Street, Palo Alto  
90 Main Street, Los Altos  
344 South Murphy Avenue, Sunnyvale

**Santa Cruz County**

California Pacific Title Company  
109 Cooper Street, Santa Cruz  
Lettrunich Building, Watsonville

**San Joaquin County**

Stockton Abstract and Title Company  
26 South San Joaquin Street, Stockton

**San Mateo County**

California Pacific Title Insurance Company  
2424 Broadway, Redwood City  
210 Fifth Avenue, San Mateo

**Sonoma County**

Sonoma County Land Title Company  
211 Exchange Avenue, Santa Rosa

**FINAL CERTIFICATE OF  
TITLE**

**UNITED STATES  
OF  
AMERICA**

**Dated: February 26, 1959  
at 11:01 a.m.**

FINAL CERTIFICATE OF TITLE  
CALIFORNIA PACIFIC TITLE COMPANY

Front and Cooper Streets  
Santa Cruz, California

COPY

Application No. 58026  
12th Naval District

The CALIFORNIA PACIFIC TITLE COMPANY, a corporation organized and existing under the laws of the State of California, with its principal office in the City and County of Santa Cruz, State of California, hereby certifies that it has made a thorough search of the title to the property described in SCHEDULE "A" hereof, and that the title to said property was indefeasibly vested in fee simple of record in

UNITED STATES OF AMERICA

as of the 26th day of February, 1959, at 11:01 o'clock a.m., free and clear of all encumbrances, defects, interests and all other matters whatsoever, either of record or otherwise actually known to the Corporation, impairing or adversely affecting the title to said property, except as shown in SCHEDULE "B" hereof.

The maximum liability of the undersigned under this certificate is limited to the sum of \$27,137.00.

In consideration of the premium paid, this certificate is issued for the use and benefit of the United State of America.

IN WITNESS WHEREOF, said Corporation has caused these presents to be signed in its name and behalf, sealed with its corporate seal, and delivered by its proper officers thereunto duly authorized, as of the date last above mentioned.

SEAL

CALIFORNIA PACIFIC TITLE COMPANY

BY

*O R Bodsett*

Manager.

00114

ATTEST.

Assistant Secretary.

*Oliver H. Meyer*

DISTRICT LAND REGISTER

DOC. SER. NO. 2341-00114

POSTED dd 4-24-59 2-A1

No action P/A 7/4/59 by

(4)

5  
FINAL CERTIFICATE OF TITLE  
CALIFORNIA PACIFIC TITLE COMPANY

COPY

Front and Cooper Streets  
Santa Cruz, California

Application No. 58026  
12th Naval District

The CALIFORNIA PACIFIC TITLE COMPANY, a corporation organized and existing under the laws of the State of California, with its principal office in the City and County of Santa Cruz, State of California, hereby certifies that it has made a thorough search of the title to the property described in SCHEDULE "A" hereof, and that the title to said property was indefeasibly vested in fee simple of record in

UNITED STATES OF AMERICA

as of the 26th day of February, 1959, at 11:01 o'clock a.m., free and clear of all encumbrances, defects, interests and all other matters whatsoever, either of record or otherwise actually known to the Corporation, impairing or adversely affecting the title to said property, except as shown in SCHEDULE "B" hereof.

The maximum liability of the undersigned under this certificate is limited to the sum of \$27,137.00.

In consideration of the premium paid, this certificate is issued for the use and benefit of the United State of America.

IN WITNESS WHEREOF, said Corporation has caused these presents to be signed in its name and behalf, sealed with its corporate seal, and delivered by its proper officers thereunto duly authorized, as of the date last above mentioned.

SEAL

CALIFORNIA PACIFIC TITLE COMPANY

BY

*C. R. Roddick*

ATTEST.

Manager. *DO114*

Assistant Secretary.

*Oliver H. Meyer*

DISTRICT LAND REGISTER

DOC. SER. NO. *2341 - DO114*

POSTED *dd 4-24-59 2-A1*

*No action P/A 7/4/59 by*

(4)

## CERTIFICATE OF TITLE

CALIFORNIA PACIFIC TITLE COMPANY

## Schedule "A"

The property covered by this certificate is accurately and fully described as follows:

THAT PORTION of Township 9 South, Range 3 West, Mount Diablo Base and Meridian, situated in Santa Cruz County, California, described as follows:

BEGINNING at a 1-1/2 inch iron pipe in a rock mound at the intersection of the Northerly line of Section 28 of the aforementioned Township and Range with the Northwesterly line of the Rancho San Vicente, and running thence along said Rancho line the following courses and distances:

South  $11^{\circ} 04' 40''$  West 1315.96 feet; South  $10^{\circ} 59' 30''$  West 591.62 feet; and South  $10^{\circ} 59' 10''$  West 3468.53 feet to a 1-1/2 inch iron pipe in a rock mound; thence North  $89^{\circ} 51' 50''$  West 1738.00 feet to a 1-1/2 inch iron pipe in a rock mound; thence North  $0^{\circ} 09' 35''$  East 5263.47 feet to a 1-1/2 inch iron pipe in a rock mound set in the said Northerly line of Section 28; thence along the said Northerly line of Section 28, North  $89^{\circ} 48' 0''$  East 2750.00 feet to the point of beginning, and CONTAINING THEREIN 271.37 acres of land.

SUBJECT to all covenants, conditions and restrictions of record, and excepting and reserving a non-exclusive easement and right of ingress and egress and the right to install, operate, use and maintain a roadway, power, gas and telephone lines and related equipment upon, over, above and beneath the following portion of the above described parcel of land together with such additional areas adjacent thereto as may be required to provide for cut and fill slopes adequate for the construction of said roadway:

A strip of land fifty feet wide, the center line of which is described as follows:

COMMENCING at a 1-1/2 inch iron pipe in a rock mound set at the intersection of the Northerly line of Section 28 of Township 9 South, Range 3 West, Mount Diablo Base and Meridian, Santa Cruz County, California, with the Northwesterly line of the Rancho San Vicente, and running thence along the said Northerly line of Section 28, South  $89^{\circ} 48'$  West 1165.71 feet to the true point of beginning of this description; thence South  $26^{\circ} 46'$  East 25.60 feet to the beginning of a tangent curve to the left, having a radius of 500 feet; thence continuing along said curve through an angle of  $45^{\circ} 21' 20''$ , an arc length of 395.80 feet; thence tangent to said curve South  $72^{\circ} 07' 20''$  East 116.52 feet to the beginning of a tangent curve to the right, having a radius of 200 feet; thence continuing along said curve through an angle of  $78^{\circ} 54' 40''$  an arc length of 275.45 feet; thence tangent to said curve South  $6^{\circ} 47' 20''$  West 840.36 feet to the beginning of

Schedule "A"  
- continued -

a tangent curve to the right, having a radius of 1000 feet; thence continuing along said curve through an angle of  $14^{\circ} 20' 40''$  an arc length of 250.36 feet; thence tangent to said curve South  $21^{\circ} 08' \text{ West}$  134.43 feet to a point of intersection with a nontangent curve to the right having a radius of 598.00 feet, a radial line of said curve through said point of intersection bearing North  $9^{\circ} 32' 56'' \text{ West}$ ; thence continuing along said curve through an angle of  $13^{\circ} 37' 26''$  an arc length of 142.19 feet; thence tangent to said curve North  $85^{\circ} 55' 30'' \text{ West}$  239.14 feet to the beginning of a tangent curve to the left having a radius of 200 feet; thence continuing along said curve through an angle of  $113^{\circ} 19' 30''$  an arc length of 395.58 feet; thence tangent to said curve South  $19^{\circ} 15' \text{ East}$  214.50 feet to the beginning of a tangent curve to the right having a radius of 400 feet; thence continuing along said curve through an angle of  $26^{\circ} 50' 40''$  an arc length of 187.41 feet; thence tangent to said curve South  $7^{\circ} 35' 40'' \text{ West}$  596.78 feet to the beginning of a tangent curve to the right having a radius of 1000 feet; thence continuing along said curve through an angle of  $12^{\circ} 38' 50''$  an arc length of 220.74 feet; thence tangent to said curve South  $20^{\circ} 14' 30'' \text{ West}$  452.57 feet to a point; thence South  $19^{\circ} 15' \text{ East}$  200.18 feet to a point; thence South  $22^{\circ} 46' 30'' \text{ West}$  216.00 feet to a point; thence South  $15^{\circ} 43' \text{ East}$  420.34 feet to a point; thence South  $4^{\circ} 22' 10'' \text{ West}$  251.65 feet to a point; thence South  $30^{\circ} 09' 20'' \text{ East}$  234.20 feet to a point; thence South  $0^{\circ} 37' 50'' \text{ East}$  211.60 feet to a point; thence South  $17^{\circ} 06' 50'' \text{ West}$  226.30 feet to a point, from which point the said point of commencement at the intersection of the Northerly line of Section 28 with the Northeasterly line of the San Vicente Rancho bears North 5276.12 feet and East 1472.87 feet.

SAID easement and right are reserved for the benefit of and appurtenant to the remaining property lying Northerly and Southerly of the first above-described property.

TOGETHER with the following easements:

A. A non-exclusive easement and right to construct, use and maintain a road for purposes of ingress and egress over and upon that certain strip of land 50.00 feet wide, situated in the County of Santa Cruz, State of California, the center line of which is described as follows:

"COMMENCING at the common section corner of Sections 16, 17, 20 and 21 of Township 9 South, Range 3 West, Mount Diablo Base and Meridian, Santa Cruz County, California, and running thence North  $89^{\circ} 51' 30'' \text{ East}$ , 1052.69 feet to the true point of beginning of this description; thence South  $8^{\circ} 30' 10'' \text{ West}$ , 56.96 feet to the beginning of a tangent curve to the left, having a radius of 800 feet; thence continuing along said curve through an angle of  $45^{\circ} 21' 30''$  an arc length of 633.32 feet; thence tangent to said curve South  $36^{\circ} 51' 20'' \text{ East}$ , 43.55 feet; thence North  $84^{\circ} 35' \text{ East}$ , 431.27 feet to the beginning of a tangent

Schedule "A"  
 - continued -

curve to the right having a radius of 400 feet; thence continuing along said curve through an angle of  $68^{\circ} 39'$ , an arc length of 479.27 feet; thence tangent to said curve South  $26^{\circ} 46' 00''$  East, 4285.09 feet; to a point on the Northerly line of Section 28 of the aforementioned township and range from which point a 1-1/2 inch iron pipe in a rock mound set at the intersection of said Northerly line of Section 28 with the Northwesterly line of the Rancho San Vicente bears North  $89^{\circ} 48'$  East, 1165.71 feet;"

TOGETHER with a like non-exclusive easement and right over such additional areas adjacent thereto as may be required for construction and maintenance of cut and fill slopes for said road.

B. A non-exclusive easement and right to install, operate, use and maintain overhead utility lines over that certain strip of land 50.00 feet wide, situated in the County of Santa Cruz, State of California, the center line of which is described as follows:

"COMMENCING at the common section corner of Sections 16, 17, 20 and 21 of Township 9 South, Range 3 West, Mt. Diablo Base and Meridian, Santa Cruz County, California and running thence South 525.06 feet and East 830.58 feet to the true point of beginning of this description; thence North  $89^{\circ} 51' 30''$  East 271.00 feet to a point, thence South  $38^{\circ} 36' 30''$  East, 216.00 feet to a point; thence North  $84^{\circ} 35'$  East 704.39 feet to a point; thence South  $26^{\circ} 46'$  East 2,653.00 feet to a point herein for convenience called point "A"; thence South  $26^{\circ} 46'$  East 1,905.21 feet to a point on the Northerly line of Section 28 of the aforementioned township and range from which point a 1-1/2 inch iron pipe in a rock mound, set at the intersection of the said Northerly line of Section 28 with the Northwesterly line of the Rancho San Vicente bears North  $89^{\circ} 48'$  East 1,165.71 feet;"

such power line to be installed in such location and in such a manner as not to obstruct any road constructed on the easement described in paragraph A. above.

B.1. A non-exclusive easement and right to install, operate, use and maintain overhead utility lines over that certain strip of land situated in the County of Santa Cruz, State of California, which is described as follows:

"COMMENCING at a point "A" as described in B. above and running North  $63^{\circ} 14'$  East 45 feet to a point; thence at right angles South  $26^{\circ} 46'$  East 532.00 feet to a point; thence at right angles South  $63^{\circ} 14'$  West 90 feet to a point; thence at right angles North  $26^{\circ} 46'$  West 532 feet to a point; thence at right angles North  $63^{\circ} 14'$  East 45 feet to point "A" and the true point of beginning of this description,"

such power line to be installed in such location and in such a manner as not to obstruct any road constructed on the easement described in paragraph A. above.

Schedule "A"  
- continued -

C. A non-exclusive easement and right of ingress and egress and the right to install, operate, use and maintain an underground water line and overhead utility lines upon, over, above and beneath that certain strip of land 20 feet in width situated in the County of Santa Cruz, State of California, the center line of which is described as follows:

"COMMENCING at the common section corner of Sections 16, 17, 20 and 21 of Township 9 South, Range 3 West, Mount Diablo Base and Meridian, Santa Cruz County, California, and running thence South 8716.33 feet and West 1622.82 feet to the true point of beginning of this description; thence North 17° 00' 00" East, 4.36 feet to a point, thence North 0° 22' 30" West, 37.55 feet to a point; thence North 21° 56' 00" West, 27.85 feet to a point; thence North 68° 04' 00" East, 10.00 feet to a point; thence North 21° 56' 00" West, 116.15 feet to a point; thence North 6° 01' 30" West, 46.56 feet to a point, thence North 11° 15' 30" East, 73.25 feet to a point; thence North 3° 33' 00" East, 133.75 feet to a point; thence North 2° 31' 30" West, 225.92 feet to a point; thence North 14° 41' 30" West, 118.47 feet to a point; thence North 2° 42' 50" West, 56.09 feet to a point; thence North 5° 33' 10" East, 134.33 feet to a point; thence North 50° 35' 40" East, 276.67 feet to a point; thence North 53° 36' 40" East, 152.12 feet to a point; thence North 71° 51' 40" East, 222.80 feet to a point; thence North 60° 56' 10" East, 499.72 feet to a point; thence North 59° 15' 10" East 487.38 feet to a point; thence North 0° 28' 20" West, 437.68 feet to a point; thence North 9° 34' 20" West, 74.66 feet to a point; thence North 25° 05' 50" West, 387.41 feet to a point; thence North 33° 18' 10" East, 464.28 feet to a point; thence North 9° 41' 00" East, 33.87 feet to the beginning of a tangent curve to the right having a radius of 500.00 feet; thence continuing along said curve through an angle of 11° 38' 40", an arc length of 101.62 feet; thence tangent to said curve North 21° 19' 40" East, 270.23 feet to the beginning of a tangent curve to the right having a radius of 1000.00 feet; thence continuing along said curve through an angle of 9° 22' 20", an arc length of 163.58 feet; thence tangent to said curve North 30° 42' 00" East, 286.94 feet to a point; thence North 16° 04' 50" West, 266.04 feet to the beginning of a tangent curve to the right having a radius of 1000.00 feet; thence continuing along said curve through an angle of 6° 09' 40", an arc length of 107.53 feet; thence tangent to said curve North 9° 55' 10" West, 121.18 feet to a point on a non-tangent curve to the right having a radius of 740.00 feet, the bearing of the radial line at said point being South 58° 59' 51" East; thence continuing along said curve through an angle of 13° 57' 01", an arc length of 180.17 feet; thence tangent to said curve North 44° 57' 10" East, 147.69 feet to the beginning of a tangent curve to the right having a radius of 740.00 feet; thence continuing along said curve through an angle of 13° 59' 30", an arc length of 180.71 feet to a point of compound curvature; thence continuing along a curve having a radius of 606.91 feet, through an angle of 26° 50' 20", an arc length of 284.29 feet; thence tangent to said curve North 85° 47' 00"

Schedule "A"  
- continued -

East, 275.30 feet to a point; thence South  $33^{\circ} 01' 00''$  East, 110 feet to a point; thence North  $78^{\circ} 29' 57''$  East, 120.57 feet to a point; thence South  $52^{\circ} 33' 15''$  East, 979.71 feet to a point; thence South  $52^{\circ} 06' 45''$  East, 289.78 feet to the beginning of a tangent curve to the left having a radius of 475.00 feet; thence continuing along said curve through an angle of  $35^{\circ} 49' 00''$ , an arc length of 296.93 feet; thence tangent to said curve South  $87^{\circ} 55' 45''$  East, 3.89 feet to a point on the Westerly boundary line of the 271.37 acre parcel of land conveyed from Lockheed Aircraft Corporation to the Government by Warranty Deed executed on the 19th day of November, 1957, which has not been recorded as of this date; said point bears South  $0^{\circ} 09' 35''$  West, 208.99 feet from the Northwesterly corner of said 271.37 acre parcel, and said point also bears South 4904.50 feet and East 2390.68 feet from the common section corner of Sections 16, 17, 21 and 20 of Township 9 South, Range 3 West, Mount Diablo Base and Meridian, Santa Cruz County, California";

D. A non-exclusive easement and right of ingress and egress and the right to construct, install, operate, use and maintain a pump house, water line, and overhead utility lines upon, over, above and beneath that certain parcel of land situated in the County of Santa Cruz, State of California, described as follows:

"COMMENCING at the common section corner of Sections 16, 17, 20 and 21 of Township 9 South, Range 3 West, Mount Diablo Base and Meridian, Santa Cruz County, California, and running thence South 8646.35 feet and West 1622.39 feet to the true point of beginning of this description; thence South  $87^{\circ} 27' 30''$  East, 169.01 feet to a point; thence North  $2^{\circ} 32' 30''$  East, 100.00 feet to a point; thence North  $87^{\circ} 27' 30''$  West 214.53 feet to a point; thence South  $21^{\circ} 56' 00''$  East, 109.87 feet to the true point of beginning of this description."



FINAL CERTIFICATE OF TITLE  
CALIFORNIA PACIFIC TITLE COMPANY  
Schedule "B"

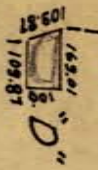
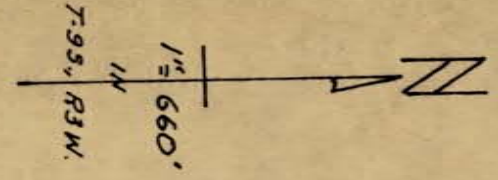
The property described in SCHEDULE "A" hereof is free and clear from all interests, encumbrances and defects of title and all other matters whatsoever of record, or which, though not of record, are actually known to this Corporation to exist impairing or adversely affecting the title to said property, except the following:

- 1: Reservation of all petroleum, gas, asphaltum, and other hydrocarbons as reserved in the Deed from Coast Counties Gas and Electric Company, a corporation, to William A. Deans and Earl Harris, dated May 26th, 1950 and recorded June 21, 1950 in Volume 778 of Official Records at Page 230, Santa Cruz County Records.

NOTE: By Quitclaim Deed from Pacific Gas and Electric Company a corporation, successor to Coast Counties Gas and Electric Company, a corporation, to Lockheed Aircraft Corporation, a corporation, dated January 11, 1957 and recorded January 18, 1957 in Volume 1112 of Official Records at Page 254, Santa Cruz County Records, quitclaiming all of those certain oil, gas and mineral rights in and to the above mentioned Deed. RESERVING AND EXCEPTING, HOWEVER, to Pacific Gas & Electric Company, its successors and assigns, forever, as a royalty, the equal one-eighths (1/8) part and portion of the oil, gas, asphaltum or other hydrocarbons and other minerals which may be produced, provided, however, that said Lockheed Aircraft Corporation, its successors and assigns shall have the sole and exclusive right, but shall never be under any obligation to drill or mine for oil, gas and other minerals, and that such drilling or mining, both before and after production, shall be wholly at the option of the said Lockheed Aircraft Corporation, its successors and assigns.

- 2: Agreement Respecting Timber Rights dated December 18, 1956, between Santa Cruz Land and Development Company, called seller, and Gaylord D. Hart, called buyer, recorded January 18, 1957 in Volume 1112 of Official Records at Page 244, Santa Cruz County Records; AND RE-RECORDED on February 5, 1957 in Volume 1115 of Official Records at Page 225, Santa Cruz County Records.

COURTESY OF  
CALIFORNIA PACIFIC TITLE COMPANY  
109 GODDARD STREET  
SANTA CRUZ, CALIF.



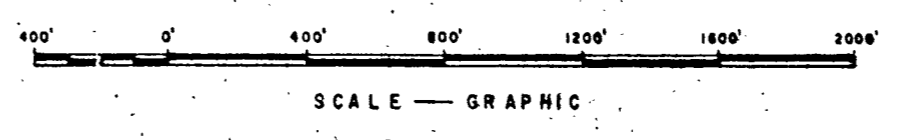
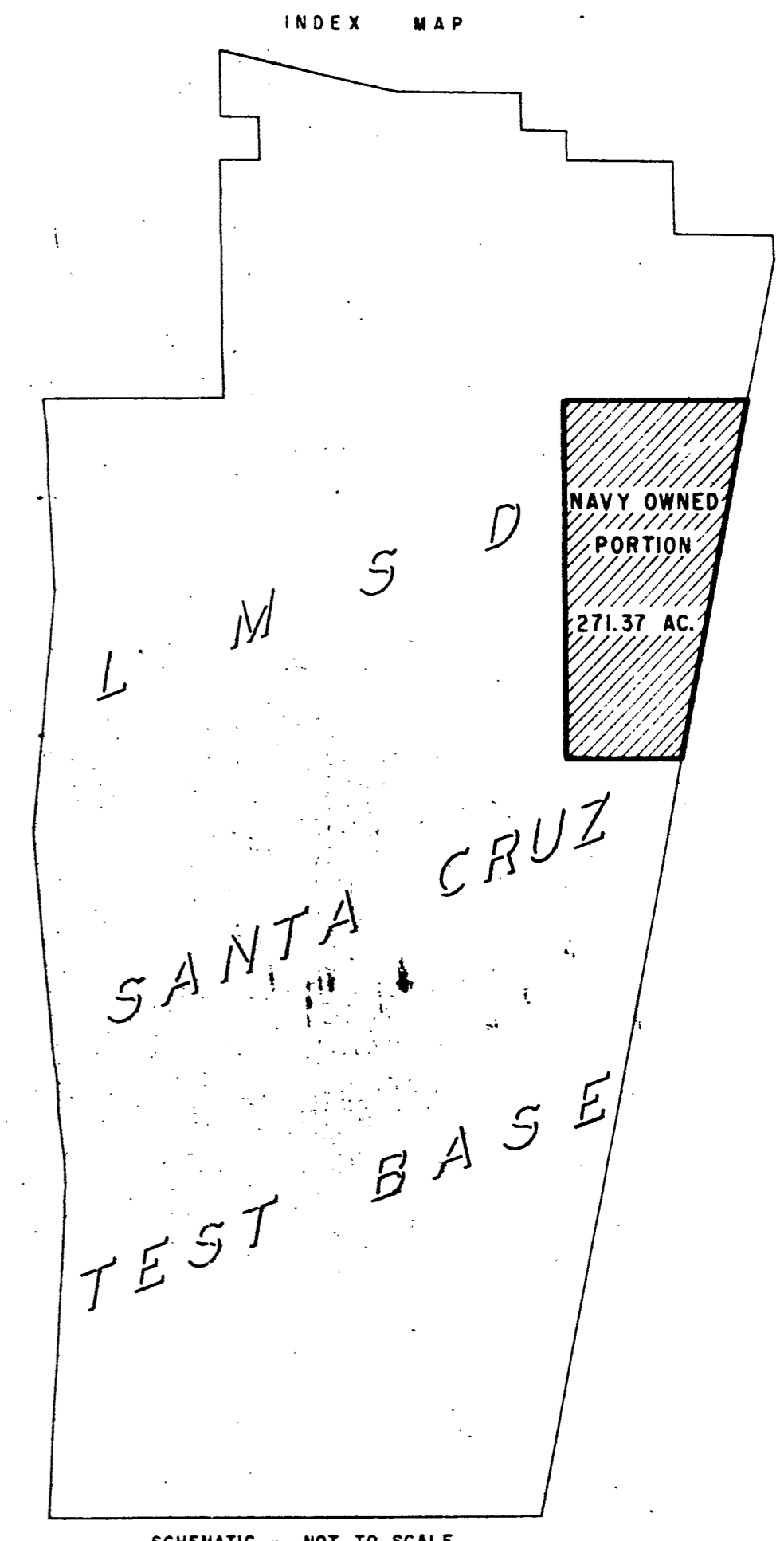
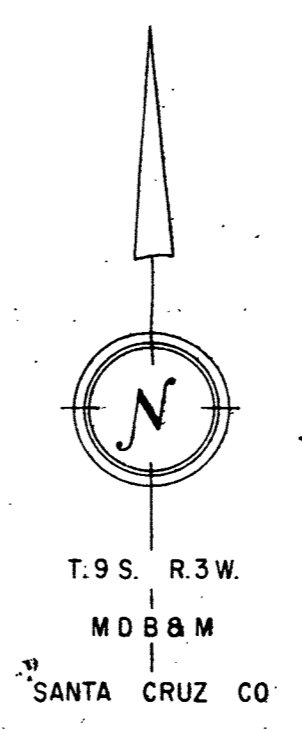
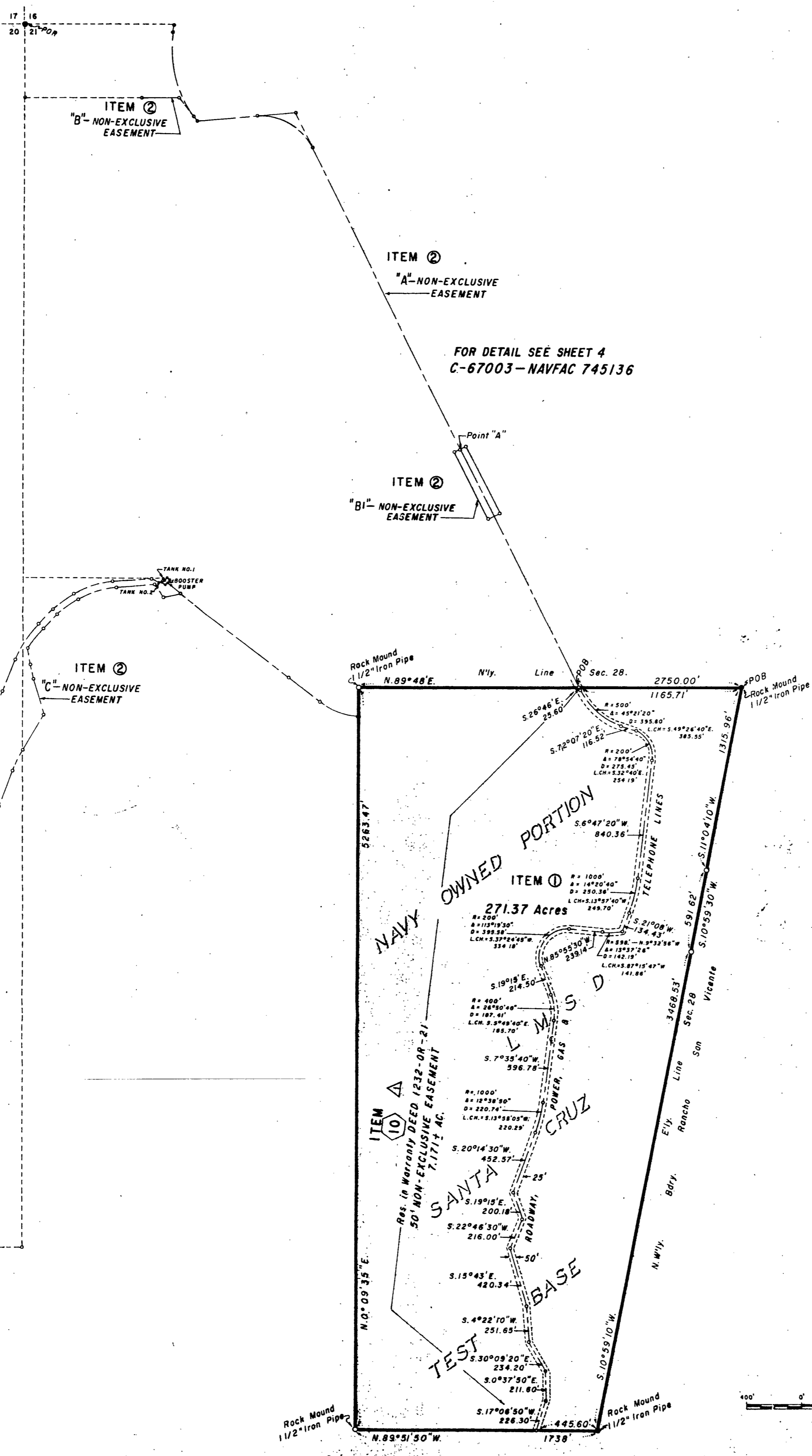
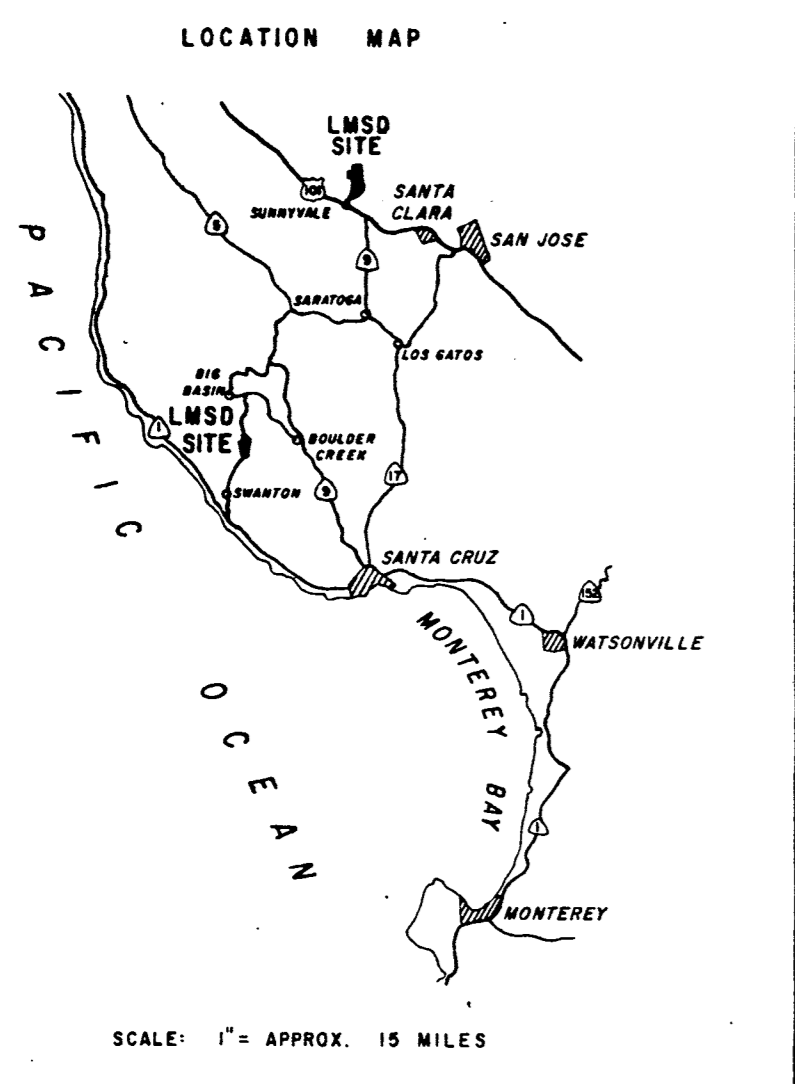
**LAND HOLDINGS SUMMARY**

**ITEM ①**  
Government acquired fee simple title to 271.37 acres, more or less, by warranty deed dated November 19, 1957, recorded in Volume 1232 Official Records at page 21, Records of Santa Cruz County, California. The conveyance is subject to the exception and reservation therefrom unto the grantor of non-exclusive easement for roadway and utility lines over a portion thereof and the right of ingress and egress.

**ITEM ②**  
Government by easement deed dated November 19, 1957, recorded in Volume 1232 Official Records at page 24, Records of Santa Cruz County, California, acquired:  
A Non-exclusive easement for road and additional areas adjacent thereto for slope cut and fill.  
B & B1 Non-exclusive easement for overhead utility lines.  
C Non-exclusive easement for underground water line and overhead utility lines.  
D Non-exclusive easement for pump house, water line and overhead utility lines.

**ITEM ③**  
Government by License executed March 10, 1959 by Lockheed Aircraft Corp. acquires non-exclusive use of certain electric power, water pumping and water storage facilities, delineated as ITEM ③ "A"-B-C" on sheet 4 of NAVFAC 745135

**JURISDICTION**  
Proprietorial interest only in this property, no acceptance of Federal Political Jurisdiction



1	CORRECTION	TITLE BLOCK REVISED, SHEET NO. CHANGED, ITEM ⑩ ADDED	8 / 21 / 68	<i>[Signature]</i>
N O	AMD OR COR	DESCRIPTION OF AMENDMENT OR CORRECTION	DATE	APPROVED
WEST DIV NAVFAC ENG COM		DEPT. OF THE NAVY NAVAL FACILITIES ENGINEERING COMMAND		
DR WS NO C-67002		NAVAL WEAPONS INDUSTRIAL RESERVE PLANT		
DESIGNER H VAN SYCKEL		SUNNYVALE, CALIFORNIA		
DRAWN H VAN SYCKEL		ACTIVITY CODE NO. D0D-484 COMMAND NAVORD		
CHECK <i>[Signature]</i>		REAL ESTATE SUMMARY MAP		
DIRECTOR Real Estate Division		(REMOTE OFF-SITE COMPONENT)		
FOR WEST DIV FOR COMMANDER NPEC		DATE 8/21/68		
CONCURRED <i>[Signature]</i>		APPROVED BY NPEC-01669		
C.O.W.O.H. DATE 8/21/68		SCALE AS SHOWN		NAVFAC DWG. NO. 745135
SHEET 3 OF 4				

06 8601 RE 03/04

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**LAND HOLDINGS SUMMARY**

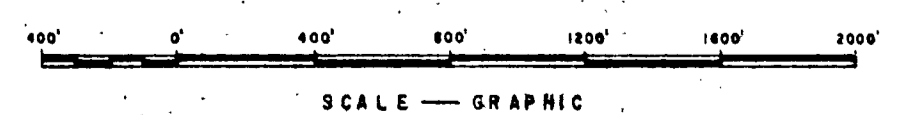
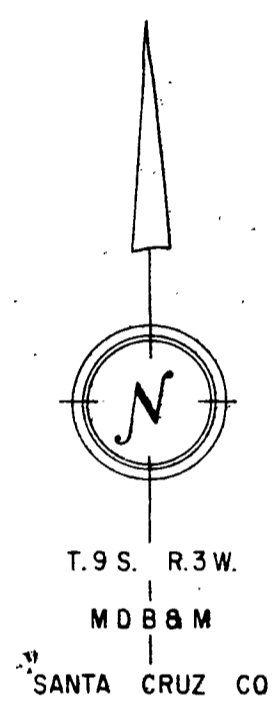
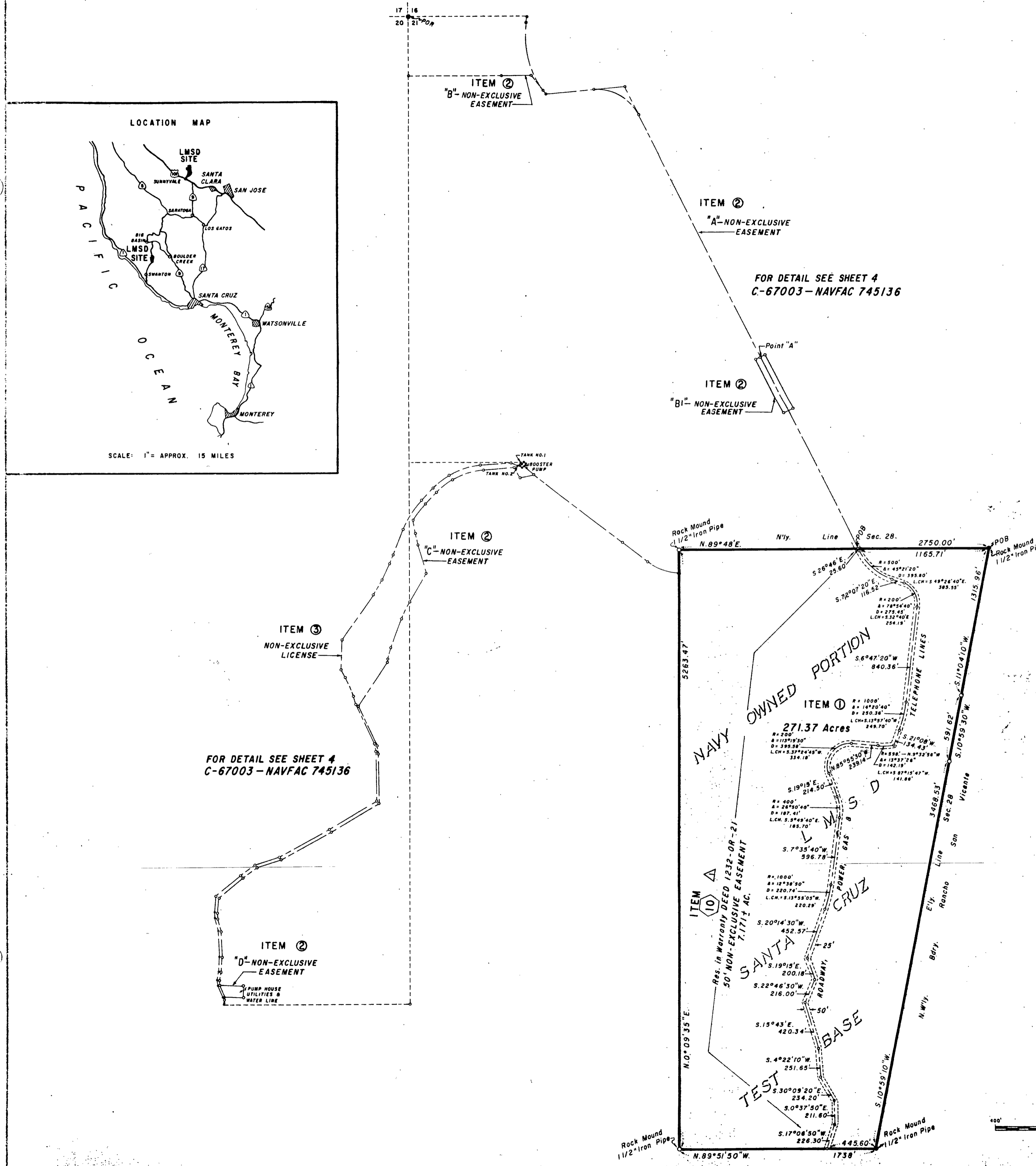
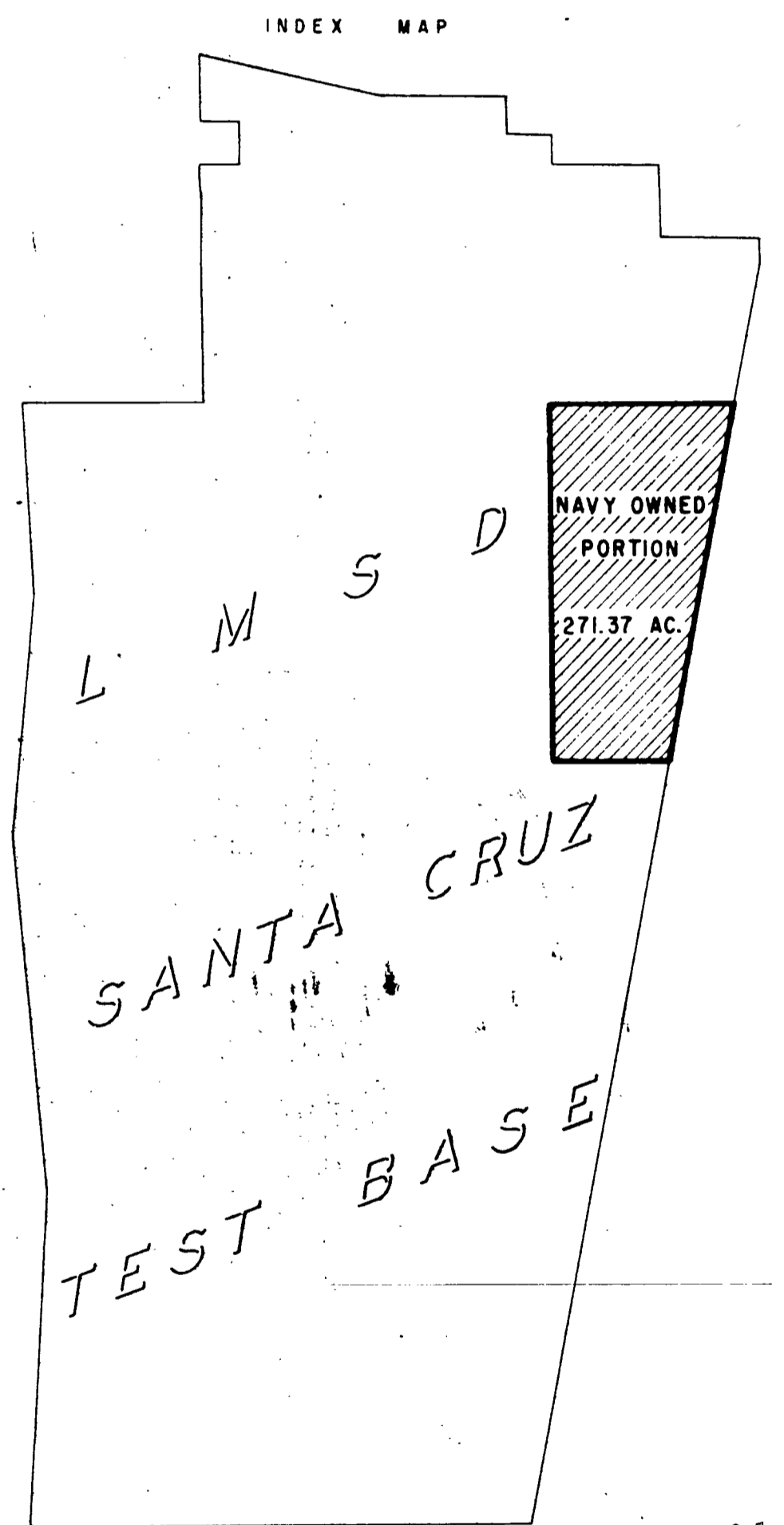
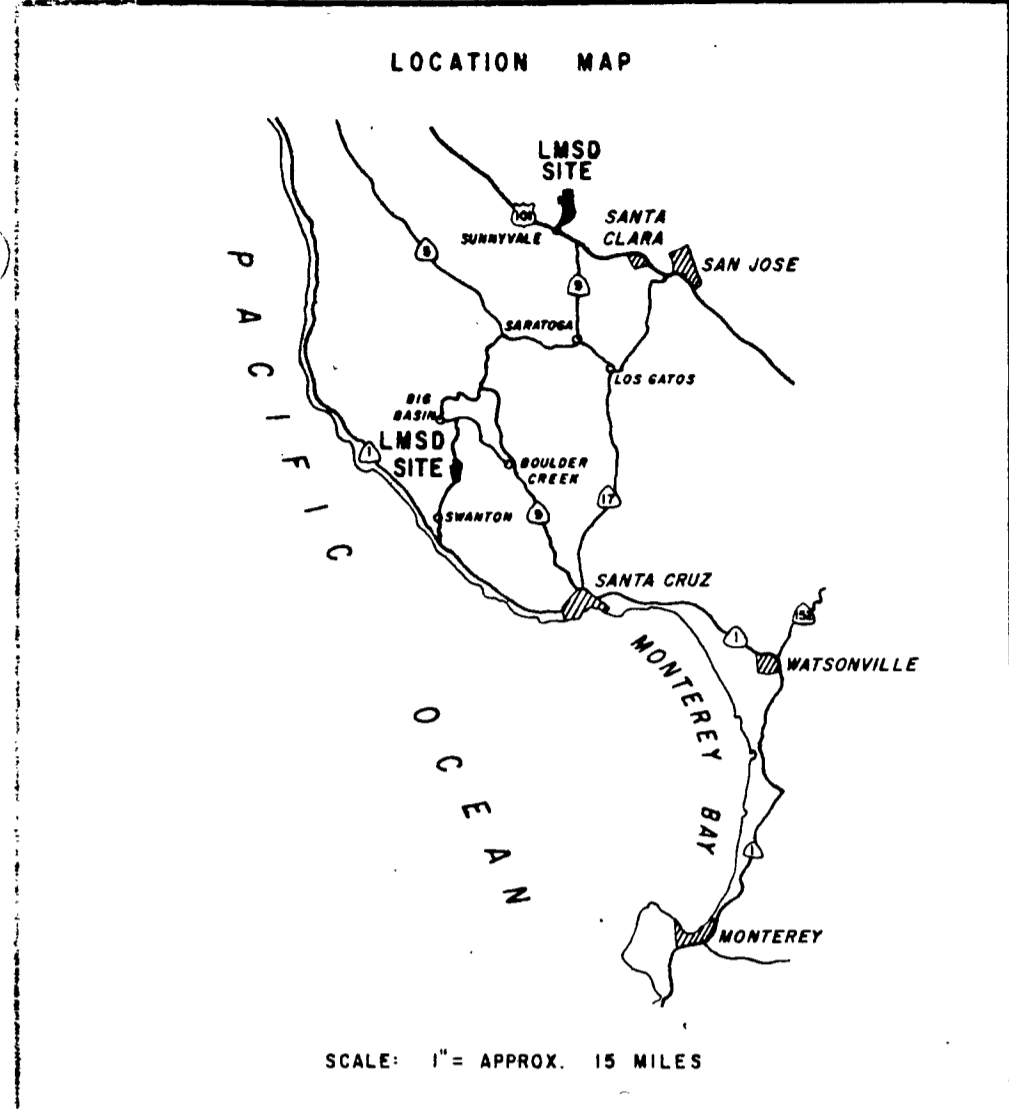
ITEM ① Government acquired fee simple title to 271.37 acres, more or less, by warranty deed dated November 19, 1957, recorded in Volume 1232 Official Records at page 21, Records of Santa Cruz County, California. The conveyance is subject to the exception and reservation therefrom unto the grantor of non-exclusive easement for roadway and utility lines over a portion thereof and the right of ingress and egress.

ITEM ② Government by easement deed dated November 19, 1957, recorded in Volume 1232 Official Records at page 24, Records of Santa Cruz County, California, acquired:

- A. Non-exclusive easement for road and additional areas adjacent thereto for slope cut and fill.
- B & B1 Non-exclusive easement for overhead utility lines.
- C. Non-exclusive easement for underground water line and overhead utility lines.
- D. Non-exclusive easement for pump-house, water line and overhead utility lines.

ITEM ③ Government by License executed March 10, 1959 by Lockheed Aircraft Corp. acquires non-exclusive use of certain electric power, water pumping and water storage facilities, delineated as ITEM ③ "A"-B-C" on sheet 4 of NAVFAC 745135

**JURISDICTION**  
 Proprietary interest only in this property, no acceptance of Federal Political Jurisdiction



SCHMATIC — NOT TO SCALE -01010

NO. 1	CORRECTION	TITLE BLOCK REVISED, SHEET NO. CHANGED, ITEM ① ADDED	6/21/68	
NO. 2	AMD OR COR.	DESCRIPTION OF AMENDMENT OR CORRECTION	DATE	APPROVED
WEST DIV NAVFAC ENG COM		DEPT. OF THE NAVY NAVAL FACILITIES ENGINEERING COMMAND		
DR. WS. NO. C-67002		NAVAL WEAPONS INDUSTRIAL RESERVE PLANT		
DESIGN H. VAN SYCKEL		SUNNYVALE, CALIFORNIA		
DRAWN H. VAN SYCKEL		ACTIVITY CODE NO. DOD-484 COMMAND NAVORD		
CHECK <i>Baker</i>		DIRECTOR Real Estate Division		
FOR WEST DIV FOR COMMANDER NFEC		REAL ESTATE SUMMARY MAP		
CONCHOR		(REMOTE OFF-SITE COMPONENT)		
C.O. W.S.H. DATE 3/12/68		APPROVED BY NFEC		
		SCALE: AS SHOWN		NAVFAC DWG. NO.
		SHEET 3 OF 4		745135

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33-5-2051

January 23, 1959

Honorable Thomas S. Gates, Jr.  
Secretary of the Navy  
Washington 25, D. C.

*1st Opinion  
lets look at it*

My dear Mr. Secretary:

A re-examination has been made of the title data relating to 271.37 acres of land, more or less, in connection with the Reserve Ordnance Plant Project in Santa Cruz County, California. This land is to be acquired for a consideration of \$1.00 by authority of existing legislation. The file number of this Department is 33-5-2051.

The land is described in the enclosed copy of deed dated November 19, 1957, from Lockheed Aircraft Corporation, to the United States of America.

The title report, No. 58026, dated as of December 26, 1957, was prepared by the California Pacific Title Company and is satisfactory in form.

The report and accompanying data disclose the title to be vested in Lockheed Aircraft Corporation, subject to:

1. All taxes and assessments.
2. Rights or claims of persons in possession, if any, not shown of record.
3. Mechanics' liens, if any, not shown of record.
4. Easements for roads, highways and public utilities, if any, not shown of record.
5. Rights of the United States under the enclosed deed.

*Rog. Please see me  
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R220*

Doc. 929 P/A.....  
 Code 2014 FILE 241  
 Encl. AttyGen Opinion of..... MICRO BY BUDOCKS  
 Micro.....To BUDOCKS.....

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6. Reservation of all petroleum, gas asphaltum and other hydrocarbons contained in the deed referred to at item 2 of the report.
7. Timber rights noted at item 3 of the report.

Prior to the consummation of this purchase it should be definitely determined that the deed to the United States and the title insurance policy include all of the land described in the option.

According to the administrative approval of your Department, the land is to be acquired subject to the rights and easements referred to in objections 4, 6 and 7 above, which are therefore waived.

When the above requirement and objections numbered 1, 2 and 3 have been met, and the enclosed deed to the United States properly stamped, has been recorded, the purchase price has been paid, and a title insurance policy has been obtained showing the vesting of a valid title in the United States of America, the title will be approved subject to the rights and easements referred to in objections 4, 6 and 7, and the reservations, if any, contained in the option.

The title report and related papers are enclosed.

This is in lieu of the preliminary opinion dated April 8, 1958.

Sincerely yours,

Attorney General

Enclosures

April 8, 1958

Honorable Thomas S. Gates, Jr.  
Secretary of the Navy  
Washington, D. C.

My dear Mr. Secretary:

An examination has been made of the title data relating to 271.37 acres of land, more or less, in connection with the Naval Industrial Support Facility Project in Santa Cruz County, California. This land is to be acquired for a consideration of \$1.00 by authority of existing legislation. The file number of this Department is 33-5-2051.

The land is described in the enclosed copy of deed dated November 19, 1957, from Lockheed Aircraft Corporation to the United States of America.

The title report No. 58026, dated as of December 26, 1957, was prepared by California Pacific Title Company and is satisfactory in form.

The report and accompanying data disclose the title to be vested in Lockheed Aircraft Corporation, a California corporation, subject to:

1. All taxes and assessments.
2. Rights or claims of persons in possession, if any, not shown of record.
3. Mechanics' liens, if any, not shown of record.
4. Easements for roads, highways and public utilities, if any, not shown of record.
5. Rights of the United States under the original deed.
6. Minerals rights referred to at item 2 of the report.

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 Micro.....To BUDOCKS.....

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7. Timber rights noted at item 3 of the report.

Prior to the consummation of this purchase it should be definitely determined that the deed to the United States and the title insurance policy include all of the land described in the option.

According to the administrative approval of your Department the land is to be acquired subject to the rights and easements referred to in objections 4 and 6 above, which are therefore waived.

When the above requirement and objections numbered 1, 2, 3 and 7 have been met, and the original deed to the United States properly stamped, has been recorded, the purchase price has been paid, and a title insurance policy has been obtained showing the vesting of a valid title in the United States of America, the title will be approved subject to the rights and easements referred to in objections 4 and 6 and the reservations, if any, contained in the option.

The title report and related papers are enclosed.

Sincerely yours,

Attorney General

Enclosures



TO

Assistant Attorney-General,  
 Lands Division  
 Department of Justice  
 Washington 25, D. C.

It is requested that an opinion on the title to be acquired by the United States be furnished covering the land hereinafter identified.

PROPERTY IDENTIFICATION

NUMBER OF ACRES (More or Less)	PARCEL NO.	LOCATION		
		CITY	COUNTY	STATE
271.37	--	-----	Santa Cruz	California

PROPERTY IS DESCRIBED MORE PARTICULARLY IN (Specify enclosure)

**Proposed form of deed and title report herewith**

NAVAL ACTIVITY <b>Naval Industrial Support Facility Santa Cruz, California</b>	VENDOR <b>Lockheed Aircraft Corporation</b>
---	--

REQUEST FOR PRELIMINARY OPINION

REQUEST FOR FINAL OPINION

It is requested that this opinion be furnished to the official whose title and address is shown below.

It is requested that this opinion be furnished to the Chief of the Bureau of Yards and Docks, Department of the Navy, Washington 25, D. C.

AUTHORIZATION ACT

PUBLIC LAW NO. <b>85-241</b>	CONGRESS NO. <b>85</b>	DATE APPROVED <b>August 30, 1957</b>
---------------------------------	---------------------------	---

PRELIMINARY OPINION RENDERED (DATE)	JUSTICE DEPT. FILE NO.	DATE OF DEED
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APPROPRIATION ACT

PUBLIC LAW NO. <b>85-170</b>	CONGRESS NO. <b>85</b>	DATE APPROVED <b>August 28, 1957</b>
---------------------------------	---------------------------	---

RECORDATION

STATE & COUNTY	DEED BOOK NO.
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CONGRESSIONAL COMMITTEES ON ARMED SERVICES APPROVALS

SENATE (Date) <b>Not required</b>	HOUSE (Date) <b>Not required</b>
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PAGE NO.	DATE
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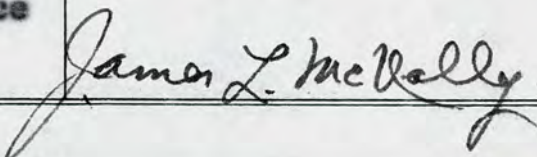
ENCLOSURE (LIST)

- a) Copy of deed conveying fee title to 271.37 acres of land
- b) California Pacific Title Co.'s Supplemental Amended Report #58026
- c) Quitclaim of oil, gas and mineral rights with reservation of 1/8 royalty interest (Exception No. 2 in title report)
- d) Agreement reserving timber rights, with contract of assignment attached (Exception No. 3 in title report)
- e) Vendor's letter of 2/20/58 confirming intention to convey access rights (Refers to note in title report regarding lack of access to the land)
- f) Certificate of Inspection and Possession
- g) Plat of 271.37 acre parcel to be acquired

ADDITIONAL COMMENTS

**SEE MEMORANDUM ATTACHED**

Doc. 931 P/A.....  
 Code 2014 FILE 241  
 Encl. AttyGen Opinion of.....**MICRO-BY-BUDOCKS**  
 Micro.....To BUDOCKS.....

NAME, TITLE & ADDRESS <b>James L. McHally, Counsel District Public Works Office Twelfth Naval District San Bruno, California</b>	SIGNATURE 	DATE <b>7 March 1958</b>
---	---	-----------------------------

QUIT CLAIM

KNOW ALL MEN BY THESE PRESENTS, that PACIFIC GAS AND ELECTRIC COMPANY, a corporation, successor to Coast Counties Gas and Electric Company, a corporation, for and in consideration of Ten Dollars (\$10.00) to it paid, the receipt of which is hereby acknowledged, and other good and valuable considerations, does hereby release, remise and quitclaim unto LOCKHEED AIRCRAFT CORPORATION, a corporation, its successors and assigns, forever, all of those certain oil, gas and mineral rights and interests, and those certain easements, rights of way and servitudes necessary or convenient to the enjoyment thereof, all as reserved in that certain deed from Coast Counties Gas and Electric Company, a corporation, to William A. Deans and Earl Harris, dated May 26, 1950, recorded June 21, 1950, in Volume 778 of Official Records at Page 230, Santa Cruz County Records, in, to, under and upon those certain eighteen (18) parcels of land situated in the County of Santa Cruz, State of California, particularly described in Exhibit "A", entitled "Property", attached hereto and made a part hereof.

EXCEPTING AND RESERVING unto the said PACIFIC GAS AND ELECTRIC COMPANY, its successors and assigns, forever, as a royalty, the equal one-eighth (1/8) part and portion of the oil, gas, asphaltum or other hydrocarbons and other minerals which may be produced from sand, strata, formations and horizons in and underlying the said real property or any allocation thereto in the event of the unitization thereof with other lands; provided, however, that the said LOCKHEED AIRCRAFT CORPORATION, its

1.

District Land Register

DOC. SER. NO. 1238

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WL 1112 PAGE 257

successors and assigns, shall have the sole and exclusive right, but shall never be under any obligation, to drill or mine for oil, gas and other minerals, and that such drilling or mining, both before and after production, shall be wholly at the option of the said LOCKHEED AIRCRAFT CORPORATION, its successors and assigns.

IN WITNESS WHEREOF, the said PACIFIC GAS AND ELECTRIC COMPANY has executed this deed this 11th day of January, 1957.

PACIFIC GAS AND ELECTRIC COMPANY,  
a corporation

By L. Harold Anderson  
Its Vice President and Assistant General Manager

By R. E. Manhard  
Its Secretary

State of California,  
City & County of SAN FRANCISCO } ss.  
On this 11th day of January in the year 1957, before me,  
Marie H. Stanley a Notary Public in and for the said  
City & County, duly commissioned and sworn, personally appeared  
L. Harold Anderson and R. E. Manhard  
Vice-Pres. & Assistant Gen. Mgr.  
and Secretary of the corporation that executed the  
within and foregoing instrument, and to be the person who executed  
the said instrument on behalf of said corporation therein named, and  
acknowledged to me that such corporation executed the within instru-  
ment pursuant to its by-laws or a resolution of its board of directors.  
In Witness Whereof, I have hereunto set my hand and affixed my  
official seal, in the City & County of San Francisco  
the day and year in this certificate first above written.  
Marie H. Stanley  
Notary Public in and for the City & County  
of San Francisco State of California

EXHIBIT A

EXHIBIT

SITUATE in the County of Santa Cruz, State of California, and described as follows:

PARCEL ONE

THE Northeast quarter of Section 29 in Township 9 South of Range 3 West of Mount Diablo Base and Meridian, according to official plat thereof approved by the office of the Surveyor General, May 16, 1868.

PARCEL TWO

THE Southeast one quarter of Section 29 in Township 9 South of Range 3 West of Mount Diablo Base and Meridian, according to official plat thereof approved by the office of the Surveyor General, May 16, 1868.

PARCEL THREE

THE East one half of the Northwest one quarter; the Northeast one quarter; the East one half of the Southwest one quarter; and the Southeast one quarter, all in Section 32, Township 9 South of Range 3 West of Mount Diablo Base and Meridian, according to the official plat thereof approved by the office of the Surveyor General, May 16, 1868.

PARCEL FOUR

THE West one half of the Southwest one quarter of Section 33 in Township 9 South of Range 3 West of Mount Diablo Base and Meridian, according to official plat thereof approved by the office of the Surveyor General, May 16, 1868.

PARCEL FIVE

THE Southwest one quarter of the Northwest one quarter; the Northwest one quarter of the Southwest one quarter; and the Southwest one quarter of the Southwest one quarter of Section 5, Township 10 South, Range 3 West, Mount Diablo Meridian, according to official plat thereof approved by the office of the Surveyor General, February 11, 1881.

PARCEL SIX

LOTS 1 and 2 and the South one half of the Northeast one quarter of Section 5, Township 10 South, Range 3 West, Mount Diablo Base and Meridian, according to official plat thereof approved by the office of the Surveyor General, December 9, 1869.

PARCEL SEVEN

THE East one half of the West one half; and the Southeast one quarter of Section 5, Township 10 South, Range 3 West, M. D. B. and M., according to official plat thereof approved by the office of the Surveyor General, December 9, 1869.

PARCEL EIGHT

LOTS 1, 2 and 3, and the West one half of the Northwest one quarter of Section 4, Township 10 South, Range 3 West, Mount Diablo Base and Meridian, according to official plat thereof approved by the office of the Surveyor General, February 11, 1881.

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**PARCEL TEN**

THE Northwest 1/4 of the Southwest 1/4; the South 1/2 of the Southwest 1/4 of Section 21, Township 9 South, Range 3 West, M. D. M., and the Northwest 1/4 of the Northwest 1/4 of Section 28, Township 9 South, Range 3 West, M. D. M.; also the East 1/2 of Section 20, Township 9 South, Range 3 West, M. D. M., according to official plat thereof approved by the office of the Surveyor General, May 16, 1868.

**PARCEL ELEVEN**

THE Northwest 1/4 of the Southwest 1/4; the South 1/2 of the Southwest 1/4 of Section 21, Township 9 South, Range 3 West, M. D. M., and the Northwest 1/4 of the Northwest 1/4 of Section 28, Township 9 South, Range 3 West, M. D. M.; also the East 1/2 of Section 20, Township 9 South, Range 3 West, M. D. M., according to official plat thereof approved by the office of the Surveyor General, May 16, 1868.

**PARCEL ELEVEN**

THE Northwest 1/4 of the Southwest 1/4; the South 1/2 of the Southwest 1/4 of Section 21, Township 9 South, Range 3 West, M. D. M., and the Northwest 1/4 of the Northwest 1/4 of Section 28, Township 9 South, Range 3 West, M. D. M.; also the East 1/2 of Section 20, Township 9 South, Range 3 West, M. D. M., according to official plat thereof approved by the office of the Surveyor General, May 16, 1868.

EXCEPTING THEREFROM that certain five acre portion of the Northeast 1/4 of said Section 20, conveyed by S. A. Buchanan and Claire F. Buchanan, his wife to Dorothea C. Dickinson, by Deed dated July 31, 1915 and recorded August 5th, 1915 in Volume 264 of Deeds at Page 48, Santa Cruz County Records; and

ALSO EXCEPTING THEREFROM that certain five acre portion of the Northeast 1/4 of said Section 20, conveyed by S. A. Buchanan and Claire F. Buchanan, his wife, to Barbara Buchanan, by Deed dated July 31, 1915 and recorded August 5th, 1915 in Volume 264 of Deeds at Page 46, Santa Cruz County Records.

ALSO EXCEPTING THEREFROM a one third interest in and to all oil and mineral rights in and on the above described lands, as reserved in the Deed from S. A. Buchanan, et al, to A. M. Rosenstirn, dated August 15th, 1938 and recorded September 19th, 1938 in Volume 343 of Official Records at Page 256, Santa Cruz County Records.

**PARCEL TWELVE**

THE Northwest 1/4 of Section 21 in Township 9 South, Range 3 West, M. D. B. and M., according to official plat thereof approved by the office of the Surveyor General, May 16, 1868.

SAVING AND EXCEPTING THEREFROM so much thereof as was conveyed by Robert Canham and Minerva Canham, his wife, to Nathaniel B. Ellis, by Deed dated August 8th, 1881 and recorded August 8th, 1881 in Volume 31 of Deeds at Page 566, Santa Cruz County Records, described as follows, to wit:

BEGINNING on the Section line dividing Sections 16 and 21 of Township 9 South, Range 3 West, at a point 15 rods distant from the Northeast corner of the Northwest 1/4 of Section 21, Township 9 South, Range 3 West; thence Easterly along said Section line, 15 rods to the Northeast corner of the Northeast 1/4 of said Section 21; thence South along the line between the Northeast 1/4 and

1112-259

Vol 1112 Page 260

the Northwest 1/4 of said Section 21, 80 rods, more or less; thence West along the line separating the North 1/2 from the South 1/2 of said Northwest 1/4 of said Section 21, a distance of 15 rods; thence North in a direct line to the place of beginning.

CONTAINING 7-1/2 acres, more or less.

PARCEL THIRTEEN

LOTS 1 and 2; the West 1/2 of the Southeast 1/4; the Southwest 1/4 of the Northeast 1/4 and the Northeast 1/4 of the Southwest 1/4 of Section 21 in Township 9 South, Range 3 West, M. D. B. and N., according to official plat thereof approved by the office of the Surveyor General, May 16, 1868.

PARCEL FOURTEEN

THE East 1/2 of the Southwest 1/4 of Section 33 in Township 9 South, Range 3 West, M. D. B. and N., according to official plat thereof approved by the office of the Surveyor General, May 16, 1868.

PARCEL FIFTEEN

THE Northeast 1/4 of the Northwest 1/4; the West 1/2 of the Northeast 1/4, and Lots 1 and 2 of Section 28, Township 9 South, Range 3 West, M. D. N., according to official plat thereof approved by the office of the Surveyor General, May 16, 1868.

PARCEL SIXTEEN

THE South 1/2 of the Southwest 1/4; the Northeast 1/4 of the Southwest 1/4, and the Southeast 1/4 of the Northwest 1/4 of Section 28, and the Northwest 1/4 of Section 33, all in Township 9 South, Range 3 West, M. D. N., according to official plat thereof approved by the office of the Surveyor General, May 16, 1868.

PARCEL SEVENTEEN

LOTS 3 and 4 of Section 33, Township 9 South, Range 3 West, M. D. N., according to official plat thereof approved by the office of the Surveyor General, May 16, 1868.

PARCEL EIGHTEEN

LOTS 1 and 2 in Section 33; Lots 3 and 4 and the Northwest 1/4 of the Southeast 1/4 of Section 28, all in Township 9 South, Range 3 West, M. D. N., according to official plat thereof approved by the office of the Surveyor General, May 16, 1868.

PARCEL NINETEEN

THE Southwest 1/4 of the Northwest 1/4 and the Northwest 1/4 of the Southwest 1/4 of Section 28, Township 9 South, Range 3 West, M. D. B. and N., according to official plat thereof approved by the office of the Surveyor General, May 16, 1868.

PARCEL TWENTY

LOT 4, Section 5, Township 10 South, Range 3 West, M. D. N., according to official plat thereof approved by the office of the Surveyor General, February 11, 1861.

TOGETHER with all rights, easements, privileges and interests that Grantees have or may have in and to, or necessary to the enjoyment of the waters now flowing or hereafter to flow in those certain streams known as Mill Creek, Big Creek and Bayes Creek, and their tributaries.

Case 55326

Vol. 1112 No. 254

RESOLUTION DULY ADOPTED BY THE EXECUTIVE  
COMMITTEE OF THE BOARD OF DIRECTORS OF  
PACIFIC GAS AND ELECTRIC COMPANY

January 15, 1957

RESOLVED that L. Harold Anderson, as Vice-President and Assistant General Manager, and E. E. Manhard, as Secretary of this corporation be, and they are hereby authorized and directed to execute and deliver, for and on behalf of this corporation, in its name and under its corporate seal, a quitclaim deed dated January 11, 1957, quitclaiming unto LOCKHEED AIRCRAFT CORPORATION, a corporation, its successors and assigns, forever, those certain oil, gas and mineral rights and interests, and those certain easements, rights of way and servitudes necessary or convenient to the enjoyment thereof, all as reserved in that certain deed from Coast Counties Gas and Electric Company, a corporation, predecessor in interest of this Company, to William A. Deans and Earl Harris, dated May 26, 1950, recorded June 21, 1950, in Volume 778 of Official Records at Page 230, Santa Cruz County Records, in, to, under and upon those certain eighteen (18) parcels of land situated in the County of Santa Cruz, State of California, particularly described in Exhibit "A", entitled "Property", attached to said quitclaim deed and made a part thereof, excepting and reserving unto this Company, its successors and assigns, forever, as a royalty, the equal one-eighth (1/8) part and portion of the oil, gas, asphaltum or other hydrocarbons and other minerals which may be produced from sand, strata, formations and horizons in and underlying the said real property or any allocation thereto in the event of the unitization thereof with other lands.

DISTRICT LAND REGISTER

DOC. SER. NO. 1238  
POSTED 3-10-58 by ky

I, E. E. MANHARD, do hereby certify that I am the Secretary of the PACIFIC GAS AND ELECTRIC COMPANY, a corporation organized and existing under the laws of the State of California; that the above and foregoing is a full, true and correct copy of a resolution which was duly and regularly adopted by the Executive Committee of the Board of Directors of said company at a meeting of the said Committee which was duly and regularly called and held at the office of said company on the 15th day of January 1957; that the said resolution has never been amended, revoked or repealed, but is still in full force and effect; that the following is a true excerpt from Section 2 of Article II of the By-Laws of said corporation relating to the said Executive Committee:

"The Executive Committee, subject to the provisions of law, may exercise any of the powers and perform any of the duties of the Board of Directors; but the Board may by an affirmative vote of a majority of its members withdraw or limit any of the powers of the Executive Committee.";

and that the said Board of Directors has in no way withdrawn nor limited the powers of the said Executive Committee to adopt the said resolution.

WITNESS my hand and the seal of said corporation hereunto affixed this 15th day of January 1957.



Secretary of the  
PACIFIC GAS AND ELECTRIC COMPANY



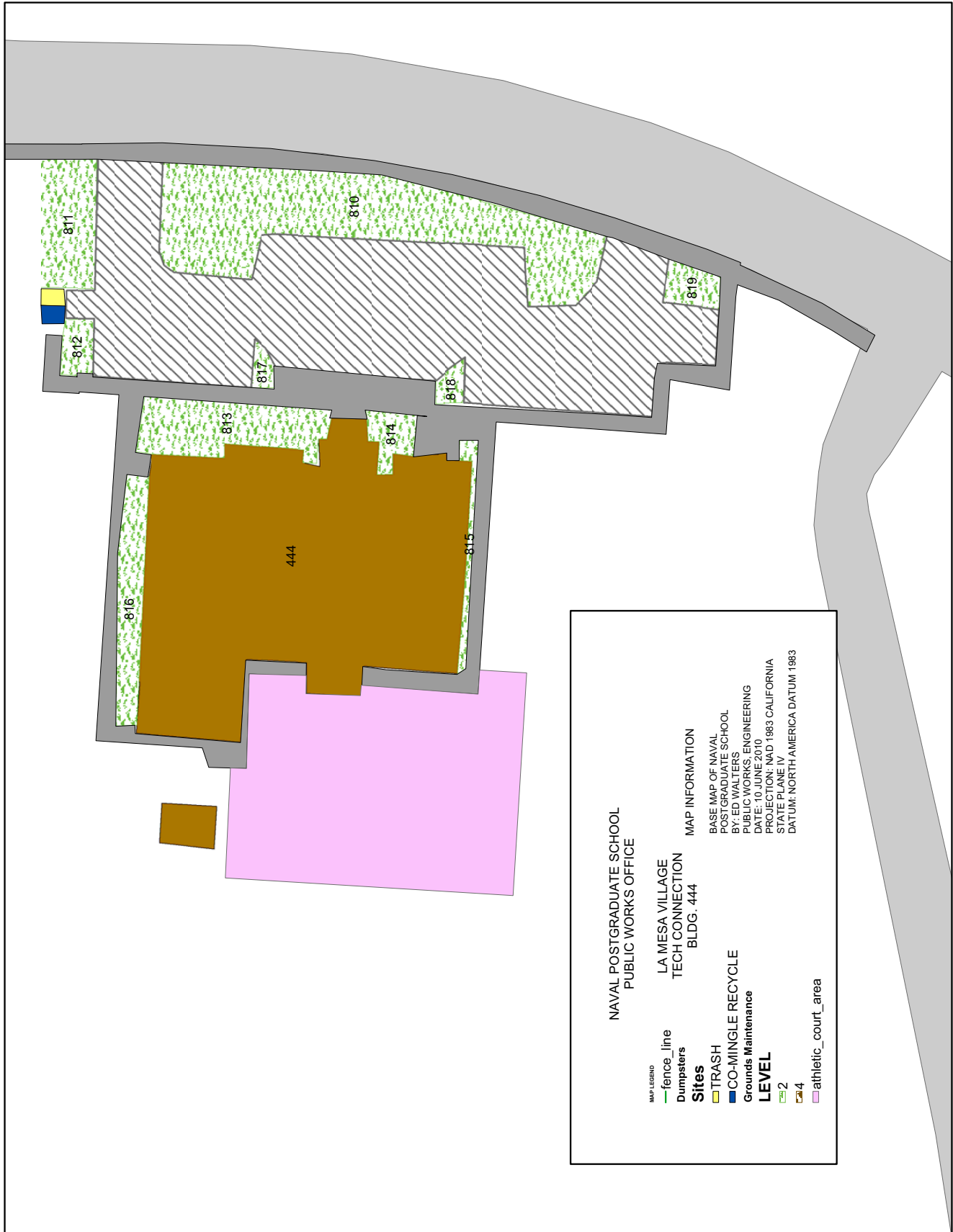


## Appendix D: Grounds Maintenance Maps

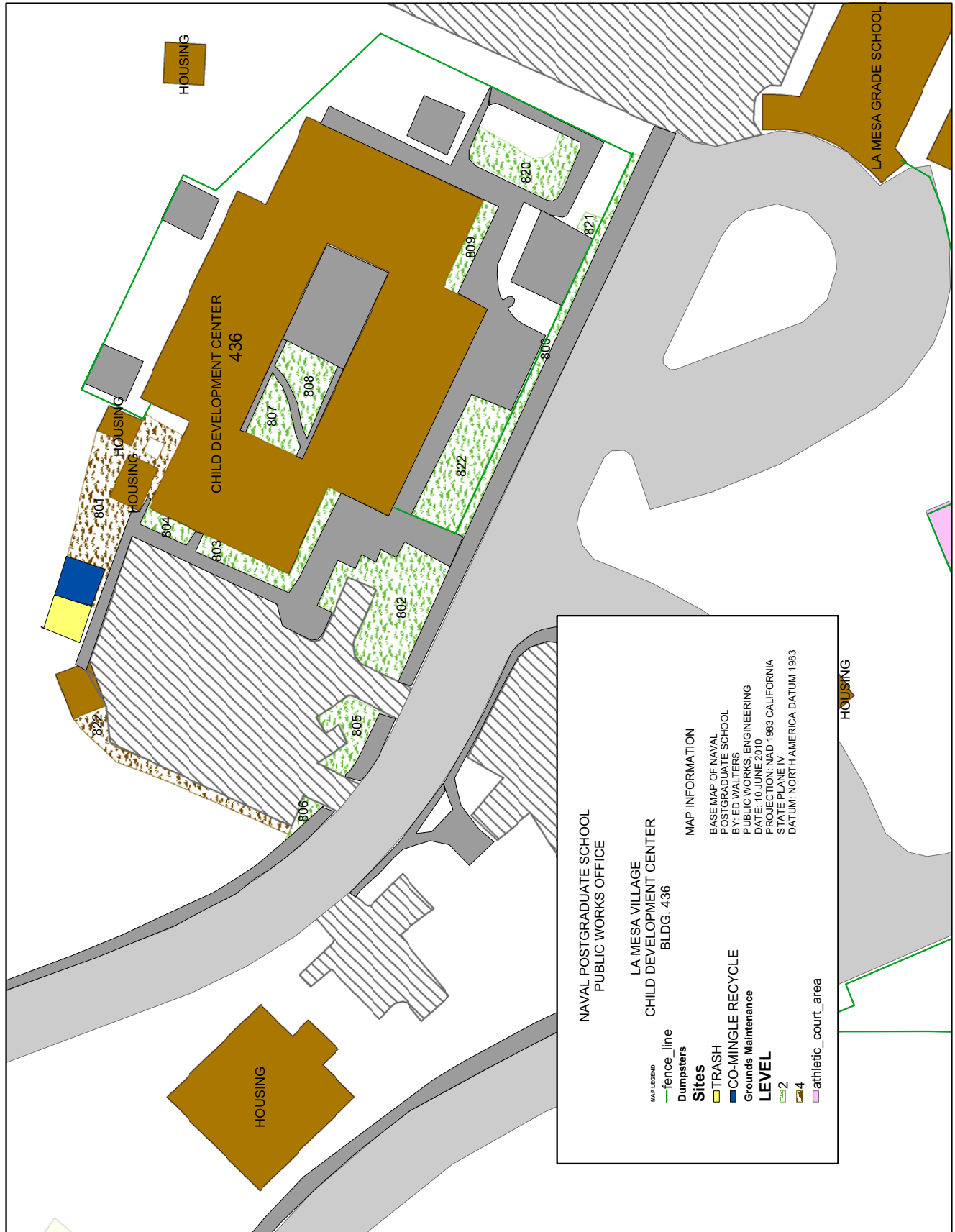
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Map D-1. Naval Postgraduate School.



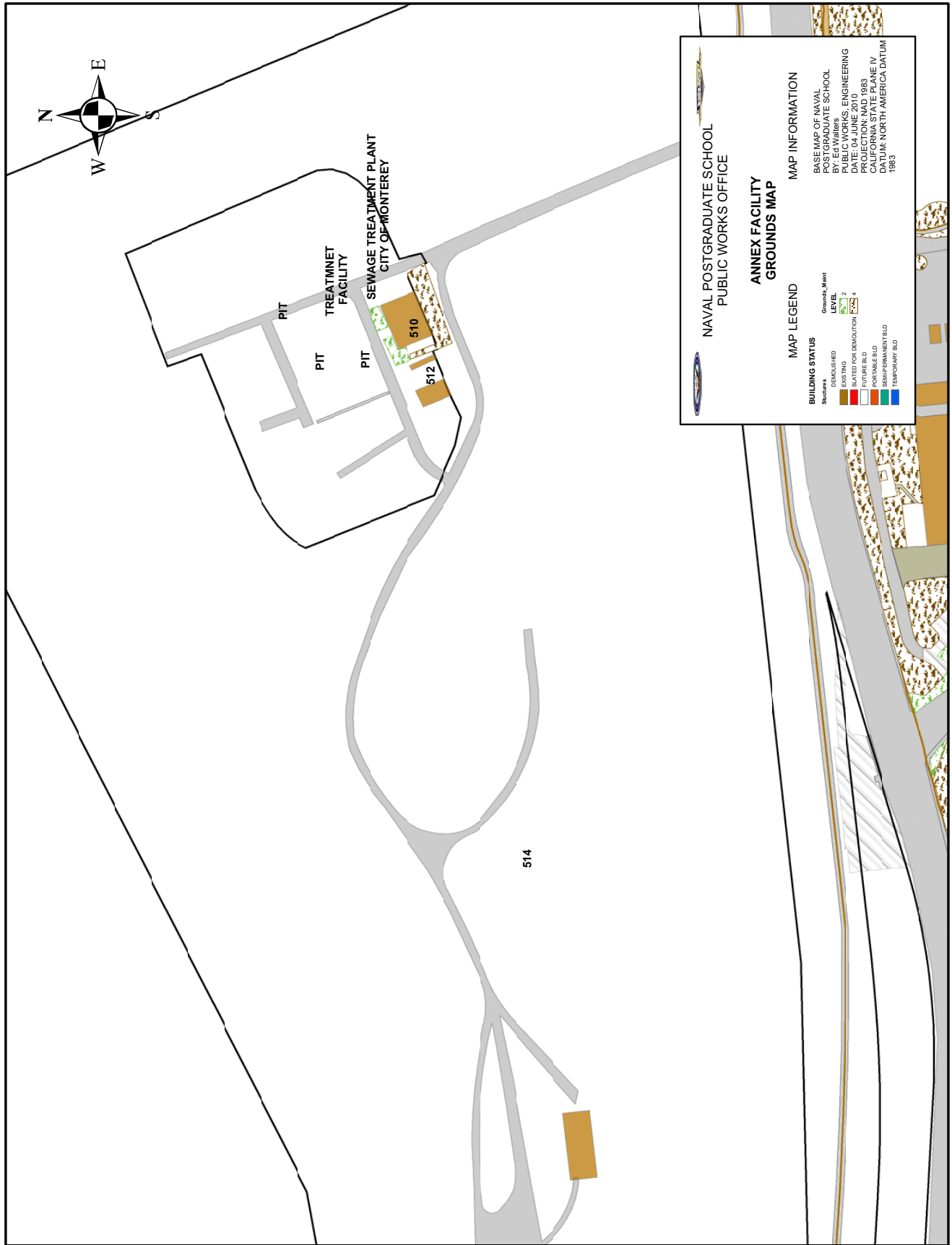
Map D-2. La Mesa Village Building 444.



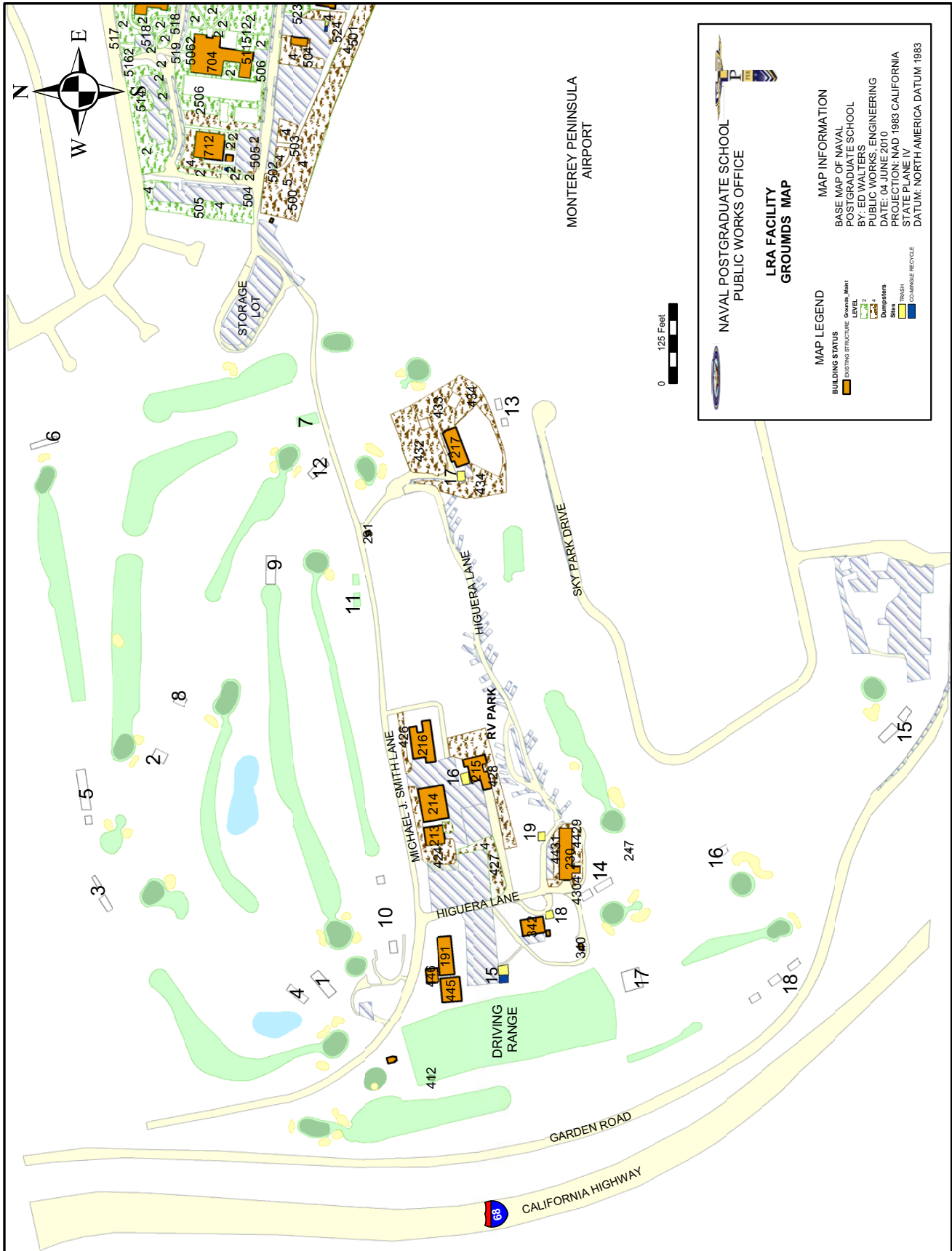
Map D-3. La Mesa Village Child Development Center.



*Map D-4. Navy Inn.*

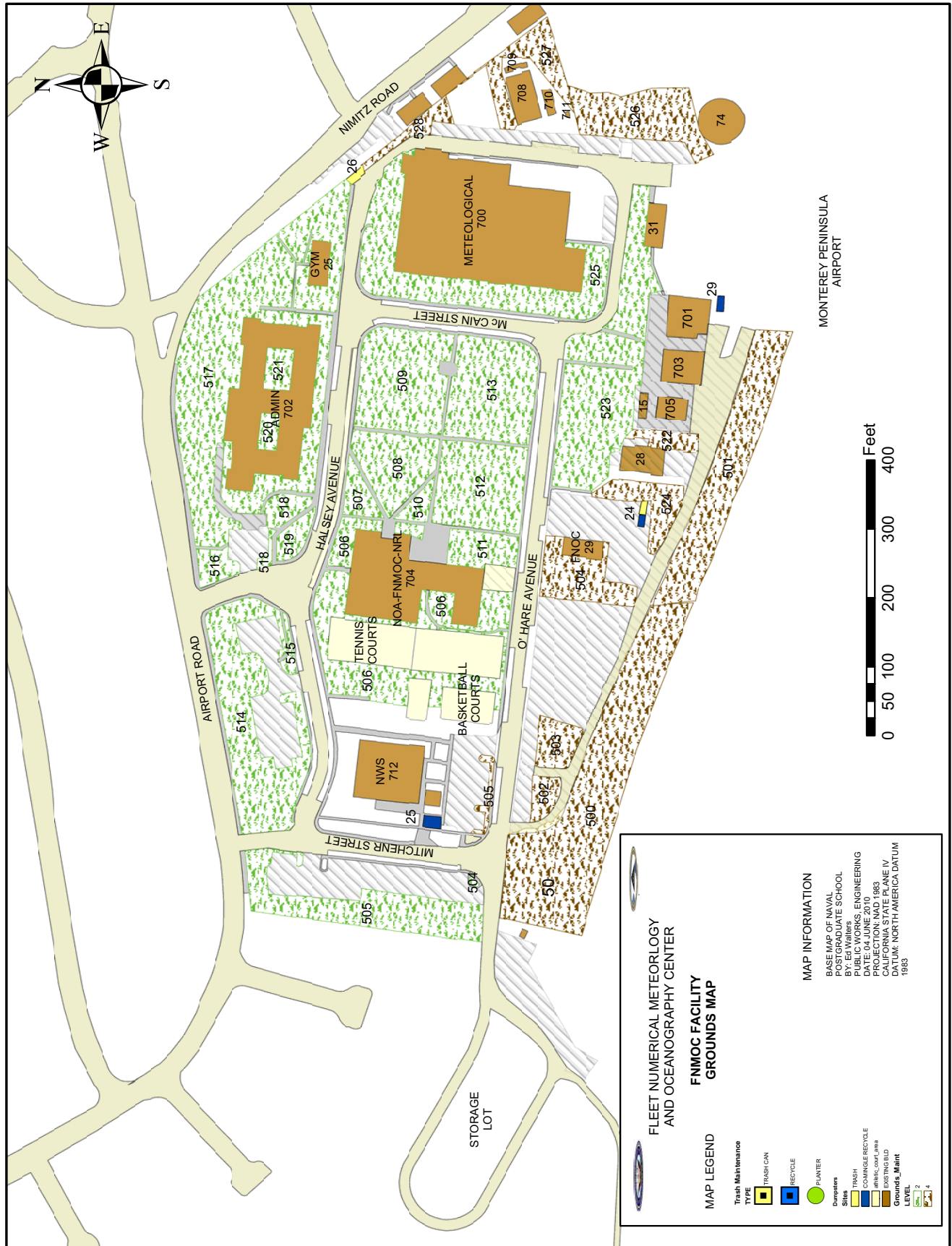


Map D-5. Annex Facility.

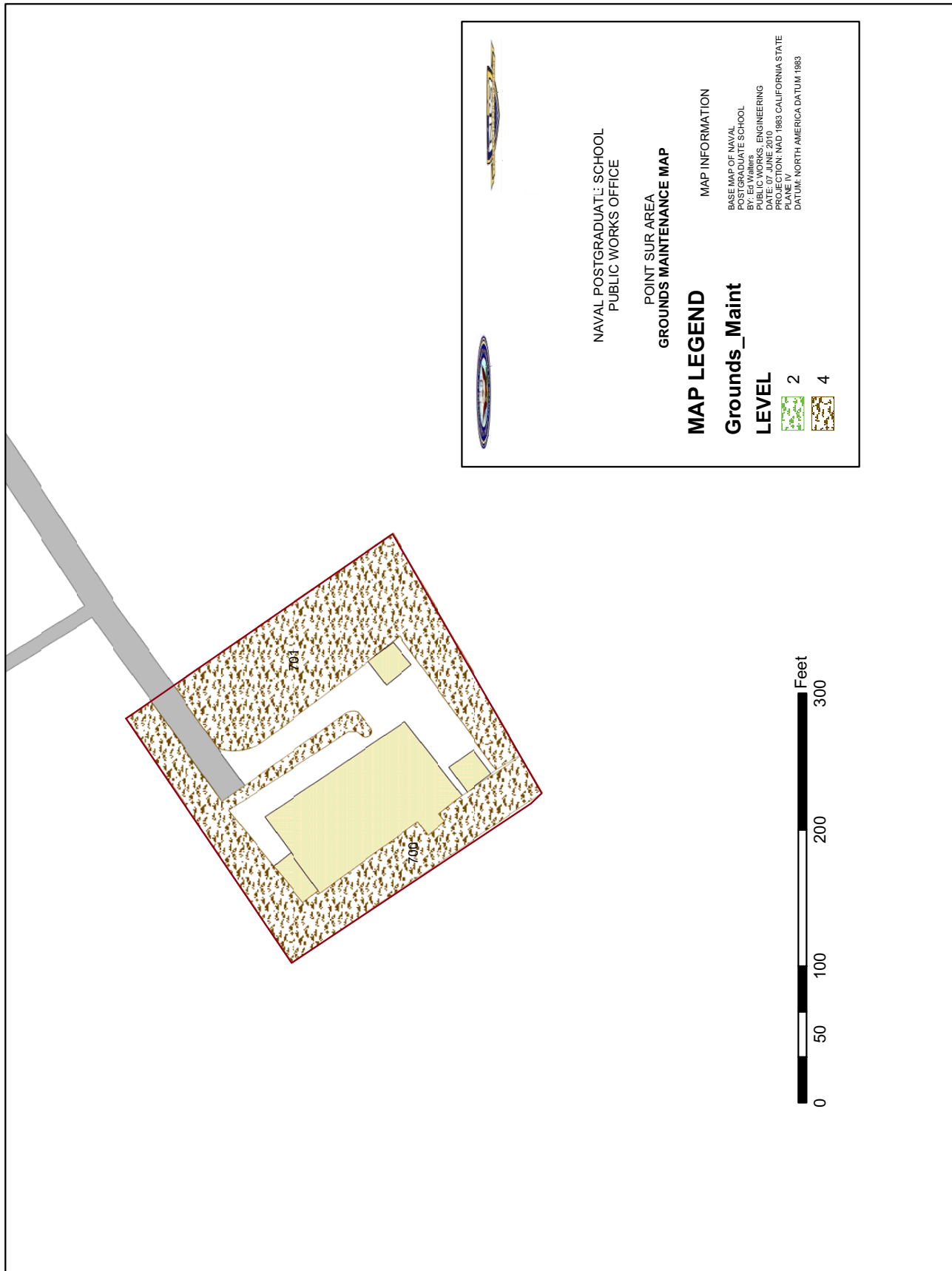


Map D-6. Lab/Recreation Area.





Map D-7. Fleet Numerical Meteorology and Oceanography Center.



Map D-8. Point Sur Facility.



## Appendix E: NSA Monterey Species List

### E.1 Flora

Note: Nomenclature corresponds to the Jepson Manual 1993 unless otherwise noted.

Table E-1. Terrestrial plant species observed at the Monterey Area Properties.

Scientific Name	Common Name	MG	LMV	Lab/Rec	Annex	Native to CA?	CDFA Status	Cal-IPC Status
<i>Abronia latifolia</i> *	yellow sand verbena					Yes	-	-
<i>Abronia umbellata</i>	pink sand verbena					Yes	-	-
<i>Acacia longifolia</i>	Sydney golden wattle					No	-	-
<i>Acacia melanoxylon</i>	blackwood acacia					No	-	L
<i>Acacia sp.</i>	acacia	X				No	-	-
<i>Achillea millefolium</i> <sup>+</sup>	common yarrow		X			Yes	-	-
<i>Acmispon americanus</i> (syn. <i>Lotus purshianus</i> ) <sup>†</sup>	Spanish clover lotus		X			Yes	-	-
<i>Acmispon glaber</i> (syn. <i>Lotus scoparius</i> )	deerweed		X	X	X	Yes	-	-
<i>Acmispon heermannii</i> var. <i>orbicularis</i> (syn. <i>Lotus heermannii</i> var. <i>eriphorus</i> ; <i>L. heermannii</i> ; <i>L. eriphorus</i> ) <sup>†</sup>	hairy lotus, Heermann's bird's foot trefoil	X	X	X	X	Yes	-	-
<i>Acmispon parviflorus</i> (syn. <i>Lotus micranthus</i> )	bird's-foot trefoil, small flowered trefoil, desert deervetch		X			Yes	-	-
<i>Acmispon strigosus</i> (syn. <i>Lotus strigosus</i> ) <sup>†</sup>	Bishop's lotus, strigose lotus		X			Yes	-	-
<i>Acmispon wrangelianus</i> (syn. <i>Lotus wrangelianus</i> ) <sup>†</sup>	Chilean lotus, calf lotus		X			Yes	-	-
<i>Adenostoma fasciculatum</i> <sup>†</sup>	chamise		X	X		Yes	-	-
<i>Agoseris grandiflora</i>	bigflower agoseris, giant mountain dandelion		X			Yes	-	-
<i>Agrostis pallens</i>	leafy bentgrass		X	X		Yes	-	-
<i>Ambrosia chamissonis</i>	beach bur					Yes	-	-
<i>Ammophila arenaria</i> <sup>†</sup>	European beachgrass					No	-	H
<i>Amsinckia spectabilis</i>	woolly breeches, seaside fiddleneck					Yes	-	-
<i>Anagallis arvensis</i>	scarlet pimpernel, poor-man's weatherglass					No	-	-
<i>Angelica hendersonii</i>	Henderson's angelica		X			Yes	-	-
<i>Anthriscus caucalis</i>	bur chervil					No	-	-
<i>Arbutus menziesii</i>	Pacific madrone		X	X		Yes	-	-
<i>Arctostaphylos hookeri</i> ssp. <i>hookeri</i> <sup>†,+</sup>	Hooker's manzanita		X			Yes	-	-
<i>Arctostaphylos pumila</i> <sup>+</sup>	sandmat manzanita			X	X	Yes	-	-
<i>Arctostaphylos tomentosa</i> (syn. <i>Arctostaphylos crustacea</i> )	woollyleaf manzanita, shaggy-bark manzanita		X	X	X	Yes	-	-
<i>Arctotis fastuosa</i> <sup>+</sup>	African daisy					No	-	-
<i>Armeria maritima</i> <sup>+</sup>	thrift seapink					Yes	-	-
<i>Artemisia californica</i> <sup>+</sup>	California sagebrush				Undetermined	Yes	-	-
<i>Artemisia douglasiana</i> <sup>†</sup>	mugwort, Douglas' sagewort		X			Yes	-	-

Table E-1. Terrestrial plant species observed at the Monterey Area Properties. (Continued)

Scientific Name	Common Name	MG	LMV	Lab/Rec	Annex	Native to CA?	CDFA Status	Cal-IPC Status
<i>Artemisia pycnocephala</i>	coastal sagewort					Yes	-	-
<i>Astragalus nuttallii</i> <sup>†</sup>	Nuttall's milkvetch, ocean bluff milk vetch, rattle weed					Yes	-	-
<i>Atriplex lentiformis</i> <sup>†</sup>	big saltbush					Yes	-	-
<i>Atriplex leucophylla</i>	beach saltbush					Yes	-	-
<i>Atriplex triangularis</i>	spearscale, fat hen	X				Yes	-	-
<i>Avena barbata</i>	slender wild oat				Undetermined	No	-	M
<i>Avena fatua</i>	wild oat				Undetermined	No	-	M
<i>Baccharis douglasii</i>	saltmarsh baccharis	X				Yes	-	-
<i>Baccharis pilularis</i> <sup>†</sup>	coyote brush	X	X			Yes	-	-
<i>Brassica sp.</i>	mustard					No	-	-
<i>Briza maxima</i>	rattlesnake grass		X			No	-	L
<i>Bromus carinatus</i> <sup>†</sup>	California brome		X	X		Yes	-	-
<i>Bromus diandrus</i>	ripgut grass					No	-	M
<i>Bromus hordeaceus</i>	soft chess					No	-	L
<i>Bromus madritensis ssp. rubens</i>	red brome					No	-	H
<i>Cakile maritima</i>	sea rocket					No	-	L
<i>Calamagrostis nutkaensis</i> <sup>†</sup>	Pacific reedgrass					Yes	-	-
<i>Calandrinia ciliata</i> <sup>†</sup>	red maids			X		Yes	-	-
<i>Calochortus albus</i>	white globe lily		X			Yes	-	-
<i>Calochortus luteus</i> <sup>†</sup>	yellow mariposa lily		X			Yes	-	-
<i>Calystegia macrostegia</i>	island false bindweed, island morning glory		X			Yes	-	-
<i>Calystegia purpurata ssp. purpurata</i>	climbing morning glory		X			Yes	-	-
<i>Calystegia soldanella</i>	beach morning glory					Yes	-	-
<i>Camissonia cheiranthifolia</i>	beach primrose					Yes	-	-
<i>Camissonia cheiranthifolia ssp. cheiranthifolia</i>	beach evening primrose					Yes	-	-
<i>Camissonia cheiranthifolia ssp. suffruticosa</i> <sup>†</sup>	shrubby beach primrose, giant beachprimrose					Yes	-	-
<i>Camissonia micrantha</i>	small primrose, miniature suncup					Yes	-	-
<i>Camissonia ovata</i>	sun cup		X	X		Yes	-	-
<i>Camissonia strigulosa</i>	strigose sun cup, sandysoil suncup			X		Yes	-	-
<i>Cardamine californica</i>	California toothwort, milkmaids		X			Yes	-	-
<i>Cardamine oligosperma</i>	Idaho bittercress, popweed		X			Yes	-	-
<i>Cardionema ramosissimum</i> <sup>†</sup>	sandcarpet, sand mat			X	X	Yes	-	-
<i>Carduus pycnocephalus</i>	Italian thistle					No	C	M
<i>Carex globosa</i> <sup>†</sup>	round fruit sedge			X		Yes	-	-
<i>Carex harfordii</i> <sup>†</sup>	Harford's sedge			X		Yes	-	-
<i>Carex pansa</i> <sup>†</sup>	sand dune sedge	X	X			Yes	-	-
<i>Carex tumulicola</i>	slender sedge, foothill sedge		X			Yes	-	-
<i>Carpobrotus chilensis</i> <sup>†</sup>	sea fig					No	-	M
<i>Carpobrotus edulis</i>	ice plant, Hottentot fig					No	-	H
<i>Carpobrotus sp.</i>	sea fig, ice plant	X				No	-	M
<i>Carpobrotus hybrid</i> <sup>†</sup>	hybrid iceplant					No	-	M/H
<i>Castilleja affinis</i>	Indian paintbrush		X			Yes	-	-
<i>Castilleja exserta</i> <sup>†</sup>	Owl's clover			X		Yes	-	-
<i>Castilleja latifolia</i>	Monterey Indian paintbrush					Yes	-	-
<i>Ceanothus cuneatus var. rigidus</i>	Monterey ceanothus			X		Yes	-	-
<i>Ceanothus dentatus</i>	dwarf ceanothus, sandscrub ceanothus			X		Yes	-	-

Table E-1. Terrestrial plant species observed at the Monterey Area Properties. (Continued)

Scientific Name	Common Name	MG	LMV	Lab/Rec	Annex	Native to CA?	CDFA Status	Cal-IPC Status
<i>Ceanothus griseus</i> <sup>†</sup>	Carmel ceanothus					Yes	-	-
<i>Ceanothus griseus</i> var. <i>horizontalis</i>	Carmel creeper, Yankee Point ceanothus	X				Yes	-	-
<i>Ceanothus thyrsiflorus</i>	blue blossom		X			Yes	-	-
<i>Ceanothus</i> sp.	ceanothus			X		Yes	-	-
<i>Centaurea melitensis</i>	Maltese starthistle					No	-	M
<i>Centaurea solstitialis</i>	yellow starthistle					No	C	H
<i>Cerastium glomeratum</i>	Mouse-ear chickweed, sticky chickweed, large mouse ears					No	-	-
<i>Chenopodium album</i>	lamb's quarters, white goosefoot					No	-	-
<i>Chenopodium californicum</i> <sup>†</sup>	California goosefoot		X			Yes	-	-
<i>Chlorogalum pomeridianum</i>	wavyleaf soap plant, soaproot		X			Yes	-	-
<i>Chorizanthe pungens</i> var. <i>pungens</i> <sup>†</sup>	Monterey spineflower				X	Yes	-	-
<i>Cirsium brevistylum</i> <sup>†</sup>	clustered thistle, Indian thistle		X			Yes	-	-
<i>Cirsium occidentale</i> var. <i>venustum</i> (syn. <i>Cirsium proteanum</i> ) <sup>†</sup>	cobwebby thistle, Venus thistle		X			Yes	-	-
<i>Cirsium vulgare</i>	bull thistle					No	-	M
<i>Clarkia lewisii</i>	Lewis' clarkia, farewell to spring					Yes	-	-
<i>Claytonia parviflora</i>	streambank springbeauty, narrow-leaved miner's lettuce					Yes	-	-
<i>Claytonia perfoliata</i> <sup>†</sup>	miner's lettuce	X	X		X	Yes	-	-
<i>Claytonia rubra</i>	redstem springbeauty					Yes	-	-
<i>Collinsia heterophylla</i>	purple Chinese houses		X			Yes	-	-
<i>Conium maculatum</i>	poison hemlock		X			No	-	M
<i>Conyza bonariensis</i>	horseweed					No	-	-
<i>Conyza canadensis</i> <sup>†</sup>	Canadian horseweed	X				Yes	-	-
<i>Corethrogyne filaginifolia</i> (syn. <i>Lessingia filaginifolia</i> ) <sup>†</sup>	dune aster, common sandaster		X	X	X	Yes	-	-
<i>Cornus sericea</i> ssp. <i>sericea</i>	redosier dogwood		X			Yes	-	-
<i>Cortaderia jubata</i> <sup>†</sup>	pampas grass				CIRPAS Facility	No	-	H
<i>Crassula connata</i>	sand pygmyweed, pygmy weed					Yes	-	-
<i>Crassula tillaea</i>	moss pygmyweed, Mediterranean pygmyweed					No	-	-
<i>Cryptantha clevelandii</i>	Cleveland's cryptantha, common cryptantha					Yes	-	-
<i>Cryptantha leiocarpa</i>	popcorn flower, coast cryptantha					Yes	-	-
<i>Cynara cardunculus</i>	artichoke thistle				Undetermined	No	B	M
<i>Cynodon dactylon</i>	Bermuda grass	X				No	C	M
<i>Cyperus eragrostis</i>	tall flatsedge, umbrella sedge	X	X			Yes	-	-
<i>Danthonia californica</i> <sup>†</sup>	California oatgrass		X	X		Yes	-	-
<i>Deinandra corymbosa</i> (previously: <i>Hemizonia corymbosa</i> ; syn. <i>H. angustifolia</i> ) <sup>†</sup>	coastal tarweed, common tarplant		X			Yes	-	-
<i>Deschampsia cespitosa</i> ssp. <i>holciformis</i> <sup>* †</sup>	California hairgrass					Yes	-	-
<i>Dichelostemma capitatum</i> <sup>†</sup>	blue dicks, wild hyacinth		X			Yes	-	-
<i>Dichondra donnellii</i> <sup>†</sup>	California ponysfoot, dichondra		X			Yes	-	-
<i>Distichlis spicata</i>	saltgrass	X				Yes	-	-
<i>Dryopteris arguta</i>	California wood fern		X			Yes	-	-
<i>Dudleya caespitosa</i>	coast dudleya, sand lettuce					Yes	-	-
<i>Ehrharta erecta</i>	panic veldtgrass					No	-	M
<i>Elymus glaucus</i>	blue wildrye, western wild rye		X	X		Yes	-	-

Table E-1. Terrestrial plant species observed at the Monterey Area Properties. (Continued)

Scientific Name	Common Name	MG	LMV	Lab/Rec	Annex	Native to CA?	CDFA Status	Cal-IPC Status
<i>Epilobium canum</i> <sup>+</sup>	California fuchsia, hummingbird trumpet					Yes	-	-
<i>Epilobium ciliatum</i>	fringed willowherb, slender willowherb	X				Yes	-	-
<i>Epilobium paniculatum</i> <sup>†</sup>	willowherb	X	X			Yes	-	-
<i>Ericameria ericoides</i>	mock heather, California goldenbush				X	Yes	-	-
<i>Erigeron foliosus</i> <sup>†</sup>	leafy fleabane, leafy daisy	X				Yes	-	-
<i>Erigeron glaucus</i> <sup>+</sup>	seaside daisy, seaside fleabane					Yes	-	-
<i>Eriogonum deserticola</i>	dune buckwheat, Colorado Desert buckwheat					Yes	-	-
<i>Eriogonum latifolium</i>	coast buckwheat					Yes	-	-
<i>Eriogonum parvifolium</i>	seacliff buckwheat					Yes	-	-
<i>Eriophyllum confertiflorum</i> <sup>†</sup>	golden yarrow, yellow yarrow		X		X	Yes	-	-
<i>Eriophyllum staechadifolium</i>	seaside woolly sunflower					Yes	-	-
<i>Erodium botrys</i>	long-beaked filaree, longbeak stork's bill					No	-	-
<i>Erodium cicutarium</i>	redstem filaree, redstem stork's bill					No	-	L
<i>Erodium moschatum</i>	musky stork's bill, whitestem filaree					No	-	-
<i>Erodium sp.</i>	filaree					Undetermined <sup>2</sup>	-	-
<i>Erysimum ammoditum</i>	blooming coast wallflower, sand-loving wallflower					Yes	-	-
<i>Eschscholzia californica</i> (syn. <i>Eschscholzia californica</i> var. <i>maritima</i> )	California poppy			X		Yes	-	-
<i>Eucalyptus globulus</i>	Tasmanian blue gum eucalyptus	X				No	-	M
<i>Euphorbia peplus</i>	petty surge					No	-	-
<i>Eurybia radulina</i> (syn. <i>Aster radulinus</i> )	roughleaf aster, woodland aster		X			Yes	-	-
<i>Festuca arundinacea</i>	tall fescue					No	-	M
<i>Festuca rubra</i> <sup>+</sup>	red fescue					Yes	-	-
<i>Fragaria chiloensis</i> <sup>+</sup>	beach strawberry					Yes	-	-
<i>Fragaria vesca</i>	woodland strawberry		X			Yes	-	-
<i>Frangula californica</i> (syn. <i>Rhamnus californica</i> )	California coffeeberry	X	X	X		Yes	-	-
<i>Galium aparine</i>	stickywilly, goose grass					Yes	-	-
<i>Galium californicum</i>	California bedstraw		X			Yes	-	-
<i>Galium porrigens</i> <sup>†</sup>	graceful bedstraw, climbing bedstraw		X			Yes	-	-
<i>Galium sp.</i>	bedstraw					Undetermined <sup>1</sup>	-	-
<i>Gamochoeta purpurea</i> (previously and erroneously recorded as <i>Gnaphalium purpureum</i> ; syn. <i>Gnaphalium peregrinum</i> )	purple cudweed					Yes	-	-
<i>Genista monspessulana</i>	French broom		X	X		No	C	H
<i>Geranium dissectum</i>	wild geranium, cutleaf geranium					No	-	M
<i>Gilia tenuiflora</i> ssp. <i>arenaria</i>	Monterey gilia, sand gilia					Yes	-	-
<i>Gnaphalium californicum</i>	California everlasting, California cudweed					Yes	-	-
<i>Gnaphalium luteo-album</i>	common cudweed					No	-	-
<i>Gnaphalium ramosissimum</i>	pink cudweed, pink everlasting				X	Yes	-	-
<i>Gnaphalium stramineum</i> (syn. <i>Pseudognaphalium stramineum</i> )	Chilean cudweed, everlasting cudweed, cotton batting plant		X	X		Yes	-	-
<i>Grindelia stricta</i> var. <i>platyphylla</i> (syn. <i>G. camporum</i> var. <i>camporum</i> , <i>G. latifolia</i> )	gumplant					Yes	-	-
<i>Hedera helix</i>	English ivy	X				No	-	H
<i>Hedypnois cretica</i>	hedyponis, Cretanweed, Crete weed					Yes	-	-
<i>Heracleum maximum</i> (syn. <i>H. lanatum</i> )	common cow parsnip		X			Yes	-	-
<i>Hesperocyparis macrocarpa</i> (syn. <i>Callitropsis macrocarpa</i> , <i>Cupressus macrocarpa</i> )	Monterey cypress	X				Yes	-	-

Table E-1. Terrestrial plant species observed at the Monterey Area Properties. (Continued)

Scientific Name	Common Name	MG	LMV	Lab/Rec	Annex	Native to CA?	CDFA Status	Cal-IPC Status
<i>Heteromeles arbutifolia</i>	toyon	X	X	X		Yes	-	-
<i>Heterotheca grandiflora</i>	telegraph weed			X	X	Yes	-	-
<i>Hirschfeldia incana</i>	summer mustard, shortpod mustard, Mediterranean hoary mustard, wild mustard					No	-	M
<i>Holodiscus discolor</i>	cream bush, oceanspray		X			Yes	-	-
<i>Hordeum brachyantherum</i>	meadow barley		X			Yes	-	-
<i>Hordeum murinum</i> ssp. <i>leporinum</i>	foxtail barley, hare barley					No	-	M
<i>Horkelia cuneata</i> <sup>†</sup>	wedgeleaf horkelia			X	X	Yes	-	-
<i>Hydrocotyle ranunculoides</i>	marsh pennywort	X				Yes	-	-
<i>Hypericum anagalloides</i>	creeping St. John's wort	X				Yes	-	-
<i>Hypochaeris glabra</i>	smooth cat's ear					No	-	L
<i>Hypochaeris radicata</i>	hairy catsear, rough cat's ear					No	-	M
<i>Iris douglasiana</i> <sup>†</sup>	Douglas' iris	X				Yes	C	-
<i>Isolepis cernua</i> (syn. <i>Scirpus cernuus</i> )	low bulrush, low club rush	X				Yes	-	-
<i>Jaumea carnosa</i> <sup>†</sup>	marsh jaumea	X				Yes	-	-
<i>Juncus ballicus</i>	Baltic rush	X	X			Yes	-	-
<i>Juncus bufoniusa</i>	toad rush	X	X	X		Yes	-	-
<i>Juncus effusus</i> var. <i>brunneus</i>	bog rush	X	X			Yes	-	-
<i>Juncus occidentalis</i>	western rush		X			Yes	-	-
<i>Juncus patens</i>	common rush, spreading rush		X			Yes	-	-
<i>Juncus phaeocephalus</i> <sup>†</sup>	brown-headed rush		X			Yes	-	-
<i>Koeleria macrantha</i> <sup>†</sup>	June grass		X			Yes	-	-
<i>Lamium amplexicaule</i>	henbit deadnettle, giraffe's head					No	-	-
<i>Lasthenia minor</i>	woolly goldfields, coast goldfields			X		Yes	-	-
<i>Lathyrus vestitus</i>	Pacific pea		X			Yes	-	-
<i>Lemna</i> sp. <sup>†</sup>	duckweed	X				Yes	-	-
<i>Leymus condensatus</i> <sup>+</sup>	giant wildrye					Yes	-	-
<i>Leymus mollis</i>	Pacific dune grass, American dunegrass					Yes	-	-
<i>Leymus triticoides</i>	beardless wildrye, creeping wild rye, alkali ryegrass	X				Yes	-	-
<i>Nuttallanthus texanus</i>	toad flax, rough seeded blue toad flax			X		Yes	-	-
<i>Lobularia maritima</i>	sweet alyssum					No	-	L
<i>Lolium multiflorum</i>	Italian ryegrass					No	-	M
<i>Lonicera hispidula</i>	pink honeysuckle, hairy honeysuckle		X			Yes	-	-
<i>Lupinus arboreus</i>	yellow bush lupine, coastal bush lupine	X				Yes	-	L
<i>Lupinus bicolora</i>	miniature lupine		X	X		Yes	-	-
<i>Lupinus chamissonis</i>	dune bush lupine, blue bush lupine, silver dune lupine				X	Yes	-	-
<i>Lupinus latifolius</i>	bigleaf lupine, broadleaf lupine		X			Yes	-	-
<i>Lupinus nanus</i>	sky lupine		X	X		Yes	-	-
<i>Luzula comosa</i>	Pacific woodrush		X			Yes	-	-
<i>Lythrum hyssopifolia</i> (syn. <i>L. hyssopifolium</i> )	hyssop loosestrife	X	X			No	-	M
<i>Madia sativa</i> (syn. <i>Madia capitata</i> )	Chile tarweed, coastal tarweed		X			Yes	-	-
<i>Maianthemum stellatum</i> (syn. <i>Smilacina stellata</i> )	starry false lily of the valley, slim Solomon's seal		X			Yes	-	-
<i>Malva parviflora</i>	cheeseweed mallow, cheeseweed					No	-	-
<i>Marah fabaceus</i>	wild cucumber, California manroot		X	X	X	Yes	-	-
<i>Matricaria matricarioides</i> (syn. <i>Chamomilla suaveolens</i> ) <sup>†</sup>	pineapple weed		X	X		No	-	-
<i>Medicago polymorpha</i> (syn. <i>M. hispida</i> )	California burclover					No	-	L

Table E-1. Terrestrial plant species observed at the Monterey Area Properties. (Continued)

Scientific Name	Common Name	MG	LMV	Lab/Rec	Annex	Native to CA?	CDFA Status	Cal-IPC Status
<i>Melica torreyana</i>	Torrey's melica		X			Yes	-	-
<i>Melilotus indicus</i>	annual yellow sweetclover,					No	-	-
<i>Melilotus sp.</i>	sweetclover					No	-	-
<i>Mimulus aurantiacus</i> <sup>†, +</sup>	sticky monkeyflower, bush monkeyflower		X	X		Yes	-	-
<i>Myoporum laetum</i>	lollypop tree, ngaio tree					No	-	M
<i>Nassella lepida</i> <sup>†</sup>	small flowered needlegrass		X			Yes	-	-
<i>Nassella pulchra</i> <sup>†</sup>	purple needlegrass		X			Yes	-	-
<i>Navarretia squarrosa</i> <sup>†</sup>	skunkbush, skunkweed		X			Yes	-	-
<i>Oemleria cerasiformis</i>	osoberry, Indian plum		X			Yes	-	-
<i>Oenanthe sarmentosa</i>	water parsley, Pacific oenanthe	X				Yes	-	-
<i>Oxalis micrantha</i> (previously <i>O. laxa</i> was misapplied to <i>O. micrantha</i> species)	dwarf woodsorrel					No	-	-
<i>Oxalis pes-caprae</i>	Bermuda buttercup					No	-	M
<i>Pennisetum clandestinum</i> <sup>†</sup>	kikuyu grass					No	C	L
<i>Pentagramma triangularis</i>	goldback fern		X			Yes	-	-
<i>Persicaria punctata</i> (syn. <i>Polygonum punctatum</i> )	common water smartweed, dotted smartweed	X				Yes	-	-
<i>Phacelia malvifolia</i>	stinging phacelia		X			Yes	-	-
<i>Phacelia ramosissima</i>	branching phacelia, coast phacelia					Yes	-	-
<i>Phacelia ramosissima</i> var. <i>montereyensis</i>	Monterey branching phacelia					Yes	-	-
<i>Pholistoma auritum</i>	fiesta flower		X			Yes	-	-
<i>Pinus radiata</i>	Monterey pine	X	X	X		Yes	-	-
<i>Piperia elegans</i>	elegant piperia, coast rein orchid		X			Yes	-	-
<i>Piperia yadonii</i>	Yadon's rein orchid		X	X	X	Yes	-	-
<i>Plantago coronopus</i>	cutleaf plantain					No	-	-
<i>Plantago erecta</i>	California plantain, foothill plantain			X	X	Yes	-	-
<i>Plantago maritima</i> (syn. <i>Plantago maritima</i> var. <i>californica</i> )	Pacific seaside plantain, goose tongue					Yes	-	-
<i>Platanus racemosa</i>	western sycamore	X	X			Yes	-	-
<i>Poa annua</i>	annual bluegrass					No	-	-
<i>Poa douglasii</i>	sand dune bluegrass, Douglas bluegrass					Yes	-	-
<i>Poa pratensis</i>	Kentucky bluegrass	X				No	-	L
<i>Polygonum paronychia</i>	beach knotweed					Yes	-	-
<i>Polypogon australis</i>	Chilean rabbitsfoot grass, Chilean beard grass					No	-	-
<i>Polypogon monspeliensis</i>	annual beard grass, rabbits foot grass					No	-	L
<i>Polystichum munitum</i>	western swordfern		X			Yes	-	-
<i>Potentilla anserina</i>	silver weed cinquefoil, silverweed	X				Yes	-	-
<i>Prunus emarginata</i>	bitter cherry		X			Yes	-	-
<i>Prunus virginiana</i> var. <i>demissa</i>	western chokecherry		X			Yes	-	-
<i>Pseudognaphalium beneolens</i> (syn. <i>Gnaphalium canescens</i> ssp. <i>beneolens</i> ) <sup>†</sup>	fragrant everlasting				X	Yes	-	-
<i>Pseudognaphalium canescens</i>	Wright's cudweed					Yes	-	-
<i>Pteridium aquilinum</i> var. <i>pubescens</i> <sup>†</sup>	hairy brackenfern, western brackenfern		X	X		Yes	-	-
<i>Quercus agrifolia</i>	California live oak, coast live oak	X	X	X	X	Yes	-	-
<i>Rafinesquia californica</i> <sup>†</sup>	California plumseed, California chicory		X			Yes	-	-
<i>Ranunculus californicus</i>	California buttercup		X			Yes	-	-
<i>Raphanus sativus</i>	wild radish					No	-	L



Table E-1. Terrestrial plant species observed at the Monterey Area Properties. (Continued)

Scientific Name	Common Name	MG	LMV	Lab/Rec	Annex	Native to CA?	CDFA Status	Cal-IPC Status
<i>Rhamnus crocea</i>	redberry		X			Yes	-	-
<i>Ribes divaricatuma</i>	spreading gooseberry, creek gooseberry		X			Yes	-	-
<i>Ribes menziesii</i>	canyon gooseberry		X			Yes	-	-
<i>Ribes sanguineum</i> var. <i>glutinosum</i> <sup>†</sup>	blood currant, pink flowering currant					Yes	-	-
<i>Ribes speciosum</i>	fuchsia-flowered gooseberry		X			Yes	-	-
<i>Rubus ursinus</i>	California blackberry	X	X	X		Yes	-	-
<i>Rumex acetosella</i>	sheep sorrel					No	-	M
<i>Rumex crispus</i>	curly dock					No	-	-
<i>Rumex pulcher</i>	fiddle dock					No	-	-
<i>Rumex salicifolius</i>	willow dock	X				Yes	-	-
<i>Rumex salicifolius</i> var. <i>denticulatus</i>	toothed willow dock		X			Yes	-	-
<i>Salix babylonica</i>	weeping willow	X				No	-	-
<i>Salix lasiandra</i> <sup>†</sup>	yellow willow			X		Yes	-	-
<i>Salix lasiolepis</i>	arroyo willow	X	X	X	X	Yes	-	-
<i>Salix scouleriana</i> <sup>†</sup>	Scouler's willow		X			Yes	-	-
<i>Salix</i> sp.	willow	X	X			Undetermined <sup>1</sup>	-	-
<i>Salvia leucophylla</i> <sup>†</sup>	purple sage					Yes	-	-
<i>Salvia mellifera</i> <sup>†</sup>	black sage					Yes	-	-
<i>Sambucus nigra</i> ssp. <i>caerulea</i> (previously misapplied name: <i>S. mexicana</i> )	blue elderberry		X			Yes	-	-
<i>Sanicula crassicaulis</i>	gamble weed, Pacific blacksnakeroot		X			Yes	-	-
<i>Sanicula laciniata</i>	coast blacksnakeroot, coast sanicle		X			Yes	-	-
<i>Santolina chamaecyparissus</i>	lavender cotton					No	-	-
<i>Satureja douglasii</i>	yerba buena		X			Yes	-	-
<i>Schoenoplectus americanus</i> (syn. <i>Scirpus americanus</i> )	chairmaker's bulrush	X				Yes	-	-
<i>Schoenoplectus californicus</i> (syn. <i>Scirpus californicus</i> )	tule, California bulrush	X				Yes	-	-
<i>Scrophularia californica</i> <sup>†</sup>	California figwort, bee plant		X			Yes	-	-
<i>Senecio glomeratus</i> (syn. <i>Erechtites glomeratus</i> )	New Zealand fireweed, cutleaf burnweed					No	-	M
<i>Senecio mikanioides</i> (syn. <i>Delairea odorata</i> )	German ivy		X			No	-	H
<i>Senecio minimus</i> (syn. <i>Erechtites minimus</i> ) <sup>c</sup>	Australian fireweed, coastal burnweed					No	-	M
<i>Senecio vulgaris</i>	old man in the Spring, common groundsel					No	-	-
<i>Sequoia sempervirens</i>	coast redwood	X				Yes	-	-
<i>Sequoiadendron giganteum</i>	giant sequoia	X				Yes	-	-
<i>Silene gallica</i>	windmill pink, common catchfly					No	-	-
<i>Silybum marianum</i>	milk thistle					No	-	L
<i>Sisyrinchium bellum</i>	western blue eyed grass		X			Yes	-	-
<i>Smilacina racemosa</i>	Solomon's plume		X			Yes	-	-
<i>Solanum americanum</i>	American black nightshade, small flowered nightshade					Yes	-	-
<i>Solanum douglasii</i>	Douglas' nightshade					Yes	-	-
<i>Solanum umbelliferum</i>	bluewitch, bluewitch nightshade					Yes	-	-
<i>Sonchus asper</i>	spiny sowthistle					No	-	-
<i>Sonchus oleraceus</i>	common sow thistle					No	-	-
<i>Sparganium eurycarpum</i>	broadfruit bur reed	X				Yes	-	-
<i>Spergularia rubra</i>	red sandspurry, purple sand spurry					No	-	-
<i>Stachys bullata</i>	California hedgenettle, wood mint		X			Yes	-	-

Table E-1. Terrestrial plant species observed at the Monterey Area Properties. (Continued)

Scientific Name	Common Name	MG	LMV	Lab/Rec	Annex	Native to CA?	C DFA Status	Cal-IPC Status
<i>Stephanomeria virgata</i>	tall stephanomeria, rod wirelettuce					Yes	-	-
<i>Symphoricarpos mollis</i>	snowberry		X			Yes	-	-
<i>Symphotrichum chilense</i> (syn. <i>Aster chilensis</i> )	Pacific aster		X			Yes	-	-
<i>Tetragonia tetragonioides</i> (syn. <i>T. expansa</i> )	New Zealand spinach					No	-	-
<i>Thalictrum fendleri</i> var. <i>polycarpum</i>	meadow rue, Fendler's meadow rue, Torrey's meadow rue		X			Yes	-	-
<i>Toxicodendron diversilobum</i>	Pacific poison oak	X	X	X		Yes	-	-
<i>Toxicoscordion fremontii</i> (syn. <i>Zigadenus fremontii</i> ) <sup>†</sup>	star lily		X			Yes	-	-
<i>Trifolium barbigerum</i>	bearded clover, colony clover		X			Yes	-	-
<i>Trifolium ciliolatum</i> <sup>†</sup>	tree clover, foothill clover		X			Yes	-	-
<i>Trifolium microcephalum</i>	maiden clover, small headed clover		X			Yes	-	-
<i>Trifolium microdon</i>	Valparaiso clover, thimble clover		X			Yes	-	-
<i>Trifolium willdenovii</i>	tomcat clover		X			Yes	-	-
<i>Trifolium</i> sp.	Clover					Undetermined <sup>2</sup>	-	-
<i>Triteleia ixioides</i> (syn. <i>Brodiaea lutea</i> )	goldean brodiaea		X			Yes	-	-
<i>Triodanis biflora</i> <sup>†</sup>	Venus looking glass		X			Yes	-	-
<i>Triphysaria pusilla</i>	dwarf owl's clover, dwarf orthocarpus		X	X		Yes	-	-
<i>Typha angustifolia</i>	narrowleaf cattail	X				Yes	-	-
<i>Typha latifolia</i>	broadleaf cattail	X				Yes	-	-
<i>Urtica dioica</i>	stinging nettle		X			No	-	-
<i>Urtica dioica</i> ssp. <i>holosericea</i> <sup>†</sup>	hoary nettle, giant creek nettle	X	X			Yes	-	-
<i>Urtica urens</i>	dwarf nettle, annual stinging nettle					No	-	-
<i>Vicia americana</i>	American vetch		X			Yes	-	-
<i>Vicia sativa</i>	spring vetch					No	-	-
<i>Vicia sativa</i> ssp. <i>nigra</i> (syn. <i>V. angustifolia</i> )	garden vetch, spring vetch					No	-	-
<i>Vicia villosa</i>	hairy vetch, woolly vetch					No	-	-
<i>Vinca major</i>	periwinkle	X				No	-	M
<i>Vulpia bromoides</i>	brome fescue					No	-	-
<i>Vulpia microstachys</i>	small fescue		X			Yes	-	-
<i>Vulpia myuros</i>	rattail fescue					No	-	M

<sup>1</sup> Most species of this genus found in CA are native

<sup>2</sup> Some species of this genus are native and some are nonnative

<sup>†</sup> = For some areas of the Monterey Area Properties and the Dunes, Greening Associates (1999) reports observations of this species only in their 1993 survey effort.

<sup>‡</sup> = Greening Associates (1999) reports that these species were likely eradicated at the time of their survey.

+ = Greening Associates (1999) notes that this species was planted at the Dunes during the restoration there.

\*Species were planted during 1990 restoration at Dune/Research Area. However, they have not been listed in recent surveys.

Source: Cal-IPC 2006; C DFA 2010; Cowan 1995, 1996; GANDA 2011; Doak et al 1996, 2001, Kreiberg 1999; AgriChemical & Supply 2009; TDI 2010a, 2011; Greening & Associates 1999.

MG = Main Grounds; L MV = La Mesa Village; Lab/Rec = Laboratory/Recreation Area; Annex = Annex Area.

California Department of Food and Agriculture (C DFA 2010) Noxious Weed status:

List A - Weed species for which C DFA policies call for eradication, containment or entry refusal.

List B - Widespread species that are difficult to contain; C DFA allows county Agricultural Commissioners to decide whether to target them for eradication or containment in their jurisdictions.

List C - Weeds that are so widespread that C DFA does not endorse state or county-funded eradication or containment efforts except in nurseries or seed lots.

California Invasive Plant Council (Cal-IPC 2006) status:

High - Severe ecological impacts. Moderate to high dispersal rates. Widespread distribution.

Moderate - Substantial ecological impacts. Moderate to high dispersal rates. Limited to widespread distribution. Establishment depends on ecological disturbance.

Limited - Minor ecological impacts. Low to moderate dispersal rates. Limited distribution, but may be locally persistent and problematic.

Table E-2. Terrestrial plant species observed at the Dune/Research Area.

Scientific Name	Common Name	Native to CA?	CDFA Status	Cal-IPC Status
<i>Abronia latifolia</i> *	yellow sand verbena	Yes	-	-
<i>Abronia umbellata</i>	pink sand verbena	Yes	-	-
<i>Acacia longifolia</i>	Sydney golden wattle	No	-	-
<i>Acacia melanoxylon</i>	blackwood acacia	No	-	L
<i>Acacia sp.</i>	acacia	No	-	-
<i>Achillea millefolium</i> <sup>+</sup>	common yarrow	Yes	-	-
<i>Acmispon heermannii</i> var. <i>orbicularis</i> (syn. <i>Lotus heermannii</i> var. <i>eriphorus</i> ; <i>L. heermannii</i> ; <i>L. eriphorus</i> ) <sup>†</sup>	hairy lotus, Heermann's bird's foot trefoil	Yes	-	-
<i>Acmispon parviflorus</i> (syn. <i>Lotus micranthus</i> )	bird's-foot trefoil, small flowered trefoil, desert deervetch	Yes	-	-
<i>Acmispon strigosus</i> (syn. <i>Lotus strigosus</i> ) <sup>†</sup>	Bishop's lotus, strigose lotus	Yes	-	-
<i>Ambrosia chamissonis</i>	beach bur	Yes	-	-
<i>Ammophila arenaria</i> <sup>†</sup>	European beachgrass	No	-	H
<i>Amsinckia spectabilis</i>	woolly breeches, seaside fiddleneck	Yes	-	-
<i>Anagallis arvensis</i>	scarlet pimpernel, poor-man's weatherglass	No	-	-
<i>Anthriscus caucalis</i>	bur chervil	No	-	-
<i>Arbutus menziesii</i>	Pacific madrone	Yes	-	-
<i>Arctostaphylos hookeri</i> ssp. <i>hookeri</i> <sup>†, +</sup>	Hooker's manzanita	Yes	-	-
<i>Arctostaphylos pumila</i> <sup>+</sup>	sandmat manzanita	Yes	-	-
<i>Arctotis fastuosa</i> <sup>+</sup>	African daisy	No	-	-
<i>Armeria maritima</i> <sup>+</sup>	thrift seapink	Yes	-	-
<i>Artemisia californica</i> <sup>+</sup>	California sagebrush	Yes	-	-
<i>Artemisia pycnocephala</i>	coastal sagewort	Yes	-	-
<i>Astragalus nuttallii</i> <sup>†</sup>	Nuttall's milkvetch, ocean bluff milk vetch, rattle weed	Yes	-	-
<i>Atriplex lentiformis</i> <sup>+</sup>	big saltbush	Yes	-	-
<i>Atriplex leucophylla</i>	beach saltbush	Yes	-	-
<i>Avena barbata</i>	slender wild oat	No	-	M
<i>Avena fatua</i>	wild oat	No	-	M
<i>Baccharis pilularis</i>	coyote brush	Yes	-	-
<i>Brassica sp.</i>	mustard	No	-	-
<i>Bromus diandrus</i>	ripgut grass	No	-	M
<i>Bromus hordeaceus</i>	soft chess	No	-	L
<i>Bromus madritensis</i> ssp. <i>rubens</i>	red brome	No	-	H
<i>Cakile maritima</i>	sea rocket	No	-	L
<i>Calamagrostis nutkaensis</i> <sup>+</sup>	Pacific reedgrass	Yes	-	-
<i>Calystegia soldanella</i>	beach morning glory	Yes	-	-
<i>Camissonia cheiranthifolia</i>	beach primrose	Yes	-	-
<i>Camissonia cheiranthifolia</i> ssp. <i>cheiranthifolia</i>	beach evening primrose	Yes	-	-
<i>Camissonia cheiranthifolia</i> ssp. <i>suffruticosa</i> <sup>+</sup>	shrubby beach primrose, giant beachprimrose	Yes	-	-
<i>Camissonia micrantha</i>	small primrose, miniature suncup	Yes	-	-
<i>Camissonia strigulosa</i>	strigose sun cup, sandysoil suncup	Yes	-	-
<i>Cardamine oligosperma</i>	Idaho bittercress, popweed	Yes	-	-
<i>Cardionema ramosissimuma</i>	sandcarpet, sand mat	Yes	-	-
<i>Carduus pycnocephalus</i>	Italian thistle	No	C	M
<i>Carex pansa</i> <sup>†</sup>	sand dune sedge	Yes	-	-
<i>Carpobrotus chilensis</i> <sup>†</sup>	sea fig	No	-	M
<i>Carpobrotus edulis</i>	ice plant, Hottentot fig	No	-	H
<i>Carpobrotus sp.</i>	sea fig, ice plant	No	-	M

Table E-2. Terrestrial plant species observed at the Dune/Research Area. (Continued)

Scientific Name	Common Name	Native to CA?	CDFA Status	Cal-IPC Status
<i>Carpobrotus hybrid</i> <sup>†</sup>	hybrid iceplant	No	-	M/H
<i>Castilleja latifolia</i>	Monterey Indian paintbrush	Yes	-	-
<i>Ceanothus cuneatus</i> var. <i>rigidus</i>	Monterey ceanothus	Yes	-	-
<i>Ceanothus griseus</i> <sup>†</sup>	Carmel ceanothus	Yes	-	-
<i>Ceanothus griseus</i> var. <i>horizontalis</i>	Carmel creeper, Yankee Point ceanothus	Yes	-	-
<i>Centaurea melitensis</i>	Maltese starthistle	No	-	M
<i>Centaurea solstitialis</i>	yellow starthistle	No	C	H
<i>Cerastium glomeratum</i>	Mouse-ear chickweed, sticky chickweed, large mouse ears	No	-	-
<i>Chenopodium album</i>	lamb's quarters, white goosefoot	No	-	-
<i>Chenopodium californicum</i>	California goosefoot	Yes	-	-
<i>Chorizanthe pungens</i> var. <i>pungens</i> <sup>†</sup>	Monterey spineflower	Yes	-	-
<i>Cirsium vulgare</i>	bull thistle	No	-	M
<i>Clarkia lewisii</i>	Lewis' clarkia, farewell to spring	Yes	-	-
<i>Claytonia parviflora</i>	streambank springbeauty, narrow-leaved miner's lettuce	Yes	-	-
<i>Claytonia perfoliata</i> <sup>†</sup>	miner's lettuce	Yes	-	-
<i>Claytonia rubra</i>	redstem springbeauty	Yes	-	-
<i>Conium maculatum</i>	poison hemlock	No	-	M
<i>Conyza bonariensis</i>	horseweed	No	-	-
<i>Conyza canadensis</i> <sup>†</sup>	Canadian horseweed	Yes	-	-
<i>Corethrogyne filaginifolia</i> (syn. <i>Lessingia filaginifolia</i> ) <sup>†</sup>	dune aster, common sandaster	Yes	-	-
<i>Cortaderia jubata</i> <sup>†</sup>	pampas grass	No	-	H
<i>Crassula connata</i>	sand pygmyweed, pygmy weed	Yes	-	-
<i>Crassula tillaea</i>	moss pygmyweed, Mediterranean pygmyweed	No	-	-
<i>Cryptantha clevelandii</i>	Cleveland's cryptantha, common cryptantha	Yes	-	-
<i>Cryptantha leiocarpa</i>	popcorn flower, coast cryptantha	Yes	-	-
<i>Danthonia californica</i> <sup>†</sup>	California oatgrass	Yes	-	-
<i>Deinandra corymbosa</i> (previously: <i>Hemizonia corymbosa</i> ; syn. <i>H. angustifolia</i> ) <sup>†</sup>	coastal tarweed, common tarplant	Yes	-	-
<i>Deschampsia cespitosa</i> ssp. <i>holciformis</i> <sup>*,†</sup>	California hairgrass	Yes	-	-
<i>Distichlis spicata</i>	saltgrass	Yes	-	-
<i>Dudleya caespitosa</i>	coast dudleya, sand lettuce	Yes	-	-
<i>Ehrharta erecta</i>	panic veldtgrass	No	-	M
<i>Elymus glaucus</i>	blue wildrye, western wild rye	Yes	-	-
<i>Epilobium canum</i> <sup>†</sup>	California fuchsia, hummingbird trumpet	Yes	-	-
<i>Epilobium ciliatum</i>	fringed willowherb, slender willowherb	Yes	-	-
<i>Ericameria ericoides</i>	mock heather, California goldenbush	Yes	-	-
<i>Erigeron glaucus</i> <sup>†</sup>	seaside daisy, seaside fleabane	Yes	-	-
<i>Eriogonum deserticola</i>	dune buckwheat, Colorado Desert buckwheat	Yes	-	-
<i>Eriogonum latifolium</i>	coast buckwheat	Yes	-	-
<i>Eriogonum parvifolium</i>	seacliff buckwheat	Yes	-	-
<i>Eriophyllum staechadifolium</i>	seaside woolly sunflower	Yes	-	-
<i>Erodium botrys</i>	long-beaked filaree, longbeak stork's bill	No	-	-
<i>Erodium cicutarium</i>	redstem filaree, redstem stork's bill	No	-	L
<i>Erodium moschatum</i>	musky stork's bill, whitestem filaree	No	-	-
<i>Erodium</i> sp.	filaree	Undetermined <sup>2</sup>	-	-
<i>Erysimum ammophilum</i>	blooming coast wallflower, sand-loving wallflower	Yes	-	-
<i>Eschscholzia californica</i> (syn. <i>Eschscholzia californica</i> var. <i>maritima</i> )	California poppy	Yes	-	-

Table E-2. Terrestrial plant species observed at the Dune/Research Area. (Continued)

Scientific Name	Common Name	Native to CA?	C DFA Status	Cal-IPC Status
<i>Eucalyptus globulus</i>	Tasmanian blue gum eucalyptus	No	-	M
<i>Euphorbia peplus</i>	petty surge	No	-	-
<i>Festuca arundinacea</i>	tall fescue	No	-	M
<i>Festuca rubra</i> <sup>†</sup>	red fescue	Yes	-	-
<i>Fragaria chiloensis</i> <sup>†</sup>	beach strawberry	Yes	-	-
<i>Frangula californica</i> (syn. <i>Rhamnus californica</i> )	California coffeeberry	Yes	-	-
<i>Galium aparine</i>	stickywilly, goose grass	Yes	-	-
<i>Galium</i> sp.	bedstraw	Undetermined <sup>1</sup>	-	-
<i>Gamochaeta purpurea</i> (previously and erroneously recorded as <i>Gnaphalium purpureum</i> ; syn. <i>Gnaphalium peregrinum</i> )	purple cudweed	Yes	-	-
<i>Genista monspessulana</i>	French broom	No	C	H
<i>Geranium dissectum</i>	wild geranium, cutleaf geranium	No	-	M
<i>Gilia tenuiflora</i> ssp. <i>arenaria</i>	Monterey gilia, sand gilia	Yes	-	-
<i>Gnaphalium californicum</i>	California everlasting, California cudweed	Yes	-	-
<i>Gnaphalium luteo-album</i>	common cudweed	No	-	-
<i>Gnaphalium ramosissimum</i>	pink cudweed, pink everlasting	Yes	-	-
<i>Gnaphalium stramineum</i> (syn. <i>Pseudognaphalium stramineum</i> )	Chilean cudweed, everlasting cudweed, cotton batting plant	Yes	-	-
<i>Grindelia stricta</i> var. <i>platyphylla</i> (syn. <i>G. camporum</i> var. <i>camporum</i> , <i>G. latifolia</i> )	gumplant	Yes	-	-
<i>Hedypnois cretica</i>	hedyponis, Cretanweed, Crete weed	Yes	-	-
<i>Hesperocyparis macrocarpa</i> (syn. <i>Callitropsis macrocarpa</i> , <i>Cupressus macrocarpa</i> )	Monterey cypress	Yes	-	-
<i>Heteromeles arbutifolia</i>	toyon	Yes	-	-
<i>Heterotheca grandiflora</i>	telegraph weed	Yes	-	-
<i>Hirschfeldia incana</i>	summer mustard, shortpod mustard, Mediterranean hoary mustard, wild mustard	No	-	M
<i>Hordeum murinum</i> ssp. <i>leporinum</i>	foxtail barley, hare barley	No	-	M
<i>Hypochaeris glabra</i>	smooth cat's ear	No	-	L
<i>Hypochaeris radicata</i>	hairy catsear, rough cat's ear	No	-	M
<i>Iris douglasiana</i> <sup>†</sup>	Douglas' iris	Yes	C	-
<i>Juncus balticus</i>	Baltic rush	Yes	-	-
<i>Juncus bufonius</i> <sup>†</sup>	toad rush	Yes	-	-
<i>Lamium amplexicaule</i>	henbit deadnettle, giraffe's head	No	-	-
<i>Leymus condensatus</i> <sup>†</sup>	giant wildrye	Yes	-	-
<i>Leymus mollis</i>	Pacific dune grass, American dunegrass	Yes	-	-
<i>Leymus triticoides</i>	beardless wildrye, creeping wild rye, alkali ryegrass	Yes	-	-
<i>Nuttallanthus texanus</i>	toad flax, rough seeded blue toad flax	Yes	-	-
<i>Lobularia maritima</i>	sweet alyssum	No	-	L
<i>Lolium multiflorum</i>	Italian ryegrass	No	-	M
<i>Lupinus arboreus</i>	yellow bush lupine, coastal bush lupine	Yes	-	L
<i>Lupinus bicolor</i> <sup>†</sup>	miniature lupine	Yes	-	-
<i>Lupinus chamissonis</i>	dune bush lupine, blue bush lupine, silver dune lupine	Yes	-	-
<i>Lupinus nanus</i>	sky lupine	Yes	-	-
<i>Malva parviflora</i>	cheeseweed mallow, cheeseweed	No	-	-
<i>Marah fabaceus</i>	wild cucumber, California manroot	Yes	-	-
<i>Matricaria matricarioides</i> (syn. <i>Chamomilla suaveolens</i> ) <sup>†</sup>	pineapple weed	No	-	-
<i>Medicago polymorpha</i> (syn. <i>M. hispida</i> )	California burclover	No	-	L
<i>Melilotus indicus</i>	annual yellow sweetclover,	No	-	-
<i>Melilotus</i> sp.	sweetclover	No	-	-

Table E-2. Terrestrial plant species observed at the Dune/Research Area. (Continued)

Scientific Name	Common Name	Native to CA?	CDFA Status	Cal-IPC Status
<i>Mimulus aurantiacus</i> <sup>†, +</sup>	sticky monkeyflower, bush monkeyflower	Yes	-	-
<i>Myoporum laetum</i>	lollypop tree, ngaio tree	No	-	M
<i>Nassella lepida</i> <sup>†</sup>	small flowered needlegrass	Yes	-	-
<i>Oxalis micrantha</i> (previously <i>O. laxa</i> was misapplied to <i>O. micrantha</i> species)	dwarf woodsorrel	No	-	-
<i>Oxalis pes-caprae</i>	Bermuda buttercup	No	-	M
<i>Pennisetum clandestinum</i> <sup>†</sup>	kikuyu grass	No	C	L
<i>Phacelia ramosissima</i>	branching phacelia, coast phacelia	Yes	-	-
<i>Phacelia ramosissima</i> var. <i>montereyensis</i>	Monterey branching phacelia	Yes	-	-
<i>Pinus radiata</i>	Monterey pine	Yes	-	-
<i>Plantago coronopus</i>	cutleaf plantain	No	-	-
<i>Plantago maritima</i> (syn. <i>Plantago maritima</i> var. <i>californica</i> )	Pacific seaside plantain, goose tongue	Yes	-	-
<i>Poa annua</i>	annual bluegrass	No	-	-
<i>Poa douglasii</i>	sand dune bluegrass, Douglas bluegrass	Yes	-	-
<i>Polygonum paronychia</i>	beach knotweed	Yes	-	-
<i>Polypogon australis</i>	Chilean rabbitsfoot grass, Chilean beard grass	No	-	-
<i>Polypogon monspeliensis</i>	annual beard grass, rabbits foot grass	No	-	L
<i>Pseudognaphalium canescens</i>	Wright's cudweed	Yes	-	-
<i>Pteridium aquilinum</i> var. <i>pubescens</i> <sup>†</sup>	hairy brackenfern, western brackenfern	Yes	-	-
<i>Quercus agrifolia</i>	California live oak, coast live oak	Yes	-	-
<i>Raphanus sativus</i>	wild radish	No	-	L
<i>Ribes sanguineum</i> var. <i>glutinsum</i> <sup>+</sup>	blood currant, pink flowering currant	Yes	-	-
<i>Rumex acetosella</i>	sheep sorrel	No	-	M
<i>Rumex crispus</i>	curly dock	No	-	-
<i>Rumex pulcher</i>	fiddle dock	No	-	-
<i>Salvia leucophylla</i> <sup>+</sup>	purple sage	Yes	-	-
<i>Salvia mellifera</i> <sup>+</sup>	black sage	Yes	-	-
<i>Santolina chamaecyparissus</i>	lavender cotton	No	-	-
<i>Senecio glomeratus</i> (syn. <i>Erechtites glomeratus</i> )	New Zealand fireweed, cutleaf burnweed	No	-	M
<i>Senecio minimus</i> (syn. <i>Erechtites minimus</i> ) <sup>†</sup>	Australian fireweed, coastal burnweed	No	-	M
<i>Senecio vulgaris</i>	old man in the Spring, common groundsel	No	-	-
<i>Silene gallica</i>	windmill pink, common catchfly	No	-	-
<i>Silybum marianum</i>	milk thistle	No	-	L
<i>Solanum americanum</i>	American black nightshade, small flowered nightshade	Yes	-	-
<i>Solanum douglasii</i>	Douglas' nightshade	Yes	-	-
<i>Solanum umbelliferum</i>	bluewitch, bluewitch nightshade	Yes	-	-
<i>Sonchus asper</i>	spiny sowthistle	No	-	-
<i>Sonchus oleraceus</i>	common sow thistle	No	-	-
<i>Spergularia rubra</i>	red sandspurry, purple sand spurry	No	-	-
<i>Stachys bullata</i>	California hedgenettle, wood mint	Yes	-	-
<i>Stephanomeria virgata</i>	tall stephanomeria, rod wirelettuce	Yes	-	-
<i>Tetragonia tetragonioides</i> (syn. <i>T. expansa</i> )	New Zealand spinach	No	-	-
<i>Toxicodendron diversilobum</i>	Pacific poison oak	Yes	-	-
<i>Trifolium</i> sp.	Clover	Undetermined <sup>2</sup>	-	-
<i>Urtica urens</i>	dwarf nettle, annual stinging nettle	No	-	-
<i>Vicia sativa</i>	spring vetch	No	-	-
<i>Vicia sativa</i> ssp. <i>nigra</i> (syn. <i>V. angustifolia</i> )	garden vetch, spring vetch	No	-	-

Table E-2. Terrestrial plant species observed at the Dune/Research Area. (Continued)

Scientific Name	Common Name	Native to CA?	CDFA Status	Cal-IPC Status
<i>Vicia villosa</i>	hairy vetch, woolly vetch	No	-	-
<i>Vinca major</i>	periwinkle	No	-	M
<i>Vulpia bromoides</i>	brome fescue	No	-	-
<i>Vulpia myuros</i>	rattail fescue	No	-	M

1 Most species of this genus found in CA are native

2 Some species of this genus are native and some are nonnative

† = For some areas of the Monterey Area Properties and the Dunes, Greening Associates (1999) reports observations of this species only in their 1993 survey effort.

‡ = Greening Associates (1999) reports that these species were likely eradicated at the time of their survey.

+ = Greening Associates (1999) notes that this species was planted at the Dunes during the restoration there.

\*Species were planted during 1990 restoration at Dune/Research Area. However, they have not been listed in recent surveys. .

Source: Cal-IPC 2006; CDFA 2010; Cowan 1995, 1996; GANDA 2011; Doak et al 1996, 2001, Kreiberg 1999; AgriChemical & Supply 2009; TDI 2010a, 2011; Greening & Associates 1999.

California Department of Food and Agriculture (CDFA 2010) Noxious Weed status:

List A - Weed species for which CDFA policies call for eradication, containment or entry refusal.

List B - Widespread species that are difficult to contain; CDFA allows county Agricultural Commissioners to decide whether to target them for eradication or containment in their jurisdictions.

List C - Weeds that are so widespread that CDFA does not endorse state or county-funded eradication or containment efforts except in nurseries or seed lots.

California Invasive Plant Council (Cal-IPC 2006) status:

High - Severe ecological impacts. Moderate to high dispersal rates. Widespread distribution.

Moderate - Substantial ecological impacts. Moderate to high dispersal rates. Limited to widespread distribution. Establishment depends on ecological disturbance.

Limited - Minor ecological impacts. Low to moderate dispersal rates. Limited distribution, but may be locally persistent and problematic.

Table E-3. Terrestrial plant species observed at the Point Sur Facility.

Scientific Name	Common Name	Native to CA?	CDFA Status	Cal-IPC Status
<i>Brodiaea sp.</i>	brodiaea	Yes	-	-
<i>Hesperocyparis macrocarpa</i> (syn. <i>Callitropsis macrocarpa</i> , <i>Cupressus macrocarpa</i> )	Monterey cypress	Yes	-	-
<i>Pennisetum clandestinum</i>	kikuyu grass	No	C	L

Source: Cal-IPC 2006; CDFA 2010; Cowan 1995, 1996; GANDA 2011; Doak et al 1996, 2001, Kreiberg 1999; AgriChemical & Supply 2009; TDI 2010a, 2011; Greening & Associates 1999.

California Department of Food and Agriculture (CDFA 2010) Noxious Weed status:

List A - Weed species for which CDFA policies call for eradication, containment or entry refusal.

List B - Widespread species that are difficult to contain; CDFA allows county Agricultural Commissioners to decide whether to target them for eradication or containment in their jurisdictions.

List C - Weeds that are so widespread that CDFA does not endorse state or county-funded eradication or containment efforts except in nurseries or seed lots.

California Invasive Plant Council (Cal-IPC 2006) status:

High - Severe ecological impacts. Moderate to high dispersal rates. Widespread distribution.

Moderate - Substantial ecological impacts. Moderate to high dispersal rates. Limited to widespread distribution. Establishment depends on ecological disturbance.

Limited - Minor ecological impacts. Low to moderate dispersal rates. Limited distribution, but may be locally persistent and problematic.

Table E-4. Terrestrial plant species observed at Naval Industrial Reserve Ordnance Plant Santa Cruz.

Scientific Name	Common Name	Native to CA?	CDFA Status	Cal-IPC Status
<i>Acer macrophyllum</i>	big leaf maple	Yes	-	-
<i>Achillea millefolium</i>	common yarrow	Yes	-	-
<i>Adenocaulon bicolor</i>	American trail plant	Yes	-	-
<i>Adenostoma fasciculatum</i>	chamise	Yes	-	-
<i>Adiantum jordanii</i>	California maidenhair	Yes	-	-
<i>Aesculus californica</i>	California buckeye	Yes	-	-
<i>Agoseris grandiflora</i>	California dandelion, bigflower agoseris	Yes	-	-
<i>Agrostis gigantea</i>	redtop	No	-	-
<i>Agrostis hallii</i>	Hall's bentgrass	Yes	-	-
<i>Agrostis hooveri</i>	Hoover's bentgrass	Yes	-	-
<i>Agrostis pallens</i>	seashore bentgrass	Yes	-	-
<i>Aira caryophyllea</i>	silver hairgrass	No	-	-
<i>Allophyllum gilliioides ssp. violaceum</i>	dense false gillyflower	Yes	-	-

Table E-4. Terrestrial plant species observed at Naval Industrial Reserve Ordnance Plant Santa Cruz. (Continued)

Scientific Name	Common Name	Native to CA?	CDFA Status	Cal-IPC Status
<i>Anagallis arvensis</i>	scarlet pimpernel, poor-man's weatherglass	No	-	-
<i>Anaphalis margaritacea</i>	pearly everlasting	Yes	-	-
<i>Anthriscus caucalis</i>	bur chervil	No	-	-
<i>Antirrhinum multiflorum</i>	chaparral snapdragon	Yes	-	-
<i>Arabis glabra</i>	towermustard rockcress	Yes	-	-
<i>Aralia californica</i>	elk clover	Yes	-	-
<i>Arbutus menziesii</i>	Pacific madrone	Yes	-	-
<i>Arctostaphylos andersonii</i>	Santa Cruz manzanita	Yes	-	-
<i>Arctostaphylos crustacea</i> ssp. <i>crinita</i> (syn. <i>A. tomentosa</i> ssp. <i>crinita</i> )	Santa Cruz Mtns manzanita, woollyleaf manzanita	Yes	-	-
<i>Arctostaphylos crustacea</i> ssp. <i>crustacea</i> (syn. <i>A. tomentosa</i> ssp. <i>crustacea</i> )	brittleleaf manzanita	Yes	-	-
<i>Artemisia</i> sp.	artemisia	Undetermined <sup>1</sup>	-	-
<i>Artemisia douglasiana</i>	Douglas' sagewort	Yes	-	-
<i>Baccharis pilularis</i> (syn. <i>Baccharis pilularis</i> ssp. <i>consanguinea</i> )	coyote brush	Yes	-	-
<i>Barbarea orthoceras</i>	American wintercress, American yellow rocket	Yes	-	-
<i>Briza maxima</i>	rattlesnake grass, big quaking grass	No	-	L
<i>Briza minor</i>	little quaking grass	No	-	-
<i>Brodiaea terrestris</i> ssp. <i>terrestris</i>	dwarf brodiaea	Yes	-	-
<i>Bromus carinatus</i>	California brome	Yes	-	-
<i>Bromus diandrus</i>	ripgut grass, ripgut brome	No	-	M
<i>Bromus hordeaceus</i>	soft chess, soft brome	No	-	L
<i>Bromus laevipes</i>	chinook brome	Yes	-	-
<i>Bromus madritensis</i> ssp. <i>rubens</i>	red brome	No	-	H
<i>Bromus tectorum</i>	cheatgrass	No	-	H
<i>Calamagrostis koelerioides</i>	fire reed grass	Yes	-	-
<i>Calamagrostis rubescens</i>	pinegrass	Yes	-	-
<i>Calochortus albus</i>	white globe lily, fairy lantern	Yes	-	-
<i>Calystegia occidentalis</i> (syn. <i>Convolvulus occidentalis</i> )	chaparral false bindweed, western morning glory	Yes	-	-
<i>Camissonia micrantha</i> **	small flowered evening primrose	Yes	-	-
<i>Camissonia strigulosa</i>	strigose sun cup, sandysoil suncup	Yes	-	-
<i>Cardamine oligosperma</i>	little western bittercress, Idaho bittercress	Yes	-	-
<i>Carduus pycnocephalus</i>	Italian thistle	No	C	M
<i>Carex bolanderi</i>	Bolander's sedge	Yes	-	-
<i>Carex buxbaumii</i>	Buxbaum's sedge	Yes	-	-
<i>Carex deweyana</i> ssp. <i>leptopoda</i>	Dewye's taper fruit sedge	Yes	-	-
<i>Carex globosa</i>	round fruit sedge	Yes	-	-
<i>Carex harfordii</i>	Harford's sedge	Yes	-	-
<i>Carex serratodens</i>	two tooth sedge	Yes	-	-
<i>Carex subfusca</i>	brown sedge, rusty slender sedge	Yes	-	-
<i>Carex</i> sp.	sedge	Undetermined <sup>1</sup>	-	-
<i>Castilleja densiflora</i>	dense flower Indian paintbrush, denseflower owl's clover		-	-
<i>Castilleja foliolosa</i>	woolly Indian paintbrush, Texas Indian paintbrush	Yes	-	-
<i>Ceanothus cuneatus</i>	buck brush	Yes	-	-
<i>Ceanothus incanus</i>	coast whitethorn	Yes	-	-
<i>Ceanothus oliganthus</i> var. <i>sorediatus</i>	jim brush	Yes	-	-
<i>Ceanothus papillosus</i>	wartleaf ceanothus	Yes	-	-
<i>Ceanothus thyrsiflorus</i>	blueblossom	Yes	-	-
<i>Centaurea melitensis</i>	toalote, Maltese starthistle	No	-	M



Table E-4. Terrestrial plant species observed at Naval Industrial Reserve Ordnance Plant Santa Cruz. (Continued)

Scientific Name	Common Name	Native to CA?	CDFA Status	Cal-IPC Status
<i>Cerastium glomeratum</i>	sticky chickweed	No	-	-
<i>Chlorogalum pomeridianum</i>	wavyleaf soap plant	Yes	-	-
<i>Chorizanthe diffusa</i>	diffuse spineflower	Yes	-	-
<i>Cirsium occidentale var. venustum</i>	cobwebby thistle, Venus thistle	Yes	-	-
<i>Cirsium vulgare</i>	bull thistle	No	-	M
<i>Clarkia purpurea ssp. quadrivulnera</i>	clarkia, purple godetia	Yes	-	-
<i>Claytonia perfoliata</i>	miner's lettuce	Yes	-	-
<i>Collomia heterophylla</i>	varied leaved collomia	Yes	-	-
<i>Convolvulus arvensis</i>	bindweed, orchard morning glory	No	C	-
<i>Corallorhiza maculata</i>	spotted coralroot	Yes	-	-
<i>Cordylanthus rigidus ssp. rigidus</i>	stiffbranch bird's beak	Yes	-	-
<i>Cortaderia jubata</i>	purple pampas grass	No	-	H
<i>Corylus cornuta var. californica</i>	California hazelnut	Yes	-	-
<i>Crassula connata</i>	sand pygmyweed	Yes	-	-
<i>Cryptantha cf. clevelandii</i>	Cleveland's cryptantha	Yes	-	-
<i>Cryptantha muricata</i>	prickly cryptantha	Yes	-	-
<i>Cupressus arizonica</i>	Arizona cypress	Yes	-	-
<i>Cupressus bakeri (syn. Callitropsis bakeri)</i>	Baker cypress, modoc cypress	Yes	-	-
<i>Cynoglossum grande</i>	Pacific hound's tongue	Yes	-	-
<i>Cynosurus cristatus</i>	crested dogtail grass	No	-	-
<i>Cynosurus echinatus</i>	hedgehog dogtail grass	No	-	M
<i>Cyperus eragrostis</i>	tall flatsedge	Yes	-	-
<i>Cyperus esculentus</i>	nut grass	Yes	B	-
<i>Dendromecon rigida</i>	bush poppy	Yes	-	-
<i>Deschampsia caespitosa</i>	tufted hair grass	Yes	-	-
<i>Deschampsia danthonioides</i>	annual hairgrass	Yes	-	-
<i>Dichelostemma capitatum</i>	bluedicks	Yes	-	-
<i>Disporum hookeri (syn. Prosartes hookeri)</i>	Hooker's disporum, drops of gold	Yes	-	-
<i>Dryopteris arguta</i>	coastal wood fern	Yes	-	-
<i>Elymus glaucus</i>	blue wildrye	Yes	-	-
<i>Epilobium ciliatum</i>	fringed willowherb	Yes	-	-
<i>Epipactis helleborine</i>	broadleaf helleborine	No	-	-
<i>Equisetum arvense</i>	field horsetail	Yes	-	-
<i>Eremocarpus setigerus (syn. Croton setigerus)</i>	Turkey mullein, doveweed	Yes	-	-
<i>Ericameria arborescens</i>	golden fleece	Yes	-	-
<i>Eriodictyon californicum</i>	California yerba santa	Yes	-	-
<i>Eriogonum sp.</i>		Yes	-	-
<i>Eriogonum nudum var. auriculatum</i>	naked buckwheat	Yes	-	-
<i>Eriophyllum confertiflorum</i>	golden-yarrow	Yes	-	-
<i>Erodium botrys</i>	broad leaf filaree, red stork's bill	No	-	-
<i>Erodium cicutarium</i>	redstem filaree	No	-	L
<i>Eschscholzia californica (syn. Eschscholzia californica var. maritima)</i>	California poppy	Yes	-	-
<i>Eucalyptus globulus</i>	Tasmanian blue gum	No	-	M
<i>Eucalyptus sp.</i>	eucalyptus	No	-	-
<i>Festuca arundinacea</i>	tall fescue	No	-	M
<i>Festuca elmeri</i>	Elmer fescue, coast fescue	Yes	-	-
<i>Festuca idahoensis</i>	Idaho fescue, blue bunchgrass	Yes	-	-
<i>Festuca occidentalis</i>	western fescue	Yes	-	-
<i>Filago gallica (syn. Logfia gallica, Oglifa gallica)</i>	narrowleaf cottonrose, filago	No	-	-
<i>Fragaria vesca</i>	woodland strawberry	Yes	-	-

Table E-4. Terrestrial plant species observed at Naval Industrial Reserve Ordnance Plant Santa Cruz. (Continued)

Scientific Name	Common Name	Native to CA?	CDFA Status	Cal-IPC Status
<i>Galium aparine</i>	stickywilly	Yes	-	-
<i>Galium californicum ssp. maritimum</i>	coastal California bedstraw	Yes	-	-
<i>Galium californicum ssp. californicum</i>	California bedstraw	Yes	-	-
<i>Galium nuttallii</i>	climbing bedstraw	Yes	-	-
<i>Galium porrigens</i>	graceful bedstraw	Yes	-	-
<i>Galium sp.</i>	bedstraw	Undetermined <sup>1</sup>	-	-
<i>Galium verum</i>	ladie's bedstraw, yellow string bedstraw	No	-	-
<i>Garrya elliptica</i>	silk tassel bush, wavyleaf silktassel	Yes	-	-
<i>Garrya fremontii</i>	bearbrush	Yes	-	-
<i>Gastridium ventricosum</i>	nitgrass	No	-	-
<i>Genista monspessulana</i>	French broom	No	C	H
<i>Geranium dissectum</i>	cutleaf geranium	No	-	M
<i>Gilia achilleifolia</i>	California gilia	Yes	-	-
<i>Gnaphalium californicum</i>	California everlasting, California cudweed	Yes	-	-
<i>Gnaphalium canescens ssp. beneolens</i>	Wright's cudweed	Yes	-	-
<i>Gnaphalium ramosissimum</i>	pink everlasting	Yes	-	-
<i>Heracleum lanatum (syn. H. maximum, H. sphondylium ssp. montanum, H. sphondylium var. lanatum)</i>	common cowparsnip	Yes	-	-
<i>Heterocodon rariflorum</i>	rareflower heterocodon	Yes	-	-
<i>Heteromeles arbutifolia</i>	toyon	Yes	-	-
<i>Heterotheca grandiflora</i>	telegraph weed	Yes	-	-
<i>Heterotheca sessiliflora ssp. bolanderi</i>	sessileflower false golden aster	Yes	-	-
<i>Heuchera micrantha</i>	crevice alumroot	Yes	-	-
<i>Hieracium albiflorum</i>	white hawkweed	Yes	-	-
<i>Holcus lanatus</i>	common velvet grass	No	-	M
<i>Hordeum murinum</i>	mouse barley	No	-	M
<i>Hordeum murinum ssp. leporinum</i>	hare barley	No	-	M
<i>Hypochoeris glabra</i>	smooth cat's ear	No	-	L
<i>Iris douglasiana</i>	Douglas' iris	Yes	C	-
<i>Iris macrosiphon</i>	bowtube iris	Yes	-	-
<i>Iris sp.</i>	iris	Undetermined <sup>1</sup>	-	-
<i>Juglans hindsii</i>	Northern California black walnut	Yes	-	-
<i>Juncus bufonius</i>	toad rush	Yes	-	-
<i>Juncus effusus</i>	common rush	Yes	-	-
<i>Juncus occidentalis</i>	Western rush	Yes	-	-
<i>Juncus patens</i>	spreading rush	Yes	-	-
<i>Juncus phaeocephalus</i>	brownhead rush	Yes	-	-
<i>Koeleria macrantha</i>	junegrass	Yes	-	-
<i>Lactuca saligna</i>	willowleaf lettuce	No	-	-
<i>Lathyrus vestitus</i>	Pacific pea	Yes	-	-
<i>Lepechinia calycina</i>	woodbalm, pitcher sage, white pitcher sage	Yes	-	-
<i>Lithocarpus densiflorus</i>	tanoak, tanbark oak	Yes	-	-
<i>Lolium multiflorum</i>	Italian ryegrass	No	-	M
<i>Lonicera sp.</i>	honeysuckle	Undetermined <sup>1</sup>	-	-
<i>Lonicera hispidula</i>	pink honeysuckle	Yes	-	-
<i>Lotus corniculatus</i>	broadleaf birdsfoot trefoil	No	-	-
<i>Lotus heermannii var. orbicularis (syn. L. eriophorus, L. heermannii var. eriophorus)</i>	hairy lotus, Heerman's bird's foot trefoil	Yes	-	-
<i>Lotus micranthus</i>	desert deervetch, small flowered lotus	Yes	-	-
<i>Lotus purshianus</i>	Spanish lotus	Yes	-	-
<i>Lotus scoparius</i>	deerweed, California broom	Yes	-	-

Table E-4. Terrestrial plant species observed at Naval Industrial Reserve Ordnance Plant Santa Cruz. (Continued)

Scientific Name	Common Name	Native to CA?	CDFA Status	Cal-IPC Status
<i>Lotus sp.</i>	lotus	Undetermined <sup>1</sup>	-	-
<i>Lotus strigosus</i>	strigose bird's-foot trefoil, Bishop's lotus	Yes	-	-
<i>Lupinus albilfrons</i>	silver lupine	Yes	-	-
<i>Lupinus arboreus</i>	yellow bush lupine	Yes	-	L
<i>Lupinus bicolor</i>	miniature lupine	Yes	-	-
<i>Lupinus hirsutissimus</i>	stinging lupine	Yes	-	-
<i>Lupinus nanus</i>	sky lupine	Yes	-	-
<i>Madia gracilis</i>	grassy tarweed, slender tarweed	Yes	-	-
<i>Madia madioides</i>	woodland madia	Yes	-	-
<i>Marah fabaceus</i>	California manroot, wild cucumber	Yes	-	-
<i>Melica torreyana</i>	Torrey's melicgrass	Yes	-	-
<i>Microseris bigelovii</i>	coast microseris	Yes	-	-
<i>Mimulus aurantiacus</i>	sticky monkeyflower	Yes	-	-
<i>Mimulus cardinalis</i>	scarlet monkeyflower	Yes	-	-
<i>Mimulus guttatus</i>	seep monkey flower, common yellow monkeyflower	Yes	-	-
<i>Mimulus pilosus</i>	false monkeyflower	Yes	-	-
<i>Moenchia erecta</i>	upright chickweed	No	-	-
<i>Monardella villosa ssp. franciscana</i>	San Francisco coyote mint	Yes	-	-
<i>Navarretia atractyloides</i>	hollyleaf pincushionplant	Yes	-	-
<i>Navarretia mellita</i>	skunk navarretia, honeyscented pincushionplant	Yes	-	-
<i>Navarretia squarrosa</i>	skunkbush	Yes	-	-
<i>Nemophila parviflora</i>	smallflower nemophila	Yes	-	-
<i>Orobanche fasciculata</i>	clustered broomrape	Yes	-	-
<i>Osmorhiza berteroi (syn. O. chilensis)</i>	sweet cicely	Yes	-	-
<i>Oxalis sp.</i>	oxalis	Undetermined <sup>2</sup>	-	-
<i>Panicum acuminatum var. acuminatum</i>	Pacific panic grass	Yes	-	-
<i>Pellaea andromedifolia</i>	coffee cliffbrake	Yes	-	-
<i>Pentagramma triangularis</i>	gold back fern	Yes	-	-
<i>Phacelia imbricata</i>	imbricate phacelia	Yes	-	-
<i>Phalaris aquatica (syn. P. tuberosa)</i>	harding grass	No	-	M
<i>Phalaris minor</i>	littleseed canarygrass	No	-	-
<i>Pickeringia montana var. montana</i>	chaparral pea	Yes	-	-
<i>Pinus attenuata</i>	knobcone pine	Yes	-	-
<i>Pinus radiata</i>	Monterey pine	Yes	-	-
<i>Piperia candida</i>	white-flowered rein orchid, peral orchid	Yes	-	-
<i>Piperia unalascensis</i>	Alaska rein orchid	Yes	-	-
<i>Piperia sp.</i>		Yes	-	-
<i>Poa secunda</i>	bluegrass	Yes	-	-
<i>Polygala californica</i>	California milkwort	Yes	-	-
<i>Polypodium californicum</i>	California polypody	Yes	-	-
<i>Polypogon maritimus</i>	Mediterranean rabbit's footgrass	No	-	-
<i>Polypogon monspeliensis</i>	annual beard grass, rabbits foot grass	No	-	L
<i>Polystichum munitum</i>	western swordfern	Yes	-	-
<i>Prunus emarginata</i>	bitter cherry	Yes	-	-
<i>Pseudotsuga menziesii</i>	Douglas fir	Yes	-	-
<i>Pteridium aquilinum var. pubescens</i>	western brackenfern	Yes	-	-
<i>Pterostegia drymarioides</i>	woodland pterostegia	Yes	-	-
<i>Pyrola picta</i>	white-veined wintergreen	Yes	-	-
<i>Quercus agrifolia</i>	California live oak, coast live oak	Yes	-	-
<i>Quercus berberidifolia</i>	scrub oak	Yes	-	-
<i>Quercus chrysolepis</i>	canyon live oak	Yes	-	-

Table E-4. Terrestrial plant species observed at Naval Industrial Reserve Ordnance Plant Santa Cruz. (Continued)

Scientific Name	Common Name	Native to CA?	CDFA Status	Cal-IPC Status
<i>Rhamnus californica</i>	California coffeeberry	Yes	-	-
<i>Rhododendron macrophyllum</i> (syn. <i>R. californicum</i> )	California rosebay	Yes	-	-
<i>Rhododendron occidentale</i>	western azalea	Yes	-	-
<i>Rosa gymnocarpa</i>	dwarf rose, wood rose	Yes	-	-
<i>Rubus parviflorus</i>	western thimbleberry	Yes	-	-
<i>Rubus ursinus</i>	California blackberry	Yes	-	-
<i>Rumex acetosella</i>	sheep sorrel	No	-	M
<i>Rupertia physodes</i>	forest scurfpea, California tea	Yes	-	-
<i>Salix lucida</i> ssp. <i>lasiandra</i>	shining willow	Yes	-	-
<i>Sambucus mexicana</i> (syn. <i>S. nigra</i> ssp. <i>caerulea</i> , <i>S. nigra</i> ssp. <i>cerulea</i> )	blue elderberry	Yes	-	-
<i>Sanicula crassicaulis</i>	Pacific black snakeroot	Yes	-	-
<i>Satureja douglasii</i>	yerba buena	Yes	-	-
<i>Scrophularia californica</i>	California figwort	Yes	-	-
<i>Scutellaria tuberosa</i>	common skullcap	Yes	-	-
<i>Senecio vulgaris</i>	old-man-in-the-spring, common groundsel	No	-	-
<i>Sequoia sempervirens</i>	redwood	Yes	-	-
<i>Sherardia arvensis</i>	blue fieldmadder	No	-	-
<i>Silene gallica</i>	common catchfly, windmill pink	No	-	-
<i>Sisyrinchium bellum</i>	blue-eyed grass	Yes	-	-
<i>Solanum umbelliferum</i>	bluewitch nightshade	Yes	-	-
<i>Solidago canadensis</i>	Canada goldenrod	Yes	-	-
<i>Sonchus asper</i>	spiny sowthistle	No	-	-
<i>Stachys ajugoides</i>	bugle hedgenettle	Yes	-	-
<i>Stachys bullata</i>	California hedgenettle	Yes	-	-
<i>Stephanomeria virgata</i>	rod wirelettuce	Yes	-	-
<i>Symphoricarpos albus</i> var. <i>laevigatus</i>	snowberry	Yes	-	-
<i>Thermopsis macrophylla</i> (syn. <i>T. macrophylla</i> var. <i>macrophylla</i> )	Santa Ynez false-lupine	Yes	-	-
<i>Torilis arvensis</i>	spreading hedgeparsley	No	-	M-ALERT
<i>Toxicodendron diversilobum</i>	Pacific poison oak	Yes	-	-
<i>Trichostema lanatum</i>	woolly bluecurls	Yes	-	-
<i>Trifolium</i> sp.	clover	Undetermined <sup>1</sup>	-	-
<i>Trifolium barbigerum</i> var. <i>andrewsii</i>	bearded clover	Yes	-	-
<i>Trifolium ciliolatum</i>	foothill clover, tree clover	Yes	-	-
<i>Trifolium depauperatum</i>	cowbag clover, dwarf sack clover	Yes	-	-
<i>Trifolium gracilentum</i>	pinpoint clover	Yes	-	-
<i>Trifolium hirtum</i>	rose clover	No	-	M
<i>Trifolium microcephalum</i>	maiden clover, smallheaded clover	Yes	-	-
<i>Trifolium willdenovii</i>	tomcat clover	Yes	-	-
<i>Triphysaria pusilla</i>	dwarf owl's-clover	Yes	-	-
<i>Uropappus lindleyi</i>	silver puffs	Yes	-	-
<i>Verbascum bombyciferum</i> ***	silver mullein	Undetermined	-	-
<i>Verbascum thapsus</i>	common mullein	No	-	L
<i>Vicia</i> sp.	vetch	Undetermined <sup>2</sup>	-	-
<i>Viola ocellata</i>	western heart's ease	Yes	-	-
<i>Viola sempervirens</i>	evergreen violet	Yes	-	-
<i>Vulpia myuros</i>	rattail fescue	No	-	M
<i>Whipplea modesta</i>	whipplea, yerba de selva	Yes	-	-
<i>Woodwardia fimbriata</i>	giant chain fern	Yes	-	-

Table E-4. Terrestrial plant species observed at Naval Industrial Reserve Ordnance Plant Santa Cruz. (Continued)

Scientific Name	Common Name	Native to CA?	CDFA Status	Cal-IPC Status
<i>Wyethia glabra</i>	shining mule ears	Yes	-	-
<i>Zigadenus fremontii</i>	Fremont's deathcamas, chaparral zygodene	Yes	-	-

1 Most species of this genus found in CA are native

2 Some species of this genus are native and some are nonnative

\*Species were planted during 1990 restoration at Dune/Research Area. However, they have not been listed in recent surveys.

\*\*Species originally recorded as *Chamissonis micranthus* in the 1996 NIROP INRMP.

\*\*\*Species being added to the Jepson Manual 2nd Edition. Does not currently appear in Jepson Manual 1st Edition.

Source: Cal-IPC 2006; CDFA 2010; Cowan 1995, 1996; GANDA 2011; Doak et al. 1996, 2001, Kreiberg 1999; AgriChemical & Supply 2009; TDI 2010a, 2011; Greening & Associates 1999.

California Department of Food and Agriculture (CDFA 2010) Noxious Weed status:

List A - Weed species for which CDFA policies call for eradication, containment or entry refusal.

List B - Widespread species that are difficult to contain; CDFA allows county Agricultural Commissioners to decide whether to target them for eradication or containment in their jurisdictions.

List C - Weeds that are so widespread that CDFA does not endorse state or county-funded eradication or containment efforts except in nurseries or seed lots.

California Invasive Plant Council (Cal-IPC 2006) status:

High - Severe ecological impacts. Moderate to high dispersal rates. Widespread distribution.

Moderate - Substantial ecological impacts. Moderate to high dispersal rates. Limited to widespread distribution. Establishment depends on ecological disturbance.

Limited - Minor ecological impacts. Low to moderate dispersal rates. Limited distribution, but may be locally persistent and problematic.

## E.2 Terrestrial and Freshwater Invertebrates

Table E-5. Terrestrial invertebrates observed at the Dune/Research Area and Naval Industrial Reserve Ordnance Plant Santa Cruz.

Dune/Research Area	NIROP Santa Cruz
dune beetle ( <i>Coelus ciliatus</i> )	<b>ORDER</b>
Monarch butterfly ( <i>Danaus plexippus</i> )	Acari
Smith's blue butterfly ( <i>Euphilotes enoptes smithi</i> )	Arachnida
Tilden's blue butterfly ( <i>Euphilotes enoptes tildeni</i> )	Araneae
<b>ORDER</b>	Coleoptera
Acari	Collembola
Amphipoda	Dermaptera
Araneae	Diptera
Coleoptera	Geophilomorpha
Collembola	Hemiptera
Dermaptera	Homoptera
Diplura	Hymenoptera
Diptera	Isoptera
Geophilomorpha	Lepidoptera
Hemiptera	Lithobiomorpha
Homoptera	Microcoryphia
Hymenoptera	Neuroptera
Isopoda	Opiliones
Lepidoptera	Orthoptera
Lithobiomorpha	Phasmida
Microcoryphia	Psocoptera
Neuroptera	Scorpiones
Orthoptera	Thysanoptera
Scolopendromorpha	-
Thripidae	-
Thysanoptera	-
Thysanura	-

Source: Navy 2001, GANDA 2011.

Table E-6. Freshwater aquatic invertebrates observed at the Main Grounds (Del Monte Lake and Sedimentation Basin) and the Dune/Research Area.

Scientific Name	Common Name	Del Monte Lake	Sedimentation Basin	Dune/ Research Area
<b>Order</b>				
Amphipoda	scuds	X	X	X
Coleoptera	beetles	X	X	X
Decapoda	crayfish	X		X
Diptera	midges	X		X
Class: Gastropoda	snails	X		
Hemiptera	water boatmen, backswimmers	X	X	X
Odonata	damselflies	X		X

Source: GANDA 2011.

## E.3 Reptiles and Amphibians

There are no federal/state listed reptile or amphibian species that have been observed at NSA Monterey.

Table E-7. Reptile and amphibian species observed at the Monterey Area Properties.

Common Name	Scientific Name	MG	LMV	Lab/Rec	Annex	Status
<b>Reptiles</b>						
coast garter snake	<i>Thamnophis elegans terrestris</i>	X				-
<b>Amphibians</b>						
arboreal salamander	<i>Aneides lugubris</i>		X			-
California newt, coast range newt	<i>Taricha torosa torosa</i>	X				SSC-Monterey Co. south only
Gabilan Mountains slender salamander*	<i>Batrachoseps gavilanensis</i>	X	X	X		CA endemic
Monterey ensatina, yellow-eyed salamander	<i>Ensatina eschscholtzii eschscholtzii</i>		X			-
Pacific treefrog	<i>Pseudacris regilla</i>	X		X		-

\*The 2001 NPS INRMP listed the presence of the Pacific slender salamander (*Batrachoseps pacificus*) at the Dune Research Area. In fact, the scientific name corresponds to the Channel Islands slender salamander, whose range does not include Monterey Bay. In February 2010, GANDA Associates confirmed the presence of the Gabilan Mountains slender salamander (*Batrachoseps gavilanensis*) at both the Main Grounds and La Mesa Village. Given the presence of the Gabilan Mtns. slender salamander, it is most likely that the salamander listed in the 2001 NPS INRMP should be *Batrachoseps gavilanensis*. Another possible identification is the Santa Lucia Mountains slender salamander (*Batrachoseps luciae*), which also occurs in the area.

MG = Main Grounds; LMV = La Mesa Village; Lab/Rec = Laboratory/Recreation Area; Annex = Annex Area.

Sources: CDFG 2008; USFWS 2008; CNDDDB 2009; GANDA 2011; Doak et al 1996, 2001; Kreiberg 1999; AgriChemical & Supply 2009.

Codes

FT = Federally Threatened; SSC = California Species of Special Concern (CNDDDB 2009)

Table E-8. Reptile and amphibian species observed at the Dune/Research Area.

Common Name	Scientific Name	Status
<b>Reptiles</b>		
California alligator lizard	<i>Elgaria multicarinata multicarinata</i>	-
California legless lizard	<i>Anniella pulchra</i>	SSC
San Francisco alligator lizard	<i>Elgaria coerulea coerulea</i>	-
western fence lizard	<i>Sceloporus occidentalis biseriatus</i>	-
<b>Amphibians</b>		
Gabilan Mountains slender salamander*	<i>Batrachoseps gavilanensis</i>	CA endemic
Monterey ensatina, yellow-eyed salamander	<i>Ensatina eschscholtzii eschscholtzii</i>	-
Pacific treefrog	<i>Pseudacris regilla</i>	-

\*The 2001 NPS INRMP listed the presence of the Pacific slender salamander (*Batrachoseps pacificus*) at the Dune Research Area. In fact, the scientific name corresponds to the Channel Islands slender salamander, whose range does not include Monterey Bay. In February 2010, GANDA Associates confirmed the presence of the Gabilan Mountains slender salamander (*Batrachoseps gavilanensis*) at both the Main Grounds and La Mesa Village. Given the presence of the Gabilan Mtns. slender salamander, it is most likely that the salamander listed in the 2001 NPS INRMP should be *Batrachoseps gavilanensis*. Another possible identification is the Santa Lucia Mountains slender salamander (*Batrachoseps luciae*), which also occurs in the area.

Sources: CDFG 2008; USFWS 2008; CNDDDB 2009; GANDA 2011; Doak et al. 1996, 2001; Kreiberg 1999; AgriChemical & Supply 2009.

Codes

FT = Federally Threatened; SSC = California Species of Special Concern (CNDDDB 2009)

Table E-9. Reptile and amphibian species observed at Naval Industrial Reserve Ordnance Plant Santa Cruz.

Common Name	Scientific Name	Status
<b>Reptiles</b>		
California alligator lizard	<i>Elgaria multicarinata multicarinata</i>	-
coast garter snake	<i>Thamnophis elegans terrestris</i>	-
Northern Pacific rattlesnake*	<i>Crotalus oreganus oreganus</i>	-
northwestern fence lizard	<i>Sceloporus occidentalis occidentalis</i>	-
Pacific gopher snake	<i>Pituophis catenifer catenifer</i>	-
pine snake	<i>Pituophis melanoleucus</i>	-
San Francisco alligator lizard	<i>Elgaria coerulea coerulea</i>	-
sharp-tailed snake	<i>Contia tenuis</i>	-
Skilton's skink, western skink	<i>Eumeces skiltonianus skiltonianus</i>	-
western fence lizard	<i>Sceloporus occidentalis</i>	-
western yellow-bellied racer	<i>Coluber constrictor mormon</i>	-
<b>Amphibians</b>		
bullfrog	<i>Lithobates catesbeianus</i>	-
California newt, coast range newt	<i>Taricha torosa torosa</i>	SSC - Monterey Co. south only
California slender salamander	<i>Batrachoseps attenuatus</i>	-
Monterey ensatina, yellow-eyed salamander	<i>Ensatina eschscholtzii eschscholtzii</i>	-
Pacific treefrog	<i>Pseudacris regilla</i>	-
rough-skinned newt	<i>Taricha granulosa</i>	-

\*The 2001 NPS INRMP identified the northern Pacific rattlesnake as *Crotalus viridis oreganus*. As a result of a name change, it is now identified as *Crotalus oreganus oreganus*. The INRMP also identified the presence of the Pacific rattlesnake (*Crotalis viridis*). Given the location, it is believed to be the same species as *Crotalus oreganus oreganus*.

Sources: CDFG 2008; USFWS 2008; CNDDDB 2009; GANDA 2011; Doak et al 1996, 2001; Kreiberg 1999; AgriChemical & Supply 2009.

Codes

FT = Federally Threatened; SSC = California Species of Special Concern (CNDDDB 2009)

Table E-10. Reptile and amphibian species observed at the Point Sur Facility.

Common Name	Scientific Name	Status
bullfrog	<i>Lithobates catesbeianus</i>	-
California red-legged frog	<i>Rana draytonii</i>	Federally threatened, SSC
Pacific treefrog	<i>Pseudacris regilla</i>	-

Sources: CDFG 2008; USFWS 2008; CNDDDB 2009; GANDA 2011; Doak et al 1996, 2001; Kreiberg 1999; AgriChemical & Supply 2009.

## E.4 Birds

There are no federal/state listed bird species that have been observed at NSA Monterey.

Table E-11. Bird species observed at the Monterey Area Properties.

Common Name (Scientific Name)	MG	LMV	Lab/Rec Annex	Status	NSA Monterey Affiliation
acorn woodpecker ( <i>Melanerpes formicivorus</i> )	X	X	X		Year-round
American coot ( <i>Fulica americana</i> )	X		X		Year-round
American crow ( <i>Corvus brachyrhynchos</i> )	X	X	X		Year-round
American robin ( <i>Turdus migratorius</i> )		X	X		Year-round
Anna's hummingbird ( <i>Calypte anna</i> )	X	X	X		Year-round
barn swallow ( <i>Hirundo rustica</i> )			X		Summer
barn owl ( <i>Tyto alba</i> )	X				Year-round
black phoebe ( <i>Sayornis nigricans</i> )	X	X	X		Year-round
black-crowned night-heron ( <i>Nycticorax nycticorax</i> )	X				Year-round
brown creeper ( <i>Certhia americana</i> )	X	X	X		Year-round
brown pelican ( <i>Pelecanus occidentalis</i> )				CFP, DL*	Year-round
bush-tit ( <i>Psaltriparus minimus</i> )	X				Year-round
California gull ( <i>Larus californicus</i> )					Winter
California quail ( <i>Callipepla californica</i> )		X			Year-round
California towhee ( <i>Melospiza crissalis</i> )	X	X			Year-round
Canada goose ( <i>Branta canadensis</i> )	X		X		Winter
cedar waxwing ( <i>Bombycilla cedrorum</i> )	X	X			Winter
chestnut-backed chickadee ( <i>Poecile rufescens</i> )	X				Year-round
cliff swallow ( <i>Petrochelidon pyrrhonota</i> )				Undetermined	Summer
common peafowl ( <i>Pavo cristatus</i> )	X				Year-round; non-native
common raven ( <i>Corvus corax</i> )	X	X			Year-round
dark-eyed junco ( <i>Junco hyemalis</i> )	X	X	X		Year-round
domestic goose ( <i>Anser anser domesticus</i> )	X				Year-round
double-crested cormorant ( <i>Phalacrocorax auritus</i> )	X				Year-round - winter nesting at Del Monte Lake
Eurasian collared-dove ( <i>Streptopelia decaocto</i> )		X			Year-round
European starling ( <i>Sturnus vulgaris</i> )	X		X		Year-round
golden-crowned sparrow ( <i>Zonotrichia atricapilla</i> )	X	X	X		Winter
great blue heron ( <i>Ardea herodias</i> )	X				Year-round
great horned owl ( <i>Bubo virginianus</i> )	X	X			Year-round - possible nesting in Monterey pine in La Mesa Village
hairy woodpecker ( <i>Picoides villosus</i> )					Year-round
Heermann's gull ( <i>Larus heermanni</i> )					Winter



Table E-11. Bird species observed at the Monterey Area Properties.

Common Name (Scientific Name)	MG	LMV	Lab/Rec	Annex	Status	NSA Monterey Affiliation
house finch ( <i>Carpodacus mexicanus</i> )	X	X	X			Year-round
house sparrow ( <i>Passer domesticus</i> )	X					Year-round
Hutton's vireo ( <i>Vireo huttoni</i> )						Year-round
killdeer ( <i>Charadrius vociferus</i> )	X		X			Year-round
lesser goldfinch ( <i>Spinus psaltria</i> )		X				Year-round
mallard ( <i>Anas platyrhynchos</i> )	X		X			Year-round
merlin ( <i>Falco columbarius</i> )						Winter
mountain quail ( <i>Oreortyx pictus</i> )	X					Year-round
mourning dove ( <i>Zenaidura macroura</i> )	X	X				Year-round
northern flicker ( <i>Colaptes auratus</i> )		X				Year-round
northern mockingbird ( <i>Mimus polyglottos</i> )						Year-round
nuthatch sp. ( <i>Sitta</i> sp.)	X					
Nuttall's woodpecker ( <i>Picoides nuttallii</i> )		X			BCC	Year-round
oak titmouse ( <i>Baeolophus inornatus</i> )	X	X			BCC	Year-round
orange-crowned warbler ( <i>Oreothlypis celata</i> )						Year-round
osprey ( <i>Pandion haliaetus</i> )						Winter
Pacific loon ( <i>Gavia pacifica</i> )						Winter
Pacific-slope flycatcher ( <i>Empidonax difficilis</i> )	X	X				Summer
pie-billed grebe ( <i>Podilymbus podiceps</i> )						Year-round
red-shouldered hawk ( <i>Buteo lineatus</i> )	X	X	X			Year-round
red-tailed hawk ( <i>Buteo jamaicensis</i> )		X				Year-round
red-winged blackbird ( <i>Agelaius phoeniceus</i> )	X					Year-round
rock pigeon ( <i>Columba livia</i> )	X	X				Year-round
ruby-crowned kinglet ( <i>Regulus calendula</i> )	X		X			Winter
ruddy duck ( <i>Oxyura jamaicensis</i> )	X					Year-round
song sparrow ( <i>Melospiza melodia</i> )		X				Year-round
spotted towhee ( <i>Pipilo maculatus</i> )	X	X				Year-round
scurf scoter ( <i>Melanitta perspicillata</i> )						Winter
Townsend's warbler ( <i>Dendroica townsendi</i> )	X					Winter
tree swallow ( <i>Tachycineta bicolor</i> )	X	X	X			Summer
turkey vulture ( <i>Cathartes aura</i> )	X					Year-round
western grebe ( <i>Aechmophorus occidentalis</i> )						Year-round
western gull ( <i>Larus occidentalis</i> )	X		X			Year-round
western scrub-jay ( <i>Aphelocoma californica</i> )	X	X	X			Year-round
white-breasted nuthatch ( <i>Sitta carolinensis</i> )	X	X				Year-round
white-crowned sparrow ( <i>Zonotrichia leucophrys</i> )		X				Year-round
white-throated swift ( <i>Aeronautes saxatalis</i> )						Year-round
yellow-rumped warbler ( <i>Dendroica coronata</i> )	X	X				Year-round

\*The California brown pelican (*Pelecanus occidentalis californicus*) was delisted from the Federal endangered list on December 17, 2009 and from the State endangered list on June 3, 2009.

Sources: CDFG 2008, 2010; USFWS 2008, CNDDDB 2010; GANDA 2011; Doak et al 1996, 2001; Kreiberg 1999; AgriChemical & Supply 2009.

MG = Main Grounds; LMV = La Mesa Village; Lab/Rec = Laboratory/Recreation Area; Annex = Annex Area; Dunes = Dune/Research Area.

Codes

BCC = Birds of Conservation Concern (USFWS 2008)

CFP = California Fully Protected (CDFG 2010)

DL = Delisted (CDFG 2010)

Table E-12. Bird species observed at the Dune/Research Area.

Common Name (Scientific Name)	Status	NSA Monterey Affiliation
American crow ( <i>Corvus brachyrhynchos</i> )		Year-round
Anna's hummingbird ( <i>Calypte anna</i> )		Year-round
black phoebe ( <i>Sayornis nigricans</i> )		Year-round
brown pelican ( <i>Pelecanus occidentalis</i> )	CFP, DL*	Year-round
bush-tit ( <i>Psaltriparus minimus</i> )		Year-round
California gull ( <i>Larus californicus</i> )		Winter
California towhee ( <i>Melospiza crissalis</i> )		Year-round
cliff swallow ( <i>Petrochelidon pyrrhonota</i> )		Summer
common raven ( <i>Corvus corax</i> )		Year-round
dark-eyed junco ( <i>Junco hyemalis</i> )		Year-round
double-crested cormorant ( <i>Phalacrocorax auritus</i> )		Year-round - winter nesting at Del Monte Lake
European starling ( <i>Sturnus vulgaris</i> )		Year-round
golden-crowned sparrow ( <i>Zonotrichia atricapilla</i> )		Winter
great blue heron ( <i>Ardea herodias</i> )		Year-round
hairy woodpecker ( <i>Picoides villosus</i> )		Year-round
Heermann's gull ( <i>Larus heermanni</i> )		Winter
house finch ( <i>Carpodacus mexicanus</i> )		Year-round
Hutton's vireo ( <i>Vireo huttoni</i> )		Year-round
lesser goldfinch ( <i>Spinus psaltria</i> )		Year-round
merlin ( <i>Falco columbarius</i> )		Winter
northern flicker ( <i>Colaptes auratus</i> )		Year-round
northern mockingbird ( <i>Mimus polyglottos</i> )		Year-round
orange-crowned warbler ( <i>Oreothlypis celata</i> )		Year-round
osprey ( <i>Pandion haliaetus</i> )		Winter
Pacific loon ( <i>Gavia pacifica</i> )		Winter
pie-billed grebe ( <i>Podilymbus podiceps</i> )		Year-round
red-shouldered hawk ( <i>Buteo lineatus</i> )		Year-round
rock pigeon ( <i>Columba livia</i> )		Year-round
song sparrow ( <i>Melospiza melodia</i> )		Year-round
spotted towhee ( <i>Pipilo maculatus</i> )		Year-round
scurf scoter ( <i>Melanitta perspicillata</i> )		Winter
turkey vulture ( <i>Cathartes aura</i> )		Year-round
western grebe ( <i>Aechmophorus occidentalis</i> )		Year-round
western gull ( <i>Larus occidentalis</i> )		Year-round
western scrub-jay ( <i>Aphelocoma californica</i> )		Year-round
white-crowned sparrow ( <i>Zonotrichia leucophrys</i> )		Year-round

\*The California brown pelican (*Pelecanus occidentalis californicus*) was delisted from the Federal endangered list on December 17, 2009 and from the State endangered list on June 3, 2009.

Sources: CDFG 2008, 2010; USFWS 2008; CNDDDB 2010; GANDA 2011; Doak et al 1996, 2001; Kreiberg 1999; AgriChemical & Supply 2009.

Codes

CFP = California Fully Protected (CDFG 2010)

DL = Delisted (CDFG 2010)

Table E-13. Bird species observed at the Point Sur Facility.

Common Name (Scientific Name)	Status	NSA Monterey Affiliation
barn owl ( <i>Tyto alba</i> )		Year-round
barn swallow ( <i>Hirundo rustica</i> )		Summer
Brewer's blackbird ( <i>Euphagus cyanocephalus</i> )		Year-round
brown pelican ( <i>Pelecanus occidentalis</i> )	CFP, DL*	Year-round
chipping sparrow ( <i>Spizella passerina</i> )		Summer
purple finch ( <i>Carpodacus purpureus</i> )		Year-round
red-tailed hawk ( <i>Buteo jamaicensis</i> )		Year-round
turkey vulture ( <i>Cathartes aura</i> )		Year-round

\*The California brown pelican (*Pelecanus occidentalis californicus*) was delisted from the Federal endangered list on December 17, 2009 and from the State endangered list on June 3, 2009.

Sources: CDFG 2008, 2010; USFWS 2008; CNDDDB 2010; GANDA 2011; Doak et al 1996, 2001; Kreiberg 1999; AgriChemical & Supply 2009.

Codes

CFP = California Fully Protected (CDFG 2010)

DL = Delisted (CDFG 2010)

Table E-14. Bird species observed at Naval Industrial Reserve Ordnance Plant Santa Cruz.

Common Name (Scientific Name)	Status	NSA Monterey Affiliation
acorn woodpecker ( <i>Melanerpes formicivorus</i> )		Year-round
American kestrel ( <i>Falco sparverius</i> )		Year-round
American robin ( <i>Turdus migratorius</i> )		Year-round
Anna's hummingbird ( <i>Calypte anna</i> )		Year-round
ash-throated flycatcher ( <i>Myiarchus cinerascens</i> )		Summer
band-tailed pigeon ( <i>Patagioenas fasciata</i> )		Year-round
Bewick's wren ( <i>Thryomanes bewickii</i> )		Year-round
black-headed grosbeak ( <i>Pheucticus melanocephalus</i> )		Summer
black-throated gray warbler ( <i>Dendroica nigrescens</i> )		Summer
Brewer's blackbird ( <i>Euphagus cyanocephalus</i> )		Year-round
brown creeper ( <i>Certhia americana</i> )		Year-round
bush-tit ( <i>Psaltriparus minimus</i> )		Year-round
California quail ( <i>Callipepla californica</i> )		Year-round
California towhee ( <i>Melospiza crissalis</i> )		Year-round
Cassin's vireo ( <i>Vireo cassinii</i> )**		Summer
cedar waxwing ( <i>Bombycilla cedrorum</i> )		Winter
chestnut-backed chickadee ( <i>Poecile rufescens</i> )		Year-round
common raven ( <i>Corvus corax</i> )		Year-round
Cooper's hawk ( <i>Accipiter cooperii</i> )		Year-round
dark-eyed junco ( <i>Junco hyemalis</i> )		Year-round
downy woodpecker ( <i>Picoides pubescens</i> )		Year-round
European starling ( <i>Sturnus vulgaris</i> )		Year-round
golden-crowned sparrow ( <i>Zonotrichia atricapilla</i> )		Winter
great blue heron ( <i>Ardea herodias</i> )		Year-round
great horned owl ( <i>Bubo virginianus</i> )		Year-round
hairy woodpecker ( <i>Picoides villosus</i> )		Year-round
horned lark ( <i>Eremophila alpestris</i> )		Year-round
house finch ( <i>Carpodacus mexicanus</i> )		Year-round
Hutton's vireo ( <i>Vireo huttoni</i> )		Year-round
lesser goldfinch ( <i>Spinus psaltria</i> )		Year-round
mourning dove ( <i>Zenaidura macroura</i> )		Year-round
northern flicker ( <i>Colaptes auratus</i> )		Year-round
orange-crowned warbler ( <i>Oreothlypis celata</i> )		Year-round

Table E-14. Bird species observed at Naval Industrial Reserve Ordnance Plant Santa Cruz.

Common Name (Scientific Name)	Status	NSA Monterey Affiliation
Pacific-slope flycatcher ( <i>Empidonax difficilis</i> )		Summer
purple finch ( <i>Carpodacus purpureus</i> )		Year-round
red-breasted nuthatch ( <i>Sitta canadensis</i> )		Winter
red-shouldered hawk ( <i>Buteo lineatus</i> )		Year-round
red-tailed hawk ( <i>Buteo jamaicensis</i> )		Year-round
ruby-crowned kinglet ( <i>Regulus calendula</i> )		Winter
sharp-shinned hawk ( <i>Accipiter striatus</i> )		Winter
short-eared owl ( <i>Asio flammeus</i> )	BSSC	Winter
song sparrow ( <i>Melospiza melodia</i> )		Year-round
spotted towhee ( <i>Pipilo maculatus</i> )***		Year-round
Steller's jay ( <i>Cyanocitta stelleri</i> )		Year-round
Townsend's warbler ( <i>Dendroica townsendi</i> )		Winter
turkey vulture ( <i>Cathartes aura</i> )		Year-round
varied thrush ( <i>Ixoreus naevius</i> )		Winter
warbling vireo ( <i>Vireo gilvus</i> )		Summer
western screech-owl ( <i>Megascops kennicottii</i> )		Year-round
western scrub-jay ( <i>Aphelocoma californica</i> )		Year-round
Wilson's warbler ( <i>Wilsonia pusilla</i> )		Summer
wrenit ( <i>Chamaea fasciata</i> )		Year-round
yellow warbler ( <i>Dendroica petechia</i> )	BSSC	Summer

\*\*This species was originally identified in the 1996 Santa Cruz NIROP INRMP as solitary vireo (*Vireo solitarius*). Since then, this species has been split. Given the location, the most likely present identification is Cassin's vireo (*Vireo cassinii*).

\*\*\*This species was originally identified in the 1996 Santa Cruz NIROP INRMP as rufous-sided towhee (*Pipilo erythrophthalmus*). Since then, this species has been split. Given the location, the most likely present identification is spotted towhee (*Pipilo maculatus*).

Sources: CDFG 2008, 2010; USFWS 2008; CNDDDB 2010; GANDA 2011; Doak et al 1996, 2001; Kreiberg 1999; AgriChemical & Supply 2009.

Codes

BSSC = California Bird Species of Special Concern (CDFG 2008)

Table E-15. Bird species observed at Naval Program Management Office Strategic Systems Program Mountain View.

Common Name (Scientific Name)	Status	NSA Monterey Affiliation
American crow ( <i>Corvus brachyrhynchos</i> )		Year-round
Anna's hummingbird ( <i>Calypte anna</i> )		Year-round
black phoebe ( <i>Sayornis nigricans</i> )		Year-round
bushtit ( <i>Psaltriparus minimus</i> )		Year-round
California towhee ( <i>Melospiza crissalis</i> )		Year-round
white-crowned sparrow ( <i>Zonotrichia leucophrys</i> )		Year-round

Sources: CDFG 2008, 2010; USFWS 2008; CNDDDB 2010; GANDA 2011; Doak et al 1996, 2001; Kreiberg 1999; AgriChemical & Supply 2009.

## E.5 Terrestrial Mammals

There are no federal/state listed mammal species that have been observed at NSA Monterey.

Table E-16. Terrestrial mammal species observed at the Monterey Area Properties.

Common Name	Scientific Name	MG	LMV	Lab/Rec	Annex	Status
big brown bat	<i>Eptesicus fuscus</i>	X				
Botta's pocket gopher	<i>Thomomys bottae</i>					
brush mouse	<i>Peromyscus boylii</i>		X			
brush rabbits	<i>Sylvilagus bachmani</i>					
California mole	<i>Scapanus latimanus</i>		X			
California mouse	<i>Peromyscus californicus</i>		X			
California vole	<i>Microtus californicus</i>		X			
deer mouse	<i>Peromyscus maniculatus</i>		X			
desert cottontail	<i>Sylvilagus audubonii</i>	X				
dusky-footed woodrat	<i>Neotoma fuscipes</i>		X			SSC if Monterey dusky-footed woodrat. <sup>a</sup>
fox	<i>Urocyon sp.</i>	X				
fox squirrel	<i>Sciurus niger</i>	X				
gray fox	<i>Urocyon cinereoargenteus</i>		X			
ground squirrel	Unknown sp.					Undetermined
hoary bat	<i>Lasiurus cinereus</i>	X				
house mouse	<i>Mus musculus</i>					
Mexican free-tailed bat	<i>Tadarida brasiliensis</i>	X				
Monterey ornate shrew	<i>Sorex ornatus salarius</i>		X			SSC
mule deer	<i>Odocoileus hemionus</i>	X	X			
myotis bat (California myotis or Yuma myotis)	<i>Myotis sp.</i>	X				
opossum	<i>Didelphis virginiana</i>	X				
pinyon mouse	<i>Peromyscus truei</i>					
raccoon	<i>Procyon lotor</i>	X	X			
roof rat	<i>Rattus rattus</i>					Undetermined
weasel	<i>Mustela sp.</i>	X				
western gray squirrel	<i>Sciurus griseus</i>	X	X			
western harvest mouse	<i>Reithrodontomys megalotis</i>					
western spotted skunk	<i>Spilogale gracilis</i>	X	X			

Sources: CDFG 2009, USFWS 2008; CNDDDB 2010; GANDA 2010; Doak et al 1996, 2001; Kreiberg 1999; AgriChemical & Supply 2009.

MG = Main Grounds; LMV = La Mesa Village; Lab/Rec = Laboratory/Recreation Area; Annex = Annex Area; Dunes = Dune/Research Area.

Codes

SSC = California Species of Special Concern

<sup>a</sup>. The Monterey dusky footed woodrat (*Neotoma fuscipes luciana*, syn. *Neotoma macrotis luciana*) was observed by researchers from U.C. Santa Cruz in 1996 as reported in Doak et al. (1996). However this species was not observed in 2011 during general flora and fauna surveys by GANDA (2011).

Table E-17. Terrestrial mammal species observed at the Dune/Research Area.

Common Name	Scientific Name	Status
Botta's pocket gopher	<i>Thomomys bottae</i>	
brush mouse	<i>Peromyscus boylii</i>	
brush rabbits	<i>Sylvilagus bachmani</i>	
California vole	<i>Microtus californicus</i>	
deer mouse	<i>Peromyscus maniculatus</i>	
fox squirrel	<i>Sciurus niger</i>	
ground squirrel	Unknown sp.	
house mouse	<i>Mus musculus</i>	
opossum	<i>Didelphis virginiana</i>	
pinyon mouse	<i>Peromyscus truei</i>	
raccoon	<i>Procyon lotor</i>	

Sources: CDFG 2009; USFWS 2008; CNDDDB 2010; GANDA 2010; Doak et al 1996, 2001; Kreiberg 1999; AgriChemical & Supply 2009.

Table E-18. Terrestrial mammal species observed at the Point Sur Facility.

Common Name	Scientific Name	Status
California myotis	<i>Myotis californicus</i>	
hoary bat	<i>Lasiurus cinereus</i>	
Mexican free-tailed bat	<i>Tadarida brasiliensis</i>	
Townsend's big-eared bat	<i>Corynorhinus townsendii</i>	SSC

Sources: CDFG 2009; USFWS 2008; CNDDDB 2010; GANDA 2010; Doak et al 1996, 2001; Kreiberg 1999; AgriChemical & Supply 2009.

Codes

SSC = California Species of Special Concern

Table E-19. Terrestrial mammal species observed at Naval Industrial Reserve Ordnance Plant Santa Cruz.

Common Name	Scientific Name	Status
big brown bat	<i>Eptesicus fuscus</i>	
bobcat	<i>Lynx rufus</i>	
Botta's pocket gopher	<i>Thomomys bottae</i>	
brush mouse	<i>Peromyscus boylii</i>	
brush rabbit	<i>Sylvilagus bachmani</i>	
California mouse	<i>Peromyscus californicus</i>	
California pocket mouse	<i>Chaetodipus californicus</i>	
California vole	<i>Microtus californicus</i>	
coyote	<i>Canis latrans</i>	
deer mouse	<i>Peromyscus maniculatus</i>	
gray fox	<i>Urocyon cinereoargenteus</i>	
hoary bat	<i>Lasiurus cinereus</i>	
little brown bat	<i>Myotis lucifugus</i>	
long-eared myotis	<i>Myotis evotis</i>	
long-tailed weasel	<i>Mustela frenata</i>	
Merriam's chipmunk	<i>Neotamias merriami</i> (syn. <i>Tamias merriami</i> )	
Monterey dusky-footed woodrat <sup>a</sup>	<i>Neotoma macrotis luciana</i> (syn. <i>N. fuscipes luciana</i> )	SSC
mountain lion	<i>Puma concolor</i>	

Table E-19. Terrestrial mammal species observed at Naval Industrial Reserve Ordnance Plant Santa Cruz.

Common Name	Scientific Name	Status
mule deer	<i>Odocoileus hemionus</i>	
myotis bat	<i>Myotis</i> sp.	
opossum	<i>Didelphis virginiana</i>	
raccoon	<i>Procyon lotor</i>	
red fox	<i>Vulpes vulpes</i>	
striped skunk	<i>Mephitis mephitis</i>	
Townsend's big-eared bat	<i>Corynorhinus townsendii</i>	SSC
Trowbridge shrew	<i>Sorex trowbridgii</i>	
western gray squirrel	<i>Sciurus griseus</i>	
western harvest mouse	<i>Reithrodontomys megalotis</i>	
wild boar	<i>Sus scrofa</i>	
woodrat	<i>Neotoma</i> sp.	

Sources: CDFG 2009; USFWS 2008; CNDDDB 2010; GANDA 2010; Doak et al 1996, 2001; Kreiberg 1999; AgriChemical & Supply 2009.

Codes

SSC = California Species of Special Concern

a. The Monterey dusky footed woodrat (*Neotoma fuscipes luciana*, syn. *Neotoma macrotis luciana*) was observed by researchers from U.C. Santa Cruz in 1996 as reported in Doak et al. (1996). However this species was not observed in 2011 during general flora and fauna surveys by GANDA (2011).

## E.6 Marine Life

There are no federal/state listed mammal species that have been observed at NSA Monterey.

Table E-20. Marine algae and plants observed at the Point Sur Facility.

Scientific Name	Common Name
<i>Codium fragile</i>	Dead man's fingers
<i>Chondracanthus exasperatus</i>	Turkish towel
<i>Egregia menziesii</i>	Feather boa kelp
<i>Fucus</i> sp.	Rockweed
<i>Gelidium coulteri</i>	Red algae
<i>Gigartina</i> sp.	Sea tongue alga
<i>Halosaccion glandiforme</i>	Sea sacs
<i>Macrocystis pyrifera</i>	Giant kelp
<i>Mazaella cordata</i>	Iridescent algae
<i>Nereocystis leutkeana</i>	Bull kelp
<i>Phyllospadix</i> sp.	Surfgrass
<i>Ulva</i> sp.	Sea lettuce

Source: GANDA 2011.

Table E-21. Marine wildlife observed at the Monterey Area Properties.

Common Name	Scientific Name	Status
California sea lion	<i>Zalophus californianus</i>	-

Sources: CDFG 2009; USFWS 2008; CNDDDB 2010; GANDA 2010.

Table E-22. Marine wildlife observed at the Point Sur Facility.

Common Name	Scientific Name	Status
<b>Invertebrates</b>		
acorn barnacle	<i>Balanus sp.</i>	-
anemone sp.		-
black turban snail	<i>Tegula funebris</i>	-
brown turban snail, brown tegula	<i>Tegula brunnea</i>	-
buckshot barnacle	<i>Chthamalus sp.</i>	-
California mussel	<i>Mytilus californianus</i>	-
checkered periwinkle	<i>Littorina plena/scutulata</i>	-
chiton sp.		-
coral sp.		-
crab sp.		-
flatworm sp.		-
gooseneck barnacle	<i>Pollicipes polymerus</i>	-
hermit crab sp.		-
Hooked slipper snail	<i>Crepidula adunca</i>	-
kelp crab sp.		-
kelp fly	<i>Fucellia rufitibia</i>	-
limpet sp.		-
pile worm sp.		-
purple sea star, Ochre sea star	<i>Pisaster ochraceus</i>	-
purple shore crab	<i>Hemigrapsus nudus</i>	-
red abalone	<i>Haliotis rufescens</i>	-
rough limpet	<i>Lottia scabra</i>	-
sea anemone	<i>Unknown sp.</i>	-
shrimp sp.		-
six-rayed sea star	<i>Leptasterias sp.</i>	-
tunicate sp.		-
<b>Fishes</b>		
kelp fish	<i>Chironemidae (Family)</i>	-
Northern clingfish	<i>Gobiesox maeandricus</i>	-
Pacific staghorn sculpin	<i>Leptocottus armatus</i>	-
prickleback fish	<i>Stichaeidae (Family)</i>	-
<b>Mammals</b>		
harbor seal	<i>Phoca vitulina</i>	-

Sources: CDFG 2009; USFWS 2008; CNDDDB 2010; GANDA 2010.





## Appendix F: Species Profiles

### F.1 Invasive Species

#### French Broom (*Genista monspessulana*)

CDFA List C, Cal-IPC "High" Invader

French broom is a woody perennial shrub and a legume native to the Mediterranean region. When introduced to a new area, it can become an invasive plant. Its reproductive vigor and preference for Mediterranean climates make it a very successful species in California and the Pacific Northwest, where it is considered a severe noxious weed, covering over 40,000 hectares (Cal-IPC 2011a). It is even more widespread in Australia, where it covers 600,000 hectares and is also considered a noxious weed (Australian Weeds Committee 2011). Its reproductive success is due to its ability to reproduce vegetatively (from roots and buried stems) as well as by seed, and the fact that each plant can produce an enormous number of seeds. Seed pods explode, which widely scatters the seed, but they are also transported by flowing water, birds, and humans. Seeds can remain viable in the soil for decades, making eradication of French broom quite difficult.

Where French broom competes with native vegetation, it usually wins by forming dense fields and crowding out other species (including wildlife) (Cal-IPC 2011a). Some stands of French broom can be so thick that they make meadows and pastures useless for wild and domestic animals. Other harmful effects include its ability to shade out tree seedlings in reforested areas, its tendency to catch fire, and the toxicity of its leaves and seeds, which contain alkaloids poisonous to many large domestic animals (Hoshovsky 1986).

#### Iceplant (*Carpobrotus edulis*)

Cal-IPC "High" Invader

Rated a "high" invader by Cal-IPC (Cal-IPC 2011b), ice plant was introduced into the western United States for dune stabilization in the early 1900s. It is native to South Africa, but naturalized in many other regions around the world (Cal-IPC 2011b). In the west, it is found from north of Eureka, California south to at least Rosarito in Baja California.

It has succulent foliage with bright magenta or yellow flowers and its resistance to some harsh coastal climatic conditions (i.e. salt) have also made it a favored garden plant. As a result, it has been widely planted by CalTrans along highways (contributing to its other common name: highway ice plant) for soil stabilization and is still sold as an ornamental in some areas.



French broom  
(*Genista monspessulana*)  
Photo credit: Calibas



Iceplant  
(*Carpobrotus edulis*)  
Photo credit: Hans Hillewaert / CC-BY-SA-3.0

As an invasive colonizer, it does well in coastal habitats by forming a dense fibrous root system that interferes with water uptake by other plants. (Native shrubs often increase in canopy size when ice plant is removed.) It also reduces soil pH and influences nutrient dynamics, successfully outcompeting grasses. Though, unlike in coastal scrub or backdune areas, it needs soil disturbance to colonize coastal grassland. And it commonly invades maritime chaparral after fire. Once established, individual plants can expand more than a meter in diameter per year. It does not require cross-pollination to reproduce and can produce seeds without fertilization. Seed production is often over 1,500 per fruit and occurs between February and May. Ungerminated seeds remain viable for at least two years and uneaten fruits can remain on the plant for several years. Ingestion by animals often enhances germination.

### European Beachgrass (*Ammophila arenaria*)

Cal-IPC "High" Invader



European Beachgrass  
(*Ammophila arenaria*)  
Photo credit: Elly Waterman

European beachgrass is rated a "high" invader by Cal-IPC (Cal-IPC 2011c). It is native to the coastlines of Europe and North Africa. In the United States, it is restricted to coastal strand and dunes in central and northern California. It was introduced to the state in the late 1800s to provide stabilization to shifting sand dunes. Since then, it has essentially been planted or established in all dune systems from Santa Barbara northward to British Columbia (Cal-IPC 2011c). In those habitats, it displaces native species (including rare, endangered and threatened) and creates significant changes in composition of native dune mat and dune scrub communities. Sand accretion is essential to its growth; it does not survive well in stable sand dunes. Its spread is mostly due to continued growth of rhizomes (which can withstand saltwater immersion) and dune-building, though some seed-germination has been documented in northern California (Cal-IPC 2011c).

### Pampas Grass (*Cortaderia selloana*)

Cal-IPC "High" Invader



Pampa Grass  
(*Cortaderia selloana*)  
Photo credit: Carsten Niehaus

Pampas grass is an invasive species from South America. In California, it is restricted mostly to coastal areas, primarily north of Santa Barbara and easily invades disturbed sites. It is able to tolerate serpentine soils and appears to require fog. It is not frost tolerant, does poorly under high light intensities and cannot survive high temperatures (Cal-IPC 2011d).

As a perennial grass its average lifespan is 15 years. Large plants often represent many generations and consist of a large, mostly dead, mass of old leaves and root crowns within which younger seedlings can take root (Doak et al. 1996). As a result, it can produce a significant amount of biomass that is extremely flammable, increasing both frequency and intensity of fire. Its large size also reduces light availability for other species. Total alteration of native plant communities decreases forage and nesting sites for native animals, though rats, some snakes and rabbits have been observed in dense infestations. Prolific seed production and light, wind-dispersed seeds facilitate rapid expansion: seeds blow up to 20 miles in the wind, can also be transported by water or soil, and

stick to animal fur and on other vegetation. An individual plume is capable of producing more than 100,000 seeds, although only about 30 percent are viable. Plants re-sprout vigorously and root balls will re-root. Many estimates agree that the total acreage in the state covered by this species is still increasing (Cal-IPC 2011d).

### Tall Fescue (*Festuca arundinacea*)

Cal-IPC "Moderate" Invader

Tall fescue is an invasive perennial grass with coarse foliage found throughout California (except in the Great Basin and deserts) (Cal-IPC 2011e). It can be distinguished from other grasses by a slightly purple cast to its panicles and macroscopic hairs on the auricles (TNC Global Invasive Species Team 2010).

A native of northern Europe, it was introduced to the United States as winter forage for livestock in the late 1800s. Since then, it has been widely planted throughout North America as turf and forage grass and for erosion control. Given its vigor, pest resistance and ability to grow in dry and poor soils, this species now occupies more acreage in the United States than any other introduced grass. It has invaded many wild areas and devastated many prairie remnants throughout the U.S.

It favors sites with heavy soil, including grassland, coastal scrub, woodland habitats, edges of some marsh and fen systems, roadsides, ditches and other disturbed sites (Cal-IPC 2011e; TNC Global Invasive Species Team 2010). It is especially likely to displace native species when it already grows in an area where there are disturbances or the natural fire regime has been suppressed (TNC Global Invasive Species Team 2010). Though it forms thinner stands than other grasses (thus contributing to soil erosion), native displacement occurs through shading out or upon death, when fescue leaves fall to the ground, creating a thick thatch that prevents germination of native seeds (Cal-IPC 2011e).

Tall fescue's documented toxicity to livestock is due to a fungus that lives inside the plant's cells and produces ergot alkaloids. Approximately 75 percent of tall fescue throughout the United States may be infected with this endophytic fungus. Symptoms include rough hair coats, intolerance to heat and poor weight gain. It is also responsible for gangrene of the extremities known as "fescue foot". Although its effects on wildlife have been less studied, mice and other wildlife can also be infected by feeding on it.



Pampa Grass  
(*Cortaderia selloana*)  
Photo credit: Carsten Niehaus

## F.2 Special Status Species

### Monterey Spineflower (*Chorizanthe pungens* var. *pungens*) Federal-Listed Threatened



Monterey Spineflower  
(*Chorizanthe pungens* var.  
*pungens*)

#### Background

Monterey spineflower is endemic to sandy soils in active dune systems and bluffs with deposited windblown sands. It does best where competition with other plant species is minimal as it does not tolerate shade from other plants such as iceplant and European beachgrass. Populations may also be found in central maritime chaparral, cismontane woodland, coastal scrub and valley and foothill grasslands that feature sandy soils and openings that are free of other vegetation. Its current range includes southern Santa Cruz and northern Monterey Counties. The most inland population is found in the Salinas Valley in interior Monterey County. The spineflower's historical range included the California coast as far south as San Simeon. The northernmost population is believed to be near Rodeo Gulch Road in Santa Cruz County. It is primarily threatened by development and was listed as federally threatened in 1994 and is included on the CNPS List 1B.2 (USFWS 2009a).

#### Reproduction

Monterey spineflower is an annual species that produces one seed per flower, with dozens to over one hundred seeds produced per plant. Recent studies suggest that the density of Monterey spineflower is directly related to the previous year's seed set (as it does not develop an extensive persistent soil seedbank) and that it apparently germinates well under most winter conditions. Because it responds strongly to annual precipitation patterns and amounts, there can be large fluctuations in population of plants visible above-ground from year to year. A study on the related (and genetically and phenotypically similar) robust spineflower (*Chorizanthe robusta* var. *robusta*) indicates that pollinator access to flowers increases seed set and thus reproductive success, while noting a high diversity of pollinators (including sweat bees, bumblebees, wasps, honeybees, and soft-winged flower beetles) given the variation in microhabitat conditions. Diminished pollinator visitation due to encroaching invasive plants may indirectly affect the spineflower, especially since many pollinators important to this species require bare ground for nesting. It blooms from April to June (USFWS 2009a).

### Monterey Gilia (*Gilia tenuiflora* ssp. *arenaria*) Federal-Listed Endangered, State-Listed Threatened

#### Background

Monterey gilia is endemic to the Monterey Bay and Peninsula dune complexes. In Monterey County it is typically found in sandy soils and openings in coastal sand dunes, coastal sage scrub and maritime chaparral (and occasionally cismontane woodland) (USFWS 2008). It is likely that populations within its current range have been extirpated over the past 100 years with land conversion and development. As a result, only fifteen known populations are distributed from Span-

ish Bay on the Monterey Peninsula north to Moss Landing near the Salinas River. Two of its greatest current threats continue to be habitat destruction due to development and competition from invasive, non-native species (i.e. iceplant, ripgut brome, pampas grass, *Avena* spp.). It does not compete well in denser vegetation structure and excessive soil stabilization (often provided by invasive plants). It was listed as state threatened in 1987 and federally endangered in 1992 and is included on List 1B.2 of the CNPS. Moreover, the CCC considers the presence of Monterey gilia as a criterion in its determination of environmentally sensitive habitat.



Monterey Gilia  
(*Gilia tenuiflora* ssp. *arenaria*)  
Photo credit:

### *Reproduction*

Monterey gilia populations can experience large changes in the number of individuals from year to year, with seed production largely a function of plant size. Late-season rainfall can also markedly affect germination and growth. A recent study has shown that it may have long-lived seeds, contributing to a relatively persistent soil seed bank (Fox et al. 2005 as cited in USFWS 5-year review 2008). Most populations have a high cover of non-native plants already established or are being encroached upon. It blooms from April to June.

### Yadon's Rein Orchid (*Piperia yadonii*)

Federal-Listed Endangered

### *Background*

A slender perennial herb in the orchid family, Yadon's rein orchid is endemic to northern coastal Monterey County. It prefers vegetation structure that provides filtered sunlight on sandy soils. As a result, it is found within Monterey pine forest (where it grows through pine needle duff among sparse herbaceous vegetation) and maritime chaparral communities (often on sandstone ridges where soils are shallow). Individuals of this species are also commonly found under the edges of prostrate mats of Hooker's manzanita. Currently, the northernmost point of its range is the Los Lomas area, near the border of Santa Cruz County. An isolated population near Palo Colorado Canyon is its southernmost extent. The largest populations occur on properties owned and managed by the Pebble Beach Company. Threats to their survival currently include non-native species (including pampas grass, French broom, acacia and rattlesnake grass), habitat fragmentation and recreational activities. It was listed as federally endangered in 1998 and is a List 1B.1 species of the CNPS.



Yadon's Rein Orchid  
(*Piperia yadonii*)  
Photo credit: NSA  
Monterey

### *Reproduction*

Seed germination is believed to involve a symbiotic relationship with a fungus. Moreover, individuals that flower in one year may not flower the next and a portion of the population may be completely dormant in any given year. A study by Doak and Graff (2001, as cited in USFWS 2009 5-year Review) suggests that the reproductive output of orchids is limited by pollinator availability or activity: it was found that Yadon's rein orchid had reduced seed set under natural pollinations compared to manual pollination, indicating that seed set may be pollinator limited. In particular, pollinators of Yadon's rein orchid include

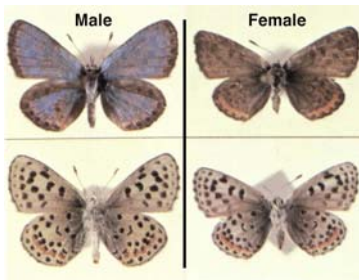


Yadon's Rein Orchid  
(*Piperia yadonii*)  
Photo credit: NSA Monterey

nocturnal, short-tongued moths. As a result, habitats that support a variety of other flowering plant species that provide nectar and pollen sources throughout spring and summer for pollinator populations are likely needed to sustain rein orchid populations. It blooms from May to August (USFWS 2009b).

Smith's Blue Butterfly (*Euphilotes enoptes smithi*)  
Federal-Listed Endangered

*Background*



Smith's Blue Butterfly  
(*Euphilotes enoptes smithi*)  
Photo credit: Dr. Richard Arnold

Smith's blue butterfly is small, slightly less than one inch across with wings fully spread. Both males and females have whitish-gray undersides speckled with black dots and a band of red-orange marks crossing the hind-wings near the outer edge. The upper wing surface of males is lustrous blue, while for females it is brown. This subspecies is differentiated from others by the light undersurface ground color with prominent overlying black markings and a faint black terminal line (USFWS 2006a).

It is found in Monterey County in coastal dune systems and in coastal sage scrub habitat below 2,500 feet. The Salinas River is currently recognized as the northern limit of Smith's blue butterfly. Based on a taxonomic decision made in 1986, the USFWS considers blue butterfly populations to the north of the Salinas River to consist of a hybrid between Smith's blue butterfly and Tilden's blue butterfly. The species' current range extends as far south as the northern San Luis Obispo county coast.

*Status and Threats*

Smith's blue butterfly, in danger of extinction throughout all or a significant portion of its range, was listed as a federally endangered species in 1976. A recovery plan was prepared in 1984, which needs to be updated. Critical Habitat was proposed for Smith's blue butterfly in 1977 (USFWS 1977); however, it was never designated. In 2006, the USFWS five-year review of the species recommended to downlist it from federally endangered to threatened reasoning that although the northern portion of its range (including Monterey Bay) is substantially at risk, the average level of threats throughout its entire range is moderate (USFWS 2006a). However, no follow-up on this recommendation has occurred as of yet.

Threats to Smith's blue butterfly include urbanization, modification or destruction of dune habitat (e.g. off-road vehicle use), and competitive exclusion of host and/or nectar plants (USFWS 1984). Seacliff buckwheat and coast buckwheat are the only plants used by the Smith's blue butterfly as a nectar source for adults and host plants for larvae. The butterfly is very sedentary, and probably rarely moves more than 30 meters from its hatching site.

In dune areas invasives, such as iceplant and European beachgrass, compete with the buckwheat and stabilize the dune habitats, reducing the deposit of windblown sand that is needed for establishment of these food plants and other native dune plants. In scrub, chaparral, and grassland habitats, invasives (i.e. kikuyu grass, pampas grass, cape ivy, and French broom) compete with and displace seacliff buckwheat, especially in disturbed areas. In addition, development, tree planting and fire suppression may have reduced habitat suitability for Smith's blue butterflies in this area (USFWS 2006a). As a result, this species has become substantially or totally management dependent. It may be incapable of persisting without habitat management (NatureServe online October 2010).

### Marbled Murrelet (*Brachyramphus marmoratus*)

Federal-Listed Threatened, State-Listed Endangered

The marbled murrelet is a small seabird that occurs along the Pacific coast from Alaska to central California. It breeds at least as far south as Big Basin Redwoods State Park just north of NIROP Santa Cruz, and forages offshore to Point Concepcion (USFWS 1997). Listed as threatened by the USFWS (for California, Oregon and Washington only) and endangered by the State of California in 1992, this species is the only member of its family that breeds in trees, preferring mossy branches in old-growth forests for its nesting substrate.

The marbled murrelet is dependent on old-growth coniferous forest along the coast for breeding habitat, occurring up to 45 miles inland. In California this species often prefers areas containing large Douglas-fir branches for nesting, although along the Central Coast in Santa Cruz and San Mateo counties it is found in old-growth redwood stands (USFWS 1997). The marbled murrelet is a long-lived species with a conservative life-history strategy, with pairs producing a maximum of one chick per year (USFWS 1997).

Currently, the population in Central California has been estimated at around 367 birds (95% CL = 240-562) based on surveys of this species at sea (Henkel and Peery 2008). The population appears to be in decline, mainly due to low reproductive success (Henkel and Peery 2008). Critical Habitat for this species has been designated north of NIROP Santa Cruz in Big Basin State Park, as well as south of NIROP Santa Cruz in Henry Cowell Redwoods State Park, including the nearby Fall Creek Unit (USFWS 2006b).

The marbled murrelet's status at the Monterey Area Properties is unclear. The species occurs at least occasionally in the near-shore waters off the coast of Point Sur and the Monterey Area Properties, and breeds nearby to and potentially at NIROP Santa Cruz. No records of this species have been noted from the station, however.



Marbled Murrelet  
(*Brachyramphus marmoratus*)  
Photo credit: USFWS

## California Red-legged Frog (*Rana draytonii*)

Federal-Listed Threatened, California Species of Concern



California Red-legged Frog  
(*Rana draytonii*)  
Photo credit: Garcia and

The California red-legged frog<sup>1</sup> is presently found in and is endemic to coastal drainages in central California, from Marin County to northern Baja California, Mexico. Within this range, it occurs from sea level to 1,500 meters above sea level. However, almost all documented sightings have been below 1,050 meters elevation. The species is believed to be extirpated from 70 percent of its former range. It was listed as federally threatened in May 1996.

### *Habitat and Threats*

The California red-legged frog uses a variety of habitats including aquatic, riparian and upland. Breeding sites include backwaters in streams and creeks, ponds, marshes, springs, sag ponds, dune ponds, and lagoons. The species is also known to breed in artificial impoundments such as stock ponds, especially if there is emergent vegetation on 25 percent or more on the edge, though sometimes even without emergent vegetation cover and with the presence of non-native predators (USFWS 2002). They are sensitive to high salinity which often occurs in coastal lagoon habitats.

Individuals are known to move up to two miles from breeding sites into riparian and upland habitats. In doing so, they do not necessarily follow riparian corridors, preferring point to point travel. These overland movements usually occur at night and start with the first rains of fall. During dry periods, including summers, they are rarely found far from water; and they spend much time resting and feeding in riparian vegetation when present. If water is not available during summer, they often disperse from breeding areas seeking suitable habitat in spaces under boulders, rocks, organic debris; small mammal burrows; dense vegetation; industrial debris; drains and water troughs; abandoned sheds; and hay-ricks. California red-legged frogs also use large cracks in the bottom of dry ponds as refuges, if the underlying soil remains moist.

They are thought to be algal grazers, along with heavy consumption of invertebrates. They breed from November to April, with males arriving at breeding sites two to four weeks before females. Most lay their eggs in March. Adults may live eight to ten years, though average lifespan is probably lower.

Threats to the California red-legged frog primarily include elimination and/or degradation of habitat from various influences: land development/urban encroachment; construction of reservoirs and water diversions; channelization and flood control maintenance; contaminants, agriculture and livestock grazing. Invasion by non-native aquatic species also poses a grave threat to the California red-legged frog; introduced bullfrogs, crayfish and fish species have been a significant factor in the decline of the species, preying on one or more of its life stages. Bullfrogs may also have a competitive advantage over California red-

1. Although previously treated as a subspecies of the red-legged frog (*Rana aurora*), a recent DNA study concluded that the two subspecies—northern red-legged frog (*Rana aurora aurora*) and California red-legged frog (*Rana aurora draytonii*)—should be recognized as separate species: California red-legged frog (*Rana draytonii*) and northern red-legged frog (*Rana aurora*). They have a narrow zone of overlap (CDFG Special Animals List, January 2011).



legged frogs due to their larger size, generalized feeding, extended breeding season and lack of predation on their larvae. One study (Lawler et al. 1999 as cited in USFWS 2002) found that fewer than five percent of California red-legged frogs survived in ponds with bullfrog tadpoles and the presence of bullfrogs delayed frog metamorphosis. California red-legged frogs are also preyed upon by native species including some birds and garter snakes.

### *Management*

The USFWS Recovery Plan (USFWS 2002) for the California red-legged frog outlines a strategy for its recovery including: “(1) protecting existing populations by reducing threats; (2) restoring and creating habitat that will be protected and managed in perpetuity; (3) surveying and monitoring populations and conducting research on the biology of and threats to the [species]; and (4) reestablishing populations of the [species] within its historic range” (pg. 45).

To this end, the USFWS has established core areas in which to focus on recovery activities. However, this includes a caveat that not all core areas may contain suitable habitat, and that further investigation is required to determine if such areas should be included in recovery efforts: “Recovery goals should be implemented only where suitable or potentially suitable habitat is present” (pg. 50). Moreover, the USFWS advocates for the protection of corridors as well as the development and implementation of management plans for preserved habitat, occupied watershed and those core areas. To achieve this, the USFWS has partnered with multiple state and local agencies to incorporate consideration of the California red-legged frog in land and watershed management plans that have been developed recently (USFWS 2002).

### Western Snowy Plover (*Charadrius alexandrinus nivosus*)

Federal-Listed Threatened, California Species of Concern

### *Status*

The Pacific Coast population of the western snowy plover was listed as federally threatened in 1993 (USFWS 1993). A threatened species, or in this case a population, is one that is likely to become endangered within the foreseeable future throughout all or a significant portion of its range. The western snowy plover (*Charadrius nivosus nivosus*) has not been documented as occurring on NSA Monterey property. A small portion on the eastern edge of the Dune/Research Area was proposed as Critical Habitat in 2011 (USFWS 2011) but was exempted in 2012 (USFWS 2012). Based on a 2012 survey for the species, no suitable habitat for the species exists on NSA Monterey property. A recovery plan for the Pacific Coast Population of the Western Snowy Plover was completed in 2007 (USFWS 2007).

The western snowy plover is considered by the State as a Species of Special Concern.



Western Snowy Plover  
(*Charadrius alexandrinus nivosus*)  
Photo credit: Mike Baird

### *Background*

The western snowy plover is a small shorebird, about six inches long, with a thin dark bill, pale brown to gray upper parts, white or buff colored belly, and darker patches on its shoulders and head, white forehead and supercilium (eyebrow line). Snowy plovers also have black patches above their white forehead and behind the eye. Juvenile and basic winter plumages are similar to adult, but the black patches are absent. Some breeding males, especially in the southern portion of the species' range, may exhibit a rusty or tawny cap. Their dark gray to black legs are a useful characteristic when comparing them to other plover species (Page et al. 1995).

The Pacific coast population is defined as those individuals that nest within 50 miles of the Pacific Ocean on the mainland coast, peninsulas, offshore islands, bays, estuaries, or rivers of the United States and Baja California, Mexico (USFWS 1993). This population breeds primarily on coastal beaches from southern Washington to southern Baja California, Mexico, and most breeding occurs from southern San Francisco Bay to southern Baja California (USFWS 2007). Western snowy plovers are primarily visual foragers, using the run-stop-peck method of feeding typical of Charadrius species. They forage on invertebrates in the wet sand and amongst surf-cast kelp within the intertidal zone, in dry sand areas above the high tide, on salt pans, on spoil sites, and along the edges of salt marshes, salt ponds, and lagoons. They sometimes probe for prey in the sand and pick insects from low-growing plants (USFWS 2007).

The western snowy plover nests on undisturbed, flat areas with loose substrate, such as sandy beaches and dried mudflats along the California coast. Sand spits, dune backed beaches, sparsely to unvegetated beach strands, open areas around estuaries, and beaches at river mouths are the preferred coastal nesting areas of the snowy plover (Page and Stenzel 1981; Wilson 1980; Powell et al. 1997). Other areas used by nesting snowy plovers include dredge spoil fill, dry salt evaporation ponds, airfield ovals, and salt pond levees (Widrig 1980; Wilson 1980; Page and Stenzel 1981). These cited studies observed snowy plovers moving between salt pans, tidal flats, and beaches indicating these areas function together in providing habitat for the species.

Plovers may nest several times during the breeding season, which extends from March into mid-to-late September (Warriner et al. 1986; Terp 1996; Copper 1997a, b). There are usually three eggs per clutch, and the chicks hatch in approximately 27 days, leaving the nest within hours to search for food (Unitt 1984). The male plovers tend to care for the chicks, while the females will often nest again with a new mate (Terp 1996).

Human activities during nesting season should be limited. Nesting areas with predator control programs in place have shown marked improvements in reproductive success over unprotected sites (USFWS 2007).

Its preference for nesting on sandy beaches has led to its decline along the west coast, where much of its habitat has been developed or is subject to moderate-to-heavy human use (Copper 1997b; A. Powell, pers. com.), especially since plover nests and chicks can be difficult to detect (Terp 1996). Foraging areas have also been compromised by development and human recreational use. Human disturbance is the primary cause for the beginning of the decline of the snowy plover and remains the primary cause for their decline up to now. Predation by birds and mammals (especially ravens, crows, and red fox) is the primary cause of reproductive failure for plovers (Copper 1997a, b; USFWS 2007). Nesting areas with predator control programs in place have shown marked improvements in reproductive success over unprotected sites (USFWS 2007). Trash accumulation on the beaches can also act as an attractant to certain predators such as ravens and crows (USFWS 1998).

The western snowy plover is a shorebird in decline on a regional basis (Baird 1993) preferring open sandy beaches in high demand for human use and certain plants on southern foredunes or disturbed dunes outside its usual habitat affinity for sandy beaches. Yet, upland transition habitats are among the most threatened by development and management trends.

Population declines have been attributed to several factors including human disturbance, predation, habitat loss due to encroachment of the introduced European beachgrass, and urban development. Pedestrians and beach-related recreational activities can cause both direct mortality and harassment of western snowy plovers by crushing eggs or chicks, flushing western snowy plovers off their nests, separating adults from their nests or chicks, disrupting feeding behaviors of adults and chicks, and attracting predators to the beach. In addition, concentrations of people also deter western snowy plovers and other shorebirds from using otherwise suitable habitat (USFWS 1999).

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## Appendix G: Soil Descriptions

### Antioch Very Fine Sandy Loam

Taxonomic Class: Fine, smectitic, thermic Typic Natrixeralfs

Capability Class: IIIs-3(14); Claypan range site.

The Antioch series have light brownish gray and brown, medium acid, loam Ap and Al horizons, light gray A2 horizons, light yellowish brown yellowish brown, medium acid and moderately alkaline clay and clay loam B2t horizons. The Antioch series is moderately well to somewhat poorly drained, with slow to medium runoff, and very slow permeability.

Permeability of the Sur soil is moderately rapid. Effective rooting depth is 20–40 inches. Available water capacity is 1.0–3.5 inches. Runoff is rapid to very rapid, and the hazard of erosion is high to very high. This complex is limited for the production of timber mainly by the presence of bedrock at a depth of 20–40 inches in the Catelli and Sur soils and by the rock fragment content of 35% or more in the Sur soil.

### Aquic Xerofluvents

Taxonomic Class: N/A

Capability Class: IVw-4 (15), not placed in a range site.

Soil Description: Soil association of sand, sandy loam, silt loam, clay loam, and clay stratified in layers 1–24 inches thick, poorly drained and subject to intermittent flooding. Aquic xerofluvents is concentrated around Del Monte Lake on the Main Grounds.

### Arnold Loamy Sand, 9 to 15 Percent Slopes

Taxonomic Class: Mixed, thermic Typic Xeropsamments

Capability Class: IVe-4, sandy range site.

Soil Description: Strongly sloping soil on foot slopes (9–15% slopes) and broad upland ridges with a medium runoff, and moderate erosion hazard. Arnold loamy is found south of the Monterey Peninsula Airport and north of State Route 68 in the Laboratory/Recreation Area.

### Badland

Taxonomic Class: N/A

Capability Class: VIIe-1(15); Not assigned a range site.

This land consists of gently sloping to very steep, severely eroded areas that are broken by many deeply entrenched drainage channels. Runoff is very rapid and the erosion hazard is very high.

### Baywood Sand, 2 to 15 Percent Slopes

Taxonomic Class: Sandy, mixed, thermic Entic Haploxerolls

Capability Class: IVwe-1(15), Sandy range site.

Soil Description: Gently sloping to rolling soil (2–15% slopes) found on stabilized sand dunes. Runoff is slow to medium, and the erosion hazard slight to moderate. Hermann Hall, academic buildings on the Main Grounds, and a majority of the Laboratory/Recreation Area and Annex were built predominately on baywood sand.

### Ben Lomond-Catelli-Sur Complex, 30 to 75 Percent Slopes

Taxonomic Class: N/A

Capability subclass VIIe(4), nonirrigated; Storie index 20.

This complex is about 30% Ben Lomond sandy loam, 30% Catelli sandy loam, and 20% Sur stony sandy loam.

Permeability of the Ben Lomond soil is moderately rapid. Effective rooting depth is 40–60 inches. Available water capacity is 4.0–8.5 inches. Runoff is rapid to very rapid, and the hazard of erosion is high to very high.

Permeability of the Catelli soil is moderately rapid. Effective rooting depth is 20–40 inches. Available water capacity is 2–5 inches. Runoff is rapid to very rapid, and the hazard of erosion is high to very high.

### Ben Lomond Sandy Loam, 5 to 15 Percent Slopes

Taxonomic Class: Coarse-loamy, mixed, superactive, mesic Pachic Ultic Haploxerolls

Capability unit 3e-1 (4), irrigated and nonirrigated; Storie index 69.

Permeability of this Ben Lomond soil is moderately rapid. Effective rooting depth is 40–60 inches. Available water capacity is 4.0–8.5 inches. Runoff is medium, and the hazard of erosion is slight to moderate.

### Ben Lomond Sandy Loam, 15 to 50 Percent Slopes

Taxonomic Class: Coarse-loamy, mixed, superactive, mesic Pachic Ultic Haploxerolls

Capability subclass VIe(4), nonirrigated; Storie index 111.

Permeability of this Ben Lomond soil is moderately rapid. Effective rooting depth is 40–60 inches. Available water capacity is 4.0–8.5 inches. Runoff is rapid, and the hazard of erosion is moderate to high.

### Chamise Sandy Loam

Taxonomic Class: Clayey-skeletal, mixed, active, thermic Ultic Palexerolls

Capability Class: IVE-1 (15), Terrace range site.

Soil Description: The Chamise series is a member of the clayey-skeletal, mixed, thermic family of Ultic Argixerolls. Typically, Chamise soils have dark gray and gray, moderately acid, shaly loam A horizons, light

brownish gray, strongly acid, very shaly clay and very shaly heavy clay loam B2t horizons, and pale brown, strongly acid, very shaly clay loam C horizons. This is strongly sloping soil on terraces. Slopes are generally 12%. In places the surface layer is gravelly sandy loam. Run-off is medium, and erosion hazard is moderate.

### Coastal Beaches

Taxonomic Class: N/A

Capability Class: VIIIw-1 (15), no range site assigned.

Formed on narrow sandy beaches, adjacent to sand dunes; partly covered by water during high tides and exposed during low tides. Drainage is excessive to very poor. Runoff is slow; however, the erosion hazard is very high due to wind and wave action. Coastal beaches are located on the northern edge of the Dune/Research Area.

### Dune Land

Taxonomic Class: N/A

Capability Class: VIIIw-1 (15), no range site assigned.

Consists of gently sloping to steep areas of loose, wind-deposited quartz. Drainage is excessive and permeability is rapid. Dune land occurs in the Dune/Research Area.

### Gazos Silt Loam, 15 to 30 Percent Slopes

Taxonomic Class: Fine-loamy, mixed, superactive, thermic Pachic Haploxerolls

Capability Class: VIe-1(15); Fine range site.

Located on upland areas, moderately-well drained. Runoff is slow; the erosion hazard is slight to moderate. Gazos silt loam is the foundation for the personnel support facilities in central La Mesa Village.

### Lockwood Shaly Loam, 2 to 9 Percent Slopes

Taxonomic Class: Fine-loamy, mixed, superactive, thermic Pachic Argixerolls

Capability subclass IIe(4), nonirrigated; Storie index 14.

Permeability of this soil is moderately slow, and available water capacity is 6–8 inches. Runoff is slow to medium, erosion hazard is slight to moderate.

### Lompico-Felton Complex, 5 to 30 Percent Slopes

Taxonomic Class: N/A

Capability unit IVe-1(4), nonirrigated; Storie index 62.

This complex is about 30% Lompico loam and 25% Felton sandy loam.

Permeability of the Lompico soil is moderate. Effective rooting depth is 20–40 inches. Available water capacity is 3–7 inches.

Permeability of this Felton soil is moderately slow. Effective rooting depth is 40–72 inches. Available water capacity is 5.5–10.0 inches. Runoff is medium or rapid, and the hazard of erosion is moderate or high.

#### Los Osos Clay Loam, 9 to 15 Percent Slopes

Taxonomic Class: Fine, smectitic, thermic Typic Argixerolls

Capability subclass IIIe(3), nonirrigated; Storie index 15.

Permeability of this soil is slow, and available water capacity is 4–7.5 inches. Roots penetrate to a depth of 24–40 inches. Runoff is medium, erosion hazard is moderate.

#### Maymen-Rock Outcrop Complex

Taxonomic Class: Loamy, mixed, active, mesic, shallow Typic Dystrochrepts

Capability subclass VIIe(4), nonirrigated; Storie index 4.

The Maymen soil is shallow and somewhat excessively drained. Permeability of the Maymen soil is moderate. Effective rooting depth is 10–20 inches. Available water capacity is 1.0–2.5 inches. Runoff is very rapid, and the hazard of erosion is very high.

#### Maymen Variant Sandy Loam, 5 to 30 Percent Slopes

Taxonomic Class: Loamy, mixed, active, mesic, shallow Typic Dystrochrepts

Capability subclass VIIe(4), nonirrigated; Storie index 36

Permeability of this Maymen Variant soil is moderate. Available water capacity is 1.0–2.5 inches. Effective rooting depth is 12–20 inches. Runoff is medium, and the hazard of erosion is moderate.

#### Narlon Loamy Fine Sand, 2 to 9 Percent Slopes

Taxonomic Class: Fine, mixed, semiactive, thermic Typic Albaquults

Capability Class: VIIe-1(15); Claypan range site.

Gently sloping to rolling soil (2–9% slopes). Narlon loamy fine sand occurs on the western edge of the Laboratory/Recreation Area and in the northwestern portion of La Mesa Village.

#### Oceano Loamy Sand, 2 to 15 Percent Slopes

Taxonomic Class: Mixed, thermic Lamellic Xeropsamments

Capability Class: IVe-4(14); Sandy range site.

Undulating soil on eolian dune-like hills. Runoff is slow to medium; erosion hazard is slight to moderate. Oceano loamy sand occurs in the southeastern portions of the Main Grounds, the southwestern portion of the Laboratory/Recreation Area, and the eastern portion of the Annex.



## Pacheco Clay Loam

Taxonomic Class: Loamy Fine-loamy, mixed, superactive, thermic Fluvaquentic Haploxerolls

Capability subclass IIw(14), range site not assigned.

Runoff is very slow, and erosion is generally not a problem. Roots commonly penetrate more than 60 inches, but roots may be limited to water table depth at 36–60 inches.

## Pfieffer-Rock Outcrop Complex

Taxonomic Class: Coarse-loamy, mixed, superactive, thermic Typic Haploxerolls

Capability Class: VIIIs-1(15); range site not assigned.

Pfieffer soils make up 35% of this complex and rock outcrop 25%. Areas of Cieneba, Sheridan, Junipero, and Sur soils make up 20%. On the Pfieffer soil runoff is rapid, and the erosion hazard is very high. Roots can penetrate to a depth of more than 40 inches. On the Rock outcrop, runoff is very high, but the erosion hazard is slight.

## Santa Lucia-Reliz Association

Taxonomic Class: N/A

Capability Class: VIIe-1(15); Santa Lucia in Loamy range site, Reliz soil in Shallow loamy range site.

Steep soil with slopes ranging from 30–75%. The Santa Lucia soil has an available water capacity of 2–2.5 inches and roots can penetrate to a depth of 20–40 inches. For the Reliz soil, the permeability is moderate with a water holding capacity of 1–2 inches with roots penetrating to 10–20 inches. Runoff is rapid or very rapid, and the erosion hazard is very high.

## Santa Lucia Shaly Clay Loam, 15 to 50 Percent Slopes

Taxonomic Class: Clayey-skeletal, mixed, superactive, thermic Pachic Ultic Haploxeroll

Capability Class: 15-30% IVe-4(15); 30-50% VIe-1(15); 15-50% Loamy range site.

Steep soil with slopes ranging from 15-50%; rapid runoff and high erosion hazard. Santa Lucia shaly clay loam is located in the upland areas of southern La Mesa Village.

## Santa Lucia Shaly Clay Loam, 50 to 75 Percent Slopes

Taxonomic Class: Clayey-skeletal, mixed, superactive, thermic Pachic Ultic Haploxerolls

Capability subclass VIIe(15), nonirrigated; Storie index 12.

Permeability of this Santa Lucia soil is moderate. Effective rooting depth is 20–40 inches. Available water capacity is 1.5–4.5 inches. Runoff is very rapid, and the hazard of erosion is very high.

### Sheridan Coarse Sandy Loam, 15 to 30 Percent Slopes

Taxonomic Class: Coarse-loamy, mixed, superactive, thermic Pachic Haploxerolls

Capability Class: VIe-1(15); Granitic range site.

This is a moderately steep soil on rounded hills. Permeability is moderately rapid, and the available water holding capacity is 3–6 inches. Roots penetrate to depth of 20–40 inches. Runoff is high to very high and erosion hazard is high to very high.

### Sur-Catelli Complex, 50 to 75 Percent Slopes

Taxonomic Class: N/A

Capability subclass VIIe(4), nonirrigated; Storie index 14.

This complex is 35% Sur stony sandy loam and 25 percent Catelli sandy loam.

Catelli soils generally have slopes of less than 60%, and Sur soils have slopes of more than 60%.

Permeability of the Catelli soil is moderately rapid. Effective rooting depth is 20–40 inches. Available water capacity is 2.0–5.0 inches. Runoff is very rapid, and the hazard of erosion is very high.

Permeability of the Sur soil is moderately rapid. Effective rooting depth is 20–40 inches. Available water capacity is 1.0–3.5 inches. Runoff is very rapid, and the hazard of erosion is very high.

### Tangair Fine Sand, 2 to 9 Percent Slopes

Taxonomic Class: Mixed, thermic Aquic Durinodic Xeropsamments

Capability Class: IIIw-4(14); IVw-4(15); range site not assigned.

This is a gently sloping and moderately sloping soil on partly dissected marine terraces. Soils are similar to Tangair soils, but have a sandy clay loam or clay subsoil at 24–40 inches. Runoff is slow and erosion hazard is slight.

### Xerothents, Loamy

Taxonomic Class: N/A

Capability Class: VIIe-1(15); Loamy range site.

Steep extremely steep soils on bluffs along major rivers, on steep escarpments, of fans and terraces, and on the banks of deeply entrenched streams and gullies that have narrow bottoms. These soils consist mainly of unconsolidated alluvium that contains pebbles, cobblestones, and stones. The potential for erosion and deposition of soil material is high.

### Zayante Coarse Sand, 5 to 30 Percent Slopes

Taxonomic Class: Sandy, mixed, mesic Humic Dystroxerepts

Capability subclass VIs4, nonirrigated; Storie index 31.

Permeability of this Zayante soil is rapid. The effective rooting depth is more than 60 inches. Available water capacity is 2.5–5.0 inches. Runoff is medium or rapid, and the hazard of erosion is slight or moderate. A few areas have been subject to moderate to severe rilling and gullyng.

Zayante Coarse Sand, 30 to 50 Percent Slopes

Taxonomic Class: Sandy, mixed, mesic Humic Dystroxerepts

Capability subclass VIs(4), nonirrigated; Storie index 15.

Permeability of this Zayante soil is rapid. The effective rooting depth is more than 60 inches. Available water capacity is 2.5–5.0 inches. Runoff is rapid, and the hazard of erosion is moderate or high. SKI blowing is a moderate hazard. Most areas are subject to only slight erosion, but a few small areas have been subject to moderate to severe rilling and gullyng.

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## Appendix H: Research Requirements

This appendix fulfills the Research Requirements Appendix that is required in INRMPs according to a Memorandum dated 14 August 2006 from the Office of the Under Secretary of Defense for the Deputy Assistant Secretary of the Navy (Environment) regarding the INRMP Template. This 2006 Memorandum stated that research requirements are projects that would be nice to do by an installation but there is no legal obligation to support. The concept behind this appendix is that it will allow the installation and other entities (e.g. the DoD Strategic Environmental Research and Development Program) to quickly assess if there are any projects available for funding if it became available. Table E-1 identifies all the natural resource management strategies included in Sections 4 and 5 of the NSA Monterey INRMP that represent discretionary research tasks that the NSA Monterey Environmental Office can perform in support of the conservation and stewardship of NSA Monterey's natural resources.

*Table H-1. Natural resource management strategies for research from Chapter 4 of the Integrated Natural Resources Management Plan.*

INRMP Management Strategy
<b>Section 4.1: Managing with an Ecosystem Approach</b>
V.B. Monitor sentinel species that may be regional indicators of climate change (See Section 5.1.3).
V.C. Monitor sentinel species that may decline or increase with altered fire regime (See Section 4.4).
V.E. Monitor for specific avian species annually on permanently established walking transects in the appropriate habitat. Management focus species should be able to sustain viable populations as an indication that they have sufficient habitat conditions.
X. In cooperation with partners, consider participating in vulnerability assessments for habitats and species in relation to climate change.
XII. Participate in or ensure consistency with regional monitoring protocols in order to derive additional interpretive power from Navy data sets. Partner with other regional land management organizations to standardize data collection and share results across the population range of species.
XIII. Continue to support cooperative research ventures with schools, universities, and non-profit, scientific, research organizations.
<b>Section 4.2: Managing the Physical and Chemical Environment</b>
NONE
<b>Section 4.2.1: Water Resources and Water Quality</b>
III.A. Continue to conduct semi-annual and annual groundwater sampling at the Annex well and Del Monte Lake to conduct trend analysis. The work characterizing the water at the lake should also continue as part of the Lake Management Plan.
<b>Section 4.2.2: Floodplains</b>
I. Identify any special or unique flora and fauna associated with floodplains in order to identify the natural and beneficial functions provided by floodplains.
<b>Section 4.2.3: Soil Resources</b>
NONE
<b>Section 4.2.4: Wildland Fire Management</b>
II.K. Consider supporting partnerships with outside organizations that are engaged in researching wildland fire and forest health.
<b>Section 4.3: Management of Habitats and Plant Communities</b>
NONE
<b>Section 4.3.1: Terrestrial Vegetation Communities and Habitats</b>
V. Support research that investigates wildland fire and forest ecosystem function.

Table H-1. Natural resource management strategies for research from Chapter 4 of the Integrated Natural Resources Management Plan.

INRMP Management Strategy
<i>Section 4.3.1.1: Specific Issues for Coast Live Oak/Monterey Pine</i>
IV.E. Evaluate the efficacy of sudden oak death syndrome prevention and treatment schemes.
<i>Section 4.3.1.2: Specific Issues for Central Maritime Chaparral</i>
NONE
<i>Section 4.3.1.3: Specific Issues for Dune Scrub</i>
NONE
<i>Section 4.3.1.4: Specific Issues for Mixed Evergreen Forest and Redwood Forest</i>
NONE
<i>Section 4.3.1.5: Specific Issues for Chaparral and Grasslands at NIROP Santa Cruz</i>
NONE
<i>Section 4.3.1.6: Specific Issues for Riparian/Wetland Habitat</i>
NONE
<i>Section 4.3.2: Coastal and Marine Habitats</i>
II. Maintain natural habitat on sandy beaches by coordinating with the City of Monterey and establish protocols to ensure that beach raking equipment does not adversely effect habitat for wildlife.
<i>Section 4.4: Fish and Wildlife Management</i>
NONE
<i>Section 4.4.1: Invertebrates</i>
I.A.2. Continue to support research investigations into rare invertebrate habitat and host interactions, especially pollination of rare and endangered plant species.
<i>Section 4.4.2: Pollinators</i>
II.A. Encourage research partnerships to establish the baseline conditions of pollinators and plants and animals dependent on them at NSA Monterey.
IV. Conduct a pollination study on NSA Monterey's endangered plant species, and those plants that support endangered wildlife.
VII. Review existing literature on pollinators.
<i>Section 4.4.3: Reptiles and Amphibians</i>
NONE
<i>Section 4.4.4: Birds</i>
II. Participate in widespread bird monitoring initiatives (i.e. Monitoring Avian Productivity and Survivorship programs, Christmas Bird Count, etc.).
II.A. Investigate the compatibility of the USFS published guidelines for standardized monitoring techniques for monitoring birds (Ralph et al. 1993) for use at NSA Monterey.
II.B. Determine how current established monitoring programs might contribute to regional databases and monitoring protocols, including the Breeding Bird Survey, Breeding Bird Atlas, Colonial Waterbird Surveys, International Shorebird Survey, Hawk Migration Surveys, Breeding Bird Census, Winter Bird Population Studies, survey information collected locally by federal and state agencies, and the USGS Bird Banding Laboratory. As appropriate, coordinate with Avian Knowledge Network and DoD e-bird databases to ensure bird monitoring data are submitted.
II.C. Support biannual counts (using established methodology) of resident land birds, to determine relative abundance of species during breeding and non-breeding season.
<i>Section 4.4.5: Terrestrial Mammals</i>
II.A. Support research that investigates large mammal population dynamics at NIROP Santa Cruz.
<i>Section 4.4.5.1: Bats</i>
III. Support research to inventory and monitor bat populations on NSA Monterey.
<i>Section 4.4.6: Marine Mammals</i>
NONE
<i>Section 4.5: Special Status Species Protection</i>
NONE
<i>Section 4.5.1: Threatened and Endangered Species and Critical Habitat</i>
NONE
<i>Section 4.5.1.1: California Red-Legged Frog - Federally Threatened</i>
III. Support research that contributes to the conservation of this species.

Table H-1. Natural resource management strategies for research from Chapter 4 of the Integrated Natural Resources Management Plan.

INRMP Management Strategy
<b>Section 4.5.1.2: Western Snowy Plover - Federally Threatened</b>
V. Support research that contributes to the conservation of this species.
<b>Section 4.5.1.3: Smith's Blue Butterfly - Federally Endangered</b>
III. Support regional research that inventories and monitors for the Smith's blue butterfly.
<b>Section 4.5.1.4: Yadon's Rein Orchid - Federally Endangered</b>
IV.A. Patterns in climate data should continue to be monitored in conjunction with orchid numbers, and annual surveys completed to track natural growth cycles. Consistent monitoring over a number of years will reveal important data regarding population dynamics.
IV.B. Support research to thoroughly understand the reproductive ecology of Yadon's rein orchid. Such a study would contribute essential information for the long term maintenance of the species at NSA Monterey.
<b>Section 4.5.1.5: Monterey Spineflower - Federally Threatened</b>
IV. Research weather patterns, phenology, and pollinators of the Monterey spineflower to better understand population dynamics.
<b>Section 4.5.1.6: Monterey Gilia - Federally Endangered</b>
IV. Research weather patterns, phenology, and pollinators of the Monterey gilia to better understand population dynamics.
<b>Section 4.5.2: Other Special Status Species</b>
III.A. Support ongoing and new research on distribution and ecology of species warranting Navy stewardship. Encourage academic institutions to facilitate resource data collection.
<b>Section 4.5.3: Invasive Species</b>
II. Refine landscaping protocols to limit actions that promote invasive species such as the Argentine ant.
IV. Conduct research to determine the most effective procedures to control weeds in various habitats at NSA Monterey, especially in areas where weeds degrade the habitat of federally listed species.
<b>Section 4.6: Prevention and Control of Wildlife Damage</b>
NONE
<b>Section 4.6.1: Feral Animals and Pests</b>
NONE
<b>Section 4.6.2: Bird/Animal Strike Hazard Program</b>
NONE
<b>Section 4.6.3: Game Species</b>
NONE
<b>Section 4.7: Data Integration, Access, and Reporting</b>
II. Participate in data sharing, technology transfer, and communication as applicable.

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## Appendix I: Project List

Funding Source	EPR Project Code	Project Description	ERL
NSA Monterey ED In House		Implement a coordinated monitoring program using land health and focal species indicators that can be implemented cost-effectively over time, and facilitates reporting on natural resource conditions in relation to other central coast areas and annual INRMP program metrics questions. Set habitat objectives based on ecological sites, ecosystem function indicators, and the requirements of focus species. Do it in a manner that can be scaled up to the work of other agencies, in order to report on the health of NSA Monterey lands.	
O&MN	62271B0068	Revise INRMP to incorporate current resources and management knowledge.	4
NSA Monterey ED In House		Apply sustainability principles to the management of habitats, species, and ecological functions on NSA Monterey by identifying resource specific best practices similar to Sustainable Sites Initiative approaches.	
O&MN		Review and revise the Del Monte Lake Management Plan.	
NSA Monterey ED In House	62271NR023	Conduct water quality sampling at high value habitat for the California red legged frog.	4
NSA Monterey ED In House		Develop management plan and interim goals for 20% reduction of irrigation water use on Monterey area facilities, using FY10 as a baseline.	
NSA Monterey ED In House		Develop management plan for decreasing the impact of saline irrigation water on Annex landscaping	
NSA Monterey ED In House		Develop a checklist of items to consider during NEPA review that identifies issues of relevant to protecting the natural ecological integrity, structure, and functional values of floodplains at NSA Monterey.	
O&MN	62271NR010	Develop and implement an erosion control plan.	4
O&MN	62271NR025	Develop and implement a WFMP for NIROP Santa Cruz.	4
O&MN	62271NR004	Restore degraded vegetation communities.	4
O&MN	62271NR004	Continue to limit public access to sensitive species habitat.	4
O&MN	62271NR004	Monitor all federally listed plant populations.	4
O&MN		Develop a vegetation management plan for Del Monte Lake that considers, among other issues marine and aquatic invasives.	
NSA Monterey ED In House	N/A	Develop a map and database for invasive species and update the vegetation map when appropriate.	
O&MN		Conduct basewide flora surveys.	
O&MN	62271NR004	Conduct focused surveys annually for Yadon's rein orchid in coast live oak and Monterey pine habitat.	4
O&MN	62271NR004	Restore coast live oak and Monterey pine habitat for the Yadon's rein orchid.	4
O&MN	62271NR004	Protect coast live oak and Monterey pine habitat for Yadon's rein orchid using fencing, signage, and educational materials.	4
O&MN	62271NR025	Develop and implement a WFMP for NSA Monterey that includes coast live oak and Monterey pine forests.	4
O&MN	NSA Monterey ED In House	Develop revised protocols for weeding and landscaping in coast live oak and Monterey pine stands.	
O&MN	62271NR004	Protect federally listed species on Central Maritime Chaparral using fencing, signage and educational materials.	4

Funding Source	EPR Project Code	Project Description	ERL
O&MN	62271NR004	Conduct focused surveys annually or semi-annually for federally listed species in Central Maritime Chaparral.	4
O&MN	62271NR004	Restore habitat for federally listed species in Central Maritime Chaparral.	4
O&MN	62271NR004	Protect federally listed species on the Dunes using fencing, signage and educational materials.	4
O&MN	62271NR004	Conduct focused surveys annually for federally listed species at the Dunes.	4
O&MN	62271NR004	Restore habitat for federally listed species at the Dunes.	4
O&MN	62271NR010	Continue to investigate soil erosion and control plan for the dunes.	4
O&MN	62271NR025	Develop a NIROP Santa Cruz Wildland Fire Management Plan in conjunction with an overall forest management plan for NSA Monterey.	4
O&MN	62271NR004	Restore habitat for federally listed species at the Dunes.	4
O&MN	62271NR010	Continue to investigate soil erosion and control plan for the dunes.	4
O&MN	62271NR025	Develop a NIROP Santa Cruz Wildland Fire Management Plan in conjunction with an overall forest management plan for NSA Monterey.	4
O&MN	62271NR025	Develop and implement a WFMP for NSA Monterey that includes chaparral and grasslands.	4
O&MN	62271B0022	Establish mitigation conceptual goals, success criteria, and a restoration approach using historical reference conditions and a watershed approach. Riparian and wetland restoration at Point Sur, NIROP, and the Main Grounds. LID technology implementation on all properties. Riparian monitoring for streambank condition, sedimentation, and invasive species.	
O&MN		Document the long term effects to high value nearshore habitat of cable instrumentation at the Point Sur Facility.	
O&MN		Continue to conduct baseline inventories and develop maps of high habitat value to manage focus species to help avoidance, minimization, and conservation of resources and reduce potential for conflict with the military mission.	
O&MN	62271NR012	Conduct Smith blue butterfly surveys.	4
NSA Monterey ED In House, NSA Monterey Other Navy In House, Research Institutions		Establish pollinator-friendly landscapes and gardens where feasible at NSA Monterey, potentially as part of habitat enhancement activities and in coordination with construction and/or facility maintenance activities.	
O&MN, NSA Monterey ED In House, Research Institutions		Conduct a baseline pollinator survey at NSA Monterey and monitor pollinator populations at regular intervals. Pay special focus to the pollination requirements of threatened and endangered species.	
O&MN		Continue to conduct baseline inventories and develop maps of high habitat value to manage focus species to help avoidance, minimization, and conservation of resources and reduce potential for conflict with the military mission.	
NSA Monterey ED In House		Participate in DoD Partnership on Herptile Conservation (DoD Partners in Amphibian and Reptile Conservation) when it becomes established.	
NSA Monterey ED In House		Migratory and resident bird inventory and restoration management activities to conserve bird population and develop and maintain information on status and trend of population and habitats.	
NSA Monterey ED In House		Implement bird conservation principles, measures, and practices through avoidance and minimization measures to protect resident and migratory bird populations.	
NSA Monterey ED In House		Participate in regional avian monitoring initiatives.	

Funding Source	EPR Project Code	Project Description	ERL
O&MN		Terrestrial mammal surveys as part of base-wide flora and fauna surveys every five years.	
NSA Monterey ED In House		Educate staff on proper measures regarding sick, injured, or dead marine mammals.	
O&MN		Inventory and monitor bat populations on NSA Monterey as part of base-wide fauna surveys to adapt management strategies based on current population status.	
NSA Monterey ED In House		Continue to use educational events like earth day for the promotion, restoration, and creation of bat habitat.	
Navy Tenant Funding		Ensure that land use plans and activities in or near threatened or endangered species habitats are accomplished in accordance with the ESA in accordance with current BOs and with ESA Section 7 Consultation Handbook (USFWS and NMFS 1998).	
O&MN	62271NR004	Conduct focused surveys annually for the red-legged frog, and assess high value habitat at that time.	4
O&MN	62271NR018, 62271NR004	Restore/enhance habitat where suitable.	4
O&MN	62271B0011	Protect habitat for red-legged frog using fencing, signage, and educational materials.	4
O&MN	62271NR024	Conduct focused surveys annually for the western snowy plover	4
O&MN	62271NR024	Restore/enhance habitat where suitable.	4
O&MN	62271NR012	Conduct focused surveys annually for the Smith's blue butterfly.	4
O&MN	62271NR012	Restore/enhance habitat where suitable.	4
O&MN	62271NR012	Protect habitat for Smith's blue butterfly using fencing, signage, and educational materials.	4
O&MN	62271NR004	Conduct focused surveys annually for Yadon's rein orchid.	4
O&MN	62271NR004	Restore habitat for the Yadon's rein orchid.	4
O&MN	62271NR004	Protect habitat for Yadon's rein orchid using fencing, signage, and educational materials.	4
O&MN	62271NR004	Conduct focused surveys annually for the Monterey spineflower.	4
O&MN	62271NR004	Restore habitat for the Monterey spineflower.	4
O&MN	62271NR004	Protect habitat for the Monterey spineflower using fencing, signage, and educational materials.	4
O&MN	62271NR004	Conduct focused surveys annually for the Monterey gilia.	1
O&MN	62271NR004	Restore habitat for the Monterey gilia.	4
O&MN	62271NR004	Protect habitat for the Monterey gilia using fencing, signage, and educational materials.	4
NSA Monterey ED In House		Provide for the recovery, enhancement, and protection of species warranting Navy stewardship, as a proactive strategy to prevent federal listings and continue to resolve baseline biological data gaps.	1
O&MN	62271NR004	Restore habitat for federally listed species that is degraded due to occupation by invasive species.	4
NSA Monterey ED In House		Develop a map that depicts all invasive species concerns on NSA Monterey.	
NSA Monterey ED In House		Ensure pests and feral animals are managed according the IPMP	
NSA Monterey ED In House		Set up a central clearinghouse for data, reports, and publications pertaining to the NSA Monterey's EMS that addresses natural resources, that is accessible to staff, and that is managed by a designated data manager.	
NSA Monterey ED In House		Ensure long term and accurate data is available for adaptive management and reporting.	
NSA Monterey ED In House		Apply sustainability principles to the management of habitats, species, and ecological functions on NSA Monterey.	
NSA Monterey ED In House		Adapt and mitigate the adverse impacts of climate change through annual goal setting based on science-based scenarios, targets, collaborative planning, and adaptive management.	

Funding Source	EPR Project Code	Project Description	ERL
NSA Monterey Other Navy In House, O&MN, Navy Tenant, Project Proponent		Sustain natural resources and the NSA Monterey mission by supporting innovation in planning, design, project management, and implementation for development projects affecting the built environment.	
NSA Monterey Other Navy In House, O&MN, Navy Tenant, Project Proponent		Conduct construction and facility maintenance in a way that allows for protection of sensitive environmental resources and the timely, cost-effective completion of environmental documentation requirements, while ensuring full accomplishment of the military mission.	
NSA Monterey ED In House		Be proactive in cooperative resources planning partnerships to create regional conservation, ecosystem-based solutions of mutual benefit while protecting the military mission.	
NSA Monterey ED In House, NSA Monterey Other Navy In House		Promote compatible, sustainable outdoor recreation opportunities to enhance quality of life for military personnel and the visiting public while conserving natural resources and without compromising the military mission.	
NSA Monterey ED In House		Promote an environmental awareness and resource conservation ethic through natural resource education programming, volunteer opportunities, and distribution of NSA environmental and sustainability information for the public and installation personnel.	
NSA Monterey ED In House		Provide opportunities for public engagement via public access to NSA Monterey properties such that it does not conflict with the military mission, safety and security, and sensitive natural and cultural resource management.	
NSA Monterey ED In House		Use a smart, integrated approach to better steward the heritage trees and other plants on the Main Grounds and Annex.	
NSA Monterey ED In House		Reduce water use in the landscape with smart irrigation practices.	
NSA Monterey ED In House		Increase the viability of new plantings.	
NSA Monterey ED In House		Provide for enforcement of natural resources laws and regulations by professionally trained personnel, taking proper safety and security measures into account.	1



## Appendix J: Reporting on Migratory Bird Management

Each INRMP must address the conservation of birds and their habitat to promote and support migratory birds in compliance with the MBTA, EO 13186 and any subsequent rules, and agreements. Navy policy is that, during annual reviews of INRMPs, installations will discuss with the USFWS conservation measures implemented and the effectiveness of these measures in avoiding, minimizing, or mitigating the take of migratory birds (Navy 2006).

### DoD Migratory Bird Rule and Guidance

The DoD has specific requirements under implementation of MBTA regulations. Following a U.S. District Court decision that granted an injunction on live fire military training on behalf of a private party, Congress enacted the 2003 NDAA, which authorized an interim period during which the prohibitions on incidental take of migratory birds would not apply to military readiness activities. During this interim period, Congress also directed the Secretary of Interior to, not later than one year after enactment of the NDAA, promulgate a regulation to deal with the incidental take of migratory birds in conjunction with military readiness activities from the take prohibition of the MBTA. Under the 2003 National Defense Authorization Bill, the House Armed Services Committee authorized a set of initiatives intended to “restore a balance between protecting the environment and military readiness.” One of these initiatives, regarding the MBTA, stated:

The Migratory Bird Treaty Act allows federal agencies to obtain permits to remove migratory birds for economic or safety reasons, such as clearing geese from a golf course or runway. However, a federal court ruled in March 2002 that Navy activities at a training range near Guam violated the MBTA because the court felt that the law does not allow for permits for the accidental taking of birds during military readiness activities. As a result, the court temporarily shut down military training at the facility. In order to ensure that DoD can operate all of its facilities without further interruptions of this nature, the conferees provided the DoD with authority under which the MBTA would not apply to the incidental taking of a migratory bird by DoD during an authorized military readiness activity. In addition, the conferees directed the Secretary of the Interior, with the concurrence of DoD, to exercise its authority within one year to initiate regulations that would exempt DoD from the MBTA for incidental takings of migratory birds during authorized military readiness activities.

The Migratory Bird Rule relates to military readiness activities and was established in accordance with Section 315 of the NDAA for FY 2003. The final rule, “Migratory Bird Permits: Take of Migratory Birds by the Armed Forces,” was published as 50 CFR Part 21 in the 28 February FR (pg. 8931-8950). It authorizes the military to “take” migratory birds under the MBTA without a permit, but if the military determines that the activity will “significantly” affect a population of migratory birds, they must work with the USFWS to implement conservation measures to minimize the effects. Currently, there are no activities at NSA Monterey that are classified as military readiness activities.

This is different from the USFWS/DoD MOU (FR 30 August 2006) which addresses the conservation of migratory birds on military lands in relation to all activities except readiness. The MOU is a guidance document on how the DoD will conserve migratory birds and does not authorize any take. Key to implementing the MBTA Rule and guidance documents on the MOU between the USFWS and DoD are the wording of the authorization for take that requires an understanding of the definition of the following terms:

- *Population*, as used in Section 21.15, a group of distinct, coexisting (conspecific) individuals of a single species, whose breeding site fidelity, migration routes, and wintering areas are temporally and spatially stable, sufficiently distinct geographically (at some time of the year), and adequately described so that the population can be effectively monitored to discern changes in its status.
- *Significant adverse effect on a population*, used in Section 21.15, means an effect that could, within a reasonable period of time, diminish the capacity of a population of migratory bird species to sustain itself at a biologically viable level. A population is “biologically viable” when its ability to maintain its genetic diversity, to reproduce, and to function effectively in its native ecosystem are not significantly harmed. This effect may be characterized by increased risk to the population from actions that cause direct mortality or a reduction in fecundity. Assessment of impacts should take into account yearly variations and migratory movements of the impacted species. Due to the significant variability in potential military readiness activities and the species that may be impacted, estimates of significant measurable decline will be determined on a case-by-case basis.

In April 2007, guidance was issued by the Under Secretary of Defense for Acquisition, Technology and Logistics on implementing the MOU to Promote the Conservation of Migratory Birds between the USFWS and DoD in accordance with EO 13186 (17 January 2001). This guidance covers all activities on Navy property including natural resources management, routine maintenance and construction, industrial activities, and hazardous waste cleanups.

The guidance emphasizes interdisciplinary collaboration in framework of NABCI Bird Conservation Regions, collaborative inventory and long-term monitoring.

Many questions remain about how to implement the Migratory Bird Rule and the new guidance on the USFWS-DoD MOU. For example, how the evaluation of significance needs to be addressed in decision documents is still being worked out. Since the impact assessment must be conducted on populations of migratory birds, there may be a need to collect better population baseline data.

Conservation measures undertaken under the Migratory Bird Rule require monitoring and record-keeping for five years from the date the Armed Forces commence their conservation action. During INRMP reviews, the Armed Forces must report to the USFWS migratory bird conservation measures implemented and the effectiveness of the conservation measures in avoiding, minimizing, or mitigating take of migratory birds.

### Executive Order 13186 and DoD Migratory Bird MOU

For DoD activities other than military readiness, migratory bird concerns are addressed through a MOU (July 2006) developed in accordance with EO 13186 “Responsibilities of Federal Agencies to Protect Migratory Birds, signed 10 January 2001.” The USFWS/DoD MOU (FR 30 August 2006) that evolved out of the requirements of the EO addresses the conservation of migratory birds on military lands in relation to all activities except readiness. The MOU is a guidance document on how the DoD will conserve migratory birds and does not authorize any take. In April 2007, further guidance was issued by the Under Secretary of Defense for Acquisition, Technology and Logistics on implementing the MOU to Promote the Conservation of Migratory Birds between the USFWS and DoD in accordance with EO 13186. This guidance covers all activities at NSA Monterey, including natural resources management, routine maintenance and construction, industrial activities, and hazardous waste cleanups. The guidance emphasizes interdisciplinary collaboration in framework of NABCI Bird Conservation Regions, collaborative inventory and long-term monitoring. The EO directs executive departments to take certain actions regarding the protection of migratory birds. In the interim period until the MOU is signed, the EO encourages federal agencies “to begin immediately implementing the conservation measures” identified in the EO, “as appropriate and practicable.” The DASN(I&E) in a 19 January 2001 memorandum to the CNO and Commandant of the Marine Corps issued guidance on EO compliance. This guidance provides that U.S. Navy activities should comply with the “intent” of the EO until the EO required MOU is completed.

A Council for the Conservation of Migratory Birds was established to help agencies implement the EO. The EO requires NEPA evaluations to include effects on migratory birds and that advance notice or annual reports must be made to the USFWS concerning actions that result in the taking of migratory birds. The EO also requires agencies to control the establishment of exotic species that may endanger migratory birds and their habitat. Pursuant to its MOU, each agency shall, to the extent permitted by law and subject to the availability of appropriations and within Administration budgetary limits, and in harmony with agency missions:

- Support the conservation intent of the migratory bird conventions by integrating bird conservation principles, measures, and practices into agency activities and by avoiding or minimizing, to the extent practicable, adverse impacts on migratory bird resources when conducting agency actions;
- Restore and enhance the habitat of migratory birds, as practicable;
- Prevent or abate the pollution or detrimental alteration of the environment for the benefit of migratory birds, as practicable;
- Design migratory bird habitat and population conservation principles, measures, and practices, into agency plans and planning processes (natural resource, land management, and environmental quality planning, including, but not limited to, forest and rangeland planning, coastal management planning, watershed planning, etc.) as practicable, and coordinate with other agencies and nonfederal partners in planning efforts;
- Within established authorities and in conjunction with the adoption, amendment, or revision of agency management plans and guidance, ensure that agency plans and actions promote programs and recommendations of comprehensive migratory bird planning efforts such as PIF, U.S. National Shorebird Plan, North American Waterfowl Management Plan, North American Colonial Waterbird Plan, and other planning efforts, as well as guidance from other sources, including the Food and Agricultural Organization's International Plan of Action for Reducing Incidental Catch of Seabirds in Longline Fisheries;
- Ensure that environmental analyses of federal actions required by the NEPA or other established environmental review processes evaluate the effects of actions and agency plans on migratory birds, with emphasis on species of concern;
- Provide notice to USFWS in advance of conducting an action that is intended to take migratory birds, or annually report to USFWS on the number of individuals of each species of migratory birds intentionally taken during the conduct of any agency action, including but not limited to banding or marking, scientific collecting, taxidermy, and depredation control;
- Minimize the intentional take of species of concern by: (i) delineating standards and procedures for such take; and (ii) developing procedures for the review and evaluation of take actions. With respect to intentional take, the MOU shall be consistent with the appropriate sections of 50 CFR parts 10, 21, and 22;
- Identify where unintentional take reasonably attributable to agency actions is having, or is likely to have, a measurable negative effect on migratory bird populations, focusing first on species of concern, priority habitats, and key risk factors. With respect to those actions so identified, the agency shall develop and use principles, standards, and practices that will lessen the amount of unintentional take, developing any such conservation efforts in cooperation with USFWS. These principles, standards, and practices shall be regularly evaluated and revised to ensure that they are effective in lessening the detrimental effect of agency actions on migratory bird



populations. The agency also shall inventory and monitor bird habitat and populations within the agency's capabilities and authorities to the extent feasible to facilitate decisions about the need for, and effectiveness of, conservation efforts;

- Within the scope of its statutorily-designated authorities, control the import, export, and establishment in the wild of live exotic animals and plants that may be harmful to migratory bird resources;
- Promote research and information exchange related to the conservation of migratory bird resources, including coordinated inventorying and monitoring and the collection and assessment of information on environmental contaminants and other physical or biological stressors having potential relevance to migratory bird conservation. Where such information is collected in the course of agency actions or supported through federal financial assistance, reasonable efforts shall be made to share such information with USFWS, the USGS–Biological Resources Division, and other appropriate repositories of such data (e.g. the Cornell Laboratory of Ornithology);
- Provide training and information to appropriate employees on methods and means of avoiding or minimizing the take of migratory birds and conserving and restoring migratory bird habitat;
- Promote migratory bird conservation in international activities and with other countries and international partners, in consultation with the Department of State, as appropriate or relevant to the agency's authorities;
- Recognize and promote economic and recreational values of birds, as appropriate; and
- Develop partnerships with non-federal entities to further bird conservation.

### Migratory Birds and the NSA Monterey INRMP

Many natural resources management activities undertaken under this INRMP benefit migratory birds including feral cat control, habitat management, erosion control, managing for healthy habitats with little human activity, and invasive weed management. In addition, USFWS Birds of Conservation Concern that use NSA Monterey natural resources are identified. Monitoring and regularly scheduled surveys are performed on NSA Monterey in compliance with the Migratory Bird Rule for all avian groups and potentially affected bird species.

Of all avian species identified to utilize NSA Monterey, five have some special status assigned by government agencies (Birds of Conservation Concern - USFWS 2008, California Bird Species of Special Concern - CDFG 2008, California Fully Protected - CDFG 2010, Delisted - CDFG 2010; See Table B-5 in Appendix B: Lists of Species Observed/Documented at NSA Monterey).

The following management measures are implemented by this INRMP:

*Objective: Comply with the Migratory Bird Treaty Act, 2003 Defense Reauthorization Act Migratory Bird Rule, EO 13186, and other federal laws, regulations, and MOUs regarding the protection of migratory birds.*

*Objective: Manage existing and potential habitat of protected wildlife species in order to support and maintain biological diversity and optimum wildlife population levels within areas of sensitive habitat. Strive for maintaining land use flexibility in support of the NSA military mission.*

- I. Conduct regular avian surveys of all properties at least every five years.
  - A. Focus surveys on areas of high-potential for occurrence of Special Status species, such as the beach and dunes for western snowy plover, oak woodlands for Nuttall's woodpecker and oak titmouse, riparian areas for yellow warbler, and grasslands for short-eared owl.
- II. Participate in widespread bird monitoring initiatives (i.e. Monitoring Avian Productivity and Survivorship programs, Christmas Bird Count, etc.).
- III. Ensure the protection and conservation of species protected under the MBTA during tree removal and maintenance activities and during construction, demolition, renovation, and maintenance activities at NSA Monterey through coordination with the appropriate offices/departments.
  - A. Develop BMPs for identifying when trees need to be thinned or removed, including seasonal constraints.
  - B. Leave snags and other high-potential habitat for avian species, if it does not pose a direct threat to personnel or property.
  - C. Encourage shrubs and other understory vegetation in select areas to provide cover and habitat for ground and understory bird species.
- IV. Identify and create habitat areas to encourage avian use.
  - A. Create a habitat corridor on the Main Grounds from University Drive to Del Monte Lake to enhance species movement at NSA Monterey.
  - B. Develop the Annex habitat through tree and shrub planting.
- V. Obtain a depredation permit for oiling eggs and other methods used to control the resident Canada geese population.
- VI. Continue to regularly monitor bird exclusion systems installed on historic structures and other buildings to ensure their continued effectiveness for preventing nesting and avoiding take of any birds due to entanglement.
  - A. Continue to regulate the presence of outdoor trash to discourage seagulls from congregating.
- VII. Identify and protect key nesting areas, migration routes, important prey base areas, and concentration for birds of prey on public lands by mitigating activities during NEPA compliance, and the site approval process. Consider nesting areas and sensitive wildlife concentration areas.



# Appendix K: Critical Habitat Issues and Benefits for Endangered Species

## K.1 Introduction

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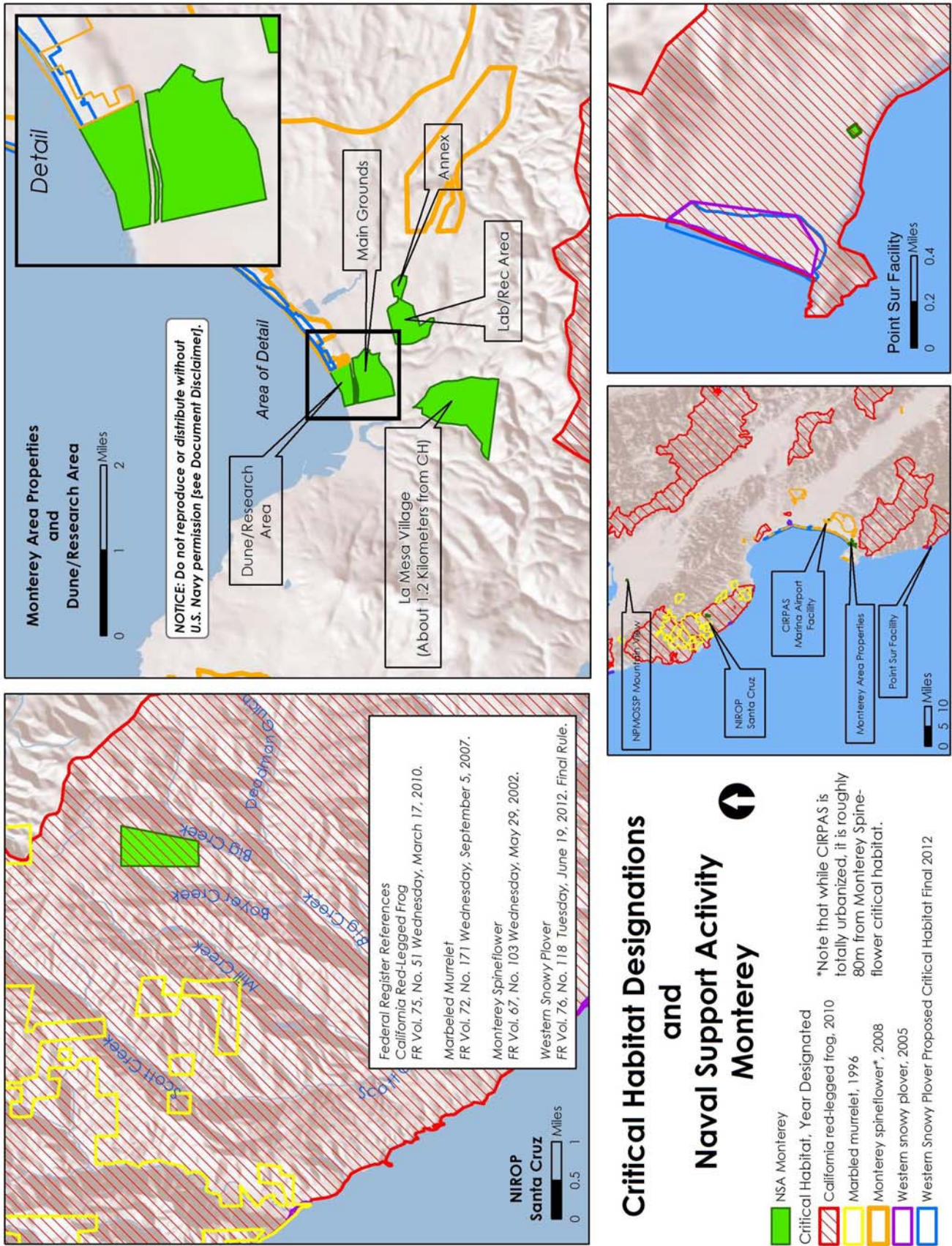
This appendix addresses the following considerations:

- The current status of Critical Habitat and BOs at NSA Monterey,
- The current trend data of documented populations of Federally Listed species at NSA Monterey,
- A brief description of the areas exhibiting the Primary Constituent Elements for Federally Listed species that have designated and proposed critical habitat at NSA Monterey,
- The details of INRMPs plan that: (1) provide a conservation benefit to the federally listed species; (2) provide certainty that the management plan will be implemented; and (3) provide certainty that the conservation effort will be effective.

## K.2 Critical Habitat - Designated, Proposed, and Exempted

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Currently there is designated Critical Habitat for the California red-legged frog (Map K-1). The California red-legged frog is known to occur at the Point Sur Facility (GANDA 2012). The western snowy plover is not known to occur at NSA Monterey (GANDA 2011; Doak et al. 1996; Navy 2001; Kreiberg 1999; AgriChemical & Supply 2009). NSA Monterey was exempted from western snowy plover Critical Habitat with an addendum to the 2001 INRMP addressing management for the species. Monterey has been exempted from Critical Habitat for Yadon's rein orchid, Monterey gilia, and Monterey spineflower by BO 1-8-01-F-29, dated 2001, and authored by the USFWS Ventura Field Office.



1 Map K-1. Critical habitat designations for Naval Support Activity Monterey Properties.

## K.3 Trends in Extant Populations of Federally Listed Species

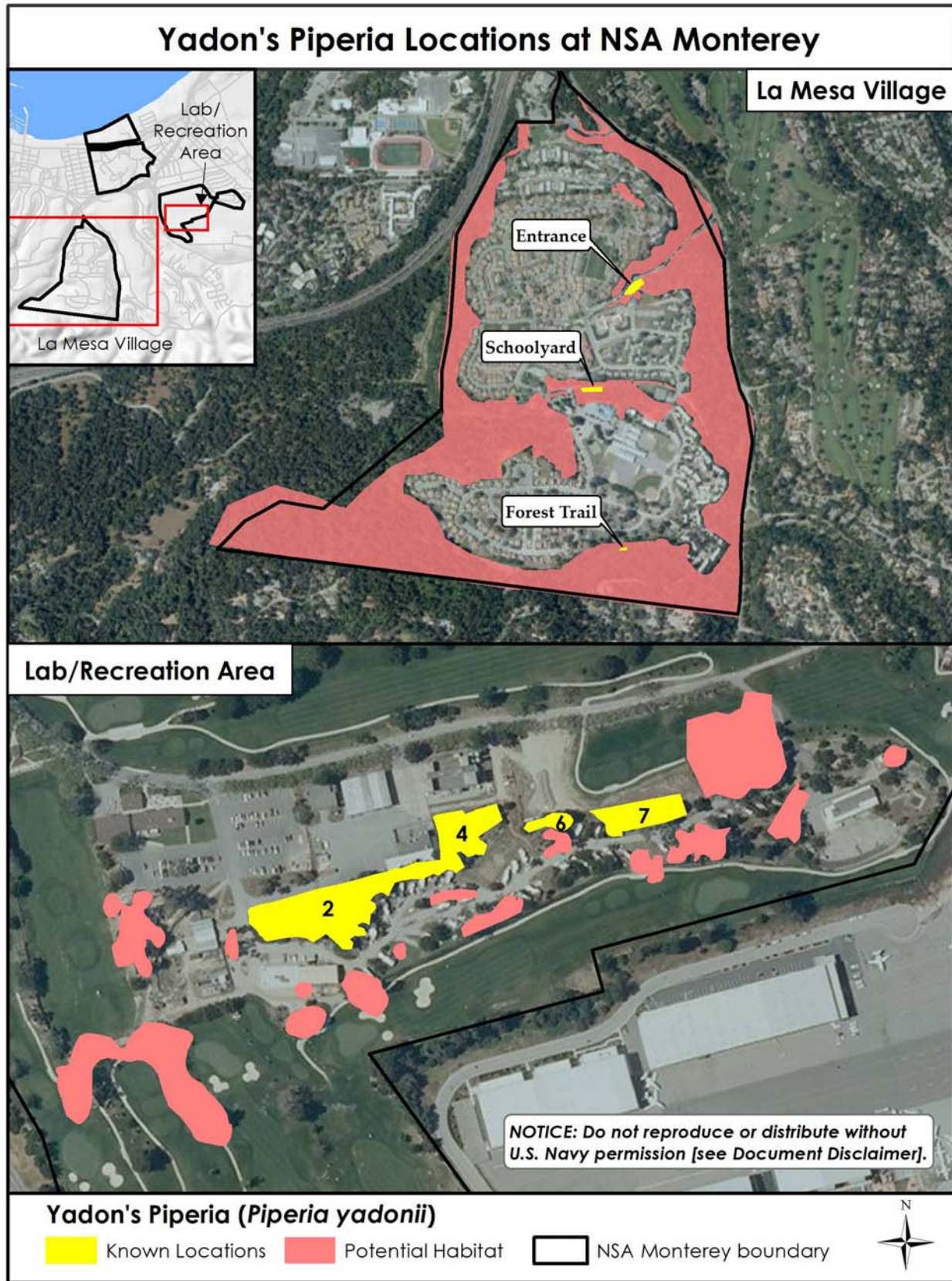
### K.3.1 Yadon's Rein Orchid

Total 2010 counts for Yadon's rein orchid decreased from 2009 yet are still the second highest since surveys began. In La Mesa Village, there was a 19% overall decrease in the Yadon's rein orchid population from the 2009. At the school yard site, there was a slight increase in plant counts in 2010. Some of the smaller individual plots that contained plants in 2009 did not have plants present in the 2010 surveys. Although there were not data for all Yadon's rein orchid populations from 2007 and 2008, the overall 2010 counts were still higher than any other year for which data exists other than 2009 (Table K-1). Referring to Map K-2, the largest number of plants was counted at Group 7. Group numbers correspond to the 2009 Agri Chemical survey. Groups 4 and 6, adjacent to the laboratory buildings, were combined into one total count of 65 plants. 386 plants were counted in Group 2.

Table K-1. Historic records of Yadon's rein orchid on Naval Support Activity Monterey (\* = estimated counts).

Date of Surveys	Lab/Recreation Area	La Mesa Village	Annex	Total
6/6/1993	315	63	4	382
4/16/1999	1,010 (2,275) <sup>a</sup>	~35	28	1,073 (2,338)
7/10/2003	2,485*	134	17	2,338*
4/19/2004	1,979	46	5	2,636
4/18/2005	2,028*	38	7	2,073*
5/19, 6/2/2006	768*	32	2	802
6/19, 7/23, 8/14/2007	750	?	?	750
2/13, 4/12/2008	450	?	?	450
3/19, 4/6-4/8/2009	5,330	488	3	5,727
6/27-7/11/2010	2277	394	None observed	2671

a. From AgriChemical & Supply 2009 Spring/Summer Monitoring Survey of Endangered and Threatened Plants. December 2009. Two different counts for the Yadon's rein orchid exist. Greening Associates (1999) report 1,010 plants in the Lab/Recreation area. The report states that "the number of plants appears to have increased substantially," yet fail to provide an exact number of plants in one group in the area. However, the NSA Monterey INRMP (Navy 2001) reported 2,275 plants in the same area.



Map K-2. Locations of Yadon's rein orchid on Naval Support Activity Monterey.

### K.3.2 Monterey Gilia

Although 2010 counts of Monterey gilia were somewhat lower than for 2009, ten years of data for the Monterey gilia indicate that the population is stable with fluctuating numbers (Table K-2). The transect counts for 2010 are 22% lower and 18% lower for density than in 2009. It is unknown how data was collected years prior to 2009, and the majority of these counts are estimates; therefore, 2009 and 2010 belt transects are the only comparable data sets available. Precipitation, a major influence on annual germination of seeds in the soil's seed bank, probably did not contribute to the fewer numbers found in 2010. Rainfall from July 1 to June 30 was 17.1 inches in 2008-09 and 24.1 inches in 2009-10. Rainfall distribution patterns were also similar in both years. The soil requirements for Monterey gilia are exacting, so minor changes in sand cover can affect germination and establishment of new plants. It is more likely that detected declines in 2010 are associated with pressure from humans and pets. The potential habitat for Monterey gilia at NSA Monterey is only about one hectare, so a simple solution to the problem of protecting the species is a combination of signage and fencing. Habitat restoration may also contribute to the stability and survival of the species at this site.

*Table K-2. Historic counts of Monterey gilia on Naval Support Activity Monterey (AgriChemical & Supply, Inc. 2009).*

Year	Number of individuals sampled
1992	1,905
1998	>10,000*
2003	3,468
2004	3,768
2005	7,729*
2006	8,506*
2007	5,500*
2008	5,000*
2009	8,555 (from transects, density 15.3/m <sup>2</sup> )**
2010	6,683 (density 12.5/m <sup>2</sup> )

\*Estimated counts

\*\*AgriChemical also reports total counts in 2009 at 86,102 individual plants.

### K.3.3 Monterey Spineflower

Although Monterey spineflower counts from belt transect data increased 15% and density increased 13% from 2009 counts, this is a much smaller difference than the decrease seen over previous years (Table K-3). Because most of the historical data are only estimate counts, it is difficult to compare data prior to 2009. Counts prior to the establishment of the belt transects were likely total population estimates for 3.5 hectares of habitat. Recall that trend projections for this species predicted densities per hectare of 30,000 to 50,000, depending on the sampling method. The Monterey spineflower should be carefully monitored annually, implementing a consistent method of data collection that captures the population and the species' annual growth pattern.

*Table K-3. Historic counts of Monterey spineflower on Naval Support Activity Monterey (AgriChemical & Supply, Inc. 2009).*

Year	Number of individuals sampled
1992	1,600
1998	>100,000*
2003	2,485
2004	12,584*
2005	8,977*
2006	6,225*
2007	6,500*
2008	5,000*
2009	1,461 (from transects, density 2.6/m <sup>2</sup> )**
2010	1,728 (density 3.0/m <sup>2</sup> )

\*Estimated counts.

\*\* Agri-Chemical also reports total counts in 2009 at 13,667 individual plants.

### K.3.4 California Red-Legged Frog

In 2012, GANDA led focused surveys for the California red-legged frog at the Point Sur Facility and NIROP Santa Cruz. Three adults were observed at the Point Sur Facility.

*Table K-4. Known observations of California red-legged frog at Naval Support Activity Monterey.*

Year	Number of individuals sampled
2012	2 (Point Sur Facility only*)

\*Data from GANDA (2012). Surveys included NIROP Santa Cruz as well.

## K.4 NSA Monterey Properties with Primary Constituent Elements for Existing and Proposed Critical Habitat

### K.4.1 California Red-Legged Frog

As stated above, NSA Monterey contains critical habitat for the California red-legged frog at NIROP Santa Cruz and the Point Sur Facility. Table K-5 states the Primary Constituent Elements for these species as defined by the USFWS and describes the habitat at NSA Monterey that would most likely fit these categories.



Table K-5. Primary Constituent Elements and associated habitat for the California red-legged frog based on Federal Register / Vol. 75, No. 51 / Wednesday, March 17, 2010 / Rules and Regulations, Page 12816.

Primary Constituent Elements	Conditions at NIROP Santa Cruz (NSC) and the Point Sur Facility (PSF)
<p>(1) Aquatic Breeding Habitat. Standing bodies of fresh water (with salinities less than 4.5 ppt), including natural and manmade (e.g. stock) ponds, slow-moving streams or pools within streams, and other ephemeral or permanent water bodies that typically become inundated during winter rains and hold water for a minimum of 20 weeks in all but the driest of years.</p>	<p><b>NSC</b> - Pocket wetlands, ephemeral streams, and streams are present in many valleys and some meadows on the property. Several observed recently during the wetland delineation are likely wet all or most of the year.</p> <p><b>PSF</b> - Standing body of water in manmade basin of unknown salinity and water quality. Drainage ditch around two sides of property holds water for several months past winter rains.</p>
<p>(2) Aquatic Non-Breeding Habitat. Freshwater pond and stream habitats, as described above, that may not hold water long enough for the species to complete its aquatic life cycle but which provide for shelter, foraging, predator avoidance, and aquatic dispersal of juvenile and adult California red-legged frogs. Other wetland habitats considered to meet these criteria include, but are not limited to: plunge pools within intermittent creeks, seeps, quiet water refugia within streams during high water flows, and springs of sufficient flow to withstand short-term dry periods.</p>	<p><b>NSC</b> - Pocket wetlands, small streams, seeps, and wet meadows are present on the property. Also on the property is Boyer Creek, a small jurisdictional tributary of Big Creek that runs year round.</p> <p><b>PSF</b> - Drainage ditch around two sides of property is well covered in vegetation and wet at least part of the year. Area is not visited by large animals nor disturbed by people. This ditch is within 350 feet of a known breeding population.</p>
<p>(3) Upland Habitat. Upland areas adjacent to or surrounding breeding and non-breeding aquatic and riparian habitat up to a distance of 1 mi (1.6 km) in most cases (i.e. depending on surrounding landscape and dispersal barriers) including various vegetational types such as grassland, woodland, forest, wetland, or riparian areas that provide shelter, forage, and predator avoidance for the California red-legged frog. Upland features are also essential in that they are needed to maintain the hydrologic, geographic, topographic, ecological, and edaphic features that support and surround the aquatic, wetland, or riparian habitat. These upland features contribute to: (1) Filling of aquatic, wetland, or riparian habitats; (2) maintaining suitable periods of pool inundation for larval frogs and their food sources; and (3) providing non-breeding, feeding, and sheltering habitat for juvenile and adult frogs (e.g. shelter, shade, moisture, cooler temperatures, a prey base, foraging opportunities, and areas for predator avoidance). Upland habitat should include structural features such as boulders, rocks and organic debris (e.g. downed trees, logs), small mammal burrows, or moist leaf litter.</p>	<p><b>NSC</b> - Wet areas on the property are in narrow valleys, and upland areas are primarily covered by oak forests with dense litter and downed timber.</p> <p><b>PSF</b> - Kikuyu non-native grassland drains into wetland features to the west. Adjacent State park property is covered in deep perennial grass and trees. Small animal burrows are evident. Red legged frog has been observed in concrete tanks on the park property, approximately 350 feet from the NSA Monterey property. Grazing land surrounding the park and NSA Monterey properties is covered in mostly annual grasses and includes a riparian corridor within 500 feet of NSA Monterey property.</p>
<p>(4) Dispersal Habitat. Accessible upland or riparian habitat within and between occupied or previously occupied sites that are located within one mi (1.6 km) of each other, and that support movement between such sites. Dispersal habitat includes various natural habitats, and altered habitats such as agricultural fields, that do not contain barriers (e.g. heavily traveled roads without bridges or culverts) to dispersal. Dispersal habitat does not include moderate- to high-density urban or industrial developments with large expanses of asphalt or concrete, nor does it include large lakes or reservoirs over 50 ac (20 ha) in size, or other areas that do not contain those features identified in PCE 1, 2, or 3 as essential to the conservation of the species.</p>	<p><b>NSC</b> - Most of the NIROP Santa Cruz property is narrow valleys and ridges covered in oak forest. There are no urban areas, heavily traveled roads or other barriers to frog movement. RLF has been observed within one mile of the NIROP property, in Mill Creek.</p> <p><b>PSF</b> - Kikuyu non-native grassland covers the property and drains into wetland features to the west. Adjacent State park property is covered in deep perennial grass and trees. Grazing land surrounding the park and NSA Monterey properties is covered in mostly annual grasses and includes a riparian corridor within 500 feet of NSA Monterey property. Upland chaparral areas are found within 0.3 miles on the other side of Highway 1. Highway 1 in this area is two-lane and not heavily traveled most of the year. NSA Monterey and adjacent properties have very few barriers that would impede frog movement</p>

### K.4.2 Western Snowy Plover

Table K-6 states the Primary Constituent Elements for this species as defined by the USFWS and describes the habitat at NSA Monterey that would most likely fit these categories.

Table K-6. Primary Constituent Elements and associated habitat for the western snowy plover based on Federal Register / Vol. 76, No. 55 / Tuesday, March 22, 2011 / [Page 16046] Proposed Rules.

Primary Constituent Elements	Conditions at the Dune/Research Area
(1) Areas that are below heavily vegetated areas or developed areas and above the daily high tides,	Area is below vegetated dunes and normally above high tide.
(2) Shoreline habitat areas for feeding, with no or very sparse vegetation, that are between the annual low tide or low-water flow and annual high tide or high-water flow, subject to inundation but not constantly under water,	Shoreline is a sandy beach with no vegetation. Beach may be inundated at spring high tides, particularly if there is a storm surge or high waves, but is normally not under water.
(3) Surf- or water-deposited organic debris located on open substrates, and	Kelp and other organic debris is located on the beach. It has been cleaned off the beach by the City of Monterey in the last few years, but we intend to discontinue this practice.
(4) Minimal disturbance from the presence of humans, pets, vehicles, or human-attracted predators.	Beach walkers and dog walkers are common on this beach at all times of year. While it is not an off-leash area, many walkers do not keep their dogs leashed on this section of the beach. NSA Monterey does not patrol or correct this infraction.

## K.5 Conservation Benefit, Implementation, and Effectiveness

The ESA was revised via the NDAA of 2004 (PL 108-136) to recognize INRMP conservation measures and species benefit that could obviate the need for Critical Habitat designation on Navy lands.

Section 4(a)(3) of the revised ESA states that: “The Secretary [of the Interior] shall not designate as Critical Habitat any lands or other geographical areas owned or controlled by DoD, or designated for its use, that are subject to an integrated natural resources management plan prepared under section 101 of the SAIA (16 USC 670a), if the Secretary determines in writing that such plan provides a benefit to the species for which Critical Habitat is proposed for designation.”

All Navy installations with federally listed threatened or endangered species, proposed federally listed threatened or endangered species, candidate species, or unoccupied habitat for a listed species where Critical Habitat may be designated, must structure the INRMP to avoid the designation of Critical Habitat. The INRMP may obviate the need for Critical Habitat if it specifically addresses both the benefit provided to the listed species and the provisions made for the long-term conservation of the species. The species benefit must be clearly identifiable in the document and should be referenced as a specific topic in the INRMP table of contents.

The USFWS uses a three-point criteria test, to determine if an INRMP provides a benefit to the species. An installation is strongly encouraged to use these USFWS criteria, listed below, when structuring its INRMP to avoid the need for Critical Habitat designation:

1. The plan provides a conservation benefit to the species. The cumulative benefits of the management activities identified in a management plan, for the length of the plan, must maintain or provide for an increase in a species' population, or the enhancement or restoration of its habitat within the area covered by the plan [i.e. those areas deemed essential to the conservation of the species]. A conservation benefit may result from reducing frag-

mentation of habitat, maintaining or increasing populations, insuring against catastrophic events, enhancing and restoring habitats, buffering protected areas, or testing and implementing new conservation strategies.

2. The plan provides certainty that the management plan will be implemented. Persons charged with plan implementation are capable of accomplishing the objectives of the management plan and have adequate funding for the management plan. They have the authority to implement the plan and have obtained all the necessary authorizations or approvals. An implementation schedule, including completion dates, for the conservation effort is provided in the plan.
3. The plan provides certainty that the conservation effort will be effective. The following criteria will be considered when determining the effectiveness of the conservation effort. The plan includes (1) biological goals (broad guiding principles for the program) and objectives (measurable targets for achieving the goals); (2) quantifiable, scientifically valid parameters that will demonstrate achievement of objectives and standards for these parameters by which progress will be measured are identified; (3) provisions for monitoring and, where appropriate, adaptive management; (4) provisions for reporting progress on implementation (based on compliance with the implementation schedule) and effectiveness (based on evaluation of quantifiable parameters) of the conservation effort are provided; and (5) a duration sufficient to implement the plan and achieve the benefits of its goals and objectives.

The federally threatened California red-legged frog, federally threatened western snowy plover, federally endangered Smith's blue butterfly, federally endangered Yadon's rein orchid, federally threatened Monterey spineflower, and federally endangered Monterey gilia need to be addressed for NSA Monterey.

## K.5.1 NSA Monterey Ecosystem

### K.5.1.1 The plan provides a conservation benefit to the federally listed species.

NSA Monterey natural resources, including special status species, will be managed through an ecosystem management approach. Goals have been developed to guide the ecosystem management approach at NSA Monterey; these are discussed under the third criteria in this section concerning the NSA Monterey ecosystem. The objectives and management strategies developed to support the NSA Monterey INRMP ecosystem management goals are included in Chapter 4: Natural Resource Management Objectives and Strategies, Chapter 5: Sustainability and Compatible Use at NSA Monterey, and Chapter 6: Implementation Strategy. The INRMP topics that are addressed in Chapters 4, 5, and 6 are respectively identified in Table K-7, Table K-8, and Table K-9. The INRMP topics identified in the tables below are all supported by an objective and management strategy. The INRMP topics that did not have an explicit objective and management strategy are not included in these tables.

*Table K-7. Chapter 4 natural resource management objectives and strategies topics .*

INRMP Section	INRMP Natural Resource Management Topics
4.1	Managing with an Ecosystem Approach
4.2	Managing the Physical and Chemical Environment
4.2.1	Water Resources and Water Quality
4.2.2	Floodplains
4.2.3	Soil Resources
4.2.4	Wildland Fire Management
4.3	Management of Habitats and Plant Communities
4.3.1	Terrestrial Vegetation Communities and Habitats
4.3.1.1	Specific Issues for Coast Live Oak/Monterey Pine
4.3.1.2	Specific Issues for Central Maritime Chaparral
4.3.1.3	Specific Issues for Dune Scrub
4.3.1.4	Specific Issues for Mixed Evergreen Forest and Redwood Forest
4.3.1.5	Specific Issues for Chaparral and Grasslands at NIROP Santa Cruz
4.3.1.6	Specific Issues for Riparian/Wetland Habitat
4.3.2	Coastal and Marine Habitats
4.4	Fish and Wildlife Management
4.4.1	Invertebrates
4.4.2	Pollinators
4.4.3	Reptiles and Amphibians
4.4.4	Birds
4.4.5	Terrestrial Mammals
4.4.5.1	Bats
4.4.6	Marine Mammals
4.5	Special Status Species Protection
4.5.1	Threatened and Endangered Species and Critical Habitat
4.5.1.1	California Red-Legged Frog - Federally Threatened
4.5.1.2	Western Snowy Plover - Federally Threatened
4.5.1.3	Smith's Blue Butterfly - Federally Endangered
4.5.1.4	Yadon's Rein Orchid - Federally Endangered
4.5.1.5	Monterey Spineflower - Federally Threatened
4.5.1.6	Monterey Gilia - Federally Endangered
4.5.2	Other Special Status Species
4.5.3	Invasive Species
4.6	Prevention and Control of Wildlife Damage
4.6.1	Feral Animals and Pests
4.6.2	Bird/Animal Strike Hazard Program
4.6.3	Game Species
4.7	Data Integration, Access, and Reporting

*Table K-8. Chapter 5 natural resource management objectives and strategies topics .*

INRMP Section	INRMP Natural Resource Management Topics
5.1	Sustainability of the Military Mission in the Natural Environment
5.1.1	Integrated Military Mission and Sustainable Land Use Decisions
5.1.2	Adapting to Effects of Climate Change and Regional Growth
5.1.3	Sustainability in the Built Environment
5.2	Beneficial Partnerships and Collaborative Resources Planning
5.3	Outdoor Recreation
5.4	Environmental Education and Public Outreach

*Table K-8. Chapter 5 natural resource management objectives and strategies topics (Continued).*

INRMP Section	INRMP Natural Resource Management Topics
5.5	Public Access
5.6	Integrating Other Plans
5.6.1	Integrated Cultural Resource Management Plan
5.6.2	Integrated Pest Management Plan
5.6.3	Stormwater Management Plan
5.6.5	Installation Restoration Plan
5.7	NEPA Compliance
5.8	Natural Resources Consultation Planning
5.9	Landscaping and Grounds Maintenance
5.10	Training of Natural Resource Management Personnel
5.11	Natural Resources Law Enforcement

*Table K-9. Chapter 6 implementation strategy topics .*

INRMP Section	INRMP Natural Resource Management Topics
6.1	General Considerations
6.1.1	Responsibility
6.1.2	Federal Anti-Deficiency Act
6.1.3	Staffing
6.1.4	Annual Update, Review and Metrics
6.2	Funding and INRMP Implementation
6.2.5	External Assistance
6.2.5.1	INRMP Partners
6.2.5.2	Planned External Support
6.3	Funding Sources
6.3.1	Research Funding Requirements
6.4	INRMP Implementation Summary and Schedule
6.5	Implementation Funding

The INRMP topics included in Chapters 4 through 6, implemented together in an integrated approach, provide a direct cumulative benefit to the NSA Monterey ecosystem, associated terrestrial habitats, terrestrial flora, resident and migratory wildlife populations, and to special status species.

#### **K.5.1.2 The plan provides certainty that the management plan will be implemented.**

The following is an excerpt from Section 1.2: Authority that describes the authority for NSA Monterey resource managers to implement the NSA Monterey INRMP and to ensure that the INRMP will be implemented:

The Sikes Act (as amended) directs the DoD to take the appropriate management actions necessary to protect and enhance the land and water resources on all installations under its control. DoDD 4700.4 Natural Resources Management Program, and DoDI 4715.03 March 2011 Natural Resources Conservation Program, are implemented herein to establish fundamental land management policies and procedures for all military lands to preserve the military mission, but at the same time protect natural resources. NAVFAC document #MO-100.1 provides basic technical guidance for land management practices of all DoD land and water resources. The OPNAVINST 5090.1C (as amended), Environmental and Natural Resources Program Man-

ual, Chapter 24, further sets forth program responsibilities and standards for complying with resource protection laws, regulations and EOs to conserve and manage natural resources on Navy installations in the United States and its territories and possessions. Finally, the CNO INRMP Guidance for Navy Installations, How to Prepare, Implement, and Revise INRMPs, April 2006 supplies guidelines on the process and procedure for developing an INRMP. Additional policy, regulation, and legislation regarding land management are contained in the remaining references listed in this chapter.

Federal and state legal requirements that are the primary drivers for natural resources management are listed in Appendix B (USC, PL, EOs, and CFR).

Organization of this INRMP contains all the elements of the DoD Template for INRMPs (DoD 2006). Since both DoD and Navy guidance (DoDI 4715.03 March 2011, CNO Guidance of April 2006, and OPNAVINST 5090.1C [as amended]) are more comprehensive than that identified in the DoD Template, the outline has been re-worked so that additional material is added in the document to ensure compliance with all guidelines (Navy 2006, 2011). A cross-walk between the DoD Template and this INRMP's contents is provided in the front of this INRMP.

Furthermore, persons charged with plan implementation are capable of accomplishing the objectives of the management plan and have adequate funding for the management plan. They have the authority to implement the plan and have obtained all the necessary authorizations or approvals. The following is an excerpt from Section 6.1.3: Staffing that identifies this in the Plan:

The Sikes Act (as amended) specifically requires that there be “sufficient numbers of professionally trained natural resources management and natural resources enforcement personnel to be available and assigned responsibility” to implement an INRMP.

The ED is responsible for identifying personnel requirements to accomplish INRMP goals and objectives. The ED is also responsible for providing input into this process by allocating existing budgetary and personnel resources and then identifying staffing needs based on any additional current and future projects. Personnel assigned to natural resources management are the core staff responsible for implementing the INRMP. These personnel ensure that a consistent conservation program is carried out by using strategies outlined in this plan to support the Navy mission and achieve INRMP goals and objectives.

The following is an excerpt from Section 5.10: Training of Natural Resource Management Personnel that describes additional measures to ensure that staff will receive training and will ensure that the INRMP will be implemented:

The Sikes Act (as amended) requires “sufficient numbers of professionally trained natural resources management and natural resources enforcement personnel to be available and assigned responsibility” to implement an INRMP. Staff should also be provided opportunities and support to receive both comprehensive training specific to their job and supplemental training in a timely manner, as needed, to ensure proper and efficient management of natural resources (DoDI 4715.03, OPNAVINST 5090.1C [as amended]).

There is a dedicated ED at NSA Monterey with professionally trained natural resource management personnel with various specialized skills for managing resources.

Currently, natural resources personnel participate in three organizations and societies, as well as other professional societies. Attending meetings of these societies provides excellent opportunities to communicate with fellow professionals as well as maintain professional standards.

Current opportunities for training and professional development provided to NSA Monterey natural resources staff have been sufficient to adequately implement the INRMP and manage natural resources on the installation. However, with the expanding scope of natural resource management needs in the last few years, including an expansion in the number of properties overseen, there is a need for additional training. The following is a topic list for training opportunities, certifications, workshops, conferences and other professional development that NSA Monterey natural resources staff should participate in, as needed:

- Pesticide/Integrated Pest Management training
- USFWS National Conservation Training Center courses on Inter-agency Consultation for Endangered Species
- Other USFWS National Conservation Training Center webinars and online training
- Wetland management training
- EPA National Enforcement Training Institute's online training
- CECOS Natural Resources Compliance training
- CECOS Advanced Environmental Law
- CECOS Environmental Negotiation Workshop
- CECOS Environmental Geographic Information Systems/Geostatistics course
- National Military Fisheries and Wildlife Association conference attendance
- California Stormwater Quality Association conference and workshops
- Elkhorn Slough Coastal Training Program courses and workshops
- Management of installation contributions to and expected impacts from Climate Change
- NEPA courses
- Wildlife handling training
- LEED Green Associate or AP certification
- LID certification

NSA Monterey should send at least one person to each of the following annual workshops or professional conferences as appropriate and funding allows: National Military Fish and Wildlife Association annual workshop; California Stormwater Quality Association conference and workshops; PIF national, regional, and state meetings; Training in wildlife handling.

The following is an excerpt from Section 6.4: INRMP Implementation Summary and Schedule that summarizes the objectives and strategies for INRMP implementation and summarizes the INRMP and its schedule:

The objectives and strategies that support INRMP implementation are identified in this section. Following these objectives and management strategies are Table 6-1, Table 6-2, Table 6-3, and Table 6-4 that summarize various aspects of the implementation of this INRMP.

The purpose of Table K-13 is to summarize all projects or activities that NSA Monterey intends to implement over the duration of the INRMP time frame. Table K-13 is organized according to INRMP management

topic. Management strategies presented in Chapter 4, Chapter 5, and Chapter 6 identifies the means by which NSA Monterey intends to achieve desired future conditions. Management actions, such as EPR projects, are specific projects or activities that provide NSA Monterey a mechanism to strive towards achieving those desired future conditions. Individual EPR projects may address multiple management strategies encompassing various INRMP management topics. In order to reduce redundancy, management strategies are incorporated by reference in the INRMP Management Strategy column of the table. Management topics that do not appear as a heading in the table are identified in the INRMP Management Strategy column numerically and referenced to an EPR project that may encompass several topic areas. Also, management strategies that pertain to special status species have their own sections rather than including special status species management strategies in the broader sections that pertain to wildlife populations. This Implementation Table parallels the structure of the INRMP as presented in Chapter 4, Chapter 5, and Chapter 6 and all INRMP management strategies presented in these Sections are referenced in the INRMP Management Strategy column in this table.

Table K-10 identifies the various EPR project codes and descriptions that are referenced in the EPR Project Code column of Table K-13; these include the EPR number or placeholder for future EPR projects (e.g., 63126-EPR-Dune) if appropriate. Table K-11 identifies the applicable funding sources for each project; for more information on funding sources refer to Section 6.3: Funding Sources. Table K-12 identifies the applicable INRMP legal drivers, or compliance requirements, for all of the various INRMP management projects or activities. All projects listed in Table K-13 support compliance with OPNAVINST 5090.1C CH-1 and DoDI 4715.03.

*Objective: Provide the organizational capacity, communication, planning functions, staffing, budgeting, and innovative technology support to ensure compliance with environmental laws, stewardship of natural resources, and continued use of NSA Monterey's lands by the Navy.*

*Objective: Ensure that all appropriate avenues and partnerships are investigated and sought for achieving the goals and objectives of this INRMP, for the best possible management and most efficient use of funds.*

- I. Seek a balanced, multiple-use natural resources program through professional management (Real Estate Operations and Natural Resources Management Procedural Manual NAVFAC P-73 Volume II 1987).
  - A. Ensure environmental staff receive ongoing training and professional development through attendance at workshops, classes, training, and conferences.
- II. Identify and ensure departments prioritize and allocate funding to support compliance requirements.
  - A. Funds will be requested for tasks within the INRMP, with priority given to ERL 4, ERL 3, ERL 2, and ERL 1 projects, in that order based on guidance in 5090.1C CH-1 and DoDI 4715.03.



- B.* Must fund conservation requirements are those projects and activities that are required to meet recurring natural and cultural resources conservation management requirements or current compliance (ERL 4) needs. Navy must fund projects and actions include those required to:

  - 1. Meet with legislative directive, EOs, and any legal requirement supported by laws and regulations found, but not limited to:

    - a.* Federally threatened and endangered species surveys.
    - b.* Baseline wetland delineations.
    - c.* Mapping of federally threatened and endangered species.
    - d.* Mapping of Critical Habitat.
  - 2. Meet the USFWS special management criteria for threatened and endangered species management and avoidance of Critical Habitat designation on military bases.
  - 3. Integrally support mission readiness, training requirements, and land sustainability. Examples include:

    - a.* Prevention of resource loss or degradation (e.g. soil loss, erosion control).
    - b.* Baseline data collection and long-term trend monitoring efforts.
  - 4. Provide for qualified natural resources personnel.
- C.* Identify new funding sources from federal, state, local, and nonprofit organizations with an interest in achieving the goals and objectives of this INRMP in partnership with NSA Monterey. These often require cost-sharing with a non-federal organization. This funding opportunity should be sought for projects that are not ERL4 must fund items, tied directly to regulatory compliance. Examples are watershed management, habitat enhancement, or wetland restoration.
- D.* Support the mutual goals and objectives of this INRMP and the CWAP, as well as a local Natural Community Conservation Planning, through partnership funding.
- E.* Monitor websites that keep track of funding opportunities for environmental stewardship.
- F.* Apply for grants in partnership with local non-profits or other agencies.
- III.* Seek awards for natural resource work conducted at NSA Monterey.
- IV.* Continue to ensure effective communication, adaptive oversight and policy leadership through the Navy Natural Resources Strategic Plan.

*Table K-10. Integrated Natural Resources Management Plan environmental program requirements, project codes, and descriptions.*

EPR Project Code	Description
62271B0022	1 CP SW NSA Monterey - Wetlands Restoration
62271B0068	CHS SW NSA Monterey INRMP
62271NR003	2 BO SW NSA Monterey - Endangered Species Monitoring BO Requirement
62271NR004	2 BO SW NSA Monterey - Endangered Species Protection
62271NR010	CHS SW NSA Monterey - Soil Erosion
62271NR012	SW NSA Monterey Endangered Smith's Blue Butterfly Surveys
62271NR023	1 CP SW NSA Monterey - California Red-Legged Frog
62271NR024	1 SW NSA Monterey - Western Snowy Plover Survey
62271NR025	SW NSA Monterey - NIROP Santa Cruz Wildfire Management Plan

*Table K-11. Integrated Natural Resources Management Plan project funding sources.*

Funding Sources	Description
NSA Monterey ED In House	NSA Monterey Environmental Division funding
NSA Monterey Other Navy In-House	NSA Monterey Public Works or other NSA Monterey Department or Division funding
O&MN	Operations and Maintenance Navy funding
Navy Tenant	NSA Monterey Naval tenant funding
Research Institutions	Research institution, non-governmental organization, or volunteer funding
Project Proponent	Project proponent funding

*Table K-12. Integrated Natural Resources Management Plan implementation table management project or activity legal drivers.*

Acronyms	Description
BEPA	Bald and Golden Eagle Protection Act
BO 1-8-01-F-29	Biological Opinion for the Invasive Plant Species Control and Vegetation Management Activities at the Naval Post-graduate School, Monterey County, California
CWA	Clean Water Act
CZMA	Coastal Zone Management Act
EO 11988	Floodplain Management
EO 11514	Protection and Enhancement of Environmental Quality
EO 11990	Protection of Wetlands
EO 11991	Protection and Enhancement of Environmental Quality
EO 12342	Environmental Safeguard for Animal Damage Control on Federal Lands
EO 13112	Invasive Species
EO 13423	Strengthening Federal Environmental, Energy, and Transportation Management
EO 13514	Federal Leadership in Environmental, Energy, and Economic Performance
ESA	Endangered Species Act
FNWA	Federal Noxious Weed Act
LRPPA	Legacy Resource Protection Program Act
MBTA	Migratory Bird Treaty Act
NEPA	National Environmental Policy Act
5090.1C CH-1	Environmental Protection and Natural Resources Manual (as amended)
OPPA	Oil Pollution Prevention Act
RCRA-HSWA	Resource Conservation and Recovery Act - Hazardous and Solid Waste Amendments
SCA	Soil Conservation Act
DoDI 4715.03	DoD Natural Resources Conservation Program
DoDI 6055.06	DoD Fire and Emergency Services Program
WPFPA	Watershed Protection and Flood Prevention Act

Table K-13. Integrated Natural Resources Management Plan Implementation Summary, including the assignment of priorities based on legal driver behind each project.

INRMP Management Strategy	Funding Source	EPR Project Code	Project Description	ERL	Legal Driver	Implementation		Natural Resources Metrics Builder	Goal	Cost Estimate
						Frequency	Year			
<b>Section 4: Natural Resources Management Objectives and Strategies</b>										
<b>Section 4.1: Managing with an Ecosystem Approach</b>										
	NSA Monterey ED In House		Implement a coordinated monitoring program using land health and focal species indicators that can be implemented cost-effectively over time, and that facilitates reporting on natural resource conditions in relation to other central coast areas and annual INRMP program metrics questions. Set habitat objectives based on ecological sites, ecosystem function indicators, and the requirements of focus species. Do it in a manner that can be scaled up to the work of other agencies, in order to report on the health of NSA Monterey lands.		Sikes Act (as amended), EO 13186, EO 13112, DoD guidance on ecosystem approach. DoD Interagency MOU on federal data standards, Navy guidance on annual INRMP program metrics	As needed	TBD	1. Ecosystem Integrity 2. Listed Species and Critical Habitat 4. Partnership Effectiveness 5. Team Adequacy	Sustainable and effective natural resources program that uses an ecosystem approach to management.	
	O&MN	62271B0068	Revise the INRMP to incorporate current resources and management knowledge.	4	Sikes Act (as amended)	Annual	2012	1. Ecosystem Integrity 2. Listed Species and Critical Habitat 3. Fish and Wildlife Management and Public Use 4. Partnership Effectiveness 5. Team Adequacy 6. INRMP Project Implementation 7. INRMP Impact on the Installation Mission	Sustainable and effective natural resources program that uses an ecosystem approach to management.	
	NSA Monterey ED In House		Apply sustainability principles to the management of habitats, species, and ecological functions on NSA Monterey by identifying resource specific best practices similar to Sustainable Sites Initiative approaches.		Sikes Act (as amended), NEPA, CWA, EO 13423, EO 11514, EO 11991	Ongoing	2012	1. Ecosystem Integrity 2. Listed Species and Critical Habitat	Sustainable and effective natural resources program that uses an ecosystem approach to management.	
<b>Section 4.2: Managing the Physical and Chemical Environment</b>										
<b>Section 4.2.1: Water Resources and Water Quality</b>										
	NSA Monterey ED In House		Review and revise the Del Monte Lake Management Plan.		Sikes Act (as amended), CWA, EOs on Migratory Birds, Invasive Species, Sustainability	Annually	2012	1. Ecosystem Integrity	Diverse and functioning lake ecosystem. Water quality within acceptable limits for California red-legged frog. Compliance with EO 13423.	

Table K-13. Integrated Natural Resources Management Plan Implementation Summary, including the assignment of priorities based on legal driver behind each project.

INRMP Management Strategy	Funding Source	EPR Project Code	Project Description	ERL	Legal Driver	Implementation		Natural Resources Metrics Builder	Goal	Cost Estimate
						Frequency	Year			
	O&MN	62271NR023	Conduct water quality sampling at high value habitat for the California red-legged frog.	4	ESA, CWA	As needed	TBD	1. Ecosystem Integrity 2. Listed Species and Critical Habitat	Diverse and functioning lake ecosystem. Water quality within acceptable limits for California red-legged frog. Compliance with EO 13423.	
	NSA Monterey ED In House		Develop management plan and interim goals for 20% reduction of irrigation water use on Monterey area facilities, using FY 2010 as a baseline.		EO 13423, EO 13514	One Time	2012	1. Ecosystem Integrity	Diverse and functioning lake ecosystem. Water quality within acceptable limits for California red-legged frog. Compliance with EO 13423.	
	NSA Monterey ED In House		Develop a management plan for decreasing the impact of saline irrigation water on Annex landscaping		EO 13423, EO 13514	One Time	2012	1. Ecosystem Integrity	Diverse and functioning lake ecosystem. Water quality within acceptable limits for California red-legged frog. Compliance with EO 13423.	
<b>Section 4.2.2: Floodplains</b>										
	NSA Monterey ED In House		Develop a checklist of items to consider during NEPA review that identifies issues relevant to protecting the natural ecological integrity, structure, and functional values of floodplains at NSA Monterey.		Sikes Act (as amended), CWA, CZMA, LRPPA, WPFPA, EO 11990, NEPA	ongoing	2012	1. Ecosystem Integrity 2. Listed Species and Critical Habitat 3. Fish and Wildlife Management and Public Use	Full accounting of the environmental values floodplains provide and the impacts of actions on them.	
<b>Section 4.2.3: Soil Resources</b>										
	O&MN	62271NR010	Develop and implement an erosion control plan.	4	Sikes Act (as amended), SCA, CWA, CZMA, DoDI 4715.03	one time	2014	1. Ecosystem Integrity	Soil conservation is implemented and ecosystem services are fully provided in support of the military mission and ecosystem integrity.	
<b>Section 4.2.4: Wildland Fire Management</b>										
	O&MN	62271NR025	Develop and implement a WFMP for NIROP Santa Cruz.	4	Sikes Act (as amended), DoDI 6055.6	Five Years	2014	1. Ecosystem Integrity	Forests are managed such that they minimize the potential for, and the negative impacts of, wildfire.	

Table K-13. Integrated Natural Resources Management Plan Implementation Summary, including the assignment of priorities based on legal driver behind each project.

INRMP Management Strategy	Funding Source	EPR Project Code	Project Description	ERL	Legal Driver	Implementation		Natural Resources Metrics Builder	Goal	Cost Estimate
						Frequency	Year			
<b>Section 4.3: Management of Habitats and Plant Communities</b>										
<b>Section 4.3.1: Terrestrial Vegetation Communities and Habitats</b>										
	O&MN	62271NR004	Restore degraded vegetation communities.	4	ESA, Sikes Act (as amended), EO 11990, EO 13186, CWAP, DoD MOU on Ecosystem Approach (partnerships), BO (1-8-01-F-29), DoDI 4715.03	Ongoing	2012	1. Ecosystem Integrity 2. Listed Species and Critical Habitat	Terrestrial vegetation communities have high native species diversity and support populations of special status species.	
	O&MN	62271NR004	Continue to limit public access to sensitive species habitat.	4	ESA, Sikes Act (as amended), EO 11990, EO 13186, CWAP, DoD BO (1-8-01-F-29), DoDI 4715.03	Ongoing	2012	1. Ecosystem Integrity 2. Listed Species and Critical Habitat	Terrestrial vegetation communities have high native species diversity and support populations of special status species.	
	O&MN	62271NR004	Monitor all federally listed plant populations.	4	ESA, Sikes Act (as amended), EO 11990, EO 13186, CWAP, DoD MOU on Ecosystem Approach (partnerships), BO (1-8-01-F-29)	Annual	2012	2. Listed Species and Critical Habitat	Terrestrial vegetation communities have high native species diversity and support populations of special status species.	
	O&MN		Develop a vegetation management plan for Del Monte Lake that considers, among other issues, marine and aquatic invasives.		ESA, CWA, Sikes Act (as amended)	One Time	2012	1. Ecosystem Integrity	Terrestrial vegetation communities have high native species diversity and support populations of special status species.	
	NSAMonterey ED In House	N/A	Develop a map and database for invasive species and update the vegetation map when appropriate.		ESA, Sikes Act (as amended), EO 11990, EO 13186, CWAP, DoD BO (1-8-01-F-29), DoDI 4715.03	Annual	2012	1. Ecosystem Integrity 2. Listed Species and Critical Habitat 4. Partnership Effectiveness	Terrestrial vegetation communities have high native species diversity and support populations of special status species.	
	O&MN		Conduct base-wide flora surveys.		ESA, Sikes Act (as amended)	5 years	2015	1. Ecosystem Integrity 2. Listed Species and Critical Habitat	Terrestrial vegetation communities have high native species diversity and support populations of special status species.	
<b>Section 4.3.1.1: Specific Issues for Coast Live Oak/Monterey Pine</b>										
	O&MN	62271NR003	Conduct focused surveys annually for Yadon's rein orchid in coast live oak and Monterey pine habitat.	4	ESA, Sikes Act (as amended), BO 1-8-01-F-29	Annual	2012	1. Ecosystem Integrity 2. Listed Species and Critical Habitat	Coast live oak and Monterey pine forests are protected from wildfire, have a diverse understory, and support native and species status species.	

Table K-13. Integrated Natural Resources Management Plan Implementation Summary, including the assignment of priorities based on legal driver behind each project.

INRMP Management Strategy	Funding Source	EPR Project Code	Project Description	ERL	Legal Driver	Implementation		Natural Resources Metrics Builder	Goal	Cost Estimate
						Frequency	Year			
	O&MN	62271NR004	Restore coast live oak and Monterey pine habitat for the Yadon's rein orchid.	4	ESA, Sikes Act (as amended), BO 1-8-01-F-29	Annual	2012	1. Ecosystem Integrity 2. Listed Species and Critical Habitat	Coast live oak and Monterey pine forests are protected from wildfire, have a diverse understory, and support native and species status species.	
	O&MN	62271NR004	Protect coast live oak and Monterey pine habitat for Yadon's rein orchid using fencing, signage, and educational materials.	4	ESA, Sikes Act (as amended), BO 1-8-01-F-29	Annual	2012	1. Ecosystem Integrity 2. Listed Species and Critical Habitat	Coast live oak and Monterey pine forests are protected from wildfire, have a diverse understory, and support native and species status species.	
	NSA Monterey ED In House		Develop revised protocols for weeding and landscaping in coast live oak and Monterey pine stands.		Sikes Act (as amended)	One time.	2012	1. Ecosystem Integrity	Coast live oak and Monterey pine forests are protected from wildfire, have a diverse understory, and support native and species status species.	
<b>Section 4.3.1.2: Specific Issues for Central Maritime Chaparral</b>										
	O&MN	62271NR004	Protect federally listed species on Central Maritime Chaparral using fencing, signage and educational materials.	4	ESA, Sikes Act (as amended), BO 1-8-01-F-29	Annual	2012	1. Ecosystem Integrity 2. Listed Species and Critical Habitat	Central maritime chaparral communities have high native species diversity and continue to support populations of Yadon's rein orchid, Monterey gilia, and Monterey spineflower.	
	O&MN	62271NR003	Conduct focused surveys annually or semi-annually for federally listed species in Central Maritime Chaparral.	4	ESA, Sikes Act (as amended), BO 1-8-01-F-29	Annual	2012	1. Ecosystem Integrity 2. Listed Species and Critical Habitat	Central maritime chaparral communities have high native species diversity and continue to support populations of Yadon's rein orchid, Monterey gilia, and Monterey spineflower.	
	O&MN	62271NR004	Restore habitat for federally listed species in Central Maritime Chaparral.	4	ESA, Sikes Act (as amended), BO 1-8-01-F-29	Annual	2012	1. Ecosystem Integrity 2. Listed Species and Critical Habitat	Central maritime chaparral communities have high native species diversity and continue to support populations of Yadon's rein orchid, Monterey gilia, and Monterey spineflower.	
<b>Section 4.3.1.3: Specific Issues for Dune Scrub</b>										
	O&MN	62271NR004	Protect federally listed species on the Dunes using fencing, signage and educational materials.	4	ESA, NDAA 2004, Sikes Act (as amended), BO 1-8-01-F-29	Annual	2012	1. Ecosystem Integrity 2. Listed Species and Critical Habitat	Dune scrub communities are protected from public trespass to the greatest extent possible, have high native species diversity, and continue to support populations, and hosts plants of, special status species.	

Table K-13. Integrated Natural Resources Management Plan Implementation Summary, including the assignment of priorities based on legal driver behind each project.

INRMP Management Strategy	Funding Source	EPR Project Code	Project Description	ERL	Legal Driver	Implementation		Natural Resources Metrics Builder	Goal	Cost Estimate
						Frequency	Year			
	O&MN	62271NR003	Conduct focused surveys annually for federally listed species at the Dunes.	4	ESA, NDAA 2004, Sikes Act (as amended), BO 1-8-01-F-29	Annual	2012	1. Ecosystem Integrity 2. Listed Species and Critical Habitat	Dune scrub communities are protected from public trespass to the greatest extent possible, have high native species diversity, and continue to support populations, and hosts plants of, special status species.	
	O&MN	62271NR004	Restore habitat for federally listed species at the Dunes.	4	ESA, NDAA 2004, Sikes Act (as amended), BO 1-8-01-F-29	Annual	2012	1. Ecosystem Integrity 2. Listed Species and Critical Habitat	Dune scrub communities are protected from public trespass to the greatest extent possible, have high native species diversity, and continue to support populations, and hosts plants of, special status species.	
	O&MN	62271NR010	Continue to investigate soil erosion and control plan for the dunes.	4	Sikes Act (as amended), SCA, CWA, CZMA, DoDI 4715.03	One Time	2012	1. Ecosystem Integrity 2. Listed Species and Critical Habitat 4. Partnership Effectiveness	Dune scrub communities are protected from public trespass to the greatest extent possible, have high native species diversity, and continue to support populations, and hosts plants of, special status species.	
<b>Section 4.3.1.4: Specific Issues for Mixed Evergreen Forest and Redwood Forest</b>										
	O&MN	62271NR025	Develop a NIROP Santa Cruz WFMP in conjunction with an overall forest management plan.	4	ESA, DoDI 6055.6	One Time	2014	1. Ecosystem Integrity 2. Listed Species and Critical Habitat 4. Partnership Effectiveness	Mixed evergreen and redwood forests are protected from wildfire and yet remain healthy in terms of forest diversity and ecosystem function.	
<b>Section 4.3.1.5: Specific Issues for Chaparral and Grasslands at NIROP Santa Cruz</b>										
	O&MN	62271NR025	Develop and implement a WFMP for NIROP Santa Cruz that includes chaparral and grasslands.	4	ESA, DoDI 6055.6	One Time	2012	1. Ecosystem Integrity 2. Listed Species and Critical Habitat 4. Partnership Effectiveness	Chaparral and grassland communities have high native species diversity and are protected from inadvertent degradation and wildfire.	

Table K-13. Integrated Natural Resources Management Plan Implementation Summary, including the assignment of priorities based on legal driver behind each project.

INRMP Management Strategy	Funding Source	EPR Project Code	Project Description	ERL	Legal Driver	Implementation		Natural Resources Metrics Builder	Goal	Cost Estimate
						Frequency	Year			
<b>Section 4.3.1.6: Specific Issues for Riparian/Wetland Habitat</b>										
	O&MN	62271B0022	Establish mitigation conceptual goals, success criteria, and a restoration approach using historical reference conditions and a watershed approach. Riparian and wetland restoration at Point Sur, NIROP Santa Cruz, and the Main Grounds. LID technology implementation on all properties. Riparian monitoring for streambank condition, sedimentation, and invasive species.		CWA Sec. 404, 401; Sikes Act (as amended); CZMA; MBTA; EO 11990; EO 13186; USFWS-DoD MOU Migratory Birds; Unified Federal Policy for a Watershed Approach to Federal Land and Resource Management, 62565 - 62572 Vol. 65, FR; Soil Conservation (16 USC 590a-590q3); Navy CNO LID Policy for Storm Water Management (16 Nov. 2007); EO 13423; EO 13547; North American Wetlands Conservation Act, PL 101-233 (16 USC §§ 4401 - 4414); EISA section 438	Annual	2012	1. Ecosystem Integrity 2. Listed Species and Critical Habitat	There is no net loss to wetlands. Wetland diversity and function is improved through efficiencies in irrigation and reductions in stormwater runoff.	
<b>Section 4.3.2: Coastal and Marine Habitats</b>										
			There are no projects planned for Coastal and Marine Habitats.							
<b>Section 4.4: Fish and Wildlife Management</b>										
	O&MN		Continue to conduct baseline inventories and develop maps of high habitat value to manage focus species to help avoidance, minimization, and conservation of resources and reduce potential for conflict with the military mission.		Sikes Act (as amended), DoD partnership, DoDI 4715.03	5 years.	2015,	1. Ecosystem Integrity 2. Listed Species and Critical Habitat	Native fish and wildlife populations are maintained and special status species are supported.	
<b>Section 4.4.1: Invertebrates</b>										
	O&MN	62271NR012	Conduct Smith blue butterfly surveys.	4	ESA, Sikes Act (as amended)	Annual	2012	1. Ecosystem Integrity 2. Listed Species and Critical Habitat	Major taxa of invertebrate populations are identified and native species are protected through habitat protection.	



Table K-13. Integrated Natural Resources Management Plan Implementation Summary, including the assignment of priorities based on legal driver behind each project.

INRMP Management Strategy	Funding Source	EPR Project Code	Project Description	ERL	Legal Driver	Implementation		Natural Resources Metrics Builder	Goal	Cost Estimate
						Frequency	Year			
<b>Section 4.4.2: Pollinators</b>										
	NSA Monterey ED In House, NSA Monterey Other Navy In House, Research Institutions		Establish pollinator-friendly landscapes and gardens where feasible at NSA Monterey, potentially as part of habitat enhancement activities and in coordination with construction and/or facility maintenance activities.		DoD partnership	When feasible	2012	1. Ecosystem Integrity	Populations of pollinators species are abundant and proactively supported through habitat protection and enhancement.	
	O&MN, NSA Monterey ED In House, Research Institutions		Conduct a baseline pollinator survey at NSA Monterey and monitor pollinator populations at regular intervals. Pay special focus to the pollination requirements of threatened and endangered species.		DoD partnership, ESA	As needed	TBD	1. Ecosystem Integrity 2. Listed Species and Critical Habitat	Populations of pollinators species are abundant and proactively supported through habitat protection and enhancement.	
<b>Section 4.4.3: Reptiles and Amphibians</b>										
	NSA Monterey ED In House		Participate in DoD Partnership on Herptile Conservation (DoD Partners in Amphibian and Reptile Conservation) when it becomes established.		DoD partnership	When possible	TBD	1. Ecosystem Integrity 4. Partnership Effectiveness	Populations of reptiles and amphibians are identified, maintained, and special status species are supported by habitat protection.	
<b>Section 4.4.4: Birds</b>										
	NSA Monterey ED In House		Migratory and resident bird inventory and restoration management activities to conserve bird population and develop and maintain information on status and trend of population and habitats.		MBTA, BEPA	Ongoing	2012	1. Ecosystem Integrity	The diversity of avifauna is supported and special status species are protected.	
	NSA Monterey ED In House		Implement bird conservation principles, measures, and practices through avoidance and minimization measures to protect resident and migratory bird populations.		MBTA, BEPA	Ongoing	2012	1. Ecosystem Integrity	The diversity of avifauna is supported and special status species are protected.	
	NSA Monterey ED In House		Participate in regional avian monitoring initiatives.		MBTA, BEPA	Annual	2012	1. Ecosystem Integrity 4. Partnership Effectiveness	The diversity of avifauna is supported and special status species are protected.	
<b>Section 4.4.5: Terrestrial Mammals</b>										
	O&MN		Terrestrial mammal surveys as part of base-wide flora and fauna surveys every five years.		Sikes Act (as amended), ESA	5 years	2015	1. Ecosystem Integrity 2. Listed Species and Critical Habitat	Populations of terrestrial mammals are identified and native species are supported by protection of their habitat.	

Table K-13. Integrated Natural Resources Management Plan Implementation Summary, including the assignment of priorities based on legal driver behind each project.

INRMP Management Strategy	Funding Source	EPR Project Code	Project Description	ERL	Legal Driver	Implementation		Natural Resources Metrics Builder	Goal	Cost Estimate
						Frequency	Year			
<b>Section 4.4.5.1: Bats</b>										
	O&MN		Inventory and monitor bat populations on NSA Monterey as part of base-wide fauna surveys to adapt management strategies based on current population status.		Sikes Act (as amended)	5 years.	2015	1. Ecosystem Integrity 2. Listed Species and Critical Habitat	Populations of bats are proactively supported while ensuring that they do not become a nuisance.	
	NSA Monterey ED In House		Continue to use educational events like earth day for the promotion, restoration, and creation of bat habitat.		Sikes Act (as amended)	Annual	2012	1. Ecosystem Integrity 4. Partnership Effectiveness	Populations of bats are proactively supported while ensuring that they do not become a nuisance.	
<b>Section 4.4.6: Marine Mammals</b>										
	NSA Monterey ED In House		Educate staff on proper measures regarding sick, injured, or dead marine mammals.		ESA, Sikes Act (as amended), CZMA, MMPA, National Marine Sanctuary Program Regulations, Title 15 of the CFR, Part 922.132	Annual	2012	1. Ecosystem Integrity 2. Listed Species and Critical Habitat	Marine mammals that may occupy NSA Monterey coastal habitats are managed according to regulations.	
<b>Section 4.5: Special Status Species Protection</b>										
<b>Section 4.5.1: Threatened and Endangered Species and Critical Habitat</b>										
	Navy Tenant Funding		Ensure that land use plans and activities in or near threatened or endangered species habitats are accomplished in accordance with the ESA in accordance with current BOs and with ESA Section 7 Consultation Handbook (USFWS and NMFS 1998).		ESA, Sikes Act (as amended), BO 1-8-01-F-29	Annual	2012	2. Listed Species and Critical Habitat	Full compliance with all requirements and protection of special status species.	
<b>Section 4.5.1.1: California Red-Legged Frog - Federally Threatened</b>										
	O&MN	62271NR004	Conduct focused surveys annually for the red-legged frog, and assess high value habitat at that time.	4	ESA, Sikes Act (as amended)	Annual	2012	2. Listed Species and Critical Habitat	Determine the status and condition of the species at NSA Monterey; provide adequate and protected habitat.	
	O&MN	62271B0022, 62271NR004	Restore/enhance habitat where suitable.	4	ESA, Sikes Act (as amended)	Annual	2012	2. Listed Species and Critical Habitat	Determine the status and condition of the species at NSA Monterey; provide adequate and protected habitat.	
<b>Section 4.5.1.2: Western Snowy Plover - Federally Threatened</b>										
	O&MN	62271NR024	Conduct focused surveys annually for the western snowy plover	4	ESA, Sikes Act (as amended)	Annual	2012	2. Listed Species and Critical Habitat	Determine the status and condition of the species at NSA Monterey; provide adequate and protected habitat.	

Table K-13. Integrated Natural Resources Management Plan Implementation Summary, including the assignment of priorities based on legal driver behind each project.

INRMP Management Strategy	Funding Source	EPR Project Code	Project Description	ERL	Legal Driver	Implementation		Natural Resources Metrics Builder	Goal	Cost Estimate
						Frequency	Year			
	O&MN	62271NR024	Restore/enhance habitat where suitable.	4	ESA, Sikes Act (as amended)	Annual	2012	2. Listed Species and Critical Habitat	Determine the status and condition of the species at NSA Monterey; provide adequate and protected habitat.	
<b>Section 4.5.1.3: Smith's Blue Butterfly - Federally Endangered</b>										
	O&MN	62271NR012	Conduct focused surveys annually for the Smith's blue butterfly.	4	ESA, Sikes Act (as amended)	Annual	2012	2. Listed Species and Critical Habitat	Determine the status and condition of the species at NSA Monterey; provide adequate and protected habitat.	
	O&MN	62271NR012	Restore/enhance habitat where suitable.	4	ESA, Sikes Act (as amended)	Annual	2012	2. Listed Species and Critical Habitat	Determine the status and condition of the species at NSA Monterey, provide adequate habitat, and facilitate the eventual delisting of the species.	
<b>Section 4.5.1.4: Yadon's Rein Orchid - Federally Endangered</b>										
	O&MN	62271NR003	Conduct focused surveys annually for Yadon's rein orchid.	4	ESA, Sikes Act (as amended), BO 1-8-01-F-29	Annual	2012	2. Listed Species and Critical Habitat	Populations of Yadon's rein orchid supported and protected in full compliance with BO.	
	O&MN	62271NR004	Restore habitat for the Yadon's rein orchid.	4	ESA, Sikes Act (as amended), BO 1-8-01-F-29	Annual	2012	2. Listed Species and Critical Habitat	Populations of Yadon's rein orchid supported and protected in full compliance with BO.	
	O&MN	62271NR004	Protect habitat for Yadon's rein orchid using fencing, signage, and educational materials.	4	ESA, Sikes Act (as amended), BO 1-8-01-F-29	Annual	2012	2. Listed Species and Critical Habitat	Populations of Yadon's rein orchid supported and protected in full compliance with BO.	
<b>Section 4.5.1.5: Monterey Spineflower - Federally Threatened</b>										
	O&MN	62271NR003	Conduct focused surveys annually for the Monterey spineflower.	4	ESA, Sikes Act (as amended), BO 1-8-01-F-29	Annual	2012	2. Listed Species and Critical Habitat	Populations of the Monterey spineflower are supported and protected in full compliance with BO.	
	O&MN	62271NR004	Restore habitat for the Monterey spineflower.	4	ESA, Sikes Act (as amended), BO 1-8-01-F-29	Annual	2012	2. Listed Species and Critical Habitat	Populations of the Monterey spineflower are supported and protected in full compliance with BO.	
	O&MN	62271NR004	Protect habitat for the Monterey spineflower using fencing, signage, and educational materials.	4	ESA, Sikes Act (as amended), BO 1-8-01-F-29	Annual	2012	2. Listed Species and Critical Habitat	Populations of the Monterey spineflower are supported and protected in full compliance with BO.	
<b>Section 4.5.1.6: Monterey Gilia - Federally Endangered</b>										
	O&MN	62271NR003	Conduct focused surveys annually for the Monterey gilia.	4	ESA, Sikes Act (as amended), BO 1-8-01-F-29	Annual	2012	2. Listed Species and Critical Habitat	Populations of the Monterey gilia are supported and protected in full compliance with BO.	

Table K-13. Integrated Natural Resources Management Plan Implementation Summary, including the assignment of priorities based on legal driver behind each project.

INRMP Management Strategy	Funding Source	EPR Project Code	Project Description	ERL	Legal Driver	Implementation		Natural Resources Metrics Builder	Goal	Cost Estimate
						Frequency	Year			
	O&MN	62271NR004	Restore habitat for the Monterey gilia.	4	ESA, Sikes Act (as amended), BO 1-8-01-F-29	Annual	2012	2. Listed Species and Critical Habitat	Populations of the Monterey gilia are supported and protected in full compliance with BO.	
	O&MN	62271NR004	Protect habitat for the Monterey gilia using fencing, signage, and educational materials.	4	ESA, Sikes Act (as amended), BO 1-8-01-F-29	Annual	2012	2. Listed Species and Critical Habitat	Populations of the Monterey gilia are supported and protected in full compliance with BO.	
<b>Section 4.5.2: Other Special Status Species</b>										
	NSAMonterey ED In House		Provide for the conservation, enhancement, and protection of species warranting Navy stewardship, as a proactive strategy to prevent federal listings and continue to resolve baseline biological data gaps.		ESA, Sikes Act (as amended)	Annual	2012	2. Listed Species and Critical Habitat	Native plant and animal populations are maintained and species status species are supported.	
<b>Section 4.5.3: Invasive Species</b>										
	O&MN	62271NR004	Restore habitat for federally listed species that is degraded due to occupation by invasive species.	4	ESA, Sikes Act (as amended), BO 1-8-01-F-29	Annual	2012	2. Listed Species and Critical Habitat	Invasive species' populations are controlled and reduced across NSA Monterey.	
	NSAMonterey ED In House		Develop a map that depicts all invasive species concerns on NSA Monterey.		ESA, Sikes Act (as amended), BO 1-8-01-F-29	Annual	2012	2. Listed Species and Critical Habitat	Invasive species' populations are controlled and reduced across NSA Monterey.	
<b>Section 4.6: Prevention and Control of Wildlife Damage</b>										
<b>Section 4.6.1: Feral Animals and Pests</b>										
	NSAMonterey ED In House		Ensure pests and feral animals are managed according to the IPMP.		Sikes Act (as amended), EO 12342, DoDI 4715.03	Annual	2012	1. Ecosystem Integrity	Elimination of pest species according to IPMP guidelines.	
<b>Section 4.6.2: Bird/Animal Strike Hazard Program</b>										
<b>Section 4.6.3: Game Species</b>										
<b>Section 4.7: Data Integration, Access, and Reporting</b>										
	NSAMonterey ED In House		Ensure GIS data and products that pertain to NSA Monterey natural resources are available to staff via a dedicated CITRIX share drive folder. Data and products that would be of general interest, such as listed species habitat areas, should be made available via GeoReadiness Explorer.		Sikes Act (as amended), EO 13423	Annual	2012	6. INRMP Project Implementation	Up-to-date and organized data are available to natural resources managers.	

Table K-13. Integrated Natural Resources Management Plan Implementation Summary, including the assignment of priorities based on legal driver behind each project.

INRMP Management Strategy	Funding Source	EPR Project Code	Project Description	ERL	Legal Driver	Implementation		Natural Resources Metrics Builder	Goal	Cost Estimate
						Frequency	Year			
<b>Section 5: Sustainability and Compatible Use at NSA Monterey</b>										
<b>Section 5.1: Sustainability of the Military Mission in the Natural Environment</b>										
<b>Section 5.1.1: Integrated Military Mission and Sustainable Land Use Decisions</b>										
	NSAMonterey ED In House		Ensure long term and accurate data is available for adaptive management and reporting.		Sikes Act (as amended), EO 13186, EO 13112, DoDI 4715.03, DoD Interagency MOU on federal data standards, 5090.1C CH-1	Annual	2012	1. Ecosystem Integrity 2. Listed Species and Critical Habitat 3. Fish and Wildlife Management and Public Use 4. Partnership Effectiveness 5. Team Adequacy 6. INRMP Project Implementation	Healthy and resilient natural resources and no net loss of current or future military value.	
	NSAMonterey ED In House		Apply sustainability principles to the management of habitats, species, and ecological functions on NSA Monterey.		Sikes Act (as amended), NEPA, CWA, EO 13423, EO 11514, EO 11991	Annual	2012	6. INRMP Project Implementation	Healthy and resilient natural resources and no net loss of current or future military value.	
<b>Section 5.1.2: Adapting to Effects of Climate Change and Regional Growth</b>										
	NSAMonterey ED In House		Adapt and mitigate the adverse impacts of climate change through annual goal setting based on science-based scenarios, targets, collaborative planning, and adaptive management.		5090.1C CH-1, Sikes Act (as amended), EO 13423			1. Ecosystem Integrity 2. Listed Species and Critical Habitat 4. Partnership Effectiveness	A rigorous and iterative climate change management framework that maintains core ecosystem functions.	
<b>Section 5.1.3: Sustainability in the Built Environment</b>										
	NSAMonterey Other Navy In House, O&MN, Navy Tenant, Project Proponent		Sustain natural resources and the NSA Monterey mission by supporting innovation in planning, design, project management, and implementation for development projects affecting the built environment.		Sikes Act (as amended), EO 11514, EO 11991, EO 13423	Annual	2012	1. Ecosystem Integrity 7. INRMP Impact on the Installation Mission	All major facilities and landscaping designed or retrofitted using sustainability principles.	
	NSAMonterey Other Navy In House, O&MN, Navy Tenant, Project Proponent		Conduct construction and facility maintenance in a way that allows for protection of sensitive environmental resources and the timely, cost-effective completion of environmental documentation requirements, while ensuring full accomplishment of the military mission.					1. Ecosystem Integrity 7. INRMP Impact on the Installation Mission	All major facilities and landscaping designed or retrofitted using sustainability principles.	

Table K-13. Integrated Natural Resources Management Plan Implementation Summary, including the assignment of priorities based on legal driver behind each project.

INRMP Management Strategy	Funding Source	EPR Project Code	Project Description	ERL	Legal Driver	Implementation		Natural Resources Metrics Builder	Goal	Cost Estimate
						Frequency	Year			
<b>Section 5.2: Beneficial Partnerships and Collaborative Resources Planning</b>										
	NSA Monterey ED In House		Be proactive in cooperative resources planning partnerships to create regional conservation, ecosystem-based solutions of mutual benefit while protecting the military mission.		Sikes Act (as amended), ESA, MBTA, DoDI 4715.03, CWA	Annual	2012	1. Ecosystem Integrity 2. Listed Species and Critical Habitat 3. Fish and Wildlife Management and Public Use 4. Partnership Effectiveness 6. INRMP Project Implementation 7. INRMP Impact on the Installation Mission	Participation in collaborative planning efforts with relevant state and federal agencies.	
<b>Section 5.3: Outdoor Recreation</b>										
	NSA Monterey ED In House, NSA Monterey Other Navy In House		Promote compatible, sustainable outdoor recreation opportunities to enhance quality of life for military personnel and the visiting public while conserving natural resources and without compromising the military mission.		Sikes Act (as amended), EO 11514, EO 11991, EO 13423	Annual	2012	1. Ecosystem Integrity 2. Listed Species and Critical Habitat 3. Fish and Wildlife Management and Public Use 6. INRMP Project Implementation 7. INRMP Impact on the Installation Mission	Recreational opportunities are routinely used and match user preferences.	
<b>Section 5.4: Environmental Education and Public Outreach</b>										
	NSA Monterey ED In House		Promote an environmental awareness and resource conservation ethic through natural resource education programming, volunteer opportunities, and distribution of NSA environmental and sustainability information for the public and installation personnel.		Sikes Act (as amended)	Annual	2012	4. Partnership Effectiveness	Effective public outreach and environmental education program.	
<b>Section 5.5: Public Access</b>										
	NSA Monterey ED In House		Provide opportunities for public engagement via public access to NSA Monterey properties such that it does not conflict with the military mission, safety and security, and sensitive natural and cultural resource management.		Sikes Act (as amended), DoDI 4715.03, 5090.1C CH-1	Annual	2012	2. Listed Species and Critical Habitat 3. Fish and Wildlife Management and Public Use	Efficient public access at the Dune/Research Area and Lab/Rec Area that also protects natural resources.	
<b>Section 5.6: Integrating Other Plans</b>										
<b>Section 5.6.1: Integrated Cultural Resource Management Plan</b>										
<b>Section 5.6.2: Integrated Pest Management Plan</b>										
<b>Section 5.6.3: Stormwater Management Plan</b>										
<b>Section 5.6.5: Installation Restoration Plan</b>										

Table K-13. Integrated Natural Resources Management Plan Implementation Summary, including the assignment of priorities based on legal driver behind each project.

INRMP Management Strategy	Funding Source	EPR Project Code	Project Description	ERL	Legal Driver	Implementation		Natural Resources Metrics Builder	Goal	Cost Estimate
						Frequency	Year			
<b>Section 5.7: NEPA Compliance</b>										
<b>Section 5.8: Natural Resources Consultation Planning</b>										
	NSA Monterey ED In House		Streamline natural resources consultation through clear communication of regulatory requirements. Collaborate with project proponents to plan mitigation and conservation measures to avoid or minimize effects on natural resources first, then "rectify, reduce, eliminate, or compensate for the impact" of unavoidable effects (CEQ 1978).		ESA	Annual	2012	1. Ecosystem Integrity 2. Listed Species and Critical Habitat 4. Partnership Effectiveness 6. INRMP Project Implementation 7. INRMP Impact on the Installation Mission		
<b>Section 5.9: Landscaping and Grounds Maintenance</b>										
	NSA Monterey ED In House		Use a smart, integrated approach to better steward the heritage trees and other plants on the Main Grounds and Annex.		DoDI 4150.07, OPNAVINST 6250.4B, and 5090.1C CH-1	Annual	2012	6. INRMP Project Implementation	Landscaping is maximized for efficiency in labor, water, natural resource benefit, and herbicide use.	
	NSA Monterey ED In House		Reduce water use in the landscape with smart irrigation practices.		DoDI 4150.07, OPNAVINST 6250.4B, and 5090.1C CH-1	Annual	2012	6. INRMP Project Implementation	Landscaping is maximized for efficiency in labor, water, natural resource benefit, and herbicide use.	
	NSA Monterey ED In House		Increase the viability of new plantings.		DoDI 4150.07, OPNAVINST 6250.4B, and 5090.1C CH-1	Annual	2012	6. INRMP Project Implementation	Landscaping is maximized for efficiency in labor, water, natural resource benefit, and herbicide use.	
<b>Section 5.10: Training of Natural Resource Management Personnel</b>										
<b>Section 5.11: Natural Resources Law Enforcement</b>										
	NSA Monterey ED In House		Provide for enforcement of natural resources laws and regulations by professionally trained personnel, taking proper safety and security measures into account.		DoDI 4150.07, OPNAVINST 6250.4B, and 5090.1C CH-1	Annual	2012	6. INRMP Project Implementation	Law enforcement that minimizes the adverse impacts to natural resources.	

### **K.5.1.3 The plan provides certainty that the conservation effort will be effective.**

#### Goal

The CO of NSA Monterey issued an Environmental Policy Statement (December 2010) stating that NSA Monterey is committed to full compliance with federal, state, and local environmental laws and regulations and will achieve this by:

1. Complying with EO 13423, Strengthening Federal Environmental, Energy, and Transportation Management.
2. Complying with Navy environmental and energy policies and directives listed in 5090.1C CH-1.
3. Integrating sound environmental practices into all operations and business decisions.
4. Continuously improving environmental performance through use of effective environmental management and planning.
5. Striving to identify and implement pollution prevention opportunities.
6. Educating employees about their responsibilities to the environment as well as assigning accountability for individual acts of non-compliance.
7. Conducting routine management reviews to assess progress towards environmental goals.

#### Parameters

The specific objectives and management strategies for the federally threatened California red-legged frog, federally threatened western snowy plover, federally endangered Smith's blue butterfly, federally endangered Yadon's rein orchid, federally threatened Monterey spineflower, and federally endangered Monterey gilia are identified in the relevant discussion that follows in this appendix.

#### Monitoring

The specific monitoring activities for the federally threatened California red-legged frog, federally threatened western snowy plover, federally endangered Smith's blue butterfly, federally endangered Yadon's rein orchid, federally threatened Monterey spineflower, and federally endangered Monterey gilia are identified in the relevant discussion that follows in this appendix.

#### Report Progress on Implementation

The following is an excerpt from Section 6.1.4: Annual Update, Review and Metrics that describes the measures that will be taken to ensure that the provisions for reporting progress on implementation are adhered to:

U.S. Department of Defense policy requires installations to review INRMPs annually in cooperation with the two primary partnering parties to the INRMP: USFWS and the state fish and wildlife agency.



Annual reviews facilitate “adaptive management” by providing an opportunity to review the goals and objectives of the plan, as well as establish a realistic schedule for undertaking proposed actions. In addition to tracking the implementation of the INRMP, an annual report is to be provided that briefly summarizes the project and activities that have been implemented during the fiscal year and how these fulfill the objective identified in the INRMP.

Section 101(b)(2) of the Sikes Act (as amended) [16 USC 670a(b)(2)] specifically directs that the INRMPs be reviewed “as to operation and effect” by the primary parties “on a regular basis, but not less often than every five years,” emphasizing that the review is intended to determine whether existing INRMPs are being implemented to meet the requirements of the Sikes Act (as amended) and contribute to the conservation and rehabilitation of natural resources on military installations. The OUSD guidance (17 May 2005) states that joint review should be reflected in a memo or letters.

Recent guidance on INRMP implementation interpreted that the five-year review would not necessarily constitute a “revision,” that this would occur only if deemed necessary. The Annual Review process is broadly guided by the Real Estate Manual (DoDD 4715.DD-R 1996) and by OPNAVINST 5090.1C (as amended). Policy memoranda in 2002, and supplemented in 2004, clarified procedures for INRMP reviews and revisions:

- DUSD[I&E] Policy Memorandum 10 October 2002, which replaced a 1998 policy memorandum.
- Assistant Deputy Under Secretary of Defense for Environment, Safety and Occupational Health Policy Memorandum (01 November 2004).

The INRMP Implementation Guidance (10 October 2002 Memorandum) improved coordination external to DoD (USFWS, state agencies, and the public) and internal to DoD (military operators and trainers, cultural resources managers, pest management coordinators). It also added metrics to ensure proper INRMP coordination occurred and that projects were implemented.

The 2002 guidance required that each installation provide a notice of intent to prepare or revise the INRMP. Each military installation must request that USFWS and the State fish and wildlife agency participate in both the development and review of INRMPs. Current coordination guidelines are that the USFWS field office is the appropriate entry point for military installations, and the USFWS Regional Sikes Act Coordinator is the liaison to facilitate INRMP review.

Supplemental DoD INRMP Guidance (01 November 2004 Memorandum) further defined the scope of the annual and five-year review, public comment on INRMP reviews, and ESA consultation. A formal review must be performed by “the parties” at least every five years. Informal annual reviews are mandatory to facilitate adaptive management, during which time INRMP goals, objectives, and “must fund” projects are reviewed, and a realistic schedule established to undertake proposed actions.

There is no legal obligation to invite the public either to review or to comment upon the parties' mutually agreed upon decision to continue implementation of an existing INRMP without revision. If the parties determine that substantial revisions to an INRMP are necessary, public comment shall be invited in conjunction with any required NEPA analysis.

In most cases INRMPs will incorporate by reference the results of an installation's previous species-by-species ESA consultations, including any reasonable and prudent measures identified in an incidental take statement. Neither a separate biological assessment nor a separate formal consultation should be necessary. Nonetheless, because the INRMP may include management strategies designed to balance the potentially competing needs of multiple species, it may be prudent to engage in informal consultation.

*Objectives and Strategies for INRMP Annual Review*

*Objective: Improve and refine natural resources management by adaptively adjusting success criteria and priorities based on past accomplishments, new risks and threats, new biological information, and changes in policy (DoDD 4715.DD-R 1996).*

- I. Provide a notice of intent to revise the INRMP to USFWS Field Office and the CDFW if a revision is found necessary. Ensure that the USFWS Regional Sikes Act Coordinator is notified.
- II. Comply with recent CNI draft guidance (January 2005) on INRMPs and compliance with the Sikes Act (as amended):
  - A. All INRMPs shall be reviewed annually by the DoD installation with the cooperation of the USFWS and the state fish and wildlife agency, and others with a stake in the outcome of the INRMP at the discretion of the Conservation Program Manager. Annual reviews shall verify that:
    1. Current information on all conservation metrics is available.
    2. All "must fund" projects and activities have been budgeted for and implementation is on schedule.
    3. All required trained natural resources positions are filled or are in the process of being filled.
    4. Projects and activities for the upcoming year have been identified and included in the INRMP. An updated project list does not necessitate revising the INRMP.
    5. All required coordination has occurred.
    6. All significant changes in the installation's mission requirements or its natural resources have been identified.
  - B. Establish a mutually agreed-upon, realistic schedule to undertake proposed actions.
  - C. The outcome of this joint review should be documented in a memorandum or letter summarizing the rationale for the conclusions the parties have reached. This written documentation should reflect the parties' mutual agreement.

*III.* Fulfill the reporting requirements of new measures to promote better understanding of the health of Navy conservation programs, using the “INRMP Metrics Builder” as required by CNI. This creates a set of metrics for Navy natural resources programs to measure conservation impacts on installation missions and the success of partnerships with the USFWS and State fish and wildlife agencies as required by the Sikes Act (as amended). See Figure 6-1 for an introduction to the metrics.

- A. Conduct a performance measure based self-review annually, based on the Metrics Builder (See Figure 6-1). These tables use the Navy and Marine Corps Natural Resources Metrics Builder Reference Guide (04 May 2005) and include March 2008 updates from the NAVFAC metrics website in.
  1. Ensure long-term threats to the health of habitats, such as sea level rise and aquatic species invasion, are addressed.
  2. Develop specific questions to support annual review process from NSA Monterey's perspective.

*IV.* Track implementation to guide and learn from past experience.

- A. Derive the most benefit possible from learning and experience by documenting it and disseminating the information to others.
- B. To track the progress of each of the INRMP's strategies, a spreadsheet program (e.g. Paradox, Access) should be constructed and maintained. Fields can be included to help (a) build queries; (b) track progress by location, type, sponsor, year, etc.; and (c) provide different types of reports. This database was developed as part of this INRMP.
- C. The GIS database (ARC/INFO) established for this INRMP should be maintained to track updates on various implementation activities, such as results of resource inventories, and locations of restoration projects.

## **K.5.2 Federally Threatened California Red-Legged Frog**

### **K.5.2.1 The plan provides a conservation benefit to the species.**

The plan will provide a cumulative benefit to the California red-legged frog at NSA Monterey through protection of potential habitat by reducing threats, restoration of habitat that will be protected and managed in perpetuity, surveying and monitoring for potential populations. The INRMP will provide a cumulative benefit to the California red-legged frog through implementation of objectives and management strategies for the following sections:

Section 4.1: Managing with an Ecosystem Approach  
 Section 4.2: Managing the Physical and Chemical Environment  
 Section 4.2.1: Water Resources and Water Quality  
 Section 4.2.3: Soil Resources  
 Section 4.2.4: Wildland Fire Management  
 Section 4.3: Management of Habitats and Plant Communities

Section 4.3.1: Terrestrial Vegetation Communities and Habitats
Section 4.3.1.2: Specific Issues for Central Maritime Chaparral
Section 4.3.1.4: Specific Issues for Mixed Evergreen Forest and Redwood Forest
Section 4.3.1.5: Specific Issues for Chaparral and Grasslands at NIROP Santa Cruz
Section 4.3.1.6: Specific Issues for Riparian/Wetland Habitat
Section 4.4: Fish and Wildlife Management
Section 4.4.3: Reptiles and Amphibians
Section 4.5: Special Status Species Protection
Section 4.5.1: Threatened and Endangered Species and Critical Habitat
Section 4.5.1.1: California Red-Legged Frog - Federally Threatened
Section 4.5.3: Invasive Species
Section 4.7: Data Integration, Access, and Reporting
Section 5.1: Sustainability of the Military Mission in the Natural Environment
Section 5.1.1: Integrated Military Mission and Sustainable Land Use Decisions
Section 5.1.2: Adapting to Effects of Climate Change and Regional Growth
Section 5.2: Beneficial Partnerships and Collaborative Resources Planning
Section 5.4: Environmental Education and Public Outreach
Section 5.5: Public Access
Section 5.6: Integrating Other Plans
Section 5.7: NEPA Compliance
Section 5.8: Natural Resources Consultation Planning
Section 5.10: Training of Natural Resource Management Personnel
Section 5.11: Natural Resources Law Enforcement

### **K.5.2.2 The plan provides certainty that the management plan will be implemented.**

Projects that will be implemented at NSA Monterey that will provide a direct and or cumulative benefit to the California red-legged frog at NSA Monterey include:

Project Number	Project Title
62271B0022	CHS SW NSA Monterey - Wetlands Restoration
62271NR004	2 BO SW NSA Monterey - Endangered Species Protection
62271NR010	SW NSA Monterey - Soil Erosion
62271NR023	1 S SW NSA Monterey - California Red-Legged Frog
62271NR025	SW NSA Monterey - NIROP Santa Cruz Wildfire Management Plan

### **K.5.2.3 The plan provides certainty that the conservation effort will be effective.**

**Goal:** Determine the status and condition of the species at NSA Monterey; provide adequate and protected habitat.

*Objective: Contribute to the conservation of the California red-legged frog through development of cooperative, ecosystem management-based strategies.*

## Parameters

- I. Protect and restore hydrologic processes and wetland habitat that perpetuate high-quality breeding habitat.
  - A. Though focused surveys determine locations of high value habitat.
    1. Develop management plans for these areas.
    2. Establish BMPs for use of these areas.
  - B. Discourage human foot traffic from suitable breeding areas with educational signage.
  - C. To the extent practical, avoid or minimize impact of military activities to the species.
  - D. Conduct water quality studies on wetland sites.
  - E. Work with adjacent land owners to address habitat threats that cross jurisdictional boundaries.
  - F. Tailor both forest management and WFMPs to benefit habitat for the red-legged frog.
  - G. Install signage that alerts employees and visitors to the presence of the frog as well as mandate that dogs should be leashed at all times.
- II. Protect the California red-legged frog by determining the threat posed by non-native predators.
- III. Support research that contributes to the conservation of this species.
- IV. Conduct monitoring in support of management objective.
  - A. Meet with stakeholders annually to oversee implementation and prioritize projects.
  - B. Periodically monitor for the California red-legged frog to determine the presence or absence of the species.

## Monitoring

Section 4.5.1.1: California Red-Legged Frog - Federally Threatened includes provisions for monitoring the California red-legged frog population in management strategy III.

## Report Progress on Implementation

Refer to the discussion of reporting progress on implementation for NSA Monterey Ecosystem management activities for the means by which NSA Monterey will annually update and report on progress of implementation for the INRMP including management activities pertaining to the California red-legged frog population.

### K.5.3 Federally Threatened Western Snowy Plover

#### K.5.3.1 The plan provides a conservation benefit to the species.

The plan will provide a cumulative benefit to the western snowy plover at NSA Monterey through 1) intensive ongoing management for the species and its habitat and developing mechanisms to ensure management in perpetuity and 2) monitoring western snowy plover populations and threats to determine success of conservation actions and refine management actions. The INRMP will provide a cumulative benefit to the western snowy plover through implementation of objectives and management strategies for the following sections:

Section 4.1: Managing with an Ecosystem Approach

Section 4.2.3: Soil Resources

Section 4.3: Management of Habitats and Plant Communities

Section 4.3.2: Coastal and Marine Habitats

Section 4.4: Fish and Wildlife Management

Section 4.4.4: Birds

Section 4.5: Special Status Species Protection

Section 4.5.1: Threatened and Endangered Species and Critical Habitat

Section 4.5.1.2: Western Snowy Plover - Federally Threatened

Section 4.7: Data Integration, Access, and Reporting

Section 5.1: Sustainability of the Military Mission in the Natural Environment

Section 5.1.1: Integrated Military Mission and Sustainable Land Use Decisions

Section 5.1.2: Adapting to Effects of Climate Change and Regional Growth

Section 5.2: Beneficial Partnerships and Collaborative Resources Planning

Section 5.3: Outdoor Recreation

Section 5.4: Environmental Education and Public Outreach

Section 5.5: Public Access

Section 5.7: NEPA Compliance

Section 5.8: Natural Resources Consultation Planning

Section 5.11: Natural Resources Law Enforcement

#### K.5.3.2 The plan provides certainty that the management plan will be implemented.

Projects that will be implemented at NSA Monterey that will provide a direct and or cumulative benefit to the western snowy plover population at NSA Monterey include:

Project Number	Project Title
62271NR004	2 BO SW NSA Monterey - Endangered Species Protection
62271NR024	1 SW NSA Monterey - Western Snowy Plover Survey

#### K.5.3.3 The plan provides certainty that the conservation effort will be effective.

**Goal:** Determine the status and condition of the species at NSA Monterey; provide adequate and protected habitat.

*Objective: Contribute to the conservation of the western snowy plover through development of cooperative, ecosystem management-based strategies.*

## Parameters/Management Strategies

- I. Protect and maintain natural coastal processes that perpetuate high-quality breeding habitat.
  - A. Ensure beach is clean of litter and contaminants.
  - B. Improve signage mandating dogs be leashed at all times.
  - C. Develop and maintain a feral animal predator management program.
  - D. Minimize activities which can affect invertebrate populations that shorebirds forage on, such as routine removal of tidal wrack.
  - E. Discourage human foot traffic from suitable nesting areas with fencing and educational signage.
  - F. To the extent practical, avoid or minimize impacts or military activities to the species.
  - G. Actively communicate management strategies to local community.
- II. Enhance remnant dune areas as potential nest sites.
  - A. Identify opportunities to use suitable dredge or other materials for expansion of beach areas to create improved nesting substrate.
  - B. Maintain native plant coverage on dunes and control invasive weeds on dunes and beach
- III. Conduct monitoring in support of management objective.
  - A. Meet with stakeholders annually to oversee implementation and prioritize projects.
  - B. Periodically monitor for the western snowy plover to determine the presence or absence of the species.
  - C. Regularly monitor dune and beach area and identify conflicts for immediate actions and long-term projects.
- IV. Coordinate with the City of Monterey and establish protocols to ensure that beach raking equipment does not affect western snowy plover habitat.
- V. Support research that contributes to the conservation of this species.

## Monitoring

Section 4.5.1.2: Western Snowy Plover - Federally Threatened includes provisions for monitoring the western snowy plover population in management strategy III.

## Report Progress on Implementation

Refer to the discussion of reporting progress on implementation for NSA Monterey Ecosystem management activities for the means by which NSA Monterey will annually update and report on progress of implementation for the INRMP including management activities pertaining to the western snowy plover population.

## K.5.4 Federally Endangered Smith's Blue Butterfly

### K.5.4.1 The plan provides a conservation benefit to the species.

The plan will provide a cumulative benefit to the Smith's blue butterfly at NSA Monterey through protection of potential habitat by reducing threats, restoration of habitat that will be protected and managed in perpetuity, surveying and monitoring for potential populations. The INRMP will provide a cumulative benefit to the Smith's blue butterfly through implementation of objectives and management strategies for the following sections:

Section 4.1: Managing with an Ecosystem Approach
Section 4.2.3: Soil Resources
Section 4.3: Management of Habitats and Plant Communities
Section 4.3.1: Terrestrial Vegetation Communities and Habitats
Section 4.3.1.3: Specific Issues for Dune Scrub
Section 4.4: Fish and Wildlife Management
Section 4.4.1: Invertebrates
Section 4.4.2: Pollinators
Section 4.5: Special Status Species Protection
Section 4.5.1: Threatened and Endangered Species and Critical Habitat
Section 4.5.1.3: Smith's Blue Butterfly - Federally Endangered
Section 4.5.3: Invasive Species
Section 4.7: Data Integration, Access, and Reporting
Section 5.1: Sustainability of the Military Mission in the Natural Environment
Section 5.1.1: Integrated Military Mission and Sustainable Land Use Decisions
Section 5.1.2: Adapting to Effects of Climate Change and Regional Growth
Section 5.2: Beneficial Partnerships and Collaborative Resources Planning
Section 5.3: Outdoor Recreation
Section 5.4: Environmental Education and Public Outreach
Section 5.5: Public Access
Section 5.7: NEPA Compliance
Section 5.8: Natural Resources Consultation Planning
Section 5.11: Natural Resources Law Enforcement

### K.5.4.2 The plan provides certainty that the management plan will be implemented.

Projects that will be implemented at NSA Monterey that will provide a direct and or cumulative benefit to the Smith's blue butterfly population at NSA Monterey include:

Project Number	Project Title
62271NR004	2 BO SW NSA Monterey - Endangered Species Protection
62271NR010	SW NSA Monterey - Soil Erosion
62271NR012	1 S SW NSA Monterey - Smith's Blue Butterfly/Survey



### K.5.4.3 The plan provides certainty that the conservation effort will be effective.

**Goal:** Determine the status and condition of the species at NSA Monterey; provide adequate and protected habitat.

*Objective: Contribute to the conservation of the Smith's blue butterfly through monitoring and protection of its habitat where and when feasible.*

#### Parameters/Management Strategies

- I. Conduct surveys during years when plant species are in good condition and over multiple years to avoid problems with the species exhibiting an extended superdiapause pupal stage.
- II. Protect Smith's blue butterfly known and potential habitats where feasible.
- III. Support regional research that inventories and monitors for the Smith's blue butterfly.

#### Monitoring

Section 4.5.1.3: Smith's Blue Butterfly - Federally Endangered includes provisions for monitoring the Smith's blue butterfly population in management strategy I.

#### Report Progress on Implementation

Refer to the discussion of reporting progress on implementation for NSA Monterey Ecosystem management activities for the means by which NSA Monterey will annually update and report on progress of implementation for the INRMP including management activities pertaining to the Smith's blue butterfly population.

## K.5.5 Federally Endangered Yadon's Rein Orchid

### K.5.5.1 The plan provides a conservation benefit to the species.

The plan will provide a cumulative benefit to the Yadon's rein orchid at NSA Monterey through protection of existing populations by reducing threats, restoration of habitat that will be protected and managed in perpetuity, surveying and monitoring populations, and conducting research on the biology of and threats to the species. The INRMP will provide a cumulative benefit to the Yadon's rein orchid population through implementation of objectives and management strategies for the following sections:

Section 4.1: Managing with an Ecosystem Approach

Section 4.2: Managing the Physical and Chemical Environment

Section 4.2.1: Water Resources and Water Quality

Section 4.2.2: Floodplains

Section 4.2.3: Soil Resources

Section 4.2.4: Wildland Fire Management

Section 4.3: Management of Habitats and Plant Communities
Section 4.3.1: Terrestrial Vegetation Communities and Habitats
Section 4.3.1.1: Specific Issues for Coast Live Oak/Monterey Pine
Section 4.3.1.2: Specific Issues for Central Maritime Chaparral
Section 4.4.1: Invertebrates
Section 4.4.2: Pollinators
Section 4.5: Special Status Species Protection
Section 4.5.1: Threatened and Endangered Species and Critical Habitat
Section 4.5.1.4: Yadon's Rein Orchid - Federally Endangered
Section 4.5.3: Invasive Species
Section 4.7: Data Integration, Access, and Reporting
Section 5.1: Sustainability of the Military Mission in the Natural Environment
Section 5.1.1: Integrated Military Mission and Sustainable Land Use Decisions
Section 5.1.2: Adapting to Effects of Climate Change and Regional Growth
Section 5.2: Beneficial Partnerships and Collaborative Resources Planning
Section 5.4: Environmental Education and Public Outreach
Section 5.5: Public Access
Section 5.7: NEPA Compliance
Section 5.8: Natural Resources Consultation Planning
Section 5.9: Landscaping and Grounds Maintenance
Section 5.10: Training of Natural Resource Management Personnel
Section 5.11: Natural Resources Law Enforcement

### **K.5.5.2 The plan provides certainty that the management plan will be implemented.**

Projects that will be implemented at NSA Monterey that will provide a direct and or cumulative benefit to the Yadon's rein orchid population at NSA Monterey include:

Project Number	Project Title
62271NR003	2 BO SW NSA Monterey - Endangered Species Monitoring BO Requirement
62271NR004	2 BO SW NSA Monterey - Endangered Species Protection
62271NR010	SW NSA Monterey - Soil Erosion

### **K.5.5.3 The plan provides certainty that the conservation effort will be effective.**

**Goal:** Populations of Yadon's rein orchid supported and protected in full compliance with BO.

*Objective: Conserve and maintain viable populations of Yadon's rein orchid and maintain compliance with BO requirements and incorporate recommendations of USFWS Five-Year Review as appropriate.*

#### Parameters/Management Strategies

- I. Protect the Yadon's rein orchid by ensuring appropriate signage and fencing exists to both educate and limit public trespass.

- A. In areas supporting populations of Yadon's rein orchid within the Annex Area, flag locations of rein orchids in order to avoid inadvertent damage by ground maintenance activities.
  - B. Maintain existing fences and signs constructed for the protection of rein orchid populations within the Laboratory/Recreation Area (Golf Course) and consider additional fencing and/or signs to protect other populations of this species that may be subject to heavy foot traffic.
  - C. Place additional barriers and signage around the large orchid areas and all foot traffic prevented. Smaller populations should also be fenced off and marked with signage and established fencing and signage should be maintained. Because of the large numbers of visitors and landscapers in the area, an education program utilizing signage would indicate the need and manner of protecting the resources. Trimming weeds, turf, and Monterey pine branches all contribute to the decline of orchids. An instructional program for the maintenance and landscapers at the NSA Monterey would also prevent unwitting damage to the orchids and their habitat.
- II. Protect the Yadon's rein orchid by annually controlling invasive plant species and continue vegetation management and restoration activities.
- A. Continue to remove invasive plants from populations of plant species protected by the ESA by hand removal only. Consult with the USFWS if herbicide application is deemed necessary in these areas.
  - B. To the maximum extent possible, conduct all weed removal activities in areas supporting rein orchid populations between mid-October and early December (the time period after the seed is dispersed and before new leaves emerge).
  - C. Maintain and create habitat conditions that support the orchid: Monterey pine trees and duff, supportive moisture and water conditions in the soil, and shading. Use Monterey pine needle mulch to enrich the soil.
  - D. Develop and implement a protocol for the long term maintenance of the Monterey pine canopy that address both the population structure of the overstory tree and fire hazard of old, dying, or dead trees.
- III. Continue to conduct an annual population census.
- A. In the future, preliminary walkovers for the orchid should be completed in March-May, and surveys completed by mid-June.
  - B. Surveys of potential habitat in the Annex Area should be conducted throughout the vegetative season, more frequently during the peak growing period, in order to verify the orchids' loss in this area.
- IV. Research weather patterns, phenology, pollinators, and germination ecology of the Yadon's rein orchid to better understand population dynamics.

- A. Patterns in climate data should continue to be monitored in conjunction with orchid numbers, and annual surveys completed to track natural growth cycles. Consistent monitoring over a number of years will reveal important data regarding population dynamics.
- B. Support research to thoroughly understand the reproductive ecology of Yadon's rein orchid. Such a study would contribute essential information for the long term maintenance of the species at NSA Monterey.

## Monitoring

Section 4.5.1.4: Yadon's Rein Orchid - Federally Endangered includes provisions for monitoring the Yadon's rein orchid population in management strategy I. This monitoring effort will be included as a component of the Yadon's rein orchid management activities identified in the NSA Monterey Endangered Species Monitoring BO Requirement (Refer to Appendix K Biological Opinions).

## Report Progress on Implementation

Refer to the discussion of reporting progress on implementation for NSA Monterey Ecosystem management activities for the means by which NSA Monterey will annually update and report on progress of implementation for the INRMP including management activities pertaining to the Yadon's rein orchid.

## K.5.6 Federally Threatened Monterey Spineflower

### K.5.6.1 The plan provides a conservation benefit to the species.

The plan will provide a cumulative benefit to the Monterey spineflower at NSA Monterey through protection of existing populations by reducing threats, restoration of habitat that will be protected and managed in perpetuity, surveying and monitoring populations, and conducting research on the biology of and threats to the species. The INRMP will provide a cumulative benefit to the Monterey spineflower through implementation of objectives and management strategies for the following sections:

Section 4.1: Managing with an Ecosystem Approach

Section 4.2: Managing the Physical and Chemical Environment

Section 4.2.2: Floodplains

Section 4.2.3: Soil Resources

Section 4.2.4: Wildland Fire Management

Section 4.3: Management of Habitats and Plant Communities

Section 4.3.1: Terrestrial Vegetation Communities and Habitats

Section 4.3.1.2: Specific Issues for Central Maritime Chaparral

Section 4.3.1.3: Specific Issues for Dune Scrub

Section 4.4.1: Invertebrates

Section 4.4.2: Pollinators

Section 4.5: Special Status Species Protection

Section 4.5.1: Threatened and Endangered Species and Critical Habitat

Section 4.5.1.5: Monterey Spineflower - Federally Threatened
Section 4.5.1.6: Monterey Gilia - Federally Endangered
Section 4.5.3: Invasive Species
Section 4.7: Data Integration, Access, and Reporting
Section 5.1: Sustainability of the Military Mission in the Natural Environment
Section 5.1.1: Integrated Military Mission and Sustainable Land Use Decisions
Section 5.1.2: Adapting to Effects of Climate Change and Regional Growth
Section 5.2: Beneficial Partnerships and Collaborative Resources Planning
Section 5.4: Environmental Education and Public Outreach
Section 5.5: Public Access
Section 5.7: NEPA Compliance
Section 5.8: Natural Resources Consultation Planning
Section 5.10: Training of Natural Resource Management Personnel
Section 5.11: Natural Resources Law Enforcement

### **K.5.6.2 The plan provides certainty that the management plan will be implemented.**

Projects that will be implemented at NSA Monterey that will provide a direct and or cumulative benefit to the Monterey spineflower population at NSA Monterey include:

Project Number	Project Title
62271NR003	2 BO SW NSA Monterey - Endangered Species Monitoring BO Requirement
62271NR004	2 BO SW NSA Monterey - Endangered Species Protection
62271NR010	SW NSA Monterey - Soil Erosion

### **K.5.6.3 The plan provides certainty that the conservation effort will be effective.**

**Goal:** Populations of the Monterey spineflower are supported and protected in full compliance with BO.

*Objective: Conserve and maintain viable populations of the Monterey spineflower and maintain compliance with BO requirements and incorporate recommendations of USFWS Five-Year Review as appropriate.*

#### Parameters/Management Strategies

- I. Protect the Monterey spineflower by ensuring appropriate signage and fencing exists to both educate and limit public trespass.
  - A. Continue to provide convenient and accurate means of identifying areas that support protected species in the Dune/Research Area as off limits to student research.
- II. Enhance habitat for the Monterey spineflower.
  - A. Protect the Monterey spineflower by annually controlling invasive plant species and continue vegetation management and restoration activities.

1. Continue to remove invasive plants from populations of plant species protected by the ESA by hand removal only. Consult with the USFWS if herbicide application is deemed necessary in these areas.
  2. Ensure that non-native plant control and landscaping efforts do not in themselves pose a threat to sensitive habitat and species. Non-native plant control that is carried out in areas with Monterey spineflower needs to be conducted by adequately trained and supervised contractors/personnel to avoid negative impacts to the sensitive species and their habitat.
- B.* Monitor the ongoing process of dune stabilization, and in areas deemed appropriate, return later successional stage habitat to open sand thus creating favorable habitat for the Monterey spineflower.
- III.* Continue to conduct an annual population census. Conduct standardized sensitive plant species monitoring according to refined, tested, and repeatable methods tailored for the Monterey spineflower.
- IV.* Research weather patterns, phenology, and pollinators of the Monterey spineflower to better understand population dynamics.

### Monitoring

Section 4.5.1.5: Monterey Spineflower - Federally Threatened includes provisions for monitoring the Monterey spineflower population in management strategy I. This monitoring effort will be included as a component of the Monterey spineflower management activities identified in the NSA Monterey Endangered Species Monitoring BO Requirement (Refer to Appendix L: Biological Opinions, Environmental Assessments, and MOUs).

### Report Progress on Implementation

Refer to the discussion of reporting progress on implementation for NSA Monterey Ecosystem management activities for the means by which NSA Monterey will annually update and report on progress of implementation for the INRMP including management activities pertaining to the Monterey spineflower.

## K.5.7 Federally Threatened Monterey Gilia

### K.5.7.1 The plan provides a conservation benefit to the species.

The plan will provide a cumulative benefit to the Monterey gilia at NSA Monterey through Monterey giliaough protection of existing populations by reducing threats, restoration of habitat that will be protected and managed in perpetuity, surveying and monitoring populations, and conducting research on the biology of and threats to the species. The INRMP will provide a cumulative benefit to the Monterey gilia through implementation of objectives and management strategies for the following sections:

- Section 4.1: Managing with an Ecosystem Approach
- Section 4.2.2: Floodplains
- Section 4.2.3: Soil Resources
- Section 4.2.4: Wildland Fire Management
- Section 4.3: Management of Habitats and Plant Communities
- Section 4.3.1: Terrestrial Vegetation Communities and Habitats
- Section 4.3.1.3: Specific Issues for Dune Scrub
- Section 4.4.1: Invertebrates
- Section 4.4.2: Pollinators
- Section 4.5: Special Status Species Protection
- Section 4.5.1: Threatened and Endangered Species and Critical Habitat
- Section 4.5.1.6: Monterey Gilia - Federally Endangered
- Section 4.5.3: Invasive Species
- Section 4.7: Data Integration, Access, and Reporting
- Section 5.1: Sustainability of the Military Mission in the Natural Environment
- Section 5.1.1: Integrated Military Mission and Sustainable Land Use Decisions
- Section 5.1.2: Adapting to Effects of Climate Change and Regional Growth
- Section 5.2: Beneficial Partnerships and Collaborative Resources Planning
- Section 5.3: Outdoor Recreation
- Section 5.4: Environmental Education and Public Outreach
- Section 5.5: Public Access
- Section 5.7: NEPA Compliance
- Section 5.8: Natural Resources Consultation Planning
- Section 5.10: Training of Natural Resource Management Personnel
- Section 5.11: Natural Resources Law Enforcement

**K.5.7.2 The plan provides certainty that the management plan will be implemented.**

Projects that will be implemented at NSA Monterey that will provide a direct and or cumulative benefit to the Monterey gilia population at NSA Monterey include:

Project Number	Project Title
62271NR003	2 BO SW NSA Monterey - Endangered Species Monitoring BO Requirement
62271NR004	2 BO SW NSA Monterey - Endangered Species Protection
62271NR010	SW NSA Monterey - Soil Erosion

**K.5.7.3 The plan provides certainty that the conservation effort will be effective.**

**Goal:** Populations of the Monterey gilia are supported and protected in full compliance with BO.

*Objective: Conserve and maintain viable populations of the Monterey gilia and maintain compliance with BO requirements and incorporate recommendations of USFWS Five-Year Review as appropriate.*

## Parameters/Management Strategies

- I. Protect the Monterey gilia by ensuring appropriate signage and fencing exists to both educate and limit public trespass.
  - A. Continue to provide convenient and accurate means of identifying areas that support protected species in the Dune/Research Area as off limits to student research.
- II. Enhance habitat for the Monterey gilia.
  - A. Protect the Monterey gilia by annually controlling invasive plant species and continue vegetation management and restoration activities.
    1. Continue to remove invasive plants from populations of plant species protected by the ESA by hand removal only. Consult with the USFWS if herbicide application is deemed necessary in these areas.
    2. Ensure that non-native plant control and landscaping efforts do not pose a threat to sensitive habitat and species. Non-native plant control that is carried out in areas with Monterey gilia needs to be implemented by adequately trained and supervised contractors/personnel to avoid negative impacts to the sensitive species and their habitat.
  - B. Monitor the ongoing process of dune stabilization, and in areas deemed appropriate, return later successional stage habitat to open sand thus creating favorable habitat for the Monterey gilia.
- III. Continue to conduct an annual population census. Conduct standardized sensitive plant species monitoring according to refined, tested, and repeatable methods tailored for the Monterey gilia.
- IV. Research weather patterns, phenology, and pollinators of the Monterey gilia to better understand population dynamics.

## Monitoring

Section 4.5.1.6: Monterey Gilia - Federally Endangered includes provisions for monitoring the Monterey gilia population in management strategy I. This monitoring effort will be included as a component of the Monterey gilia management activities identified in the NSA Monterey Endangered Species Monitoring BO Requirement (Refer to Appendix L: Biological Opinions, Environmental Assessments, and MOUs).

## Report Progress on Implementation

Refer to the discussion of reporting progress on implementation for NSA Monterey Ecosystem management activities for the means by which NSA Monterey will annually update and report on progress of implementation for the INRMP including management activities pertaining to the Monterey gilia.





## Appendix L: Biological Opinions, Environmental Assessments, and MOUs

### L1 Biological Opinions

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United States Fish and Wildlife Service. 2001. Biological Opinion for the Invasive Plant Species Control and Vegetation Management Activities at the Naval Postgraduate School, Monterey County, California (1-8-01-F-29).

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## L2 Environmental Assessments

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Environmental Assessment for the NSA Monterey INRMP (BOUND SEPARATELY).

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## L3 Memoranda of Understanding

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Any applicable documents.

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## L4 Any Applicable Documents

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## L5 Records of Decision

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Any applicable documents.

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## L6 Cooperative Agreements

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Any applicable documents.

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# United States Department of the Interior

## FISH AND WILDLIFE SERVICE

Ventura Fish and Wildlife Office  
2493 Portola Road, Suite B  
Ventura, California 93003

July 2, 2001

Mark Meadows, Head, Planning and Real Estate  
Engineering Field Activity, West  
Naval Facilities Engineering Command  
Department of the Navy  
900 Commodore Drive  
San Bruno, California 94066-5006

Subject: Biological Opinion for the Invasive Plant Species Control and Vegetation  
Management Activities at the Naval Postgraduate School, Monterey County,  
California (1-8-01-F-29)

Dear Mr. Meadows:

This document transmits the U.S. Fish and Wildlife Service's (Service) biological opinion based upon our review of the Department of the Navy's (Navy) ongoing and proposed invasive plant species control and vegetation management activities at the Naval Postgraduate School (NPGS) in Monterey County and its effects on the federally endangered Yadon's piperia (*Piperia yadonii*) and sand or Monterey gilia (*Gilia tenuiflora* ssp. *arenaria*), and the federally threatened Monterey spineflower (*Chorizanthe pungens* var. *pungens*), in accordance with section 7 of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.). Your April 9, 2001, request for formal consultation was received on April 12, 2001.

This biological opinion is based on information which accompanied your request for consultation and the draft Final Integrated Natural Resources Management Plan (INRMP) for the NPGS dated April 18, 2001 (Navy 2001). We used information on the current status of plant species at the NPGS from the Sensitive Plant Species Survey of Semi-Developed Areas (Greening Associates 1999) and the Status of Rare and Endangered Species, NPGS Dune Restoration (Cowan 1998), as well as previous reports in our files. We also incorporated information from the final rule listing Yadon's piperia as endangered (63 *Federal Register* 43100), the final rule listing Monterey gilia as endangered (57 *Federal Register* 27858), the final rule listing Monterey spineflower as threatened (59 *Federal Register* 5499), and the recovery plan for seven coastal plants and the Myrtle's silverspot butterfly (Service 1998). A complete administrative record for this consultation is on file in the Ventura Fish and Wildlife Office.

## CONSULTATION HISTORY

The Navy consulted with the Service in 1992 on its project for the Dunes/Research area which was designed to eradicate and control invasive non-native plant species and to revegetate the area with native species. At that time, the Smith's blue butterfly (*Euphilotes enoptes smithi*) was listed as endangered, and Monterey gilia, Monterey spineflower, and Menzies' wallflower (*Erysimum menziesii*) were proposed for listing under the Act. The Service concurred with the Navy that the proposed dune vegetation restoration project would not adversely affect the Smith's blue butterfly, given the implementation of certain measures to avoid effects to this species.

To satisfy the requirements of the Sikes Act Improvement Act of 1997, the Navy has prepared an INRMP for the NPGS in coordination with the Service and the California Department of Fish and Game. The INRMP was developed to guide the effective management of natural resources while supporting the academic-based military mission at the 615-acre NPGS until the year 2005. The Navy sent the Draft INRMP for our review and comment in June of 2000. Although we did not comment on the Draft INRMP, we submitted comments in a letter dated October 10, 2000, on the Navy's draft environmental assessment (DEA), dated August 2000, for implementation of the INRMP (Tetra Tech, Inc. 2000). The Navy made revisions to the INRMP and DEA to address our concerns and comments. In a letter dated March 23, 2001, we provided further comments and recommendations on management actions presented in the Navy's draft Final INRMP, dated January 31, 2001, as they relate to sensitive plant and animal species. On March 29, 2001, the Navy initiated informal consultation with a meeting and field tour of the NPGS, where we discussed potential management measures for the conservation and protection of listed species. Our recommendations were incorporated into the draft Final INRMP dated April 18, 2001, and we agreed that the proposed measures to control invasive plant species will ultimately have a beneficial effect on local populations of listed native plant species (Navy 2001). However, we still recommended that the Navy formally consult with us due to the likelihood of adverse effects on individuals of listed plant species resulting from specific management actions.

## BIOLOGICAL OPINION

### DESCRIPTION OF THE PROPOSED ACTION

According to the Final INRMP (Navy 2001) and the information which accompanied your request for consultation, the Navy has proposed the following management measures to benefit local populations of native plant species. These measures include continued removal of invasive nonnative plant species in the main grounds and the Dune/Research area, management of Yadon's piperia populations, and continued enhancement of the Dune/Research area, described further below. In addition, annual surveys will be conducted for Yadon's piperia, Monterey gilia, and Monterey spineflower to determine their locations and approximate numbers over time.

The Navy will continue to remove invasive plants from areas within the NPGS that support populations of federally listed plants, primarily by hand. However, if herbicide use is determined to be necessary for effective invasive species control, the Navy will not use any herbicides within ten feet of Yadon's piperia, Monterey gilia, or Monterey spineflower. Any necessary invasive plant removal within ten feet of these species will be accomplished by hand removal. All herbicide application will be conducted by certified personnel with a hand-held applicator and will adhere to all label and federal application requirements. The Navy will flag all known locations of Yadon's piperia, Monterey gilia, and Monterey spineflower prior to any invasive plant removal activity to avoid inadvertent trampling or damage to individuals during the growing season.

### Main Grounds

The Navy proposes to continue to control invasive species, primarily pampas grass (*Cortaderia jubata*), French broom (*Genista monspessulana*), and annual non-native grasses, in areas of the main grounds that support Yadon's piperia (the Annex area, Laboratory/Recreation area, and La Mesa Village). All invasive plant control activities in areas containing Yadon's piperia will occur after seed maturation and dispersal (mid-October) and will be concluded prior to late-February to avoid adverse effects to above-ground parts of individual plants.

Central maritime chaparral supporting Yadon's piperia remains in the Annex area, concentrated along the southern boundary adjacent to the Monterey Peninsula Airport. The Navy requires clearance of perimeter vegetation; Naval policy on clearing vegetation near fence lines is balanced with the value of the remnant native vegetation by NPGS staff. The Fleet Numerical Meteorological and Oceanographic Center (Center) has also requested that some vegetation be cleared from the fence line. The environmental coordinator of the NPGS has worked with the Center to determine the types and quantity of vegetation that needs to be removed.

The Navy proposes to maintain existing fences and signs constructed in the Annex and the Laboratory/Recreation areas for the protection of populations of Yadon's piperia. The Navy also proposes to potentially establish additional fencing and/or signs to protect additional populations of Yadon's piperia that may be subject to heavy foot traffic in the Laboratory/Recreation area, if necessary. Removal of annual grasses and French broom in the Annex and the Laboratory/Recreation areas will be conducted by hand crews.

For populations of Yadon's piperia at the La Mesa Village, the Navy proposes to continue to monitor the spread of French broom and to remove French broom annually. Similarly, the Navy will remove other invasive species that may threaten the populations of Yadon's piperia, such as cape ivy (*Senecio mikanooides*). Within the La Mesa Village, the Navy will remove French broom as it grows around the housing areas for fire safety. Work will be performed by hand crews with weed cutters and use of approved herbicide (*i.e.*, Roundup) to treat remnant stumps.

The Navy also proposes to control poison oak (*Toxicodendron diversilobum*) as it grows adjacent to the fire access road around the housing area with Roundup.

Dune/Research area

In the INRMP, the Navy proposes to protect, maintain, and enhance remnant natural plant communities at the NPGS through the continuation of efforts to restore the dune ecosystem in the Dune/Research area. Efforts are ongoing in the Dune/Research area to control invasive non-native species, including ripgut brome grass (*Bromus diandrus*), Hottentot fig iceplant (*Carpobrotus edulis*), and European dune grass (*Ammophila arenaria*). Since 1992, the 45-acre area has undergone extensive native revegetation and efforts to control invasive non-native plant species. Other protection activities beneficial to the revegetation effort implemented in 1992 include the installation of interpretative signs, the prevention of off-road vehicle use with a cable along the access road, and the construction of a boardwalk with railing to direct public access to the beach. In continuation of efforts to revegetate the Dune/Research area, the Navy proposes to plant native coastal dune grass (*Leymus mollis*) on the bluffs and sand dunes closest to the high water activity of Monterey Bay.

To enhance existing populations of Monterey gilia and Monterey spineflower in the Dune/Research area, you will continue vegetation management and restoration activities, primarily by hand removal of invasive plant species. All invasive plant control work in areas supporting the Monterey gilia and the Monterey spineflower will be conducted while these plants are not visibly growing in as much as is practicable. However, some invasive plant removal may occur during the growing season of these plants to allow for effective control in the Dune/Research area.

INV

Trash resulting from homeless camps as well as trash observed incidentally (e.g., bottles, papers, plastic containers) will be removed from the back dunes of the Dune/Research area. The Navy proposes to post signs to restrict human activity within the coastal dunes area. The Navy will also maintain the cable fence within the Dune/Research area to restrict vehicle traffic from the dunes. Student research is ongoing in the Dune/Research area; the Navy proposes to continue to provide convenient and accurate means of identifying areas that support protected species in the Dune/Research area as "off-limits" to student research.

TRASH  
CABLE FENCE

Another vegetation management action presented in the INRMP is the potential mapping of invasive plant locations to track spread and control success over time. However, a higher priority for funding and implementation is placed on the eradication and management of invasive plant species than on mapping of invasive plant species.

MAPPING

STATUS OF THE SPECIES

**Yadon's piperia**

Yadon's piperia, a slender perennial herb in the orchid family, was listed as endangered on



August 12, 1998 (63 *Federal Register* 43100). We are currently preparing a recovery plan for five plants of the Monterey Peninsula, including Yadon's piperia. Information contained in this account was obtained primarily from the final rule for listing as endangered, Allen (1996), Jones and Stokes Associates (1996), and Doak and Graff (2000).

Yadon's piperia is found within Monterey pine forest and maritime chaparral communities in northern Monterey County. Its center of distribution appears to be the Monterey Peninsula where plants are found throughout the larger undeveloped tracts of Monterey pine forest. To the north, the range of Yadon's piperia extends to the Los Lomas area, near the border of Santa Cruz County. Yadon's piperia has been found at one location about 15 miles south of the Monterey Peninsula near Palo Colorado Canyon in maritime chaparral along the Big Sur Coast. Yadon's piperia has been found only four to six miles inland despite searches of lands farther east.

Yadon's piperia is known to occur in two primary habitat types: Monterey pine forest with an herbaceous, sparse understory; and ridges in maritime chaparral growing beneath dwarfed Hooker's manzanita (*Arctostaphylos hookeri*) shrubs in shallow soils. In the Monterey pine forest habitat, the species grows through pine needle duff in filtered sun on soils with a shallow clay hard pan that become very dry during the flowering season. Plants may also be found among dense stands of annual grasses, especially quaking grass (*Briza maxima*). In maritime chaparral, it grows on sandstone and is found only under the edges of prostrate mats of Hooker's manzanita, along with Pajaro manzanita (*Arctostaphylos pajaroensis*), chamise (*Adenostema fasciculatum*), Monterey ceanothus (*Ceanothus cuneatus* var. *rigidus*), golden-yarrow (*Eriophyllum confertiflorum*), and monkeyflower (*Mimulus aurantiacus*). Overall, Yadon's piperia appears to favor a well-drained soil that retains moisture during the rainy season but is not subject to inundation. Yadon's piperia can be found in some locations where disturbance had occurred previously, such as abandoned dirt roads or the cut slopes created by their construction. As in other orchid species, Yadon's piperia does not appear to be an early successional species, but is able to colonize trails and road banks within the dwarf maritime chaparral or Monterey pine forest once a decade or more has passed and if light and moisture regimes are favorable.

As in other orchids, germination of Yadon's piperia seeds probably involves a symbiotic relationship with a fungus. Following germination, orchid seedlings typically grow below ground for one to several years before producing their first basal leaves. Plants may produce only vegetative growth for several years, before producing flowers. In mature plants of Yadon's piperia, the basal leaves typically emerge sometime after fall or winter rains and wither by May or June, when the plant produces a single flowering stem. The blooming season of Yadon's piperia is fairly short; the first flowers are dependent on age and/or tuber size and will open in late June with blooming completed by early August and fruits maturing from August to early October. The plant is dormant until the winter rains stimulate root and leaf bud development. Pollinators include nocturnal moths, bumblebees, and infrequent midges and mosquitoes (Doak and Graff 2000).

Allen (1996) has observed that only a small percentage of the Yadon's piperia plants in a population may flower in any year. This is consistent with what is known of other orchid species. As in some other plant taxa, individual orchids that flower in one year may not have the necessary energy reserves to flower in the following year, so size and flowering are not necessarily age-dependent.

As of the 1998 final rule, approximately 84,000 plants on about 350 acres were counted at all known sites throughout the range of this species since 1990. Extant populations occur on property owned by the Pebble Beach Company, Del Monte Forest Foundation, U.S. Department of Defense, and The Nature Conservancy, with the largest populations occurring on the Pebble Beach Company property. Plants observed during surveys in 1995 and 1996 were often densely clustered, with 100 to 200 plants per square meter (Allen 1996). The populations of Yadon's piperia at the NPGS consist more than 2,350 individuals, identified in 1999 in the La Mesa Village, the Laboratory/Recreation area, and the Annex area of the Main Grounds (Greening Associates 1999).

Continued fragmentation and destruction of habitat due to urban and golf course development are the greatest threats to Yadon's piperia. Other threats include exclusion by nonnative species, roadside mowing of vegetation, and deer grazing of flowering stems.

### **Monterey gilia**

Monterey gilia, a small, erect annual plant in the phlox family, was listed as endangered on June 22, 1992 (57 *Federal Register* 27858). Information contained in this account was obtained primarily from the final rule for listing, the recovery plan for seven coastal plants and the Myrtle's silverspot butterfly (Service 1998), and Dorrell-Canepa (1994).

Monterey gilia is a Monterey County endemic species, restricted to the coastal dune scrub community of the Monterey Bay dunes and the Asilomar dunes of the Monterey Peninsula. Monterey Bay dune populations occur from Moss Landing to Monterey, scattered along coastal and inland dunes. Monterey Peninsula populations occur in the vicinity of Spanish Bay and Asilomar State Beach.

This species grows in sandy soils of dune scrub and maritime chaparral habitat in the coastal dunes of Monterey County. This species is associated with dune scrub vegetation types that grow on transgressive sedimentary (rocks laid down by episodic changes in sea level) and aeolian (wind-blown) deposits of the late Wisconsin pluvials (*i.e.*, Flandrian dunes), occurring on rear dunes, near the dune summit in level areas, and on depressions or slopes in the dunes. Suitable habitat usually has a north, east or west aspect, and in wet years can occur on southern aspects. The elevational range for the species occurs from sea level to 100 feet. The substrate is sand with some soil development and litter accumulation. The species favors sites with limited exposure to strong winds, salt spray, and waves. It grows in open areas and wind-sheltered openings in the low-growing dune scrub vegetation or in areas where the sand has experienced

some disturbance, such as along trails and roads. The species is usually tolerant of small amounts drifting sand.

Low-growing central dune scrub species associated with Monterey gilia are silver beach lupine (*Lupinus chamissonis*), beach sagewort (*Artemisia pycnocephala*), mock heather (*Ericameria ericoides*), and coast buckwheat (*Eriogonum latifolium*). Within the open, sparsely vegetated dunes, associated species include Monterey spineflower, dune knotweed (*Polygonum paronychia*), slender fescue (*Vulpia octoflora*), blue toadflax (*Linaria canadensis*), and popcorn-flower (*Plagiobothrys leiocarpa*).

Although protected from direct exposure to ocean wind and salt spray, Flandrian dunes do experience some wind disturbance. Seeds of Monterey gilia are dispersed by wind throughout the dune openings; dispersal, however, is inhibited by dense stands of low-growing dune scrub.

Generally, the species is thought to be primarily self-pollinating based on non-exserted stamens, no observations of pollinators, and very viable seed. Dorrell-Canepa (1994) has studied the ecology and growth of this species. She found that seeds, in the field, germinate from December to February, and fruit is set from the end of April to the end of May. The species appears to produce viable seed even at very small statures. Dorrell-Canepa (1994) has studied the survival of seeds directly planted in dunes versus outplanting of greenhouse raised seedlings. She found that greenhouse germination was almost 100 percent, as compared to 6 to 15 percent of seed sown in dunes. She attributed the low field germination rates to variability in rain.

Rabbit herbivory has been observed to significantly affect the survival of young seedlings and adult plants. Mice or voles may also graze the species, but if the basal rosette is not entirely taken, the plant often recovers and sets seeds.

As of 1998, the 15 known natural occurrences of Monterey gilia contained approximately 110,000 individuals (Service 1998). Populations occur on property managed by the U.S. Department of Defense, City of Sand City, California Department of Parks and Recreation (CDPR), and the Pebble Beach Company, with the largest populations thought to occur at the former Fort Ord. The closure of Fort Ord will result in the transfer of management of some of the habitat for this subspecies to the Bureau of Land Management (BLM), University of California, and the CDPR to be managed as open space.

Overall, the species is threatened by the degradation of suitable habitat from encroachment of invasive, non-native plant species, trampling by equestrians and pedestrians, as well as habitat removal for commercial and/or residential development. Off-road vehicle activities have historically degraded habitat for the species.

To facilitate the recovery of Monterey gilia, the recovery plan for seven coastal plants and the Myrtle's silverspot butterfly (Service 1998) recommends protecting habitat for Monterey gilia and minimizing threats from invasive, non-native plants through application of control measures.

In addition, the recovery plan suggests obtaining life history and response-to-management data, such as data on effects of soil and vegetation disturbance on recruitment of seedlings, and experimental results on effects of removal of non-native species. The recovery plan promotes management of specific Monterey gilia occurrences and monitoring of occurrences and threats to determine effectiveness of management and to establish delisting criteria. Finally, recovery actions should be coordinated to protect other listed species and species of special concern, and an outreach program should be developed and implemented.

The recovery plan also states that the endangered status of Monterey gilia should be reviewed when: (1) habitat throughout its range is protected from encroachment of non-native species, recreational activities, and development; (2) habitat is restored to native vegetation at proper densities to allow natural colonization by this plant; (3) habitat is monitored sufficiently to ensure that local threats are detected promptly; and (4) enough plants exist at enough locations within the protected vegetation to reasonably assure the viability of the species. Specifically, the recovery plan states that the population of Monterey gilia at the NPGS should be protected and managed with a goal of sustaining 10,000 to 40,000 individuals.

### **Monterey spineflower**

Monterey spineflower, a small, prostrate annual in the buckwheat family, was listed as threatened on February 4, 1994 (59 *Federal Register* 5499). Information contained in this account was obtained primarily from the final rule for listing and the recovery plan for seven coastal plants and the Myrtle's silverspot butterfly (Service 1998), the proposed rule for designation of critical habitat published on February 15, 2001 (66 *Federal Register* 10440), and Reveal and Hardham (1989).

Monterey spineflower occurs in sandy soils within coastal habitats from the Monterey Peninsula (Monterey County) northward along the coast to southern Santa Cruz County, and inland to the coastal plain of Salinas Valley. As of the 1998 recovery plan, 29 recorded extant populations occur on property managed by the U.S. Department of Defense, County of Monterey, City of Sand City, CDPR, and the Pebble Beach Company and other private lands, with the largest populations thought to occur on the undeveloped areas of the western half of the former Fort Ord. The closure of Fort Ord will result in the transfer of management of some of the habitat for this species to the BLM, University of California, and the CDPR to be managed as open space.

At coastal sites ranging from the Monterey Peninsula north to Manresa State Beach, Monterey spineflower is found in active coastal dune systems and on coastal bluffs upon which windblown sand has been deposited. On coastal dunes, the distribution of suitable habitat is subject to dynamic shifts caused by patterns of dune mobilization, stabilization, and successional trends in coastal dune scrub that increase in cover over time. Accordingly, individual colonies of Monterey spineflower, found in gaps between stands of scrub, shift in distribution and size over time. Other native plants associated with Monterey spineflower include beach bur (*Ambrosia chamissonis*), beach sagewort, mock heather, Monterey Indian paintbrush (*Castilleja latifolia*), and beach pea (*Lathyrus littoralis*). At some northern Monterey County locations, Monterey

spineflower occurs in close proximity to the endangered Monterey gilia, Menzies' wallflower, Smith's blue butterfly, and the threatened western snowy plover (*Charadrius alexandrinus nivosus*).

At more inland sites, Monterey spineflower occurs on sandy, well-drained soils in a variety of plant communities, most frequently maritime chaparral, valley oak woodlands, and grasslands. Within grassland communities, Monterey spineflower occurs along roadsides, in firebreaks, and in other disturbed sites, while in oak woodland, chaparral, and scrub communities, it occurs in sandy openings between shrubs. In older stands with a high cover of shrubs, the plant are restricted to roadsides, firebreaks, and trails that bisect these communities. Prior to onset of human use of this area, Monterey spineflower may have been restricted to openings created by wildfires within these communities (Service 1998). The southwestern edge of Monterey spineflower habitat on the former Fort Ord was once continuous with habitat found in the community of Del Rey Oaks and at the Monterey Airport. Other inland sites that support Monterey spineflower are located in the area between Aptos and La Selva Beach in Santa Cruz County and near Prunedale in northern Monterey County. At some of these locations, Monterey spineflower occurs in close proximity with the Yadon's piperia and the federally endangered robust spineflower (*Chorizanthe robusta* var. *robusta*).

Farther up the Salinas River, Monterey spineflower was recently found on a dune located within the river floodplain near Soledad, Monterey County (California Natural Diversity Data Base 2000). Two historic sites for Monterey spineflower occur near here; the plant has likely been extirpated from these sites due to conversion to agriculture and channelization activities along the Salinas River. The dune near Soledad is the only one of its size and extent between there and the river mouth.

Monterey spineflower is a short-lived annual species. It germinates during the winter months and flowers from April through June. Although pollination ecology has not been studied for this taxon, Monterey spineflower is likely visited by a wide array of pollinators; observations of pollinators on other species of *Chorizanthe* that occur in Santa Cruz County have included leaf cutter bees (megachilids), at least six species of butterflies, flies, and sphecid wasps. Each flower produces one seed; depending on the vigor of an individual plant, dozens, if not hundreds, of seeds could be produced. The importance of pollinator activity in seed set has been demonstrated by the production of seed with low viability where pollinator access was limited (Harding Lawson Associates 2000). Seed is collectable through August. The plants turn a rusty hue as they dry through the summer months, eventually shattering during the fall. Seed dispersal is facilitated by the involucre spines, which attach the seed to passing animals. While animal vectors most likely facilitate dispersal between colonies and populations, the prevailing coastal winds undoubtedly play a part in scattering seed within colonies and populations.

Several coastal dune restoration efforts within the last decade have included measures to eliminate non-native species and to propagate and reintroduce Monterey spineflower, notably at Moss Landing North Harbor, Pajaro Dunes, and the University of California's Moss Landing

Marine Laboratory. Such efforts have contributed to our understanding that Monterey spineflower readily grows where suitable sandy substrates occur and competition with other plant species is minimal. Where Monterey spineflower occurs within native plant communities, along the coast as well as at more interior sites, it occupies microhabitat sites found between scrub and shrub stands with little cover from other herbaceous species. Where Monterey spineflower occurs within grassland communities, the density of Monterey spineflower may decrease with an increase of the density of other herbaceous species.

Residential development, agricultural land conversion, recreational use, sand mining, dune stabilization, and competition with non-native plants, such as European beach grass and iceplant, have all reduced the populations and habitat of the Monterey spineflower. Habitat loss and conversion from agricultural and residential development, activities at military institutions, and invasion by non-native plants were identified as the primary threats to Monterey spineflower (59 *Federal Register* 5505). Hikers and equestrians may trample these plants at various locations throughout its range. Most of the historical locations of the Monterey spineflower in the Salinas Valley have probably been extirpated by conversion of grassland and valley oak woodland habitats to agricultural fields.

The measures recommended for recovery of the Monterey spineflower in the recovery plan for seven coastal plants and the Myrtle's silverspot butterfly (Service 1998) are similar to the measures proposed for the Monterey gilia. The recovery plan also states that the threatened status of Monterey spineflower should be reviewed when: (1) the former Fort Ord disposal and reuse process has led the management agencies to develop, fund, and implement permanent protection plans for the species' habitat including permanent programs to suppress iceplant; and (2) beach-dune occurrences on State Park and private lands throughout its current range from Santa Cruz to the Monterey Peninsula are covered under a permanent protection plan.

## ENVIRONMENTAL BASELINE

Remnant natural areas containing native vegetation within the main grounds of the NPGS support populations of Yadon's piperia, while Monterey gilia and Monterey spineflower occur in the Dune/Research area.

### Annex area

The Annex area is a densely developed area resembling an industrial park. Native vegetation at the Annex is concentrated along the southern boundary, adjacent to the Monterey airport. At the end of Mitscher Street, the remnant strip (100 to 200 feet long) of maritime chaparral contains a moderate diversity of native plants, including Yadon's piperia and sandmat manzanita (*Arctostaphylos pumila*), and relatively sparse grass cover. The remainder of the strip is highly modified and less diverse, with annual grasses (e.g., ripgut brome) that are mowed annually (Greening Associates 1999).

**Yadon's piperia**

Yadon's piperia was detected in botanical surveys conducted in 1993 and 1999 of the southern boundary of the Annex (Uribe and Associates 1993, Greening Associates 1999). In the remnant strip of maritime chaparral, one colony of Yadon's piperia had increased from four individuals in 1993 to eight plants in 1999 (Greening Associates 1999). During the 1993 survey, damage by annual mowing of invasive annual grasses was noted as a threat to flowering plants of Yadon's piperia (Uribe and Associates 1993). Another colony of Yadon's piperia was newly discovered in 1999 in an open grassy area and was estimated to consist of 20 plants. The entire area containing both colonies was mowed prior to the 1999 survey, conducted in mid-April, and several individuals of Yadon's piperia were observed to have been inadvertently damaged by mowing.

**Monterey spineflower**

A small population of about 140 plants of Monterey spineflower was observed in 1993 in an area of about 6 feet by 6 feet in a small open patch of sand at a fence corner (Uribe and Associates 1993). In 1999, no individuals of Monterey spineflower were present, apparently due to encroachment by sandmat manzanita and lack of adequate surface disturbance in the habitat (Greening Associates 1999).

Laboratory/Recreation area**Yadon's piperia**

In the Laboratory/Recreation area, four colonies of Yadon's piperia were identified in botanical surveys conducted in 1993 and 1999 of the perimeter and all the non-irrigated areas of the golf course (Uribe and Associates 1993, Greening Associates 1999). The four colonies were located in remnant areas of native vegetation supporting sandmat manzanita on low, north-facing cut slopes shaded by Monterey pines and with little or no understory vegetation. Numbers of individuals of Yadon's piperia in the Laboratory/Recreation area increased from a total of approximately 370 individuals in 1993 to more than 2,275 individuals in 1999.

Invasion by pampas grass, weedy annual grasses including wild oats (*Avena* spp.), French broom, and two species of acacia trees have been considered as threats to the habitat quality of this site. However, the increased numbers of Yadon's piperia from 1993 to 1999 appear to be a direct result of successful management efforts to control invasive non-native species (Greening Associates 1999).

The largest colony of Yadon's piperia covers a relatively extensive area, along the slope surrounding the southern edge of the baseball field. More than 15 individuals were counted in 1993, and this colony was estimated in 1999 to have increased by about 1,295 plants, most likely in response to removal of pampas grass and French broom (Greening Associates 1999, Navy 2001). In 1993, much of the slope was observed to be covered with short annual grasses which had been mowed; inadvertent cutting during annual mowing was noted as a potential threat to individuals of Yadon's piperia (Uribe and Associates 1993). This area containing Yadon's

piperia is now surrounded by a low rail fence, although many Yadon's piperia plants were observed during our recent site visit to be growing outside of the fence.

The remaining three colonies have also increased in numbers since 1993 due to successful management efforts (Uribe and Associates 1993, Greening Associates 1999). One colony was located at the southern edge of a parking lot north of Building 217, estimated to contain about 80 mature individuals in 1993 and a total of about 300 plants in 1999. Another colony, located at the northeast corner of building 215 on shaded north- and west-facing banks and on level ground at the foot of the slope, was estimated to consist of more than 80 plants in 1993 and about 500 plants in 1999. The fourth colony was located at the southwest corner of Building 215 on a slope separated by a ditch from the paved parking area and shaded by a dense stand of young Monterey pine trees. This colony was estimated to contain about 140 plants in 1993 and had increased to more than 180 plants in 1999. This area was enclosed by a low rail fence prior to the 1999 survey (Greening Associates 1999).

### La Mesa Village

#### **Yadon's piperia**

Yadon's piperia was detected in botanical surveys conducted in 1993 and 1999 of the entire perimeter of the housing area of the La Mesa Village and portions of the interior containing natural vegetation (Uribe and Associates 1993, Greening Associates 1999). The La Mesa Village area contains more relatively unaltered habitat than other natural areas of the main grounds, with a much greater diversity of native vegetation. Most of the area is covered by dense Monterey pine/coast live oak forest on steep slopes, with well-developed soils and dense understory vegetation. Less heavily wooded areas that are floristically rich include Briza Flat, above the main entrance of La Mesa Village; this area is the largest undeveloped piece of level land in the area and contains a stand of pine and oak with a sparse shrub and grass understory, including a number of native flowering plants not seen elsewhere in the La Mesa Village. This area has become somewhat overgrown since 1993 and as a consequence is less floristically rich (Greening Associates 1999). In addition, a small but floristically rich area known as "Bulb Flat" contained an abundance of flowering bulbs including coast rein orchid (*Piperia elegans*) in 1993; this area was observed to be threatened by French broom (Uribe and Associates 1993). In 1999, although the French broom had been recently removed, few native plants were observed (Greening Associates 1999). No special status species have been identified in these remnant areas of native vegetation.

The La Mesa Village contains an intact forest canopy on the steep slopes that appeared to be less disturbed than the other areas included in the botanical survey of spring of 1999, but invasive French broom has substantially altered the vegetation of these slopes (Greening Associates 1999). Areas with substantial amounts of French broom are being cleared to the benefit of the native vegetation community.



A relatively pristine area containing a diverse mixture of pine-oak woodland and chaparral with a perennial herb understory occurs on a north-facing slope along Sylvan Road, just east of the road entrance to La Mesa Grade School. Eight mature plants of Yadon's piperia were identified in surveys in 1993 (Uribe and Associates 1993). As of the 1999 survey, this colony of Yadon's piperia was intact and French broom had not yet invaded the remnant patch of habitat but may threaten this colony in the future (Greening Associates 1999).

In addition, a colony of more than 55 individuals of Yadon's piperia was identified in 1993 on a gentle, wooded north-facing slope along the trail behind 111 Mervine Street (Uribe and Associates 1993). The colony was noted in 1993 to be closely surrounded by French broom; although the French broom was cleared as of the 1999 visit, the colony was reduced to about half of its previous size from competition from the French broom and other vegetation. A single plant of Hooker's manzanita along the trail was present in 1993 but was not detected in the 1999 survey (Greening Associates 1999).

The NPGS staff has recently located another colony of Yadon's piperia in La Mesa Village along a recreational trail in Monterey pine forest habitat (Navy 2001). The number of plants in this colony has not yet been estimated.

#### Dune/Research area

The Dune/Research area was extensively altered in the past by placement and grading of fill and by planting of and encroachment by invasive non-native species. Prior to a revegetation project implemented in 1992 through the City of Monterey and funded by the NPGS and the Naval Facilities Engineering Command, most of the dunes were in poor condition; as a result of grading, compaction, introduction of fill material, and previous landscaping activities, native dune sand remains on only about 20 percent of the property. However, several acres of native vegetation had remained in relatively good condition with viable colonies of native plants. Since 1992, the 45-acre area has undergone extensive native revegetation and efforts to control invasive non-native plant species, primarily iceplant, ripgut brome grass, and European dune grass. Following initial eradication of these invasive species, more than 90,000 plants of 50 native dune and coastal bluff species were planted over five years (Cowan 1998, Navy 2001).

In 1999, the dune vegetation appeared to be in excellent condition (Greening Associates 1999). Native dune species located primarily on the more exposed dune face of the back dune area include Monterey gilia, Monterey spineflower, coast wallflower (*Erysimum ammophilum*), Monterey Indian paintbrush, beach sagewort, and seacliff buckwheat (*Eriogonum parvifolium*). In 1999, colonies of sensitive plant species appeared to be thriving and most of the invasive plant species had been eradicated or were noted to be controlled by ongoing weeding (Greening Associates 1999). In addition to native dune species, some rare native plant species have been planted in the Dune/Research area that may not have naturally occurred there, such as Monterey ceanothus and sandmat manzanita.

The Dune/Research area of the NPGS also contains habitat for two listed animal species. A substantial colony of seacliff buckwheat, the host plant for the federally endangered Smith's blue butterfly, occurs in the Dune/Research area. Despite efforts by the Navy to reduce threats and enhance habitat, the Smith's blue butterfly has not been observed at the NPGS since 1981. Habitat for the federally threatened western snowy plover occurs on the beach front of the Dune/Research area; this area was included in the Service's final designation of critical habitat for the western snowy plover (64 *Federal Register* 68508). This area is subject to disturbance due to year-round human recreational use of the beach and periodic beach raking by the City of Monterey. Western snowy plovers have not been documented at the NPGS. Recently, no western snowy plovers were located during surveys conducted in the spring, summer, and fall of 1999 (Navy 2001).

### **Monterey gilia**

Monterey gilia occurs in the back dune portion of the Dune/Research area, scattered over approximately 30 acres. In 1992, 1,950 plants were counted and the estimated population in 1998 was more than 10,000 plants (Cowan 1998). The increase in plants was attributed to eliminating iceplant and riggut brome grass along with increased rainfall from 1992 to 1998. Monterey gilia was again identified in the back dunes of the Dune/Research area in surveys conducted in April to May of 1999 (Greening Associates 1999). Trampling and invasion of non-native species, such as iceplant and riggut brome grass, are threats to the occurrence of Monterey gilia at the NPGS dunes.

### **Monterey spineflower**

Like the Monterey gilia, Monterey spineflower also occurs in the back dune portion of the Dune/Research area. In 1992, approximately 1,600 plants grew within this area and, in 1998, the estimated population was more than 100,000 plants (Cowan 1998). The increase in plants was attributed to eliminating iceplant and riggut brome grass along with increased rainfall from 1992 to 1998. Monterey spineflower was again identified in the back dunes of the Dune/Research area in surveys conducted in 1999 (Greening Associates 1999).

## **EFFECTS OF THE ACTION**

Although most of the management actions proposed in the INRMP would ultimately benefit populations of listed species at the NPGS, some aspects of the invasive plant control and monitoring activities may adversely affect some individuals of listed species.

### **Yadon's piperia**

Removal of invasive non-native plant species, such as French broom and pampas grass, from areas supporting Yadon's piperia, will result in a beneficial effect to the local populations of Yadon's piperia through the removal of competition for resources, including space, water, and sunlight. Maintenance of existing fences and signs in the Annex and the Laboratory/Recreation areas will continue to minimize human disturbance of populations of Yadon's piperia. Establishment of additional fencing and/or signs, as necessary, will likely protect additional

populations of Yadon's piperia that may be subject to heavy foot traffic in the Laboratory/Recreation area.

All invasive plant control activities in areas with Yadon's piperia will occur after mid-October and will conclude prior to late February to minimize adverse effects to individuals. If new leaves of Yadon's piperia plants emerge prior to late February, damage to above-ground parts of individuals may result from weed removal activities.

Although the Navy proposes to flag Yadon's piperia to minimize adverse effects to individuals, some plants may remain undetected and may inadvertently be cut, removed, or trampled due to invasive plant removal and other grounds maintenance activities, such as vegetation removal pursuant to Naval policy or for fire safety concerns. In addition, personnel that enter sensitive areas of the main grounds to flag individuals and monitor populations may unintentionally trample individual Yadon's piperia plants that remain undetected.

#### **Monterey gilia and Monterey spineflower**

Invasive non-native plant control, removal of trash, and restriction of recreational access in the back dune portion of the Dune/Research area will likely have a beneficial effect on the local populations of Monterey gilia and Monterey spineflower. Removal of invasive non-native plants and removal of trash will likely improve the suitability of habitat for Monterey gilia and Monterey spineflower. Installation and maintenance of interpretative signs, maintenance of the cable fence to restrict vehicle off-road vehicle traffic, and accurate identification of sensitive areas as "off-limits" to student research will continue to reduce the threat of trampling from foot traffic and off-road vehicles on the dune plant community, including Monterey gilia and Monterey spineflower.

Although the Navy will flag individuals of Monterey gilia and Monterey spineflower prior to conducting invasive plant control activities, some individuals may remain undetected and may be damaged by invasive plant removal. The Navy plans on removing invasive plants during the non-growing season of Monterey gilia and Monterey spineflower. However, some removal may occur during the growing season of these plants to allow for effective control of invasive plants and may result in inadvertent trampling to individuals of Monterey gilia and Monterey spineflower.

Disturbance to individuals of Monterey spineflower and Monterey gilia may result from trash removal in the back dunes of the Dune/Research area. Additional management and monitoring actions proposed in the INRMP to control invasive species and to enhance and monitor populations of native plant species in the Dunes/Research area may result in a human disturbance to Monterey gilia and Monterey spineflower plants due to trampling. In addition, the seed bank of these species may be disturbed by management and monitoring activities through burial and local shifting of sands within the back dune area.

In summary, while adverse effects to individuals will likely result, all populations of Yadon's piperia, Monterey gilia, and Monterey spineflower at the NPGS will likely benefit from the implementation of the proposed management activities.

### CUMULATIVE EFFECTS

Cumulative effects include the effects of future State, tribal, local or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act. We are unaware of any non-federal action that is likely to occur within the action area; because the Navy manages this area, we anticipate that any future activities would entail a Federal nexus.

### CONCLUSION

After reviewing the current status of Yadon's piperia, Monterey gilia, and Monterey spineflower, the environmental baseline for the action area, the effects of the proposed activities, and the cumulative effects, it is our biological opinion that the vegetation management activities, including invasive plant control, as proposed, are not likely to jeopardize the continued existence of Yadon's piperia, Monterey gilia, or Monterey spineflower. We have reached this conclusion because removing invasive non-native plants and preventing the further spread of invasive species will likely benefit the existing populations of these species at the NPGS and the potential adverse effects of the management activities are likely to be minor.

### INCIDENTAL TAKE STATEMENT

Section 9 of the Act does not address the incidental take of listed plant species. Consequently, this biological opinion does not contain an incidental take statement. Protection of listed plants is provided in that the Act requires a federal permit for the removal or reduction to possession of endangered or threatened plants from federal lands. Furthermore, it is unlawful for any person to remove, cut, dig up, or damage or destroy a listed plant species in knowing violation of any law or regulation of any state or in the course of any violation of a state criminal trespass law [section 9(a)(2)(B) of the Act].

### CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs federal agencies to use their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

The Service recommends the following:

1. The Navy should develop a comprehensive dune restoration plan for the Dune/Research area to continue with efforts to benefit the local populations of Monterey gilia and Monterey spineflower. The dune restoration plan should include biological goals and an adequate monitoring and adaptive management program.
2. The Navy should focus revegetation of additional native plant species in the Dune/Research area in locations that would naturally support populations of these species.
3. The Navy should monitor the effectiveness of implementation of plant protection and habitat enhancement measures designed to minimize adverse effects to individuals and to benefit populations of Yadon's piperia.
4. The Navy should develop biological goals and an adaptive management strategy for the protection and enhancement of the remnant areas of maritime chaparral and Monterey pine of the main grounds.
5. The Navy should continue to monitor and document the spread of invasive plant species and effectiveness of invasive plant control strategies in the natural areas of the NPGS.

The Service requests notification of the implementation of any conservation recommendations so we may be kept informed of actions minimizing or avoiding adverse effects or benefitting listed species or their habitats.

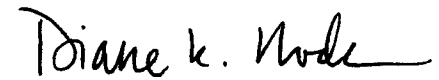
#### REINITIATION NOTICE

This concludes formal consultation on the proposed vegetation management and invasive plant control activities at the NPGS. As provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (2) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or (3) a new species is listed or critical habitat designated that may be affected by the action.

We commend you for your ongoing efforts to conserve and enhance our nation's biological resources at the NPGS. We appreciate your dedication, cooperation, and patience in working with us to successfully manage populations of federally threatened and endangered species.

Any questions or comments should be directed to Diane Pratt of my staff at (805) 644-1766.

Sincerely,

A handwritten signature in black ink that reads "Diane K. Noda". The signature is written in a cursive style with a long horizontal flourish at the end.

Diane K. Noda  
Field Supervisor

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U.S. Fish and Wildlife Service. 1998. Recovery Plan for Seven Coastal Plants and the Myrtle's Silverspot Butterfly. Portland, Oregon.





# Appendix M: Environmental and Site Approval Checklists

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# NAVFAC ENVIRONMENTAL CHECKLIST – NSA MONTEREY

This Environmental Checklist (EC) is used to analyze environmental impacts and requirements associated with a proposed project. The first page of this form should be completed and sent to Environmental as soon as details of a project are known. Please include the 1391, site map, SOW, etc. If NEPA analysis is required, this form serves as your request for support.

## GENERAL PROJECT INFORMATION

Activity Requesting:	
Activity POC / Phone / email:	
Name of Project:	
Project Number (if any):	
Project Location:	Select from pulldown menu - click here
Project Type:	Select from pulldown menu - click here
Brief Project Description	
Why is this project needed?	
Scheduled start date	

## PLANNING QUESTIONS

Total Project Area (include clear zones, laydown areas, etc)	Square feet or	acres
Percentage of project area currently impervious (asphalt, bldgs, etc.)	% of project area	
Percentage of project area impervious once project completed	% of project area	
Percentage of project area to be disturbed (excavated, graded, etc)	% of project area	
How will storm water be managed in the long-term (post-construction)?	Select from pulldown menu - click here	
How will sanitary sewage (wastewater) be managed in the long-term?	Select from pulldown menu - click here	
Will there be actions conducted in water (dredging, new pilings, etc.)?	Select from pulldown menu - click here	

## DESIGN RELATED QUESTIONS

	YES	NO	UNSURE
Will trees be removed?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Will emission-generating equipment be utilized during construction (bulldozer, backhoe, etc)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Will the project remove, install or utilize a petroleum storage tank, that is >=55-gallons?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Will the project remove or install an oil-water separator?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Will the project relocate excavated material on the installation?; if yes, where:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Will the construction/repair actions generate by-products (powerwashing, HAZWASTE)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Will the construction/repair actions require de-watering?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

## OPERATIONAL RELATED QUESTIONS

	YES	NO	UNSURE
Will emission-generating equipment be installed (paint booth, emergency generators)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Will new processes or maintenance activities be required?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

## ADDITIONAL COMMENTS

:	
Checklist Preparer, phone number and e-mail	Date

# NAVFAC ENVIRONMENTAL CHECKLIST – ALL INSTALLATIONS

## SUMMARY OF ENVIRONMENTAL REQUIREMENTS

**PLEASE NOTE: The Environmental review provided is only valid for 1 year. If the project scope has been modified or checklist has expired, please contact Environmental to re-evaluate the project.**

Name of Project:

Project Number:

### PLANNING REQUIREMENTS (Issues That Can Effect the Project's Timeline, Cost or Site Location)

Environmental Aspect	YES	NO	Environmental Requirement	Comments
National Env Policy Act (NEPA)	TBD		CATEX = 1 week; EA = 12 months; EIS = 24 months.	
Threatened, Endangered Species	<input type="checkbox"/>	<input type="checkbox"/>		
Wetland Impacts	<input type="checkbox"/>	<input type="checkbox"/>	Permits and possibly mitigation	
Navigable Water Impacts	<input type="checkbox"/>	<input type="checkbox"/>	Permits	
Outlease	<input type="checkbox"/>	<input type="checkbox"/>	Consultations with NAVFAC Real Estate	
Tree Mitigation	<input type="checkbox"/>	<input type="checkbox"/>	.	
Development in Coastal Zone	<input type="checkbox"/>	<input type="checkbox"/>	Coastal Consistent Determination (CCD)	
Cultural Resources	<input type="checkbox"/>	<input type="checkbox"/>	Consultation with SHPO	
Major Air Emission Source	<input type="checkbox"/>	<input type="checkbox"/>	Permit	
Construction Emissions	<input type="checkbox"/>	<input type="checkbox"/>	Air Conformity Record of Non-Applicability	
Installation Restoration Area	<input type="checkbox"/>	<input type="checkbox"/>	Land-use controls exist or consultation w/ EPA	
Petroleum Contamination	<input type="checkbox"/>	<input type="checkbox"/>	Follow guidance in NAVFAC POL SOP.	

### DESIGN REQUIREMENTS (Issues to be addressed in the design)

Storm water Best Mgmt Practice	<input type="checkbox"/>	<input type="checkbox"/>		
Erosion & Sediment Control	<input type="checkbox"/>	<input type="checkbox"/>		
State StormWater Mgmt Permit	<input type="checkbox"/>	<input type="checkbox"/>	Required for projects that disturb >= 1 acre of land.	
De-watering, Wastewater Mgmt	<input type="checkbox"/>	<input type="checkbox"/>		
Beach & Dune Management	<input type="checkbox"/>	<input type="checkbox"/>		
Spill Preventative Measures	<input type="checkbox"/>	<input type="checkbox"/>		

### OPERATIONAL REQUIREMENTS (Issues to be addressed prior to use)

New Industrial Process	<input type="checkbox"/>	<input type="checkbox"/>	Environmental Department site inspection required	
New Waste Generating Activity	<input type="checkbox"/>	<input type="checkbox"/>	Environmental Department site inspection required	

### ADDITIONAL REQUIREMENTS or COMMENTS

Cmmt 1	
Cmmt 2	
Cmmt 3	
Cmmt 4	
Cmmt 5	

**Environmental POC Signature**

**SITE APPROVAL CHECKLIST (Rev. 06/21/2010)**  
**PART I – EIC**

**PURPOSE:** To document that the project has been properly authorized for execution. Complete and retain in the project folder.

**PROJECT TITLE:** Bld. 233 - Remove and replace entry doors and entry door hardware

**MAXIMO #:** \_\_\_\_\_

**CUSTOMER POC:** Barbara Berlitz

**PHONE:** (831) 656-7847

**EXPECTED CONSTRUCTION PERFORMANCE PERIOD, 120 DAYS  
PLANNING ( Mark YES, NO or N/A )**

- No 1. Project has been verified with the Planner as consistent with the RSIP, BEAP, and FEP.
- Yes 2. Site conditions are suitable for proposed project/Required site improvements have been considered.
- Yes 3. There are no known subsurface foundations or structures which would adversely affect this project.
- No 4. Existing hazardous materials (asbestos, lead, contaminated soil, etc) that may adversely affect this project have been identified.
- Yes 5. The following site controls have been considered: Storm Water Management, Erosion, Dust, Noise.
- No 6. Project does not impede access to existing equipment or underground utilities.
- No 7. Project will have no adverse impact on other known projects, under construction or planned.
- No 8. There are no projects under construction or planned that would adversely affect this project.
- Yes 9. There is sufficient area available for material lay downs.
- N/A 10. There is sufficient protection provided in the design for trees on the construction site.

**NOTIFICATIONS ( Mark YES, NO or N/A )**

- No 11. The customer has been invited to review the project scope.
- No 12. The EIC has received, in writing, the customer's concurrence with the project scope of work.
- No 13. Security Department has been invited to review the project.
- Yes 14. Safety Department has been invited to review the project for safety hazards, such as the introduction of new hazardous materials.
- No 15. Fire Department has been invited to review the project.
- No 16. EIC met with Installation Environmental Program Manager to initiate the environmental review of the

Project: a) Design package provided to environmental for review, date: \_\_\_\_\_  
b) Design package environmental review comments due back  
to EIC for funding, date given: \_\_\_\_\_

Note: Environmental review time should vary depending on the size and complexity of the project.

No 17. NPS IT Department has been invited to review the project.

Yes 18. Public Works Shops have been invited to review the project.

Yes 19. Public Works Facility Support has been invited to review the project.

Yes 20. All affected parties have been notified and the project documentation is complete and ready for funding and execution.

**EIC:** Joseph Orman **date:** 4/19/11

## **PART II – ENVIRONMENTAL**

### **NEPA / NHPA DETERMINATION ( Mark YES, NO or N/A )**

This project:

No Has known discovery potential for archeological artifacts.

Yes Renovates a historic building or structure.

No Is near a wetland.

No Endangered or sensitive species inhabit the site.

No Generates hazardous waste (solid, liquid or gaseous).

Yes CATEX, EA, EIS has been attached, if applicable, and is on file.

### **INSTALLATION ENVIRONMENTAL PROGRAM MANAGER:**

Johanna Turner

**Date:** 17 May 2011

Comments: Please see Record of CATEX for caveats on this project. This is an historic building and any modifications to the building must be approved by Johanna Turner. It is possible that the SHPO will need to be consulted on the design as well.



## Appendix N: Comprehensive Landscaping Plant List

The following plant lists are intended to give guidance to landscape planning for NSA Monterey, covering the Main Grounds, Annex, Laboratory/Recreation Area, and Dune/Research Area. The historic Arizona Garden is not constrained by this list; new plants in that area should be identical to what they are replacing. Plants in the hotel historic district can be from the landscape column of the plant list or from the Trees, Shrubs and Plants for the Hotel Del Monte pamphlet (Refer to the end of this Appendix). Care should be taken to ensure plants are suited to existing conditions, particularly with respect to irrigation and companion plants.

As a comprehensive guide, specifications for each plant species are listed, as well as habitat preferences, sun exposure and irrigation needs. These lists are to be used as a replacement of the lists included in the Smart Landscape Master Plan document. Each species listed is known to be in cultivation and should be available from local sources along the Monterey-Santa Cruz corridor.

With the exception of the non-native plant collection that defined the historical landscape on the Main Grounds, recommendations made here are plants native to California or other locations with a similar Mediterranean climate with an average rainfall of approximately 20"/yr. Many of the recommended species are those that occur within 30 miles of NSA Monterey.

For each landscaping project, California native species from this plant list shall constitute a minimum of 80% of the plant material in each stratum (trees, shrubs, perennials). Other drought tolerant species from this list shall constitute the remainder of the plant material, to a maximum of 20%. A determination of whether cultivars of native species are native or non-native will be made on a case by case basis. Plants not on this list that are desired in a particular design should be discussed with the NSA Monterey ED.

There is increasing availability of plant material in nurseries of the Monterey Bay region propagated from local genetic stock. For new plantings at NSA Monterey, this would be the top choice when available. There are at least two reasons for this as a practice consistent with the goal of sustainable landscapes. Both reasons emerge from the principle that plants, like all organisms, often form local populations with a distinct gene pool. From the perspective of sustainable horticulture, obtaining plants from within the local genetic population will assure forms of the species that are most adapted to the locale. From the per-

spective of conservation, the introduction of conspecific plants (same species) from outside the local gene pool may unwittingly introduce genetic material not contained within the local gene pool. The effects of this dynamic are subtle and long term, but could contribute to a homogenization of local gene pools and the loss of genetic diversity.

One note to observe when using these lists is the ambiguous separation of perennials and shrubs. Used here is a broad understanding of a perennial plant that would include all herbaceous perennials (containing no above ground woody parts) and plants referred to as suffrutescent. These are plants that are found mostly within Mediterranean climates that may develop a scaffold of branches above ground that are woody at the base but always herbaceous within the current season's growth. These are sometimes referred to as subshrubs, but are considered perennial in the broad sense in this treatment.

Another is the distinction between trees and shrubs. Used here is a naturalistic approach that considers the life history of the species in question. Many of the larger shrubs can eventually become tree-like, especially with pruning. However, even in nature, these large growing shrubs have multiple trunks from the base of the plant with crowns typically much more dense than trees. With regard to this list, shrubs rarely exceed 20 feet in height. Most tree species listed are considerably taller when mature.



Table N-1. Annual plant species.

Botanical Name	Common Name	Native Status	Height	Spread	Irrigation	Oak Woodland	Coastal Scrub	Meadow	Dunes	Wetlands	Lake	Landscape	Rain Gardens	Bioswales	Shade	Part Shade	Full sun
<i>Calandrinia ciliata</i>	red maids	M	2-3	"1-2	"R-M-L		X	X					X	X			X
<i>Castilleja densiflora</i>	coastal paintbrush	M	4-12	"4	"M-L		X	X	X					X			X
<i>Castilleja exerta</i>	purple owl's clover	M	6-12	"4	"M-L		X	X						X			X
<i>Clarkia amoena</i>	godetia	CA	12-24	"6-12	"M-L	X	X	X						X		X	X
<i>Clarkia bottae</i>	punch-bowl godetia	M	12-24	"12-18	"M-L	X	X	X						X		X	X
<i>Clarkia concinna</i>	red ribbons	CA	4-12	"12	"M-L	X	X	X					X	X		X	X
<i>Clarkia purpurea</i>	farewell to spring	M	12-24	"6-12	"M-L	X	X	X						X		X	X
<i>Clarkia rubicunda</i>	red godetia	CA			M-L	X	X	X	X					X		X	X
<i>Clarkia unguiculata</i>	elegant clarkia	M	12-24	"12	"M-L	X	X	X						X		X	X
<i>Collinsia heterophylla</i>	Chinese houses	M	10-20	"8-12	"M-L	X							X	X	X	X	
<i>Collinsia tinctora</i>		CA	18-24	"8-12	"M-L	X		X					X	X	X	X	X
<i>Downingia pulchella</i>		M	2-3	"2-3	"R								X	X			X
<i>Eschscholzia californica</i>	California poppy	CA	12-24	"12-24	"M-L		X	X						X			X
<i>E. c. var. maritima</i>	coastal poppy	M	4-12	"8-18	"L		X		X								X
<i>Gilia capitata</i>	blue gilia	CA	4-12	"3-6	"M-L		X	X									X
<i>Gilia tricolor</i>	bird's-eye gilia	CA	4-12	"3-6	"M-L		X	X									X
<i>Lasthenia californica</i>	goldfields	M	2-4	"3-8	"M-L		X	X									X
<i>Layia platyglossa</i>	tidy tips	M	12-24	"12-18	"M-L		X	X						X			X
<i>Limnanthes douglasii</i>	meadow foam	CA	8-12	"8-12	"R-M			X					X				X
<i>Linanthus androsaceus</i>		M	4-8	"4-6	"L		X		X								X
<i>Linanthus grandiflorus</i>		M	4-8	"4-6	"L		X		X								X
<i>Linanthus parviflorus</i>		M	4-8	"4-6	"L		X		X								X
<i>Lupinus bicolor</i>	miniature lupine	M	3-6	"3-6	"M-L		X	X				X					X
<i>Lupinus densiflorus</i>	valley lupine	CA	12-24	"12-24	"M-L		X	X					X	X			X
<i>Lupinus nanus</i>	valley sky lupine	M	4-12	"4-12	"M-L		X	X						X			X
<i>Lupinus succulentus</i>	arroyo lupine	M	12-24	"12-24	"M-L		X	X					X	X			X
<i>Mentzelia laevicaulis</i>	yellow stars	M	36-48	"12-24	"L		X	X									X
<i>Mentzelia lindleyi</i>	blazing stars	CA	12-24	"12-24	"L		X	X									X
<i>Mimulus guttatus</i>	yellow monkey flower	M	8-18	"8-12	"R	X				X			X	X		X	X
<i>Nemophila maculata</i>	spotted nemophila	CA	8-12	"8-12	"R-M	X							X	X		X	
<i>Nemophila menziesii</i>	baby blue eyes	CA	3-6	"8-12	"R-M	X		X					X	X		X	X

Table N-1. Annual plant species.

Botanical Name	Common Name	Native Status	Height	Spread	Irrigation	Oak Woodland	Coastal Scrub	Meadow	Dunes	Wetlands	Lake	Landscape	Rain Gardens	Bioswales	Shade	Part Shade	Full sun
<i>Phacelia viscida</i>	sticky bluebells	M	12-24	"12-24	"M-L		X	X									X
<i>Platystemon californicus</i>	cream cups	M	4-12	"4-12	"M-L		X	X						X			X
<i>Salvia columbariae</i>	chia	M	3-24	"2-9	"L		X	X						X			X
<i>Triphysaria eriantha</i>	butter and eggs	M	2-6	"2-3	"M-L		X	X						X			X

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Table N-2. Perennial plant species.

Botanical Name	Common Name	Native Status	Height	Spread	Irrigation	Oak Woodland	Coastal Scrub	Meadow	Dunes	Wetlands	Lake	Landscape	Rain Gardens	Bioswales	Shade	Part Shade	Full sun
<i>Abronia latifolia</i>	yellow sand verbena	M	3-6	"18-24	"M-L		X	X									X
<i>Abronia umbellata</i>	pink sand verbena	M	3-6	"18-24	"M-L		X	X									X
<i>Anemopsis californica</i>	yerba mansa	M	8-24	"12"+	R-M-L					X				X	X	X	X
<i>Aquilegia formosa</i>	western columbine	M	24-36	"12-18	"R-M	X		X				X	X	X	X	X	X
<i>Asarum caudatum</i>	western ginger	M	6-12	"24"+	M	X						X	X	X	X	X	
<i>Asclepias cordifolia</i>	purple milkweed	CA	18-24	"12-18	"L		X	X									X
<i>Asclepias speciosus</i>	butterfly weed	CA	18-24	"36"+	L			X					X	X			X
<i>Aster chilensis</i>	coast aster	M	18-24	"24"+	R-M			X		X			X	X		X	X
<i>Darmeria peltata</i>	Indian rhubarb	CA	12-36	"12"+	R					X	X		X			X	
<i>Disporum hookeri</i>	fairy bells	M	12-30	"12-18	"M	X							X		X	X	
<i>Epilobium canum</i>	California fuchsia	M	6-30	"12-48	"M-L		X	X				X		X			X
<i>Epilobium septentrionale</i>	Humboldt fuchsia	CA	6-12	"6-24	"M-L		X					X		X			X
<i>Epipactis gigantea</i>	stream orchid	M	12-24	"12"+	R-M	X							X	X		X	X
<i>Erigeron glaucus</i>	seaside aster	M	8-12	"24-36	"M-L		X	X	X			X					X
<i>Eriogonum grande var. rubescens</i>	red buckwheat	CA	2-3	'3'+	L	X		X				X				X	X
<i>Eriophyllum confertiflorum</i>	yellow yarrow	M	18-24	"18-24	"M-L		X	X	X								X
<i>Eriophyllum lanatum ssp. arachnoideum</i>	dwarf woolly sunflower	M	12-24	"12-24	"M-L		X	X	X								X
<i>Erysimum menziesii</i>	dune wallflower	M	12-24	"12-18	"L		X		X								X
<i>Helianthus californicus</i>	California sunflower	M	48-84	"48"+	R-M-			X		X				X			X
<i>Heuchera maxima</i>	island alum root	CA	24-36	"12-18	"M-L	X		X				X	X	X		X	X
<i>Heuchera micrantha</i>	canyon coral bells	M	4-8	"8-12	"M-L	X						X	X			X	
<i>Iris douglasiana</i>	coast Iris	M	8-18	"24-72	"M-L	X	X	X				X		X		X	X

Table N-2. Perennial plant species.

Botanical Name	Common Name	Native Status	Height	Spread	Irrigation	Oak Woodland	Coastal Scrub	Meadow	Dunes	Wetlands	Lake	Landscape	Rain Gardens	Bioswales	Shade	Part Shade	Full sun
<i>Iris longipetala</i>	bog iris	M	24-36	"24-36	"R-M			X	X			X	X				X
<i>Iris macrosiphon</i>	woods iris	M	6-12	"8-18	"L	X	X	X								X	X
<i>Iris 'Pacific Coast Hybrids'</i>	PCH iris	Cv	12-24	"12-36	"M-L		X	X				X	X	X	X		X
<i>Lepechinia calycina</i>	pitcher sage	M	36-48	"36-48	"L	X		X					X		X	X	
<i>Lupinus latifolius</i>	broadleaf lupine	M	24-48	"24-48	"L	X	X	X									X
<i>Lupinus variicolor</i>	coast lupine	M	12-24	"48-60	"L		X	X	X								X
<i>Lysichiton americanum</i>	yellow skunk cabbage	CA	12-48	"24-48	"R					X				X	X	X	
<i>Mimulus aurantiacus</i>	sticky monkey flower	M	24-48	"24-48	"L	X	X	X				X				X	X
<i>Monardella villosa</i>	coyote mint	M	12-24	"18-36	"L		X										X
<i>Oenothera cheiranthifolia</i>	beach primrose	M	4-24	"12-24	"L		X		X								X
<i>Oenothera hookeri</i>	Hooker's evening primrose	M	18-48	"12-18	"R-M			X	X					X		X	X
<i>Oxalis oregano</i>	redwood sorrel	M	3-6	"6"+	M-L	X						X	X		X	X	
<i>Penstemon anguineus</i>	northern penstemon	CA	12-24	"12-24	"L	X	X	X									X
<i>Penstemon centranthifolius</i>	scarlet bugler	M	24-36	"18-24	"L		X	X									X
<i>Penstemon clevelandii</i>	southern penstemon	CA	24-30	"18-24	"L		X	X									X
<i>Penstemon grinnellii</i>	Santa Lucia penstemon	M	24-30	"18-24	"L		X	X									X
<i>Penstemon heterophyllus</i>	foothill penstemon	CA	8-12	"12-18	"L		X	X				X					X
<i>Penstemon rostriflorus</i>	cherry penstemon	CA	18-30	"18-24	"M-L	X		X									X
<i>Penstemon spectabilis</i>	showy penstemon	CA	36-48	"18-24	"L		X	X									X
<i>Romneya coulteri</i>	Matilija poppy	CA	60-84	"60"+	L			X				X					X
<i>Salvia spathacea</i>	hummingbird sage	M	24-48	"24"+	M-L	X	X	X				X	X	X		X	X
<i>Satureja douglasii</i>	yerba buena	M	6-12	"24"+	M-L	X						X	X	X	X	X	
<i>Sidalcea malvaeflora</i>	checkerbloom	M	6-24	"18-36	"M-L	X	X	X				X	X			X	X
<i>Silene californica</i>	California indian pink	M	4-6	"6-12	"M-L	X							X	X		X	
<i>Sisyrinchium bellum</i>	blue eyed grass	M	6-18	"4-8	"L		X	X				X					X
<i>Sisyrinchium californicum</i>	yellow eyed grass	M	12-24	"6-12	"R			X	X			X	X				X
<i>Smilacina racemosa</i>	false Solomon's seal	CA	12-24	"12	"M	X						X		X	X		
<i>Solidago californica</i>	California golden rod	M	12-36	"12	"L	X	X	X									X
<i>Solidago occidentalis</i>	western golden rod	M	24-60	"24"+	R-M			X	X			X	X				X
<i>Trillium ovatum</i>	western trillium	M	24-36	"12-18	"M-L	X						X	X		X	X	
<i>Vancouveria planipetala</i>	inside-out flower	M	6-18	"24"+	M-L	X						X	X		X	X	
<i>Venegasia carpesioides</i>	canyon sunflower	M	36-72	"36-72	"M-L	X		X				X	X		X	X	X

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Table N-3. Fern species.

Botanical Name	Common Name	Native Status	Height	Spread	Irrigation	Oak Woodland	Coastal Scrub	Meadow	Dunes	Wetlands	Lake	Landscape	Rain Gardens	Bioswales	Shade	Part Shade	Full sun
<i>Adiantum aleuticum</i>	western five-fingered fern	M	18-24	"12"+	R-M							X	X		X	X	
<i>Adiantum jordanii</i>	California maidenhair	M	6-18	"12"+	M-L	X						X	X		X	X	
<i>Dryopteris arguta</i>	coastal wood fern	M	12-24	"12"+	M-L	X						X	X		X	X	
<i>Pellaea andromedaefolia</i>	coffee fern	M	6-28	"12"+	L	X						X	X		X	X	
<i>Pellaea mucronata</i>	bird's-foot fern	M	6-12	"12"+	L	X	X					X	X		X	X	X
<i>Pentagramma triangularis</i>	gold-back fern	M	2-6	"6-12	"L	X						X			X	X	
<i>Polypodium californicum</i>	California polypody fern	M	4-12	"12"+	M-L	X						X	X		X	X	
<i>Polypodium scolieri</i>	leather-leaf polypody fern	CA	6-28	"12"+	M-L	X						X	X		X	X	
<i>Polystichum munitum</i>	western sword fern	M	24-60	"36"+	M-L	X						X			X	X	
<i>Woodwardia fimbriata</i>	giant chain fern	M	36-72	"24"+	R-M	X			X			X	X		X	X	

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Table N-4. Bulb species.

Botanical Name	Common Name	Native Status	Height	Spread	Irrigation	Oak Woodland	Coastal Scrub	Meadow	Dunes	Wetlands	Lake	Landscape	Rain Gardens	Bioswales	Shade	Part Shade	Full sun
<i>Allium crispum</i>	crinkled onion	CA	6-12	"3	"L			X									X
<i>Allium praecox</i>	early onion	CA	8-18	"3	"M-L	X		X						X		X	X
<i>Allium uniflorum</i>	pink meadow onion	M	6-24	"6"+	M-L		X	X						X			X
<i>Brodiaea californica</i>	northern brodiaea	CA	12-24	"3-6	"L	X		X				X				X	X
<i>Brodiaea coronaria</i>	crown brodiaea	M	8-12	"3-6	"L	X	X	X				X				X	X
<i>Brodiaea elegans</i>	harvest brodiaea	M	8-12	"6"+	L		X	X				X					X
<i>Calochortus albus</i>	globe lily	M	8-36	"3	"L	X	X	X								X	X
<i>Calochortus amabilis</i>	golden fairy lantern	CA	8-18	"3	"M-L	X		X						X		X	X
<i>Calochortus luteus</i>	yellow mariposa lily	M	8-18	"3	"L		X	X									X
<i>Calochortus uniflorus</i>	pink star tulip	M	4-8	"3	"M-L	X	X	X						X		X	X
<i>Calochortus venustus</i>	white mariposa lily	M	8-30	"3	"L	X	X	X								X	X
<i>Calochortus vestae</i>	goddess mariposa lily	CA	12-24	"3	"M-L	X		X						X		X	X
<i>Camassia quamash ssp. quamash</i>	common camas	CA	12-30	"12	"R-M			X					X	X		X	X
<i>Chlorogalum pomeridianum</i>	soap plant	M	24-60	"12-18	"L		X	X									X
<i>Dichelostemma capitatum</i>	blue dicks	M	12	"3-6	"L		X	X									X

Table N-4. Bulb species.

Botanical Name	Common Name	Native Status	Height	Spread	Irrigation	Oak Woodland	Coastal Scrub	Meadow	Dunes	Wetlands	Lake	Landscape	Rain Gardens	Bioswales	Shade	Part Shade	Full sun
<i>Dichelostemma congestum</i>	ookow	CA	24-36	"3-6	"L	X		X						X	X		X
<i>Dichelostemma ida-maia</i>	firecracker flower	CA	18-30	"3-6	"L	X		X				X	X	X	X		X
<i>Dichelostemma multiflorum</i>	wild hyacinth	CA	18-30	"6"+	L	X		X				X	X	X	X		X
<i>Erythronium californicum</i>	California fawn lily	CA	8-15	"4	"M-L	X							X			X	
<i>Fritillaria biflora</i>	chocolate lily	M	6-12	"3-9	"L	X		X								X	X
<i>Fritillaria lanceolata</i>	mission bells	M	18-36	"3	"M-L	X	X	X						X		X	X
<i>Fritillaria liliacea</i>	white fritillary	M	3-12	"3-9	"L	X	X									X	X
<i>Fritillaria pudica</i>	yellow bells	CA	3-9	"3	"L	X		X								X	X
<i>Fritillaria recurva</i>	scarlet fritillary	CA	12-24	"3	"L	X		X								X	X
<i>Lilium columbianum</i>	Columbia lily	CA	18-36	"12"+	R-M	X		X					X			X	X
<i>Lilium humboldtii</i>	Humboldt Lily	CA	60-84	"12"+	L	X		X				X	X			X	X
<i>Lilium kelleyanum</i>	Kelley's lily	CA	48-72	"6-12	"R			X	X	X			X	X			X
<i>Lilium kelloggii</i>	Kellogg's lily	CA	24-36	"12"+	L	X							X			X	
<i>Lilium pardalinum</i>	leopard lily	M	36-72	"12"+	R			X		X		X	X	X		X	X
<i>Lilium pitkinense</i>	Pitkin Lily	CA	36-60	"12"+	R			X		X		X	X	X			X
<i>Lilium rubescens</i>	redwood lily	CA	24-48	"12	"L	X										X	
<i>Triteleia hyacinthoides</i>	white brodiaea	M	12-24	"6"+	M-L	X	X	X				X		X		X	X
<i>Triteleia ixioides</i>	golden brodiaea	M	8-24	"6"+	L	X	X	X				X				X	X
<i>Triteleia laxa</i>	Ithuriel's spear	M	8-18	"6"+	L	X	X	X				X				X	X
<i>Triteleia peduncularis</i>	long-rayed brodiaea	M	18-30	"6"+	M-L	X	X	X						X		X	X
<i>Zigadenus fremontii</i>	Fremont's camas	M	12-36	"12	"L		X	X									X

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Table N-5. Grass and grass-like plant species.

Botanical Name	Common Name	Native Status	Height	Spread	Irrigation	Oak Woodland	Coastal Scrub	Meadow	Dunes	Wetlands	Lake	Landscape	Rain Gardens	Bioswales	Shade	Part Shade	Full sun
<b>Grass-Like species</b>																	
<i>Carex amplifolia</i>	bigleaf sedge	CA	18-36	"24"+	R-M-L	X		X		X		X	X	X	X	X	X
<i>Carex barbara</i>	Santa Barbara sedge	M	12-48	"24"+	M	X		X		X		X	X	X		X	X
<i>Carex bolanderi</i>	wood sedge	M	12-36	"24"+	M	X		X		X		X	X	X		X	X
<i>Carex brevicaulis</i>	short-stem sedge	M	2-8	"12"+	M-L	X						X	X			X	X

Table N-5. Grass and grass-like plant species.

Botanical Name	Common Name	Native Status	Height	Spread	Irrigation	Oak Woodland	Coastal Scrub	Meadow	Dunes	Wetlands	Lake	Landscape	Rain Gardens	Bioswales	Shade	Part Shade	Full sun
<i>Carex densa</i>	dense sedge	M	12-24	"12"+	R-M	X		X				X	X	X	X	X	X
<i>Carex echinata ssp. phyllomanica</i>	star sedge	M	12-24	"24-36	"R-M	X	X	X			Margin	X	X	X	X	X	X
<i>Carex globosa</i>	round-fruit sedge	M	6-12	"12"+	M-L	X	X	X				X	X	X	X	X	X
<i>Carex gracilior</i>	slender sedge	M	12-24	"12-24	"R-M	X		X				X	X	X	X	X	X
<i>Carex multicaulis</i>	rush sedge	M	12-24	"12-24	"M-L	X						X	X	X	X	X	X
<i>Carex nudata</i>	torrent sedge	M	24-36	"24-36	"R-M			X	X	Margin		X	X	X	X	X	X
<i>Carex pansa</i>	sand-dune sedge	M	2-4	"8"+	M		X	X	X			X	X	X			X
<i>Carex serratodens</i>	two-tooth sedge	M	12-48	"24"+	R-M			X	X			X	X	X			X
<i>Carex subfusca</i>	brown sedge	M	4-8	"12"+	M-L	X		X				X	X			X	X
<i>Carex tumulicola</i>	slender sedge	M	18-24	"18-24	"M-L	X		X				X	X		X	X	X
<i>Eleocharis acicularis var. occidentalis</i>	needle spikerush	M	8-12	"24"+	R-M			X	X	X				X	X	X	X
<i>Eleocharis montevidensis</i>	sand spikerush	M	6-18	"24"+	R					X	X			X	X	X	X
<i>Eleocharis parishii</i>	Parish's spikerush	M	4-12	"24"+	R					X	X			X	X	X	X
<i>Eleocharis rostellata</i>	beaked spikerush	M	12-48	"24-36	"R			X	X	X				X	X	X	X
<i>Juncus bolanderi</i>	Bolander's rush	CA	12-36	"12"+	R					X				X			X
<i>Juncus covillei</i>	Coville's rush	CA	6-12	"12"+	R			X	X					X			X
<i>Juncus effuses var. l. brunneus</i>	soft rush	M	24-60	"12-24	"M			X	X			X	X	X	X	X	X
<i>Juncus lesueurii</i>	dune rush	M	12-36	"12"+	R-M				X	X				X			X
<i>Juncus patens</i>	California gray rush	M	18-36	"12-24	"M-L	X	X	X				X	X	X	X	X	X
<i>Juncus phaeocephalus</i>	brown-headed rush	M	6-24	"12"+	R-M			X	X					X			X
<i>Juncus xiphioides</i>	flat-leaf rush	M	18-36	"12"+	R-M			X	X					X			X
<i>Schoenoplectus acutus var. occidentalis</i>	giant bulrush	M	36-144	"36"+	R					X	X						X
<i>Schoenoplectus americanus</i>	Olney's bulrush	M	18-80	"36"+	R					X	X			X			X
<i>Schoenoplectus californicus</i>	California bulrush	M	84-144	"36"+	R					X	X						X
<i>Schoenoplectus pungens</i>	common threesquare	M	8-72	"18"+	R					X	X			X			X
<i>Schoenoplectus robustus</i>	big bulrush	M	24-60	"24"+	R					X	X			X			X
<i>Sparganium emersum ssp. emersum</i>	emersed bur-reed	M	12-36	"12"+	R					X	X			X	X	X	X
<i>Sparganium eurycarpum ssp. eurycarpum</i>	giant bur-reed	M	24-96	"24"+	R					X	X						X
<i>Typha angustifolia</i>	narrow-leaved cattail	M	48-72	"24"+	R					X	Margin						X
<i>Typha domingensis</i>	southern cattail	M	96-120	"36"+	R					X	X						X
<i>Typha latifolia</i>	soft flag	M	36-84	"24"+	R					X	X						X
<b>True grasses</b>																	
<i>Calamagrostis foliosa</i>	leafy reedgrass	CA	12-18	"18-24	"M-L	X		X				X	X			X	X
<i>Calamagrostis nutkaensis</i>	Pacific reedgrass	M	24-48	"18-24	"R-M	X		X	X					X	X	X	X
<i>Danthonia californica</i>	California oatgrass	M	2-6	"12"+	M-L	X		X								X	X

Table N-5. Grass and grass-like plant species.

Botanical Name	Common Name	Native Status	Height	Spread	Irrigation	Oak Woodland	Coastal Scrub	Meadow	Dunes	Wetlands	Lake	Landscape	Rain Gardens	Bioswales	Shade	Part Shade	Full sun
<i>Deschampsia caespitosa ssp. caespitosa</i>	tufted hairgrass	M	12-18	"12-18	"M	X		X				X	X		X		X
<i>Deschampsia caespitosa ssp. holciformis</i>	Mendocino hairgrass	CA	6-12	"6-12	"M	X		X				X	X		X		X
<i>Elymus californicus</i>	California bottlebrush grass	M	36-48	"18-24	"M-L	X		X							X		X
<i>Elymus glaucous</i>	blue wildrye	M	12-18	"18-24	"L	X		X							X		X
<i>Festuca californica</i>	California fescue	M	36-48	"12-18	"M-L	X		X				X			X		X
<i>Festuca idahoensis</i>	Idaho fescue	CA	8-12	"8-12	"M-L	X		X				X			X	X	X
<i>Festuca rubra</i>	red fescue	M	6-12	"12"+	M-L	X		X				X			X	X	X
<i>Hierochloe occidentalis</i>	vanilla grass	M	24-36	"18-24	"M-L	X	X	X	X						X	X	X
<i>Koeleria macrantha</i>	junegrass	M	12-18	"8-12	"L	X		X								X	X
<i>Leymus condensatus 'Canyon Prince'</i>	San Miguel Island giant wildrye	CA	24-36	"36-48	"L	X		X				X	X		X		X
<i>Leymus mollis</i>	dune ryegrass	M	24-60	"24"+	L			X	X								X
<i>Leymus triticoides</i>	creeping wildrye	M	24-48	"24"+	L	X		X				X		X	X		X
<i>Melica californica</i>	California melic	M	24-48	"18-24	"L	X		X				X			X		X
<i>Melica imperfect</i>	melic	M	18-36	"12	"M-L	X		X				X	X		X		X
<i>Melica torreyana</i>	Torrey's melic	M	24-48	"18-24	"M-L	X		X				X	X		X		X
<i>Muhlenbergia rigens</i>	deergrass	M	36-48	"36-48	"M-L	X		X				X			X		X
<i>Nassella lepida</i>	foothill needlegrass	M	12-18	"8-12	"L	X		X							X		X
<i>Nassella pulchra</i>	purple needlegrass	M	12-24	"8-12	"L	X		X							X		X
<i>Poa secunda ssp. secunda</i>	pine bluegrass	M	12-36	"6-12	"L	X		X							X		X

Key to native status: M, species native to Monterey County; CA, plants native to California; Cv, Plant cultivars derived from California hybrids of native species. Cultivar selections of wild plants are listed as M or CA, depending on where the selections were originally made. E, non-native species imported from other regions with similar climates. Key to irrigation: R, regular watering to keep soil moist; M, moderate to occasional watering applied deeply and allowed to dry between irrigations; L, infrequent to no irrigation needed except during winter drought. Spread: X+ indicates spread after 1-3 years. But the species is known to form larger clumps over time.

Table N-6. Ground cover plant species.

Botanical Name	Common Name	Native Status	Height	Spread	Irrigation	Oak Woodland	Coastal Scrub	Meadow	Dunes	Wetlands	Lake	Landscape	Rain Gardens	Bioswales	Shade	Part Shade	Full sun
<i>Abronia latifolia</i>	yellow sand verbena	M	3-6	"18-24	"M-L		X		X								X
<i>Abronia umbellata</i>	pink sand verbena	M	3-6	"18-24	"M-L		X		X								X
<i>Arctostaphylos edmundsii</i>	Edmunds manzanita	M	4-18	"48-72	"M-L	X	X					X				X	X
<i>Arctostaphylos hookeri 'Monterey Carpet'</i>	Monterey carpet manzanita	M	8-18	"48-72	"M-L		X		X			X					X
<i>Arctostaphylos pumila</i>	sand mat manzanita	M	8-24	"48-84	"M-L	X	X		X							X	X
<i>Arctostaphylos uva-ursi</i>	kinnikinnick	CA	6-12	"36-72	"M-L	X	X	X				X				X	X

Table N-6. Ground cover plant species.

Botanical Name	Common Name	Native Status	Height	Spread	Irrigation	Oak Woodland	Coastal Scrub	Meadow	Dunes	Wetlands	Lake	Landscape Gardens	Rain Gardens	Bioswales	Shade	Part Shade	Full sun
<i>Arctostaphylos x 'Carmel Sur'</i>	carmel Sur manzanita																
<i>Arctostaphylos x 'Emerald Carpet'</i>	emerald carpet manzanita	Cv	4-8	"36-60	"M-L	X		X				X			X	X	
<i>Arctostaphylos x 'Indian Hill'</i>	Indian hill manzanita	Cv	12-24	"48-60	"M-L	edge		X				X					X
<i>Arctostaphylos x 'John Dourley'</i>	Dourley's manzanita	Cv	18-36	"48-72	"M-L			X				X					X
<i>Artemisia californica 'Canyon Gray'</i>	canyon gray coastal sagebrush	CA	6-12	"36-60	"M-L		X	X									X
<i>Artemisia pycnosephala</i>	beach sandwort	M	12-18	"18-24	"L		X	X	X								X
<i>Asarum caudatum</i>	western ginger	M	6-12	"24"+	M	X						X	X	X	X	X	
<i>Aster chilensis</i>	coast aster	M	18-24	"24"+	R-M			X		X		X	X	X	X	X	X
<i>Baccharis pilularis 'Pigeon Point'</i>	Pigeon Point coyote brush	CA	18-36	"72-144	"M-L		X	X				X					X
<i>Berberis aquifolium 'Compacta'</i>	compact Oregon grape	CA	24-36	"24"+	M	X	X	X				X	X			X	X
<i>Berberis aquifolium var. repens</i>	creeping Oregon grape	CA	24-36	"24"+	M-L	X	X	X				X				X	X
<i>Berberis nervosa</i>	longleaf barberry	M	12-24	"24"+	M-L	X	X					X	X		X	X	
<i>Ceanothus gloriosus</i>	Point Reyes wild lilac	CA	18-36	"36"+	M-L		X	X				X					X
<i>Ceanothus griseus var. horizontalis</i>	carmel creeper	M	24-36	"60"+	M-L		X	X				X					X
<i>Ceanothus griseus x C. papillosus 'Joyce Coulter'</i>	Joyce Coulter wild lilac	Cv	24-36	"60"+	M-L			X				X	X				X
<i>Epilobium canum</i>	California fuchsia	M	6-30	"12-48	"M-L		X	X				X		X			X
<i>Epilobium septentrionale</i>	Humboldt fuchsia	CA	6-12	"6-24	"M-L		X					X		X			X
<i>Erigeron glaucus</i>	seaside aster	M	8-12	"24-36	"M-L		X	X	X			X					X
<i>Eriophyllum lanatum ssp. arachnoideum</i>	dwarf woolly sunflower	M	12-24	"12-24	"M-L		X	X	X								X
<i>Grindelia stricta var. playphylla</i>	spreading gum plant	M	24-36	"48-72	"M-L		X	X		X				X			X
<i>Iris douglasiana</i>	coast Iris	M	8-18	"24-72	"M-L	X	X	X				X		X	X	X	X
<i>Iris 'Pacific Coast Hybrids'</i>	PCH iris	Cv	12-24	"12-36	"M-L		X	X				X		X	X	X	X
<i>Salvia leucophylla 'Point Sal Spreader'</i>	Point Sal purple sage	CA	24-36	"72"+	L		X	X				X					X
<i>Salvia mellifera 'Terra Seca'</i>	Terra Seca sage	CA	12-24	"36-60	"L		X	X				X					X
<i>Salvia mellifera x S. sonomensis 'Mrs. Beard'</i>	Mrs. Beard's sage	Cv	6-12	"24-48	"L		X	X				X					X
<i>Salvia sonomensis x S. clevelandii 'Bee's Bliss'</i>	bee's bliss sage	Cv	6-12	"36-60	"L		X					X					X
<i>Satureja douglasii</i>	yerba buena	M	6-12	"24"+	M-L	X						X	X	X	X	X	
<i>Sedum spp.</i>	stonecrop	E	varies	varies	M-L							X					
<i>Symphoricarpos mollis</i>	creeping snowberry	M	6-24	"48"+	M-L	X						X	X		X	X	
<i>Vancouveria planipetala</i>	Inside-out flower	M	6-18	"24"+	M-L	X						X	X		X	X	

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Table N-7. Shrub species.

Botanical Name	Common Name	Native Status	Height	Spread	Irrigation	Oak Woodland	Coastal Scrub	Meadow	Dunes	Wetlands	Lake	Landscape	Rain Gardens	Bioswales	Shade	Part Shade	Full sun
<i>Arctostaphylos andersonii</i>	Santa Cruz manzanita	CA	5-8	'6-12	'M-L	edge	X	X				X	X				X
<i>Arctostaphylos bakeri</i> 'Louis Edmunds'	Louis Edmunds manzanita	CA	4-6	'4-6	'M-L	edge		X				X	X				X
<i>Arctostaphylos densiflora</i> 'Howard McMinn'	McMinn manzanita	CA	4-6	'5-8	'M-L	edge		X				X	X				X
<i>A. d.</i> 'Sentinal'	sentinal manzanita	CA	6-8	'4-8	'M-L	edge		X				X	X				X
<i>Arctostaphylos edmundsii</i>	little Sur manzanita	M	1-2	'8-12	'M-L	edge	X	X				X	X				X
<i>Arctostaphylos glandulosa</i>	eastwood manzanita	M	3-6	'6-10	'L	edge	X	X									X
<i>Arctostaphylos hookeri</i>	Monterey manzanita	M	3-6	'4-8	'M-L	edge	X	X				X	X				X
<i>Arctostaphylos manzanita</i>	Parry manzanita	CA	6-20	'6-15	'L	edge		X				X					X
<i>Arctostaphylos pajaroensis</i>	Pajaro manzanita	M	6-8	'6-10	'L	edge	X	X				X					X
<i>Arctostaphylos purissima</i>	La Purissima manzanita	CA	3-6	'6-10	'L	edge		X				X					X
<i>Arctostaphylos rudis</i>	shagbark manzanita	CA	3-6	'4-8	'L	edge		X				X					X
<i>Arctostaphylos obispoensis</i>	serpentine manzanita	CA	6-15	'6-10	'L	edge		X				X					X
<i>Arctostaphylos x</i> 'Austin Griffiths'	Griffiths' manzanita	Cv	8-12	'6-8	'M-L	edge		X				X	X				X
<i>Arctostaphylos x</i> 'Indian Hill'	Indian hill manzanita	Cv	1-2	'4-5	'M-L	edge		X				X	X				X
<i>Arctostaphylos x</i> 'John Dourley'	Dourley's manzanita	Cv	1.5-3	'4-6	'L	edge		X				X					X
<i>Arctostaphylos x</i> 'Sunset'	sunset manzanita	Cv	6-8	'8-10	'M-L	edge		X				X	X				X
<i>Arctostaphylos x</i> 'White Lanterns'	white lanterns manzanita	Cv	4-6	'6-8	'M-L	edge		X				X	X				
<i>Arctostaphylos x</i> 'Winterglow'	winterglow manzanita	Cv	2-3	'4-6	'M-L	edge		X				X	X				X
<i>Berberis aquifolium</i>	Oregon grape	CA	4-8	'4+	M	X		X				X	X			X	X
<i>Berberis x</i> 'Golden Abundance'	golden abundance Oregon grape	Cv	4-6	'4+	M	X		X				X	X			X	X
<i>Berberis pinnata</i>	California holly grape	M	4-8	'4+	L	X	X	X				X	X			X	X
<i>Carpenteria californica</i>	California bush anemone	CA	6-10	'6-10	'M	edge						X	X			X	X
<i>Ceanothus cuneatus</i> var. <i>rigidus</i> 'Snowball'	snowball Monterey ceanothus	M	2-4	'6-10	'L	edge	X	X				X					X
<i>Ceanothus foliosus</i>	wavy-leaf ceanothus	M	2-4	'2-4	'L	edge	X	X				X					X
<i>Ceanothus griseus</i> 'Louis Edmunds'	Louis Edmonds Carmel ceanothus	M	6	'20	'L	edge	X	X				X					X
<i>Ceanothus griseus</i> 'Santa Ana'	Santa Ana Carmel ceanothus	M	5-8	'6-10	'L	edge	X	X				X					X
<i>Ceanothus maritimus</i>	Hoover ceanothus	CA	3-6	'4-8	'L	edge	X	X				X					X
<i>Ceanothus oliganthus</i> var. <i>sorediatus</i>	Hoover Jim brush	M	5-15	'10-15	'L		X	X				X					X
<i>Ceanothus purpureus</i>	hollyleaf ceanothus	CA	3-6	'4-10	'L	edge		X				X					X
<i>Ceanothus thrysiflorus</i>	blue blossom	M	6-20	'10-20	'L	edge	X	X				X				X	X
<i>C. t.</i> 'Skylark'	skylark blue blossom	CA	4-6	'9-12	'L	edge	X	X				X				X	X
<i>C. t.</i> 'Snow Flurry'	snow flurry wild lilac	CA	9-12	'9-12	'L	edge	X	X				X				X	X
<i>Ceanothus</i> 'Concha'	Concha wild lilac	Cv	4-6	'6-9	'L	edge	X	X				X					X
<i>Ceanothus</i> 'Dark Star'	dark star wild lilac	Cv	4-6	'7-10	'L	edge	X	X				X					X

Table N-7. Shrub species.

Botanical Name	Common Name	Native Status	Height	Spread	Irrigation	Oak Woodland	Coastal Scrub	Meadow	Dunes	Wetlands	Lake	Landscape	Rain Gardens	Bioswales	Shade	Part Shade	Full sun
<i>Ceanothus 'Frosty Blue'</i>	frosty blue wild lilac	Cv	8-12	'8-12	'L	edge	X	X				X					X
<i>Ceanothus 'Joyce Coulter'</i>	Joyce Coulter wild lilac	Cv	3-6	'10-15	'L	edge	X	X				X					X
<i>Ceanothus 'Julia Phelps'</i>	Julia Phelps wild lilac	Cv	4-8	'8-12	'L	edge	X	X				X					X
<i>Ceanothus 'Ray Hartman'</i>	Ray Hartman wild lilac	Cv	12-20	'12-20	'L		X	X				X					X
<i>Ceanothus 'Sierra Blue'</i>	Sierra blue wild lilac	Cv	12-20	'12-20	'L		X	X				X					X
<i>Ceanothus 'Wheeler Canyon'</i>	Wheeler Canyon wild lilac	Cv	4-8	'6-12	'L	edge	X	X				X					X
<i>Cistus purpureas</i>	rockrose	E	4	'4	'L							X					
<i>Comarostaaphyllis diversifolia ssp. planifolia</i>	summer holly	CA	12-20	'15-20	'L	edge						X					X
<i>Cornus sericea</i>	creek dogwood	M	6-15	'6+	R					X	X	X	X	X	X	X	X
<i>Dendromecon harfordii</i>	Island bush poppy	CA	8-15	'8-15	'L							X					X
<i>Dendromecon rigida</i>	bush poppy	M	8-10	'4-8	'L		X	X				X					X
<i>Eriogonum arborescens</i>	Santa Cruz Island buckwheat	CA	2-8	'2-8	'L	edge		X				X					X
<i>Eriogonum cinereum</i>	ashyleaf buckwheat	CA	2-6	'2-6	'L	edge		X				X					X
<i>Eriogonum fasciculatum ssp. foliolosum</i>	California buckwheat	M	4-6	'6-10	'L		X										X
<i>Eriogonum giganteum</i>	St. Catherine's lace	CA	6-10	'8-12	'L	edge						X					X
<i>Eriogonum latifolium</i>	coast buckwheat	M	1-2	'4-6	'L		X	X	X			X					X
<i>Fremontodendron californicum</i>	California flannel bush	M	8-20	'12-20	'L							X					X
<i>Fremontodendron x 'California Glory'</i>	California glory flannel bush	Cv	12-18	'8-12	'L							X					X
<i>Fremontodendron x 'San Gabriel'</i>	San Gabriel flannel bush	Cv	12-18	'12-20	'L							X					X
<i>Galvezia speciosa</i>	showy island snapdragon	CA	2-3	'3-6	'M-L	X						X	X		X	X	X
<i>Garrya elliptica</i>	common silk tassel	M	15-20	'8-15	'L	X	X					X					X
<i>Garrya fremontii</i>	Fremont silk tassel	M	5-10	'5-10	'L							X					X
<i>Heteromeles arbutifolia</i>	toyon	M	6-20	'6-20	'M-L	X		X				X	X			X	X
<i>Juniperus spp.</i>	juniper	E	varies	varies	M-L							X					
<i>Keckiella cordifolia</i>	heartleaf keckiella	CA	4-6	'6-8	'M-L	X						X	X			X	X
<i>Lavatera assurgentiflora</i>	malva rose	CA	5-10	'5-10	'L	X						X	X			X	X
<i>Lavendula spp.</i>	lavender	E	4	'5	'M							X					
<i>Lupinus albifrons</i>	silver bush lupine	M	4-8	'4-8	'L		X	X				X					X
<i>Lupinus albifrons var. collinus</i>	prostrate silver bush lupine	M	1-2	'4-8	'L		X		X			X					X
<i>Lupinus arboreus</i>	tree lupine	M	3-7	'3-7	'L		X	X	X			X					X
<i>Malacothamnus fasciculatus</i>	chaparral mallow	M	6-10	'6"+	L		X	X				X					X
<i>Malacothamnus palmeri</i>	Santa Lucia bush mallow	M	6-8	'6-8	'L		X	X				X					X
<i>Myrica californica</i>	Pacific wax-myrtle	M	6-12	'6-12	'M-L	X						X	X			X	X
<i>Philadelphus lewisii</i>	wild mock-orange	CA	6-10	'6-10	'M-L	edge						X	X			X	X
<i>Phormium tenax</i>	New Zealand flax	E	3'-8	'3'-5'	M-L							X					

Table N-7. Shrub species.

Botanical Name	Common Name	Native Status	Height	Spread	Irrigation	Oak Woodland	Coastal Scrub	Meadow	Dunes	Wetlands	Lake	Landscape	Rain Gardens	Bioswales	Shade	Part Shade	Full sun
<i>Rhamnus californica</i>	California coffeeberry	M	6-12	'6-12	'L	X	X					X					X
<i>R. c. 'Eve Case'</i>	Eve Case coffeeberry	CA	3-6	'3-6	'M-L	X		X				X	X			X	X
<i>R. c. 'Mound San Bruno'</i>	mound San Bruno coffeeberry	CA	3-6	'3-6	'M-L	X		X				X	X			X	X
<i>Rhamnus crocea</i>	redberry	M	3-6	'3-6	'L	X	X					X				X	X
<i>Rhamnus ilicifolia</i>	holly-leaf redberry	M	8-15	'8-15	'L	X	X									X	X
<i>Rhamnus tomentella</i>	hoary coffeeberry	M	12-18	'12-18	'L		X					X					X
<i>Ribes aureum var. gracillimum</i>	golden currant	M	3-6	'3-4	'M-L	X	X	X					X			X	X
<i>Ribes indecorum</i>	white-flowered currant	CA	4-6	'3-4	'L	X		X								X	X
<i>Ribes malvaceum</i>	chaparral currant	M	4-8	'3-6	'L	X	X	X								X	X
<i>Ribes sanguineum var. glutinosum</i>	pink-flowered currant	M	4-8	'3-6	'M-L	X	X	X				X	X			X	X
<i>Ribes speciosum</i>	fuchsia-flowered gooseberry	M	4-6	'6-8	'L	X	X	X				X				X	X
<i>Ribes viburnifolium</i>	Catalina currant	CA	2-3	'3-6	'M-L	X						X	X		X	X	
<i>Salvia apiana</i>	white sage	CA	4-6	'4-6	'L			X				X					X
<i>Salvia clevelandii</i>	Cleveland sage	CA	2-4	'4-6	'L	edge		X				X					X
<i>Salvia leucophylla</i>	purple sage	CA	4-6	'6-10	'L	edge		X				X					X
<i>S. l. 'Amethyst Bluff'</i>	amethyst bluff sage	CA	2-4	'4-8	'L	edge		X				X					X
<i>Salvia mellifera</i>	black sage	M	3-6	'4-8	'L	edge	X					X					X
<i>Salvia clevelandii</i> x <i>Salvia leucophylla</i> named hybrids																	
<i>Salvia</i> x ' <i>Allen Chickering</i> '	Allen Chickering sage	Cv	4-6	'6-8	'L	X						X					X
<i>Salvia</i> x ' <i>Aromas</i> '	aromas sage	Cv	4-6	'6-8	'L							X					X
<i>Salvia</i> x ' <i>Pozo Blue</i> '	Pozo blue sage	Cv	4-6	'6-8	'L	X						X					X
<i>Salvia</i> x ' <i>Whirly Blue</i> '	whirly blue sage	Cv	4-6	'6-8	'L							X					X
<i>Styrax redivivus</i>	snowdrop bush	CA	5-12	'5-12	'M-L	X						X				X	X
<i>Symphoricarpos albus var. laevigatus</i>	snowberry	M	2-6	'6'+	'M-L	X						X	X		X	X	
<i>Trichostema lanatum</i>	woolly blue curls	M	2-3	'2-3	'L		X	X				X					X
<i>Vaccinium ovatum</i>	California huckleberry	M	3-8	'3-8	'M-L	X		X				X	X		X	X	

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Table N-8. Climbing plant species.

Botanical Name	Common Name	Native Status	Height	Spread	Irrigation	Oak Woodland	Coastal Scrub	Meadow	Dunes	Wetlands	Lake	Landscape	Rain Gardens	Bioswales	Shade	Part Shade	Full sun
<i>Aristolochia californica</i>	California dutchman's pipe	M	12'+	12'+	M-L	X						X	X		X	X	X
<i>Bougainvillea glabra</i>	bougainvillea	E	12'+	8	'R-M							X					
<i>Calistegia macrostegia</i>	California morning glory	M	6-30	'30'+	M-L	X						X					X
<i>Clematis lasiantha</i>	chaparral clematis	M	18	'18'+	L	X	X	X				X	X			X	X
<i>Vitis californica</i>	California wild grape	M	30	'30'+	M-L	X						X	X			X	X

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Table N-9. Tree species.

Botanical Name	Common Name	Native Status	Height	Spread	Irrigation	Oak Woodland	Coastal Scrub	Meadow	Dunes	Wetlands	Lake	Landscape	Rain Gardens	Bioswales	Shade	Part Shade	Full sun
<i>Abies bracteata</i>	Santa Lucia fir	M	75-100	'30-45	'M-L							X				X	X
<i>Acer macrophyllum</i>	big leaf maple	M	30-100	'40-80	'R-M					X		X				X	X
<i>Aesculus californica</i>	California buckeye	M	20-40	'20-40	'L	Edge		X				X					X
<i>Alnus oregano</i>	red alder	CA	45-75	'30-45	'R-L					X		X				X	X
<i>Cupressus lawsoniana</i>	Port Orford cypress	CA	75-180	'25-40	'M-L							X				X	X
<i>Cupressus macrocarpa</i>	Monterey cypress	M	40-70	'40-70	'L							X				X	X
<i>Lyonothamnus floribundus ssp. asplenifolius</i>	Santa Cruz Island ironwood	CA	30-60	'20-30	'L							X				X	X
<i>Magnolia grandiflora</i>	southern Magnolia	E	60-90	'30-50	'M							X					
<i>Pinus muricata</i>	bishop pine	M	50-80	'50-80	'L							X					X
<i>Pinus radiata</i>	Monterey pine	M	60-80	'45-60	'L	X											X
<i>Pseudotsuga menziesii</i>	Douglas fir	M	70-120	'40-60	'M-L	X						X					X
<i>Quercus agrifolia</i>	coast live oak	M	60-90	'60-120	'L	X											X
<i>Quercus garryana</i>	Oregon white oak	CA	30-60	'30-60	'M-L	X											X
<i>Quercus kelloggii</i>	California black oak	M	40-80	'40-80	'M-L	X											X
<i>Quercus lobata</i>	valley oak	M	40-120	'60-120	'L	X											X
<i>Quercus suber</i>	cork oak	E	40-80	'40-80	'M-L							X					X

Table N-9. Tree species.

Botanical Name	Common Name	Native Status	Height	Spread	Irrigation	Oak Woodland	Coastal Scrub	Meadow	Dunes	Wetlands	Lake	Landscape	Rain Gardens	Bioswales	Shade	Part Shade	Full sun
<i>Salix babylonica</i>	weeping willow	E	35-50	'30-50	'R					X	X						
<i>Sequoia sempervirens</i>	coast redwood	M	150-300	'30-45	'R	X						X					X
<i>Sequoiadendron giganteum</i>	giant sequoia	CA	90-180	'30-60	'L							X					X
<i>Umbellularia californica</i>	California bay	M	50-80	"50-80	"M-L							X			X		X

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Table N-10. Historic non-native perennial species.

Botanical Name	Common Name	Native Status	Height	Spread	Irrigation	Shade	Part Shade	Full sun	Comments
<i>Achillea x 'Coronation Gold'</i>	coronation gold yarrow	Hybrid of two Mediterranean species	36"	12"+	L-M			X	Gray green fernlike foliage with bright gold flat top flower heads in summer. Plant in masses.
<i>Achillea millefolium</i>	common yarrow	California and throughout the northern hemisphere	12"	24"+	M			X	Small scale ground cover. Many color forms available.
<i>Achillea x 'Moonshine'</i>	moonshine yarrow	Hybrid of two Mediterranean species	18"	12"+	M			X	Bright yellow flowers in flat top heads all summer held above silvery green foliage.
<i>Aeonium arboreum</i>	tree aeonium	Canary Islands	36"+	36"+	M	X		X	Succulent. Thick spikes of yellow flowers winter-spring; several dark purple foliage forms available
<i>Aeonium simsii</i>	mounding aeonium	Canary Islands	6"	24"+	M	X		X	Succulent. Bright green rosettes of leaves with bright yellow spring flowers.
<i>Agastache aurantiaca</i>	orange hummingbird mint	Northern Mexico	30"	24"	M			X	Summer blooming, iridescent pink and orange flowers that attract many pollinators.
<i>Agastache cana</i>	Texas hummingbird mint	Texas, New Mexico	36"	18"	M			X	Summer blooming, reddish-pink flowers.
<i>Agastache hybrids</i>	hybrid hummingbird mint	Cultivation	30"	24"	M			X	A number of color selections are available.
<i>Aloe brevifolia</i>	short leafed aloe	South Africa	12-24"	24"+	L			X	Succulent, blue-gray foliage, showy red flowers through the year.
<i>Aloe nobilis</i>	noble aloe	South Africa	12-24"	24"+	L			X	Succulent. Bright green foliage that turns red in winter. Showy red flowers in spring.
<i>Aloe saponaria</i>	soap aloe	South Africa	12-24"	36"+	L			X	Succulent. Striped and spotted patterns on dark green foliage. Multibranching flower stalks rise to 36" spring-summer bearing nodding yellow, orange, salmon or red flowers
<i>Aloe striata</i>	coral aloe	South Africa	24"	24-36"	L			X	Succulent. Handsome gray green leaves edged in red. Showy coral pink to orange flowers midwinter to summer. Effective in mass planting.

Table N-10. Historic non-native perennial species.

Botanical Name	Common Name	Native Status	Height	Spread	Irrigation	Shade	Part Shade	Full sun	Comments
<i>Anigozanthos flavidus</i>	kangaroo paw	Australia	36-64"	24"	M			X	Unusual perennial with dense, iris-like foliage. Many selections are available that range in color from red, gold, and green. Flowers are held on stalks above foliage in small clusters. Most are fuzzy.
<i>Artemisia x 'Powis Castle'</i>	Powis Castle wormwood	Hybrid of two Mediterranean species	24"	36"+	L-M			X	Almost as tough as the native sagebrush with white, finely cut foliage. Combines well with other Mediterranean species.
<i>Ballota pseudodictamnus</i>	Cretan horehound	Crete	24"	36"	L-M			X	A shrubby perennial with near-white, fuzzy round foliage. Combines well with other Mediterranean perennials
<i>Beschorneria yuccoides</i>		Mexico	36"	48"	L-M		X	X	Soft gray-green spear-like leaves with showy coral red flowering shoots rise to 72" above the foliage bearing small green and red flowers. Striking specimen
<i>Calocephalus brownii</i>	cushion plant	South coastal Australia	24"	24"+	L			X	Forms a dense mass of tiny white stems with tiny white leaves. Half inch yellow button head flower clusters in summer.
<i>Cerastigma plumbaginoides</i>	dwarf plumbago	Central Asia	12"	36"+	M		X	X	Forms seasonal carpets of dark shiny leaves topped with bright, true blue flowers
<b><i>Dietes</i> species, listed in the Smart Landscaping Master Plan, are not recommended for NSA Monterey. Experience indicates that all cultivated forms are invasive if allowed to form seed, particularly near the coast.</b>									
<i>Epimedium grandiflorum</i>	Himalayan inside-out flower	Himalayan region	12"	24"+	R-M	X	X		A wonderful and tough relative of our <i>Vancouveria</i> with beautiful foliage and airy clusters of star-like flowers in Spring.
<i>Euphorbia rigida</i> (Note: some <i>Euphorbia</i> species are invasive. This one is not.)	Mediterranean spurge	Mediterranean region	18"	18"	L			X	Blue-green leaves clothe the stems, which produce a brilliant chartreuse-yellow flower head in spring-summer. Combines well with other Mediterranean perennials and is quite effective in drifts.
<i>Gaura lindheimeri</i>	butterfly evening primrose	South central US	36"	12"	M			X	An elegant, airy summer blooming perennial bearing hundreds of small, white, butterfly shaped flowers on wiry stems that sweep with the wind.
<i>Geranium sanguineum</i>	crane's bill	Widespread in mountainous Asia	6"	24"	M			X	A tough but elegant summer flowering perennial available in several colors ranging from white to rose.
<i>Graptopetalum paraguayensis</i>	ghost plant	Mexico	6"	24"+	M-L		X	X	Succulent with porcelain-like rosettes of 2-4" pointed leaves. Makes a nice, small scale groundcover.
<i>Helleborus orientalis</i>	Lenten rose	Southern Europe, Asia Minor	12"	12"+	M	X	X		Beautiful early blooming perennial. Its lush foliage may disappear with summer drought, but it comes back vigorously with autumn rain.
<i>Heemerocallis hybrids</i>	daylily	Central Europe to Japan	24-36"	24-36"	R-M			X	Classic summer blooming perennials available in all colors but blue. Likely widely used on the property in the late 19th century.
<i>Heuchera hybrids</i> ( <i>H. sanguina x H. maxima</i> )	coral bells	Western North America	12-36"	12"	M	X	X	X	Many selected forms are available, many originating from 2 California native plant botanical gardens. Flowers are bright red, pink or white.

Table N-10. Historic non-native perennial species.

Botanical Name	Common Name	Native Status	Height	Spread	Irrigation	Shade	Part Shade	Full sun	Comments
<i>Iris siberica</i>	Siberian Iris	Central Asia	24-36"	24"	R-M		X	X	One of the most elegant of taller Iris species. Many color forms available in blue, purple, burgundy, yellow and white.
<i>Kniphofia uvaria</i>	torch lily	South Africa	12-72"	12-36"	L-M			X	Long grassy foliage with taller spikes, flowering from late winter to mid-summer. Many forms are available, mostly in orange, red and yellow.
<i>Lamium maculatum</i>	dead nettle	Europe-W. Asia	2-4"	18-24"	M	X	X		Several varieties available. All have striking silvery-white leaves that light up dark shade.
<i>Lavandula angustifolia</i>	English lavender	Southern Europe	12-48"	24"	M-L			X	Dwarf and taller varieties available.
<i>Lavandula x 'Goodwin Creek Gray'</i>	Goodwin Creek lavender	Hybrid origin of Mediterranean species	24-36"	24-36"	M-L			X	Perhaps the best of the lavenders in cultivation, it bears silvery white leaves that densely clothe the plant with spikes of dark purple flowers nearly year-round.
<i>Lavandula x intermedia</i>	hybrid English lavender	Hybrid origin	24-48"	36-48"	M-L			X	Variety 'Grosso' bears dark blue flower spikes; principal variety of the perfume industry.
<i>Lavendula lanata</i>	woolly lavender	Southern Europe	12-24"	12-24"	M-L			X	More durable of harsh conditions, very compact, with white-woolly foliage.
<i>Lithodora diffusa</i>	Gentian rock lover	Southern Europe	3-6"	24-36"	M		X	X	Brilliant gentian-blue bell flowers against dark green foliage. Good drainage.
<i>Lobelia tupa</i>	tabaco del diablo	Central Chile	48-84"	36-48"	M-L			X	Striking upright perennial clothed in pale gray-green foliage topped by large spikes of brick red flowers. Choice
<i>Nepeta x faassenii</i>	catmint	Hybrid origin/Mediterranean species	6-18"	18-36"	M-L			X	Choice group of gray-foliaged soft textured plants with lavender flowers all summer. Dwarf and larger forms available.
<i>Oenothera berlandieri</i>	Mexican evening primrose	Mexico	12-24"	24"+	M-L			X	Vigorous spreader, masses of light pink flowers spring-fall.
<i>Omphalodes cappadocica</i>	Cappadocian forget-me-not	Turkey	6-8"	12-24"	M		X		Beautiful spring blooming evergreen perennial with satiny heart-shaped leaves and masses of bright blue flowers in spring.
<i>Origanum rotundifolium</i>	round leaf oregano	Asia Minor	4-8"	24"+	M-L			X	Showy flowering evergreen perennial handsomely clothed in round-overlapping fragrant leaves. Several forms available
<i>Pelargonium crispum</i>	lemon geranium	Southern Africa	12-24"	24-36"	M-L		X	X	Tough plant with very fragrant foliage and small lavender-purple flowers. Other scented geraniums available.
<i>Penstemon x gloxinoides</i>	border penstemon	Hybrids of Mexican species	18-36"	24"+	M		X	X	Very showy perennials ranging from deep purple through red to pink and white. A number of named forms available.
<i>Perovskia abrotanoides</i>	Russian sage	Middle East to northeast Asia	24-60"	36-60"	M-L			X	Tough deciduous perennials with white stems and large airy clusters of small blue flowers.
<i>Salvia chamaedryoides</i>	germander sage	Northern Mexico	12-24"	36"+	M-L			X	White leaves back brilliant blue flowers throughout the year. Very tough.
<i>Salvia chiapensis</i>	Chiapan sage	Chiapas, Mexico	12-24"	24"+	R-M		X	X	Satiny dark green foliage with terminal spikes of iridescent purple-pink flowers. Very showy.
<i>Salvia gesneriflora</i>	tequila sage	Central Mexico	48-72"	36"+	M		X	X	Fuzzy chartreuse foliage topped with short clusters of large, bright red flowers fall-spring.

Table N-10. Historic non-native perennial species.

Botanical Name	Common Name	Native Status	Height	Spread	Irrigation	Shade	Part Shade	Full sun	Comments
<i>Salvia greggii</i>	Texas sage	Southwestern US	24-36"	24-36"	M		X	X	Many forms available. Most have bright red, purple, or pink flowers almost all year.
<i>Salvia guaranitica</i>	Argentine sage	Argentina	48-72"	36"+	R-M		X	X	Robust, lush perennial topped with very showy bright blue flowers in summer.
<i>Salvia leucantha</i>	Mexican bush sage	Mexico	24-48"	36"+	M-L			X	Very showy spikes of purple flowers in spring and fall. 'Mid-night' is the best form.
<i>Salvia microphylla</i>	red sage	Mexico	24-36"	36"+	M-L			X	Dark purple stems, small, apple green leaves and brilliant red flowers most of the year. Tough
<i>Scabiosa columbaria</i>	pincushion flower	Central Asia	12-36"	12-36"	M-L			X	Showy lavender-blue flower heads spring-fall.
<i>Sedum telephium</i>	autumn stonecrop	Central Asia to Japan	24-36"	12-24"	M		X	X	Deciduous clumps with light green foliage topped in fall with broad flower heads red-pink.
<i>Stachys byzantina</i>	lamb's ear	Central Asia	4-12"	24"+	M-L			X	White woolly leaves. Several forms available.
<i>Tagetes lemmonii</i>	Mexican bush marigold	Mexico	48-60"	24"+	M-L			X	Fragrant foliage topped in fall-winter with bright gold to orange flowers.
<i>Teucrium chamaedrys</i>	germander	Mediterranean basin	12-18"	18-24"	M-L			X	Glossy dark green foliage topped with little spikes of pink flowers all summer.
<i>Tricyrtus formosana</i>	toad lily	Taiwan	24-36"	24"+	M	X	X		Deciduous clumping perennial with lily-like stalks adorned with ornately penciled star shaped flowers in purple-white-red-yellow in late summer.
<i>Tulbaghia violacea</i>	society garlic	South Africa	24"	18-24"	M			X	Nearly perpetual blooming with violet pink flower clusters held high above basal green narrow strap-like leaves.
<i>Xerophyllum tenax</i>	bear grass	Western US	36-72"	36"+	L		X	X	Grassy foliage topped after several years with a 6' tall torch shaped flower stalk covered with thousands of tiny cream-white flowers.
<i>Yucca flaccid</i>	prairie yucca	Central US	36-48"	36"+	L		X	X	Showy soft-leaved yucca with spectacular flower spikes and waxy white flowers.

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Table N-11. Historic non-native ground cover species.

Botanical Name	Common Name	Native Status	Height	Spread	Irrigation	Shade	Shade Part	Full sun	Comments
<i>Cistus salviifolius</i>	sage leaf rock rose	Mediterranean basin	24"	72"	L			X	Light gray-green leaves topped with masses of 1 ½ inch white flowers in spring-summer.
<i>Coprosma kirkii</i>	Kirk's mirror plant	New Zealand	12-24"	72-96"	L		X	X	Highly glossy small kaki-green leaves smother prostrate stems. Tolerates salt spray.
<i>Cotoneaster dammeri</i>	bear-berry cotoneaster	China	12-24"	60-84"	M-L		X	X	Reliable prostrate shrub covered with small dark green leaves; masses of small white flowers in spring followed by very showy coral-orange-red berries through winter.
<i>Grevillea lanigera</i> 'Coastal Gem'	coastal gem grevillea	Australia	12"	60"+	M-L			X	An intriguing ground cover shrub that is both tough and beautiful, with small grayish fuzzy leaves and coral-rose pink flowers most of the year.
<i>Halimium lasianthum</i>	yellow sunrose	Mediterranean basin	24"	48"+	L			X	Small gray leaves are smothered by 2" yellow disks-like flowers in spring. Combines well with other Mediterranean natives.
<i>Helianthemum nummularium</i>	sunrose	Medeterranean basin	12"	24"+	M-L			X	Tiny leaves support showy bright colored disk-shaped flowers in many colors.
<i>Juniperus horizontalis</i>	prostrate juniper	China	12"	48-72"	M-L		X	X	Several forms available with mostly steely-blue foliage. Tough.
<i>Rosmarinus officinalis</i>	rosemary	Mediterranean basin	12-24"	24-48"	L			X	Cultivars 'Prostratus', 'Irene', 'Ken Taylor', 'Lockwood de Forest' all produce light to dark blue flowers winter and spring.
<i>Sarcococca hookerana</i>	prostrate sweetbox	China	18"	72"+	M	X	X		Slow growing elegant creeper that bears powerfully fragrant flowers in winter-spring.
<i>Sollya heterophylla</i>	bluebell creeper	Australia	24-36"	48-60"	M		X	X	Delicate looking tumbler with bright blue flowers. Needs good drainage.

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Table N-12. Historic non-native shrub species. (Unless noted, all shrubs listed here are evergreen.)

Botanical Name	Common Name	Native Status	Height	Spread	Irrigation	Shade	Part Shade	Full sun	Comments
<i>Abutilon x hybridum</i>	flowering maple	Hybrids of Asian species	2-8'	4-8'	M		X		Best in sheltered locations; flower throughout the year. Many varieties available in reds oranges, yellows, pinks.
<i>Alyogyne huegelii</i>	blue hibiscus	Australia	5-8'	6-8'	L			X	Rugged shrub that blooms all year bearing satiny blue to purple hibiscus-like flowers.
<i>Artemisia arborescens</i>	giant wormwood	Southern Europe	4-6'	6-8'	L			X	Silvery white leaves are deeply divided into lace-like filigree. Delicate looking plant belies its incredible durability.
<i>Berberis darwinii</i>	Darwin barberry	Chile	5-10'	4-7'	M		X	X	Fountain-like growth habit, small holly-like dark green leaves and yellow-orange flowers that smother the stems in spring followed by dark blue berries.
<i>Brunfelsia pauciflora</i>	yesterday-today-and-tomorrow	Tropical America	3-6'	2-4'	M		X		Upright handsome plants that bear masses of 2" flowers in spring that open purple, fade to lavender, then to white.
<i>Buddleja davidii</i>	butterfly bush	East Asia	8-10'	8-10'	M			X	Semi-evergreen shrubs that bear dense terminal spikes of small fragrant flowers that attract butterflies in abundance. Colors are mostly deep reds and purples.
<i>Cercis chinensis 'Avondale'</i>	Avondale redbud	China	10-12'	10'	M			X	The best of the cultivated redbuds. Deciduous shrub that flowers in early spring on bare branches with deep purple flowers.
<i>Chamaelucium uncinatum</i>	Geraldton waxflower	Western Australia	6-8'	6-8'	L			X	Wispy foliage on plants that bear dense clusters of lavender-purple flowers in winter and spring. Young branches are popular as cut flowers. Needs no irrigation once established.
<i>Choisya ternata</i>	Mexican orange	Mexico	4-6'	6-10'	M-L	X	X	X	An elegant shrub that bears masses of orange-blossom like white flowers mainly in spring.
<i>Cistus x 'Blanche'</i> Note on Cistus: Wild species set viable seed in California. The selections presented here are sterile hybrids.	blanche rockrose	Sterile hybrid of Mediterranean origin	6-8'	3-6'	L			X	Bears dark green leaves with large single white flowers in spring. At home with California native shrubs.
<i>Cistus x hybridus</i>	white rockrose	Sterile hybrid of Mediterranean origin	2-3'	6-8'	L			X	Tough spreading shrub with small dark green leaves that covers itself in 2" disk-like white flowers in spring. At home with California native shrubs.
<i>Cistus x 'Peggy Sammons'</i>	Peggy Sammons' rockrose	Sterile hybrid of Mediterranean origin	3-6'	3-6'	L			X	Gray-green leaves with 2 ½ inch disk-like salmon pink flowers that appear to float above the shrub in spring.
<i>Cistus x purpureus</i>	pink rockrose	Sterile hybrid of Mediterranean origin	4-7'	6-10'	L			X	Deep pink 4" disk like flowers throughout spring and summer. An old Monterey favorite.
<i>Cistus x 'Bennett's White'</i>	Bennett's white rockrose	Sterile hybrid of Mediterranean origin	4-8'	3-6'	L			X	Upright grower with dark green leaves and large single white flowers with yellow centers. Very showy.
<i>Cistus x skanbergii</i>	Skanberg's rockrose	Sterile hybrid of Mediterranean origin	2-3'	4-6'	L			X	Small gray green fuzzy leaves and 1 ½" soft pink disk-like flowers that cover the plant in spring and early summer.
<i>Cistus x 'Sunset'</i>	sunset rockrose	Sterile hybrid of Mediterranean origin	1-2'	2-3'	L			X	A compact plant that bears magenta pink 2" flowers in spring. Arrestingly showy in bloom.

Table N-12. Historic non-native shrub species. (Unless noted, all shrubs listed here are evergreen.)

Botanical Name	Common Name	Native Status	Height	Spread	Irrigation	Shade	Part Shade	Full sun	Comments
<i>Cistus x 'Victor Reiter'</i>	Victor Reiter's rockrose	Sterile hybrid of Mediterranean origin	4-6'	6-8'	L				Gray green leaves with 3" bright salmon pink flowers in late spring. Rugged plant for dry slopes.
<i>Cleyera japonica</i>	Japanese spice bush	Japan	6-10'+	6-10'+	R-M	X	X		Elegant large shrub with intensely fragrant small cream colored flowers in spring and summer. Useful near outdoor sitting areas.
<i>Grevillea x 'Poorinda Constance'</i>	Poorinda Constance grevillea	Hybrid of Australian species	6-10'	6-10'	L			X	Narrow dark green leaves on dense shrubs that bear showy orange flowers in tip clusters in spring and summer.
<i>Grevillea lavandulacea 'Penola'</i>	lavender-leaf grevillea	Australia	4-6'	6-10'	L			X	Gray-green leaves with deep red flowers in winter and spring. Very showy.
<i>Grevillea x 'Robin Gordon'</i>	Robin Gordin grevillea	Hybrid of Australian species	4-6'	6-8'	M-L			X	The showiest grevillea listed here. Useful as a specimen plant. Light green deeply divided leaves with pendent, 6" clusters of bright red flowers most of the year.
<i>Grevillea rosmarinifolia 'Scarlet Sprite'</i>	scarlet sprite grevillea	Australia	3-6'	6-8'	L			X	Medium green needle-like leaves with brilliant red flowers in winter and spring. Superb selection.
<i>Ilex x altaclerensis 'Wilsonii'</i>	Wilson holly	Hybrid origin	6-8'	6-8'	M			X	Perhaps the best holly in modern cultivation. Evenly spine-toothed shiny leaves. Heavy producer of bright red berries.
<i>Ilex aquifolium</i>	English holly	Southern and central Europe	40'	25'	M		X	X	Many forms available. All have bright red winter fruit and dark green bristle-toothed leaves. Part of the original plant palette of Hotel Del Monte.
<i>Ilex crenata</i>	Japanese holly	Japan	2-10'	2-10'	M		X	X	A polished shrub with tiny small toothed leaves, black berries. Useful as a small hedge. A number of forms are available. 'Helleri' is an excellent dwarf selection.
<i>Lavatera thuringiaca</i>	tree mallow	Eastern Mediterranean	6-8'	4-6'	M			X	Several forms available with light to deep pink hollyhock-like flowers. Gray green leaves; combines well with other Mediterranean natives.
<i>Leonotis leonurus</i>	lion's tail	South Africa	4-6'	3-6'	L			X	An open shrub with terminal, 2' spikes of brilliant orange flowers in summer and fall.
<i>Leptospermum laevegatum</i>	Australian tea	Australia	10-30'	10-30'	L			X	Rugged large shrub with gray green waxy leaves and masses of white flowers in spring. Picturesque, twisting trunks.
<i>Leptospermum scoparium</i>	New Zealand tea	New Zealand	2-10'	2-10'	M			X	Tiny needle like leaves, usually bronzy-green. Very showy flower display in spring and summer. Many varieties available in white, pink and red shades.
<i>Leptospermum turbinatus 'Flat Rock'</i>	shining tea tree	Australia	8-10'	8-10'	M			X	Most attractive of the teas for foliage. Bronzy red to green foliage, billowy growth habit, small white flowers in spring.
<i>Leucophyllum langmanae 'Lynn's Everblooming'</i>	Lynn's everblooming Texas ranger	Texas	3-6'	3-6'	L			X	A reliable summer bloomer on the coast. Bears lavender flowers. Gray green leaves.
<i>Loropetalum chinensis</i>	Chinese witch hazel	China	6-8'	6-8'	R-M	X	X	X	An elegant showy shrub with horizontal branching patters. Several forms are available with green or purplish leaves bearing spidery white to deep pink flowers throughout the year. Choice as a close up plant in protected areas.

Table N-12. Historic non-native shrub species. (Unless noted, all shrubs listed here are evergreen.)

Botanical Name	Common Name	Native Status	Height	Spread	Irrigation	Shade	Part Shade	Full sun	Comments
<i>Melaleuca nesophila</i>	pink melaleuca	Australia	6-12'	8-12'	L			X	Picturesque shrub with small dark green waxy leaves and round clusters of lavender pink flowers throughout the year.
<i>Myrsine africana</i>	African boxwood	Africa	6-8'	2-4'	M	X	X	X	Dark bronzy small round leaves with deep red stems. Excellent as a hedge or unsheared screen plant.
<i>Osmanthus delavayi</i>	Chinese sweet olive	China	3-6'	4-8'	M	X	X	X	Makes a dark green dome with tiny dark green leaves and deliciously scented small white flowers in spring and summer.
<i>Osmanthus fragrans</i>	sweet olive	China	6-15'	6-8'	M	X	X	X	Broad dark green leaves with tiny intensely fragrant flowers in fall and winter.
<i>Osmanthus heterophyllus</i>	holly sweet olive	Japan	10-20'	10-20'	M			X	Dark holly like leaves with bronzy new growth. Tiny fragrant flowers in fall and winter. Useful as a hedge or unsheared screen plant.
<i>Philadelphus x 'Belle Etoile'</i>	mock orange	Southern Europe	6-8'	6-8'	M	X	X	X	Classic deciduous shrub that bears delightfully fragrant white flowers in spring. Fountain-like growth habit.
<i>Phlomis x 'Edward Bowles'</i>	Jerusalem sage	Hybrid of Mediterranean species	3-4'	5-6'	L			X	Tough shrub with gray-green fuzzy leaves and spikes of large, pure yellow flowers spring-fall.
<i>Pittosporum tenuifolium</i>	black-stemmed pittosporum	New Zealand	15-25'	10-15'	M	X	X	X	Small roundish leaves born on nearly black stems. Excellent as a hedge or unsheared screen plant. Several varieties are available with silvery or variegated leaves. 'Marjorie Channon' is one of the best.
<i>Polygala fruticosa 'Petite Butterflies'</i>	petite butterflies milkwort	South Africa	2-3'	2-3'	M	X	X	X	An everblooming selection with pink-purple, pea-like flowers over bluish-green foliage. Excellent in masses. Care free maintenance.
<i>Prostanthera ovalifolia</i>	mint bush	Australia	5-6'	5-6'	L			X	One of several recent introductions from UCSC. Narrowly oval small dark green leaves on slender stems
<i>Raphiolepis indica</i>	Indian hawthorn	India	2-6'	3-8'	M			X	The most commonly planted species in this section, Indian hawthorn is still worthwhile for its highly showy spring flower display of pink or white flowers. While used most often in masses, single specimens better show off the qualities of this species.
<i>Rosmarinus officinalis</i>	rosemary	Mediterranean basin	3-10'	3-10'	L			X	Indispensible for dry landscapes. A number of upright forms are available. The best are 'Santa Barbara Blue' and 'Tuscan Blue', both of which bear masses of bright blue flowers in winter-spring. Also useful as a sheared hedge.

Table N-12. Historic non-native shrub species. (Unless noted, all shrubs listed here are evergreen.)

Botanical Name	Common Name	Native Status	Height	Spread	Irrigation	Shade	Part Shade	Full sun	Comments
<i>Teucrium fruticans</i>	bush germander	Mediterranean basin	4-6'	6-8'	L			X	White-gray leaves densely clothe this mounding plant. Bears light to dark blue flowers in early spring. Attractive when maintained as sculpted mounds. Excellent for picking up headlights on a dark road.
<i>Tibouchina urvilleana</i>	princess flower	Brazil	6-10'	6-10'	R-M		X	X	Large fuzzy bronzy green leaves outlined in red are background for iridescent royal purple 3" flowers. Blooms cyclically all year.
<i>Viburnum plicatum</i> var. <i>tomentosum</i>	doublefile viburnum	China and Japan	8-15'	8-15'	M			X	Horizontal branching pattern gives tiered look to this deciduous shrub. Opulent, white, 6" flower heads adorn the branches in a double row from spring-fall. Choice specimen plant.
<i>Westringia fruticosa</i>	coast rosemary	Australia	4-6'	4-6'	L			X	Gray leaves are fine textured, similar to rosemary. Light lavender flowers stud the shrub from spring-fall.

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Note on shrubs: In the historical context of Hotel Del Monte, many other shrub species were planted that may or may not have succeeded. Not listed here but certainly of consideration in the proper context are roses, rhododendrons, azaleas and camellias. Thousands of cultivars of each of these groups have been created over the years. Care should be taken in selection of cultivars that are particularly adapted to the conditions of Monterey's weather, soil and water quality.

Table N-13. Historic non-native climbing species. (Climbers listed below are evergreen unless otherwise noted.)

Botanical Name	Common Name	Native Status	Height	Spread	Irrigation	Shade	Part Shade	Full sun	Comments
<i>Berberidopsis corallina</i>	coral plant	Chile	10'	10'	M		X	X	An elegant small climber with toothed, heart shaped dark satiny leaves with small, pendent dark red lantern shaped flowers in summer. Outstanding close up.
<i>Clematis armandii</i>	evergreen clematis	China	20-35'	20-35'	M		X	X	Fast growing vine for high fences. Dark green leaves with bronzy red new growth, clouds of 2 1/2" white fragrant flowers in spring. 'Hendersonii Rubra' has light pink flowers.
<i>Clematis hybrids</i>	clematis	Hybrid origin of species native to southern Europe and Western Asia	10-15'	10-15'	M		X	X	Many cultivars are available of this deciduous group of vines, grown for showy 3-8" flat flowers in colors ranging from dark purple, red, blue and white. Flowers in spring with some repeat bloom later in the season.
<i>Clytostoma callistegioides</i>	violet trumpet vine	Brazil, Argentina	10-15'	10-15'	M			X	Lavender trumpets produced in masses in spring with occasional blooms throughout the year. Restrained for a trumpet vine,
<i>Hardengeria violacea</i>	lilac vine	Australia	10'	10'	M		X	X	Resembles a miniature wisteria. Long dark green leaves clothe climbing stems that produce masses of hanging clusters of dark purple-rose purple flowers. 'Happy Wanderer' is a particularly good cultivar.
<i>Jasminum polyanthum</i>	pink jasmine	China	20'+	20'+	M			X	Fast growing vine that bears masses of sweetly scented waxy white flowers backed with rose-pink in late winter-spring.

Table N-13. Historic non-native climbing species. (Climbers listed below are evergreen unless otherwise noted.)

Botanical Name	Common Name	Native Status	Height	Spread	Irrigation	Shade	Part Shade	Full sun	Comments
<i>Jasminum tortuosum</i>	African jasmine	South Africa	10'	15'	M			X	More restrained than most climbing jasmines. Handsome dark green shiny leaves back up pure white fragrant flowers most of the year.
<i>Lonicera x heckrottii</i> 'Goldflame'	goldflame honeysuckle	Hybrid origin of eastern US species	10'	10'	M		X	X	Well behaved deciduous selection with blue-green leaves and whorls of sweetly scented 2" tubular rose and yellow flowers throughout summer and fall.
<i>Mandevilla laxa</i>	Chilean jasmine	Chile	15'+	15'+	M			X	Strong growing deciduous climber with heart shaped leaves and powerfully scented (gardenia-like) pure white flowers all summer.
<i>Parthenocissus henryana</i>	silver vein creeper	China	20'	20'	M	X	X	X	Deciduous climber that can cling to any surface, bearing 5-lobed leaves that are dark purple-green with a strong silver central vein. Foliage turns bright red in fall.
<i>Passiflora x 'Coral Glow'</i>	coral passion vine	Garden origin	30'+	30'+	M			X	Coral red pendant flowers 4" across adorn this powerful grower most of the year. Ideal for covering a chain-link fence.
<i>Passiflora x 'Lavender Lady'</i>	lavender lady passion vine	Garden origin	30'+	30'+	M			X	Similar in growth to the preceding cultivar, 'Lavender Lady' is thought to be one of the most beautiful, bearing 4" flowers that are purple and white.
<i>Solanum crispum 'Glasnevin'</i>	blue potato vine	Peru/Chile	10'	10'	M			X	A modest climber with shiny leaves and pendent clusters of deep blue flowers with yellow centers. Everblooming.
<i>Trachelospermum jasminoides</i>	star jasmine	China	20'+	20'+	M		X	X	The most widely planted climber on this list; size is easily controlled. Waxy dark green leaves and clusters of creamy white pinwheel fragrant flowers in profusion. Also used as a ground cover.
<i>Wisteria floribunda</i>	Japanese wisteria	Japan	50'+	50'+	M-L			X	This and the next selection are able to form giant deciduous woody vines, but are easily controlled with annual pruning. Elegant 2-3' long clusters of lavender or white lightly scented flowers are produced in masses in mid-spring.
<i>Wisteria sinensis</i>	Chinese wisteria	China	50'+	50'+	M-L		X	X	Similar in growth habit to the previous selection. Flower clusters are produced 2-3 weeks earlier, and are brighter purple to white in color, with a grape-soda scent. Reblooms during the summer, though flower clusters may be partially hidden by foliage

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Table N-14. Historic non-native palm and cycad species.

Botanical Name	Common Name	Native Status	Height	Spread	Irrigation	Shade	Part Shade	Full sun	Comments
<b>True Palms: All species listed are cold-hardy to at least 25 degrees F.</b>									
<i>Allagoptera arenaria</i>	sand palm	Brazil	4'	'4-5'	M			X	A beautiful trunkless clumping palm with dark green feather shaped leaves.
<i>Brahea armata</i>	Mexican blue palm	Baja California	35'	6-10'	L			X	Silver-blue fan shaped leaves, 15' creamy colored flower stalks form arching fountain in summer.
<i>Brahea decumbens</i>	creeping rock palm	Mexico	6'	4-10'+	L			X	Blue-gray fan shaped leaves; Multiple short trunks creep along the ground.
<i>Brahea edulis</i>	Guadalupe palm	Baja California	30'	10-15'	L			X	A clean-trunked fan palm with bright green leaves.
<i>Butia capitata</i>	Pindo palm	Brazil-Uruguay	20'	8-12'	L			X	Gray-green feather shaped leaves that arch; tasty edible jelly-like fruit.
<i>Butia paraguayensis</i>	Paraguayan jelly palm	Paraguay	6'	6-10'	L			X	Like a dwarf form of <i>B. capitata</i> , with greener leaves.
<i>Ceroxylon quindiuense</i>	Quindio wax palm	Colombia	60'	20-30'	R		X	X	Waxy white trunk with dark green, feather shaped leaves; ideally adapted to Monterey.
<i>Ceroxylon vogelianum</i>	Vogel wax palm	Throughout the Andes from Peru to Venezuela	60'	10-20'	R		X	X	Similar to the previous species but somewhat more cold-hardy.
<i>Chamaedorea microspadix</i>	hardy bamboo palm	Mexico	10'	3-6'+	R	X	X		Elegant clumping palm for shady corners.
<i>Chamaerops humilis</i>	Mediterranean fan palm	Western Mediterranean basin	20'	'6-10'+	M-L			X	Elegant slow growing palm with multiple trunks. Cultivar 'Cerifera' has blue-gray leaves.
<i>Dypsis decipiens</i>	Madagascar bottle palm	Madagascar	35'	12'	M			X	Clean trunk with feather-shaped leaves. Considered one of the most ornamental of the hardier palms.
<i>Hedyscepe canterburyana</i>	umbrella palm	Lord Howe Island (Australia)	20'	10'	R	X	X		Blue green, ringed trunk, strongly arching feather shaped leaves. One of the most beautiful shade-growing palms.
<i>Jubea chilensis</i>	Chilian wine palm	Chile	60'	18-25'	L			X	Massive smooth trunk, long feather shaded deep green leaves. A slow growing giant.
<i>Livistona australis</i>	Australian fountain palm	Australia	50'	10'	M		X	X	Small crown of fan shaped leaves with drooping leaf tips that give a fountain-like effect atop a smooth gray trunk.
<i>Livistona chinensis</i>	Chinese fountain palm	Taiwan, Japan	30'	10'	M		X	X	A shorter version of the previous species with even longer drooping leaf tips.
<i>Nannorrhops ritchiana</i>	Mazari palm	Pakistan	8'	6-10'	L			X	Very tough palm with steel gray fan shaped leaves, clumping trunks. Appreciates some heat.
<i>Parajubaea cocoides</i>	Quito coconut palm	Ecuadoran Andes	35'	16'	M			X	Slender trunk with dark green feather shaped leaves. Excellent coastal palm.
<i>Parajubaea torallyi</i>	blue Quito coconut palm	Ecuadoran Andes	50'	18'	M			X	Bluish green feather shaped leaves atop a slender smooth trunk. Excellent wind resistance.
<i>Phoenix canariensis</i>	Canary Island date palm	Canary Islands	70'	20'	L			X	This species is one of the most commonly planted palms in California. A massive spectacular palm.

Table N-14. Historic non-native palm and cycad species.

Botanical Name	Common Name	Native Status	Height	Spread	Irrigation	Shade	Part Shade	Full sun	Comments
<i>Phoenix loureiri</i>	dwarf date palm	India	10'	10'	M			X	Bluish-green feather shaped leaves atop a gnarled trunk. Appearance of a miniature Canary Island date palm.
<i>Phoenix rupicola</i>	cliff date palm	India	25'	12-15'	M			X	Perhaps the most ornamental of the date palms with a slender trunk and shiny green feather shaped leaves.
<i>Rhapis excelsa</i>	lady palm	Japan, China	12'	3-6'	M	X	X		Leaves like spokes of a half wheel with 4-8 segments, dark lustrous green. Forms a thicket of very slender trunks covered with dark brown fiber. Highly ornamental palm for the shade
<i>Rhopalostylis sapida</i>	shaving brush palm	New Zealand	30'	10'	M		X	X	Feather shaped leaves are held upright, appears in silhouette like a shaving brush. Choice but slow growing.
<i>Sabal mexicana</i>	Oaxaca palmetto	Texas south to Nicaragua	40'	12'	M			X	Palmettos all have fan shaped leaves that are arched through the fan, technically called costapalmate. Attractive large palm with smooth trunk.
<i>Sabal minor</i>	dwarf palmetto	Southeastern US	6'	6'	M		X	X	A trunkless palmetto that makes an outstanding accent.
<i>Sabal x 'Riverside'</i>	Riverside palmetto	Hybrid origin	30'	18'	M			X	Very large blue green leaves atop a thatch covered trunk. Fast growing.
<i>Trachycarpus fortunei</i>	Chinese windmill palm	China	35'	5'	M			X	Stiff dark green fan shaped leaves atop brown fibrous trunk. One of the most cold-hardy palms.
<b>Cycads:</b> Cycads are a fascinating group of ancient species of palm-like plants that are more closely related to conifers. About 300 species remain on Earth today. Species listed here have feather shaped compound leaves. Most are slow to very slow growing. All species listed are cold-hardy to at least 25 degrees F.									
<i>Cycas panzhihuaensis</i>	hardy sago	Central China	6-10'	6-10'	M		X	X	A gracefully beautiful sago with dark green foliage with a silvery cast to the underside.
<i>Cycas revoluta</i>	sago palm	Japan	10-15'	10-15'	M		X	X	This is the most common cycad presented here. Develops into a dramatic accent plant relatively faster than most cycads. Forms offshoots at base and eventually a multi-trunked specimen.
<i>Cycas taitungensis</i>	emperor sago	Taiwan	10-20'	6-10'	R		X		A beautiful somewhat larger scale sago that does not form offshoots.
<i>Dioon edule</i>	chestnut dioon	Central Mexico	6-10'	6-10'	M			X	Many selected forms of this widespread species are available.
<i>Dioon mejiae</i>	palma teosinte	Honduras	6-10'	6-10'	M			X	New leaves are covered with golden fuzz.
<i>Dioon sonorensis</i>	palma de la virgen	Northwestern Mexico	3-6'	3-6'	L			X	Steely blue leaves. Good addition to the Arizona Garden.
<b>Notes on Encephalartos:</b> The species presented here are all from South Africa. Most have somewhat to very spiny leaf edges and single trunks. These are tough plants that evolved with the dinosaurs.									
<i>Encephalartos altenseinii</i>	Eastern Cape giant cycad	South Africa	15-20'	6-10'	M			X	Deep green leaves. Each leaflet has several sharp teeth.
<i>Encephalartos arenarius</i>	Alexandria cycad	South Africa	4-8'	4-8'	M			X	Smaller and less spiny than most.



Table N-14. Historic non-native palm and cycad species.

Botanical Name	Common Name	Native Status	Height	Spread	Irrigation	Shade	Part sun	Full sun	Comments
<i>Encephalartos ferox</i>	Zululand cycad	South Africa-Mozambique	6-10'	6-10'	M	X	X	X	Dark green leaflets with prominent points. Distinct and attractive species.
<i>Encephalartos horridus</i>	ferocious blue cycad	South Africa	4-8'	4-8'	L			X	As the name suggests, the steely blue leaves are heavily armed to protect them from browsing dinosaurs.
<i>Encephalartos lanatus</i>	woolly cycad	South Africa	4-8'	4-8'	L			X	New leaves covered in silky hairs.
<i>Encephalartos lehmanii</i>	karoo cycad	South Africa	4-8'	4-8'	L			X	The bluest of the blue <i>Encephalartos</i> . Not as heavily armed as <i>E. horridus</i> . Very attractive specimen.
<i>Encephalartos natalensis</i>	natal giant cycad	South Africa	10-20'	6-10'	M			X	The largest grower among this selection of cycads. Dark green shiny leaves.
<i>Encephalartos princeps</i>	Kei River cycad	South Africa	4-8'	4-8'	L			X	Blue green leaves that lack teeth but are pointed at the tips. A refined species.
<i>Encephalartos senticosus</i>	Lebombo cycad	South Africa	10-20'	6-10'	M			X	Dark green shiny leaves with very small teeth on leaflet margins.
<i>Encephalartos trispinosus</i>	Bushman's river cycad	South Africa	4-8'	4-8'	L			X	Strongly arching leaves atop a short trunk give a fountain-like silhouette.
<i>Lepidozamia perofskiana</i>	scaley cycad	East coast of Australia	6-10'	10-15'	M	X	X	X	A spineless cycad with long, graceful leaves. One of the most elegant of all large cycads.
<i>Macrozamia glaucophylla</i>	burrawang	New South Wales, Australia	3-6'	4-8'	M	X	X	X	Small forest-edge spineless cycad with very fine textured leaves.
<i>Macrozamia miquelii</i>	zamia bush	Queensland, Australia	4-8'	4-8'	M	X	X	X	Green fine textured spineless leaves atop a short trunk. Very attractive as a close up plant.
<i>Macrozamia riedlei</i>	zamia palm	Western Australia	4-8'	4-8'	L	X	X	X	Somewhat larger and tougher than the preceding species of <i>Macrozamia</i> . Dark blue-green leaves are held more upright atop short trunks.

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Note on palms and cycads: Most of the species presented here are rare in cultivation and may be difficult to find in local nurseries. All are available via mail order from Phil Burgman of Jungle Music Nursery in Encinitas, who maintains a website rich in photographs. A number of cycad species are also rare in nature and protected under CITES. Phil is fully certified as a producer of palms and cycads grown from seed gathered under permit or from cultivated specimens.

Table N-15. Historic non-native tree species.

Botanical Name	Common Name	Native Status	Height	Spread	Irrigation	Shade	Part Shade	Full sun	Comments
<i>Arbutus x 'Marina'</i>	marina madrone	Hybrid of two Mediterranean species	50'+	30'	M-L			X	Trunk with cinnamon peeling bark, leaves bright shiny green, clusters of pink urn-shaped flowers in fall-winter followed by bright orange-red fruit. Once established, it is completely drought tolerant.
<i>Cedrus atlantica 'Glauca'</i>	blue atlas cedar	Northern Africa	60'	40'	M-L			X	Beautiful blue-gray foliage adorn this picturesque conifer. Angular-horizontal branching. Slow growing, but a great specimen with age.
<i>Cornus capitata</i>	evergreen dogwood	South China	30'	30'	M-L			X	Gray-green leaves That drop briefly in spring followed quickly by new growth. Clouds of creamy flowers in late spring followed by bright red fruits relished by birds.
<i>Crinodendron hookerianum</i>	lantern tree	Chile	10-30'	10-30'	R		X	X	A choice small evergreen tree with narrow, shiny dark green leaves. Long stalked pendant flower buds appear all along the stem in fall that open to waxy dark red 1' lanterns. Ideal in protected well watered gardens.
<i>Crinodendron patagua</i>	lily-of-the valley tree	Chile	20-25'	20-25'	M			X	Appearance of a small evergreen oak until it bursts into bloom in summer. Flowers are 1" pendant bell shaped and white. Horizontal branching makes for a very attractive crown.
<i>Cupressus guadalupensis</i>	Guadalupe Island cypress	Guadalupe Island off the northwest coast of Baja California	80'	50'	L			X	While not technically native to California, this species is recognized to be part of the California Floristic Province in Baja. Eventually forms a magnificent tree with gray-green foliage and an incredibly beautiful satiny cinnamon red trunk.
<i>Drimys winteri</i>	winter's bark	Chile	20'	20'	R		X	X	Large oval bright green shiny leaves that are silvery below. Mahogany red bark. Both bark and leaves are aromatic. Fragrant clusters of small white flowers all summer. A wonderful tree for small, well watered spaces.
<i>Eucalyptus ficifolia</i>	red flowering gum	Australia	30'+	40'+	M-L			X	This is a truly spectacular tree when it bursts into bloom in early to midsummer. This non-invasive species looks more like an oak than a Eucalyptus. Dark green oval-oblong leaves. Flowers are brilliant red to orange in 12" clusters at branch tips.
<i>Eucryphia lucida 'Pink Cloud'</i>	pink cloud eucryphia	Tasmania	20-30'	10-15'	R			X	Upright small evergreen tree for protected locations. Bear clouds of 1" light pink apple-blossom like flowers in early summer.
<i>Eucryphia x nymansensis 'Mt. Usher'</i>	Mt. Usher eucryphia	Hybrid of two Chilean species	20-30'	10-15'	R			X	Vigorous upright small tree with very dark green shiny leaves. Pure white 3" flowers in early to midsummer. Both forms are well adapted to coastal conditions if protected from strong wind.
<i>Ginkgo biloba</i>	maidenhair tree	China	50-70'	35-50'	M			X	Ancient deciduous survivor of prehistoric plant family related to conifers. Flat fan shaped and lobed 2" leaves turn bright golden yellow in fall. Plant male cultivars to avoid stinky "fruit".

Table N-15. Historic non-native tree species.

Botanical Name	Common Name	Native Status	Height	Spread	Irrigation	Shade	Part sun	Full sun	Comments
<i>Hymenosporum flavum</i>	sweetshade	Australia	40'	20	M			X	Handsome upright tree with shiny dark green leaves. Beginning in mid-spring, bears golden yellow powerfully fragrant flowers well into summer.
<i>Magnolia denudata</i>	Yulan magnolia	China	25'	25'	R-M			X	A handsome pyramid shaped deciduous tree with spectacular display of fragrant creamy white chalice shaped flowers in early spring.
<i>Metrosiderous excels</i>	New Zealand Christmas tree	New Zealand							
<i>Michelia (Magnolia) doltsopa</i> 'Silver Cloud'	silver cloud michelia	China	40'+	30'+	R-M			X	Sturdy trunk with upswept branches and 6-8' oval dark green leaves. 4-6" creamy white and strongly fragrant flowers in mid-winter to early spring. An outstanding evergreen tree for Monterey.
<i>Olea europaea</i>	olive	Mediterranean basin	30'	30'+	L			X	Common classic tree with olive green leaves, eventually forming a picturesque gnarled trunk with dark bark. Fruitless forms are available. Not recommended near buildings because of allergenic properties when flowering in mid-spring.
<i>Parrotia persica</i>	Persian ironwood	Iran	20-30'	20-30'	M-L			X	A stunning small deciduous tree with horizontal branching and good display of fall color in orange, gold and red shades.
<i>Prunus campanulata</i>	Taiwan flowering cherry	Taiwan	20-25'	20-25'	M			X	Graceful upright deciduous tree with dense crown and spectacular display of pink-purple flowers in late winter. Reliable bloom near the coast.
<i>Styrax japonicus</i>	Japanese snowdrop tree	Japan	30'	30'+	R			X	A graceful deciduous tree with horizontal branching. ¾' white flowers hang in small clusters from branches in late spring. A good tree to look up into. Some fall color.

**Key to native status:** M, species native to Monterey County; CA, plants native to California; Cv, Plant cultivars derived from California hybrids of native species. Cultivar selections of wild plants are listed as M or CA, depending on where the selections were originally made. E, non-native species imported from other regions with similar climates. **Key to irrigation:** R, regular watering to keep soil moist; M, moderate to occasional watering applied deeply and allowed to dry between irrigations; L, infrequent to no irrigation needed except during winter drought. **Spread:** x"+ indicates spread after 1-3 years. But the species is known to form larger clumps over time.

Note on palms and cycads: Most of the species presented here are rare in cultivation and may be difficult to find in local nurseries. All are available via mail order from Phil Burgman of Jungle Music Nursery in Encinitas, who maintains a website rich in photographs. A number of cycad species are also rare in nature and protected under CITES. Phil is fully certified as a producer of palms and cycads grown from seed gathered under permit or from cultivated specimens.

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# Appendix O: Natural Resources Metrics Questions

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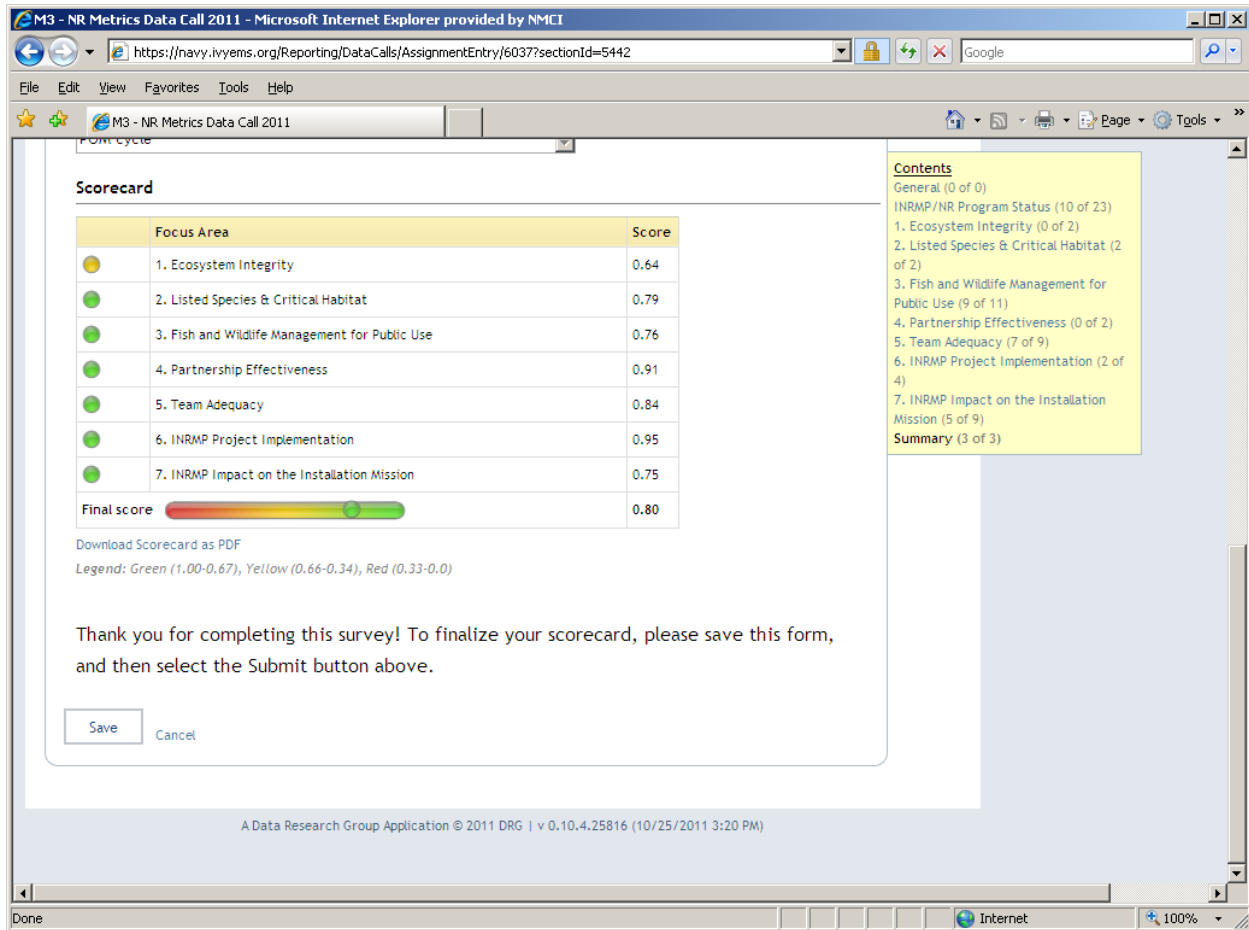
# FY11 Defense Environmental Programs Annual Report to Congress (DEPARC) – Natural Resources Data Summary

## Introduction

In accordance with DoDI 4715.03, *Natural Resources Conservation Program*, and the Sikes Act Improvement Act, the Deputy Under Secretary of Defense (Installations and Environment) requires environmental management information to support Congressional reporting and ensure DoD is on track to meet its environmental management goals. Consequently, the Navy Natural Resources (NR) Metrics were developed to support the annual Natural Resources Program reviews between the Navy and its Sikes Act partners, the USFWS and State Fish and Wildlife agencies. These NR Metrics can be used to gather and report essential information required by Congress, Executive Orders, existing U.S. laws, and the Department of Defense. There are seven Focus Areas that comprise the NR Metrics to be evaluated during the annual review of the Natural Resources Program/INRMP.

1. Ecosystem Integrity
2. Listed Species and Critical Habitat
3. Fish and Wildlife Management for Public Use
4. Partnership Effectiveness
5. Team Adequacy
6. INRMP Project Implementation
7. INRMP Impact on the Installation Mission

Each of the seven Focus Areas contains questions that can be evaluated. Questions are weighted, with responses to questions having different values, ranging from 0.0 to 1.0. Each Focus Area is scored, using a rating scheme of **Green (1.0-0.67)**, **Yellow (0.66-0.34)**, and **Red (0.33-0.0)**, resulting in a comprehensive scorecard for the entire NR Metrics for each Navy installation (Figure 1).



**Figure 1.** Example of NR Metrics Scorecard.

The questions asked in each Focus Area of the NR Metrics are intended to measure how well the Navy managed natural resources at each installation during any given year as well as the status of project implementation. In FY11, the Navy revised the questions to reflect the updated DoDI 4715.03 and draft OPNAVINST 5090, currently under revision. In addition, the field was asked to respond for all Navy-owned sites, which includes installations and special areas, in the Navy's real property database, iNFADS. Of the approximately 829 sites within iNFADS, 314 sites were found to have significant natural resources. These sites were then rolled up based on main installations, e.g. all special areas associated with an installation and covered under the same INRMP. Unique special areas having their own INRMP were counted separately. This list of sites was then correlated to the CNIC Base Command list.

**Summary of NR Metrics by Focus Area**

Per FY11 NR Metrics, many of the installations appear to have healthy NR programs (as indicated by the numerous green scores for the various Focus Areas), which reflects their ability to successfully implement projects identified in their existing INRMPS. Further, responses to questions in the Ecosystem Integrity and Listed Species & Critical Habitat Focus Areas indicate that existing INRMPS are sufficient in accomplishing ecosystem based management and protection of listed species. The questions *scored* in the NR Metrics that were used to evaluate



the health of the NR program and effectiveness of the INRMP at each installation are listed below by Focus Area.

### **Focus Area 1: Ecosystem Integrity –**

According to the DoDI 4715.3, the goal of ecosystem management is to ensure that military lands support present and future training and testing requirements while preserving, improving, and enhancing ecosystem integrity. Over the long term, that approach shall maintain and improve the sustainability and biological diversity of terrestrial and aquatic (including marine) ecosystems while supporting sustainable economies, human use, and the environment required for realistic military training operations. This Focus Area is intended to define the ecosystems that occur on the installation and assess the integrity of these ecosystems. The term, integrity, refers to the quality of state of being complete, unbroken condition, wholeness, entirety, unimpaired, without significant damage, good condition, or general soundness. Terrestrial ecosystems, as defined by Nature Serve's "[Ecological Systems of the United States: A Working Classification of US Terrestrial Systems](#)" and marine ecosystems, as defined by NOAA's "[Coastal and Marine Ecological Classification Standard](#)" (including only the Benthic Biotic Component, Surface Geology Component, and Water Column Component of the classification scheme) were selected from a list and assigned to each installation. Locally-defined ecosystems were added, if necessary. Once the ecosystems were assigned to the installation, the following questions [4 out of 5 new in FY11] were asked for each of the ecosystems identified as being present on the installation.

1. To what extent is the ecological system on the installation fragmented due to land conversion? (0-5)

Answers:

- 0 = Ecosystem fragmentation is the result of five (5) of the phenomena (0)
- 1 = Ecosystem fragmentation is the result of four (4) of the phenomena (0.20)
- 2 = Ecosystem fragmentation is the result of three (3) of the phenomena (0.40)
- 3 = Ecosystem fragmentation is the result of two (2) of the phenomena (0.60)
- 4 = Ecosystem fragmentation is the result of one (1) of the phenomena (0.80)
- 5 = No fragmentation (1.00)

2. Is the ecosystem effectively managed to sustain viable populations of species? (0-3)

Answers:

- 0 = Not effectively managed (0)
- 1 = Minimally effective management (0.33)
- 2 = Moderately effective management (0.67)
- 3 = Effectively managed (1.00)

3. To what degree is the ecological system vulnerable to stressors? (0-5)

Answers:

- 0 = Completely Vulnerable (0)
- 1 = Severely Vulnerable to Stress (0.20)
- 2 = Highly Vulnerable to Stress (0.40)

- 3 = Moderately Vulnerable to Stress (0.60)
- 4 = Slightly Vulnerable to Stress (0.80)
- 5 = Not Vulnerable to Stress (1.00)

4. To what degree has the installation's INRMP/Natural Resources Program provided an overall benefit to ecological integrity? (0-3)

Answers:

- 0 = No Benefit (0)
- 1 = Minor Benefit (0.33)
- 2 = Moderate Benefit (0.67)
- 3 = Significant Benefit (1.00)

Each of these questions in the Ecosystem Integrity Focus Area is equally weighted by a value of 1. This means that no one question contributes more to the overall score of the Focus Area than any other question. However, question #4 is the most relevant in terms of assessing the importance of the INRMP on Ecosystem Integrity. The score of each question, as well as the overall score of the Focus Area, can't exceed 1.00. This means that the score calculated for each question is the product of the numerical value associated with the answer provided and the weight (=1). For example, if the answer provided for question #4 is "No Benefit", then the score for that question is  $[0 \times 1 = 0]$ . But, if the answer provided for question #4 is "Significant Benefit", then the score for that question is  $[1.00 \times 1 = 1.00]$ . Therefore, if the INRMP has a significant benefit to ecological integrity, then the response of "Significant Benefit" to this question increases the potential for a higher overall score for this Focus Area, which may contribute to the Focus Area being coded as green.

Note: The numerical value associated with each answer is the result of the total potential score for the question (1.00) divided by the number of possible answers, except for zero. If NA is chosen, the question drops out of the calculation. For example, for question #4, there are three possible answers (other than "No Benefit", which is zero) so  $[1.00/3 = 0.33]$ . The answers are ranked according to importance, e.g. an INRMP with a "Significant Benefit" has more importance on the overall benefit to ecological integrity than an INRMP with a "minor benefit". Therefore, an answer of "Significant Benefit" to question #4 is weighted by 3, resulting in a score of 1.00 for the question.

## **Focus Area 2: Listed Species & Critical Habitat -**

This Focus Area is intended to identify the federally listed species that occur on a Navy installation and/or special area, as well as determine if conservation efforts are effective and if the INRMP provides the conservation benefits necessary to preclude designation of critical habitat for particular species. Federally listed species were selected from the USFWS list of federally threatened and endangered species and assigned to each installation. Once the listed species were assigned to the installation, the following questions [1 out of 6 new in FY11] were asked for each of the federally listed species identified as being present on the installation.

1. To what extent do INRMP projects & programs provide a benefit to this species? (0-4, NA)

Answers:

- 0 = No benefit (0)
- 1 = Minor benefits (0.25)
- 2 = Moderate benefit (0.50)
- 3 = Major benefit (0.75)
- 4 = Significant benefit (1.00)
- NA

2. To what degree have projects been funded in support of this species? (0-4, NA)

Answers:

- 0 = No funding (0)
- 1 = 1% to 25% funded (0.25)
- 2 = 26% to 50% funded (0.50)
- 3 = 51% to 75% funded (0.75)
- 4 = 76% to 100% funded (1.00)
- NA

3. To what extent are quantifiable goals, parameters, and monitoring requirements in place to assess conservation effectiveness? (0-4, NA)

Answers:

- 0 = None (0)
- 1 = Minimal (0.25)
- 2 = Moderate (0.50)
- 3 = Good (0.75)
- 4 = Excellent (1.00)
- NA

4. Do existing surveys provide adequate data on habitat conditions? (Y/N)

Answers:

- N (0)
- Y (1.00)

5. Do existing surveys provide adequate data on population presence and numbers? (Y/N)

Answers:

- N (0)
- Y (1.00)

The questions in the Listed Species & Critical Habitat Focus Area are not equally weighted. Questions #1 and #3 are weighted the most at 1.1; question #2 is weighted 1.0; and questions #4 and #5 are weighted the least at 0.9. In particular, question #1 speaks directly to the effect of the INRMP on listed species. Therefore, if the answer provided for question #1 is “Significant Benefit”, then the score for that question is  $[1.00 \times 1.1 = 1.1]$ . Therefore, if the INRMP has a

significant conservation benefit to a listed species, then the response to this question increases the potential for a higher overall score for this Focus Area, which may contribute to the Focus Area being coded as green.

### **Focus Area 3: Fish and Wildlife Management for Public Use –**

The purpose of this Focus Area is to evaluate the availability of public recreational opportunities, such as fishing and hunting, given the existing security requirements for the installation. While recreational opportunities may be available at an installation, they may be restricted for security reasons. The following questions [6 out of 9 new in FY11] were asked.

1. Are recreational opportunities available on the installation? (Y/N)

Answers:

N (0)

Y (1.00)

NA (landscape doesn't support recreational opportunities)

2. If recreational opportunities are available, are they limited/restricted for security reasons? (Y/N/NA)

Answers:

Y (0)

N (1.00)

NA (recreational opportunities are not available)

3. If recreational opportunities are available, are they offered to the public?

Answers:

N (0)

Y (1.00)

NA (recreational opportunities are not available)

4. If recreational opportunities are available, are they offered to DoD personnel?

Answers:

N (0)

Y (1.00)

NA (recreational opportunities are not available)

5. If recreational opportunities are available, are they accessible by disabled veterans/Americans?

Answers:

N (0)

Y (1.00)

NA (recreational opportunities are not available)

6. Are Sikes Act fees collected for outdoor recreational opportunities? (Y/N/NA)

Answers:

N (0)

Y (1.00)

NA (recreational opportunities do not include hunting and fishing)

7. Is there an active natural resources law enforcement program on the installation? (Y/N/NA)

Answers:

N (0)

Y (1.00)

NA (recreational opportunities do not include hunting and fishing)

8. Are sustainable harvest goals addressed in the INRMP and effective for the management of the species' population? (0-4, NA)

Answers:

0 = Not effective (0)

1 = Minimal effectiveness (0.25)

2 = Moderate effectiveness (0.50)

3 = Effective (0.75)

4 = Highly effective (1.00)

NA (recreational opportunities do not include hunting and fishing)

9. Is public outreach/educational awareness provided? (0-4, NA)

Answers:

0 = No public outreach provided (0)

1 = Low outreach (0.25)

2 = Moderate outreach (0.50)

3 = Good outreach (0.75)

4 = Excellent outreach (1.00)

NA

The questions in the Fish and Wildlife Management for Public Use Focus Area are not equally weighted. Question #1 is weighted the most at 1.2; questions #2-5, #8, and #9 are weighted 1.0; and questions #6 and #7 are weighted the least at 0.9. Overall the questions in this Focus Area are relatively evenly weighted due to the fact that there are many contributing factors to whether or not recreational opportunities are available at an installation. Specifically, security restrictions often limit access to recreational opportunities. However, question #1 speaks to whether recreational opportunities are available on the installation. Therefore, if the answer provided for question #1 is "Yes", then the score for that question is  $[1.00 \times 1.2 = 1.2]$ . Therefore, if the installation offers recreational opportunities, as prescribed by the Sikes Act, then the response to this question increases the potential for a higher overall score for this Focus Area, which may

contribute to the Focus Area being coded as green. Similarly, question #2 asks if available recreational opportunities are limited or restricted for security reasons. Therefore, if the answer provide for question #2 is “Yes”, then the score for that question is [0 x 1 = 0]. This will reduce the overall score for this Focus Area, which may contribute to the Focus Area being coded yellow or red.

#### **Focus Area 4: Partnership Effectiveness –**

The purpose of this Focus Area is to determine to what degree partnerships are cooperative and result in effective implementation of the INRMP. Partnerships and/or initiatives actively participated in by installation NR staff were identified. Once they were identified, the following questions [4 out of 10 new in FY11] were asked for each of the partnerships and/or initiatives identified as relevant to the installation.

1. Does your Natural Resources program support the regional conservation efforts of the USFWS? (Y/N)

Answers:

N (0)

Y (1.00)

2. Does your Natural Resources program support State conservation goals identified in State Wildlife Action Plans (SWAPs)? (Y/N)

Answers:

N (0)

Y (1.00)

3. Does your Natural Resources program support regional NOAA/NMFS conservation objectives/efforts? (Y/N/NA)

Answers:

N (0)

Y (1.00)

NA

4. Does your Natural Resources program support other Conservation Initiatives? (Y/N)

Answers:

N (0)

Y (1.00)

5. Is there adequate collaboration/cooperation between partners? (0-4)

Answers:

0 = None (0)

1 = Minimal cooperation (0.25)

2 = Satisfactory cooperation (0.50)

3 = Effective cooperation (0.75)

4 = Highly effective cooperative (1.00)

6. Are NR program executions meeting USFWS & State expectations? (0-4)

Answers:

0 = Dissatisfied (0)

1 = Minimally satisfied (0.25)

2 = Somewhat satisfied (0.50)

3 = Completely satisfied (0.75)

4 = More than satisfied (1.00)

7. Did the USFWS participate in the INRMP/Natural Resources Program annual review? (Y/N)

Answers:

N (0)

Y (1.00)

8. Did the State participate in the INRMP/Natural Resources Program annual review? (Y/N)

Answers:

N (0)

Y (1.00)

9. Did the NOAA/NMFS participate in the INRMP/Natural Resources Program annual review, if applicable? (Y/N/NA)

Answers:

N (0)

Y (1.00)

NA

10. To what extent has the INRMP/Natural Resources Program successfully supported other mission areas? (e.g. encroachment, BASH, range support, port operations, air operations, facilities management, etc.) (0-4)

Answers:

0 = Not supported (0)

1 = Minimally supported (0.25)

2 = Satisfactorily supported (0.50)

- 3 = Well supported (0.75)
- 4 = Very well supported (1.00)

The questions in the Partnership Effectiveness Focus Area are not equally weighted. Questions #5 and #7-9 are weighted the most at 1.1; questions #1-3 and #6 are weighted 1.0; and questions #4 and #10 are weighted the least at 0.8. In particular, questions #7-9 speak directly to stakeholder participation in the annual Sikes Act review of the INRMP and NR Program at each of the installations. Specifically, question #7 asks if the USFWS participated in the INRMP/Natural Resources Program annual review. Therefore, if the answer provided for question #7 is “Yes”, then the score for that question is [1.00 x 1.1 = 1.1]. Likewise, if the answers to question #8 (regarding State Fish and Wildlife agency participation in the review) is “Yes” and question #9 (regarding NOAA/NMFS participation in the review, when applicable) is “Yes”, then the score for each of these questions is [1.00 x 1.1 = 1.1]. Therefore, if our Sikes Act partners are actively engaged in the annual review of our INRMPs, then the response to these questions increases the potential for a higher overall score for this Focus Area, which may contribute to the Focus Area being coded as green.

**Focus Area 5: Team Adequacy –**

The purpose of this Focus Area is to assess the effectiveness and adequacy of the Navy natural resources team in accomplishing the goals and objectives of the INRMP and Natural Resources Program at each installation. Team refers to the Navy staff only. The following questions [1 out of 7 new in FY11] were asked.

1. Is there a Navy professional Natural Resources Manager assigned by the Installation Commanding Officer? (Y/N)

Answers:  
N (0)  
Y (1.00)

2. Is there an on-site Navy professional Natural Resources Manager? (Y/N)

Answers:  
N (0)  
Y (1.00)

3. Is HQ and Regional support adequate, e.g. reach back support for execution, policy support, etc.)? (0-4)

Answers:  
0 = No support (0)  
1 = Minimal support (0.25)  
2 = Satisfactory support (0.50)  
3 = Well supported (0.75)  
4 = Very well supported (1.00)



4. Is there adequate Natural Resources staff to properly implement the INRMP goals and objectives? (Y/N)

Answers:

N (0)

Y (1.00)

5. The team is enhanced by the use of contractors. (0-4)

Answers:

0 = Disagree (0)

1 = Somewhat agree (0.25)

2 = Neutral (0.50)

3 = Agree (0.75)

4 = Strongly Agree (1.00)

6. The team is enhanced by the use of volunteers. (0-4, NA)

Answers:

0 = Disagree (0)

1 = Somewhat agree (0.25)

2 = Neutral (0.50)

3 = Agree (0.75)

4 = Strongly Agree (1.00)

NA

7. The Natural Resources team is adequately trained to accomplish its duties to ensure compliance. (0-4)

Answers:

0 = Disagree (0)

1 = Somewhat agree (0.25)

2 = Neutral (0.50)

3 = Agree (0.75)

4 = Strongly Agree (1.00)

The questions in the Team Adequacy Focus Area are not equally weighted by a value of 1. Questions #4 and #7 are weighted the most at 1.1; questions #1-3 are weighted 1.0; and questions #5 and #6 are weighted the least at 0.9. In particular, questions #4 and #7 speak directly to having sufficient NR staff and adequately trained NR staff to properly implement the INRMP goals and objectives at each of the installations. Therefore, if the answers to question #4 (regarding sufficient NR staff) is “Yes” and question #7 (regarding adequately trained NR staff) is “Yes”, then the score for each of these questions is  $[1.00 \times 1.1 = 1.1]$ . Therefore, the likelihood of getting a higher overall score for this Focus Area increases if there is sufficient NR staff that is adequately trained at the installation, which may contribute to the Focus Area being coded as green.

## Focus Area 6: INRMP Project Implementation –

The purpose of this Focus Area is to assess how the goals and objectives of the INRMP have been met through the projects implemented during the previous fiscal year. Projects were selected from a list of EPRWeb projects and evaluated based on the type of funding received, the status of the project, and whether projects realized their intended goals. In addition, benefits to ecosystem integrity or a listed species, previously identified as a part of the installation, were noted for each project, if applicable. The following questions [9 out of 10 new in FY11] were asked for each project identified as being implemented during FY11 at each installation.

1. Is project accomplishment on schedule? (Y/N)

Answers:

N (0)

Y (1.00)

2. What is the Project Status? (0,1)

Answers:

0= On-Hold; Funds Not Yet Received (0)

1= In EPRWeb; In POM; Emergent; Funding Received; SOW Prepared; Awarded/Executed; Now In-Progress; Completed (1.00)

3. Which Natural Resources Program Area was most benefitted from the project? (0,1)

Answers:

0=None (0)

1= Flora; Fauna; Habitat; At Sea; INRMP; Listed Species; Wetlands; Invasives; Soil; Forestry; Outdoor Recreation; Training; Other NR Requirements (Misc) (1.00)

4. The project design met the goals and objectives of the INRMP. (0-4)

Answers:

0 = Disagree (0)

1 = Neither agree nor disagree (0.25)

2 = Somewhat Agree (0.50)

3 = Fully Agree (0.75)

4 = Strongly Agree (1.00)

The questions in the INRMP Project Implementation Focus Area are equally weighted by a value of 1. In general, these questions are intended to evaluate the status of INRMP project implementation. Because there are some many factors outside the control of the NR program manager, it is difficult to score this Focus Area. It wouldn't be fair to penalize the NR program manager because many times the implementation status is due to a lack of funding or delays in execution. As long as the NR program manager has done their part in getting projects POMed and designed to meet the goals and objectives of the INRMP, then this should be reflected in the

score for this Focus Area. For example, if the answer to question #2 (regarding status of the project) is “In EPRWeb; In POM; Emergent; Funding Received; SOW Prepared; Awarded/Executed; Now In-Progress; or Completed” and question #4 (regarding project design) is “Strongly Agree”, then the score for each of these questions is [1.00 x 1 = 1.00]. Therefore, the likelihood of getting a higher overall score for this Focus Area increases, which may contribute to the Focus Area being coded as green.

### **Focus Area 7: INRMP Impact on Installation Mission –**

This Focus Area is designed to measure the level to which existing natural resource compliance requirements and associated actions support the installation’s ability to sustain the current operational mission. Per the Sikes Act, the goals and objectives of an INRMP should achieve no net loss of the mission at an installation. The following questions [0 are new in FY11] were asked.

1. Has Coordination between natural resources staff and other installation departments and military staff been successful/effective? (0-4)

Answers:

- 0 = No coordination (0)
- 1 = Minimal coordination (0.25)
- 2 = Satisfactory coordination (0.50)
- 3 = Effective coordination (0.75)
- 4 = Highly effective coordination (1.00)

2. To what extent has the INRMP successfully supported other mission areas? (e.g. encroachment, BASH, range support, port operations, air operations, facilities management, etc.) (0-4)

Answers:

- 0 = Not supported (0)
- 1 = Minimally supported (0.25)
- 2 = Satisfactorily supported (0.50)
- 3 = Well supported (0.75)
- 4 = Very well supported (1.00)

3. To what extent has there been a net loss of training lands or mission-related operational/training activities? (0-4)

Answers:

- 0 = Mission is fully impeded; training activities cannot be conducted (0)
- 1 = Mission/Training activities are somewhat impeded with workarounds (0.25)
- 2 = Neutral (0.50)
- 3 = No loss occurred (0.75)
- 4 = Mission has seen benefits (1.00)

4. Does the Natural Resource program effectively consider current mission requirements? (0-4)

Answers:

0: Strongly disagree

1: Disagree

2: Neutral

3: Agree

4: Strongly Agree

The questions in the INRMP Impact on Installation Mission Focus Area are equally weighted by a value of 1. In general, these questions are intended to evaluate the effectiveness of the installation's NR program on mitigating and/or avoiding natural resource impacts on the installation's military mission. For example, if the answer to question #3 is "Mission has seen benefits, then the score for this question is  $[0.75 \times 1 = 0.75]$ . Therefore, the INRMP satisfies a fundamental requirement of the Sikes Act, no net loss of the mission, contributing to a higher overall score for this Focus Area, which may contribute to the Focus Area being coded as green.

### **Summary of INRMP and Sikes Act Questions**

In addition to the NR Metrics questions, some additional questions were asked to assess the status of INRMPs at installations. In general, if an installation is reported as having significant natural resources, then it was counted as an installation requiring an INRMP. Per the DoDI 4715.03, significant natural resources are defined as resources identified as having special importance to an installation and/or its ecosystem. Natural resources may be significant on a local, regional, national, or international scale. All threatened, endangered and at-risk species are significant natural resources that normally require an INRMP. Installations that actively manage fish and wildlife, forestry, vegetation and erosion control, agricultural outleasing or grazing, or wetlands protection should be evaluated for significance, but normally will require an INRMP. An evaluation for significance should also consider the degree of active management, special natural features, aesthetics, outdoor recreational opportunities, and the ecological context of the installation. There are 73 Navy installations requiring INRMPs, all of which currently have an INRMP.

However, not all Navy installations with an INRMP have a compliant INRMP. A compliant INRMP is defined as "a complete plan that meets the purposes of the Sikes Act (§101(a)(3)(A-C)), contains the required plan elements (§101(b)(1)(A-J)), and has been reviewed for operation and effect within the past 5 years (§101(2)(b)(2))." Therefore, a compliant INRMP must be Sikes Act compliant and less than 5 years old. If the INRMP is greater than 5 years old, then it must have undergone a review for operation and effect within the past 5 years. A review for operation and effect is defined as "a comprehensive review by the Parties, at least once every 5 years, to evaluate the extent to which the goals and objectives of the INRMP continue to meet the purpose of the Sikes Act, which is to carry out a program that provides for the conservation and rehabilitation of natural resources on military installations. The outcome of this review will assist in determining if the INRMP requires a revision (§101(f)(1)(A)). (CNO-N45) The annual review can qualify for the 5-year review for operation and effect, which is legally required by the Sikes Act, if mutually agreed upon by both partners (i.e. USFWS and State)." According to this

definition, there are 41 compliant INRMPs and 32 noncompliant INRMPs. But, if you qualify the annual review of the Natural Resource Program/INRMP with the USFWS and State Fish and Wildlife agencies as a sufficient review for operation and effect, then the total number of noncompliant INRMPs decreases to only 4. Therefore, the remaining 28 INRMPs could be considered partially compliant because they meet the condition of a noncompliant INRMP, but the USFWS participated in the annual NR Metrics review during the last reporting period (FY11).

INRMP implementation refers to projects that meet the goals and objectives of the INRMP. In FY11, total funds expended toward implementing all 73 INRMPs equal \$29,475,223. These funds include O&MN, MIS, Ag-Outlease, Forestry Reserve Account, Legacy, and Special Projects funds. Of this, \$4,502,462 was spent on federally listed species, which accounts for approximately 15% of the total INRMP implementation costs. There are 75 critical habitat designations across all Navy installations, with 37 of these granted critical habitat designation exclusion under the ESA (Sec. 4. (a)), per NDA 2004. Further, 31 of those critical habitat designation exclusions were granted due to an INRMP.

### **Further Consideration**

Given the results of the FY11 NR Metrics, it appears that there may be a discrepancy between the health of the NR programs across the Navy and the POM-14 budget request. It is important to consider that the NR Metrics were designed to be subjective. So, it is difficult to try and interpret the answers provided to the NR Metrics in a way that will help justify something objective, like the budget. The two are not directly correlated. The POM-14 budget request is forward looking, e.g. what is needed to execute projects associated with INRMPs in the out-years. On the other hand, the NR Metrics reflect the past execution and implementation of INRMPs.

However, the increased request for funds may reflect the fact that many of the INRMPs need to be revised. According to this year's DEPARC data, there are 28 partially compliant INRMPs and 4 noncompliant INRMPs. Many of these may require a revision. There are likely many new projects associated with these noncompliant and partially compliant INRMPs that need to be implemented; hence, the increased request for funds.

Therefore, INRMP project tables should really be compared to projects in POM-14. This will highlight if there are still projects in INRMPs that need to be implemented, hence the INRMPs are not being successfully implemented and the goals and objectives of the INRMP may not be met. In the future, consideration should be given to framing questions in the INRMP Project Implementation Focus Area in a manner that asks about INRMP Implementation tables, instead of EPR Execution Reports. If the objective is to evaluate how well the current INRMP is being implemented and meeting the goals of the NR Program, then this is what should be driving requests for funds. The annual funds expended will continue to be pulled from the EPR Execution Report.





# Appendix P: Natural Resources Coordinator Appointment Letter

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DEPARTMENT OF THE NAVY  
NAVAL SUPPORT ACTIVITY MONTEREY  
271 STONE ROAD  
MONTEREY, CA 93943-5000

IN REPLY REFER TO:  
5090  
7 Jun 12

From: Commanding Officer, Naval Support Activity Monterey  
To: Victoria L. Taber

SUBJ: APPOINTMENT AS INSTALLATION NATURAL RESOURCES COORDINATOR

Ref: (a) OPNAVINST 5090.1C

1. Per reference (a), Chapter 24, Section 24-13.5, para (e), you are hereby appointed as Naval Support Activity Monterey, Natural Resources Coordinator. Your duties include ensuring that the Commanding Officer, via the Public Works Officer, is informed regarding all natural resources issues.
2. Your duties will include reporting on the conditions of the natural resources, objectives of the Integrated Natural Resources Management Plan and potential or actual conflicts between mission requirements and natural resources mandates.
3. This appointment is effective immediately and remains in effect unless revoked or until you are properly relieved.

  
G. K. DAVID





# Appendix Q: Marine Research Permitting Contacts

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## CALIFORNIA OCEAN PROTECTION COUNCIL

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John Laird, Secretary for Natural Resources, Council Chair  
Matt Rodriguez, Secretary for Environmental Protection  
John Chiang, State Controller, State Lands Commission Chair  
Susan Golding, Public Member  
Geraldine Knatz, Public Member  
Fran Pavley, State Senator  
Toni Atkins, State Assemblymember

October 1, 2012

Dear Scientific Research Collection Permit Applicant,

The purpose of this letter is to generally inform you about California's potential permit requirements for scientific experiments, pilot projects, and other short-term research projects (hereinafter collectively referred to as "research") to be conducted in marine waters. Although these activities may be temporary, you may nevertheless need authorization from the landowner and the state's boards, departments, and commissions as well as federal agencies involved in natural resource management prior to conducting your research.

Not all ocean-based research requires prior approvals. However, research in coastal and marine environments frequently involves the placement, operation, and maintenance of monitoring equipment such as data loggers, sensors, and recorders as well as the infrastructure, power sources, and anchoring devices needed to support that equipment. Depending on the composition and size of these materials, their location, and length of time in place, the California State Lands Commission, California Coastal Commission, California Department of Fish and Game, California Department of Parks and Recreation, and the State and Regional Water Resources Control Boards may need to review the proposed research activity for consistency with their statutory authorities. The collection or removal of physical materials (such as sand, rock, or seawater), habitats, and/or plants or animals from coastal and marine areas for research purposes may also require authorization by some of these same boards, departments and commissions. Additionally, the U.S. Fish and Wildlife Service, U.S. Army Corps of Engineers, and the National Oceanic and Atmospheric Administration, may have special permit requirements for research.

Please find attached a chart with a list of state boards, departments, and commissions, federal agencies and relevant contacts that should be consulted prior to carrying out your research. Most entities have minor permit requirements or other streamlined approval processes (e.g., Letters of No Objection) for short-term activities that are designed and located in a manner that will not result in adverse impacts to the marine environment (e.g., disturbance of sensitive species or habitats, release of marine debris, or uptake of water and discharge of waste).

Please contact these government entities early in your planning process so that you have ample time to obtain any required approvals before undertaking your ocean-based research activities.

Sincerely,

A handwritten signature in blue ink that reads "John Laird".

John Laird  
California Ocean Protection Council, Chair  
Secretary of Natural Resources

Attachment: California Boards, Departments and Commissions and Federal Agencies Contacts

California Boards, Departments and Commissions	
<i>Agency</i>	<i>Contact</i>
Department of Parks and Recreation	Kevin Fleming Natural Resources Division <a href="mailto:kfleming@parks.ca.gov">kfleming@parks.ca.gov</a> (916) 651-6940
Department of Fish and Game	Gina del Rosa License and Revenue Branch (916) 928-5849 <a href="http://www.dfg.ca.gov/wildlife/nongame/research_permit/">http://www.dfg.ca.gov/wildlife/nongame/research_permit/</a>
Fish and Game Commission	Adrianna Shea (916) 653-4899 <a href="http://www.fgc.ca.gov/">http://www.fgc.ca.gov/</a>
State Water Resources Control Board	Division of Water Quality Connie Anderson (916) 341 – 5280 <a href="mailto:CSAnderson@waterboards.ca.gov">CSAnderson@waterboards.ca.gov</a>  Mariela Paz Carpio-Obeso Ocean Standards Unit <a href="mailto:Mcarpio-obeso@waterboards.ca.gov">Mcarpio-obeso@waterboards.ca.gov</a> (916) 341-5858 <a href="http://www.waterboards.ca.gov/water_issues/programs/beaches/">http://www.waterboards.ca.gov/water_issues/programs/beaches/</a>  Phil Isorena SWRCB/Waste Water NPDES permits <a href="mailto:PIsorena@waterboards.ca.gov">PIsorena@waterboards.ca.gov</a> (916) 341-5544  Greg Gearheart SWRCB/ Storm Water NPDES permits <a href="mailto:ggearheart@waterboards.ca.gov">ggearheart@waterboards.ca.gov</a> (916) 341-5892 <a href="http://www.waterboards.ca.gov/water_issues/programs/npdes/">http://www.waterboards.ca.gov/water_issues/programs/npdes/</a>
North Coast Regional Water Board (Region 1)	Luis Rivera <a href="mailto:lriviera@waterboards.ca.gov">lriviera@waterboards.ca.gov</a> Office: (707) 570- 3769 <a href="http://www.waterboards.ca.gov/northcoast/">http://www.waterboards.ca.gov/northcoast/</a>
San Francisco Bay Regional Water Board (Region 2)	Thomas Mumley <a href="mailto:tmumley@waterboards.ca.gov">tmumley@waterboards.ca.gov</a> Office: (510) 622-2395 <a href="http://www.waterboards.ca.gov/sanfranciscobay/">http://www.waterboards.ca.gov/sanfranciscobay/</a>
Central Coast Regional	Michael Thomas

Water Board (Region 3)	<a href="mailto:mthomas@waterboards.ca.gov">mthomas@waterboards.ca.gov</a> Office: (805) 542-4623 <a href="http://www.waterboards.ca.gov/centralcoast/">http://www.waterboards.ca.gov/centralcoast/</a>
Los Angeles Regional Water Board (Region 4)	Deborah Smith <a href="mailto:dsmith@waterboards.ca.gov">dsmith@waterboards.ca.gov</a> (213) 576-6609 <a href="http://www.waterboards.ca.gov/losangeles/">http://www.waterboards.ca.gov/losangeles/</a>
Santa Ana Regional Water Board (Region 8)	Kurt Berchtold <a href="mailto:kberchtold@waterboards.ca.gov">kberchtold@waterboards.ca.gov</a> Office: (951) 782-3286 <a href="http://www.waterboards.ca.gov/santaana/">http://www.waterboards.ca.gov/santaana/</a>
San Diego Regional Water Board (Region 9)	James Smith <a href="mailto:jsmith@waterboards.ca.gov">jsmith@waterboards.ca.gov</a> Office: 858-467-2732 <a href="http://www.waterboards.ca.gov/sandiego/">http://www.waterboards.ca.gov/sandiego/</a>
California State Lands Commission	Grace Kato Land Management Division <a href="mailto:Grace.Kato@slc.ca.gov">Grace.Kato@slc.ca.gov</a> (916) 574-1227
California Coastal Commission	Cassidy Teufel Energy, Ocean Resources, and Federal Consistency Division <a href="mailto:cassidy.teufel@coastal.ca.gov">cassidy.teufel@coastal.ca.gov</a> (415) 904-5502
San Francisco Bay Conservation and Development Commission	Robert Batha <a href="mailto:bobb@bcdca.gov">bobb@bcdca.gov</a> 415-352-3612 <a href="http://www.bcdca.gov/">http://www.bcdca.gov/</a>
<b>Federal Agencies</b>	
National Park Service	<a href="https://science.nature.nps.gov/research/ac/apps/apply/AppInstructions">https://science.nature.nps.gov/research/ac/apps/apply/AppInstructions</a>
NOAA Channel Islands National Marine Sanctuary	Danielle Lipski <a href="mailto:Danielle.Lipski@noaa.gov">Danielle.Lipski@noaa.gov</a> (805) 966-7107 x422 <a href="http://channelislands.noaa.gov/drop_down/permits.html">http://channelislands.noaa.gov/drop_down/permits.html</a>
NOAA Cordell Bank National Marine Sanctuary	Michael C. Carver <a href="mailto:Michael.Carver@noaa.gov">Michael.Carver@noaa.gov</a> (415) 663-1437 <a href="http://cordellbank.noaa.gov/protect/welcome.html#permitting">http://cordellbank.noaa.gov/protect/welcome.html#permitting</a>
NOAA Gulf of the Farallones National Marine Sanctuary	Brad Damitz <a href="mailto:Brad.Damitz@noaa.gov">Brad.Damitz@noaa.gov</a> 415-259-5766 <a href="http://farallones.noaa.gov/eco/permits/permits.html">http://farallones.noaa.gov/eco/permits/permits.html</a>

<p>NOAA Monterey Bay National Marine Sanctuary</p>	<p>Erica J. Burton  <a href="mailto:erica.burton@noaa.gov">erica.burton@noaa.gov</a>  (831) 647-4246  <a href="http://montereybay.noaa.gov">http://montereybay.noaa.gov</a></p>
<p>US Army Corps of Engineers, San Francisco District</p>	<p>Laurie Monarres  Regulatory Division  Chief, North Branch  (415) 503-6774  <a href="mailto:Laurie.a.monarres@usace.army.mil">Laurie.a.monarres@usace.army.mil</a></p> <p>Cameron Johnson  Regulatory Division  Chief , South Branch  (415) 503-6773  <a href="mailto:Cameron.l.johnson@usace.army.mil">Cameron.l.johnson@usace.army.mil</a></p> <p><a href="http://www.spn.usace.army.mil/regulatory/">http://www.spn.usace.army.mil/regulatory/</a></p>
<p>US Army Corps of Engineers, Los Angeles District</p>	<p>Aaron Allen  Regulatory Division  Chief, North Coast Branch (San Luis Obispo, Santa Barbara, Ventura,  Los Angeles Counties)  (805) 585-2148  <a href="mailto:Aaron.o.allen@usace.army.mil">Aaron.o.allen@usace.army.mil</a></p> <p>Therese Bradford  Regulatory Division  Chief, South Coast Branch (Orange, San Diego Counties)  (760) 602-4850  <a href="mailto:Therese.o.bradford@usace.army.mil">Therese.o.bradford@usace.army.mil</a></p> <p><a href="http://www.spl.usace.army.mil/regulatory/">http://www.spl.usace.army.mil/regulatory/</a></p>
<p>US Fish and Wildlife Service</p>	<p>Roger Root  Ventura Fish and Wildlife Office  805-644-1766 ext. 336  <a href="mailto:Roger_Root@fws.gov">Roger_Root@fws.gov</a></p>