INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN

FOR THE CHOCOLATE MOUNTAIN AERIAL GUNNERY RANGE, CALIFORNIA

Prepared by:

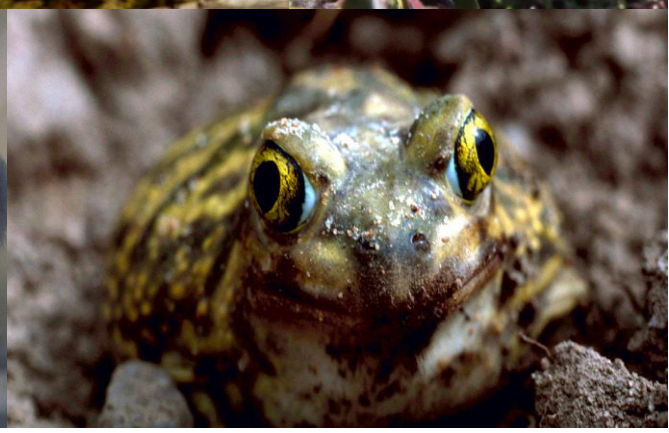
Marine Corps Air Station Yuma
Range Management Department
PO Box 99140
Yuma, Arizona

and

Naval Facilities Engineering
Command, Southwest
1220 Pacific Highway
San Diego, California

February 2017



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PREPARED BY:

MARINE CORPS AIR STATION YUMA
YUMA, ARIZONA

AND

NAVAL FACILITIES ENGINEERING COMMAND SOUTHWEST
CENTRAL INTEGRATED PRODUCT TEAM
SAN DIEGO, CALIFORNIA

WITH TECHNICAL ASSISTANCE FROM:

VERNADERO GROUP, INCORPORATED
SAN DIEGO, CALIFORNIA

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APPROVING AGENCY

This Integrated Natural Resources Management Plan for the Chocolate Mountain Aerial Gunnery Range was prepared by Marine Corps Air Station Yuma, Arizona with technical assistance from the United States (U.S.) Department of the Navy Naval Facilities Engineering Command Southwest. This plan is prepared in cooperation with the U.S. Fish and Wildlife Service and the California Department of Fish and Wildlife in accordance with the *2013 Memorandum of Understanding for a Cooperative Integrated Natural Resources Management Program on Military Installations* (U.S. Department of Defense, U.S. Fish and Wildlife Service, and Association of Fish and Wildlife Agencies 2013)

Sikes Act (16 UNITED STATES CODE 670a)

This Integrated Natural Resources Management Plan is consistent with the use of military installations to ensure the preparedness of the Armed Forces and fulfills the requirements of the Sikes Act (16 United States Code Section 670a, *et seq.*) as amended, for the Chocolate Mountain Aerial Gunnery Range.

Signature on this Integrated Natural Resources Management Plan constitutes a commitment to seek funding and execute, subject to the availability of funding, all "must fund" projects and activities in accordance with the timeframes identified (MCO P5090.2A w/changes 1-3 [HQMC 2013]).

Approving Official: U.S. Marine Corps, Marine Corps Air Station Yuma

20170623

COLONEL RICARDO MARTINEZ
Commanding Officer
Marine Corps Air Station Yuma, Arizona

Date

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INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN FOR THE CHOCOLATE MOUNTAIN AERIAL GUNNERY RANGE, CALIFORNIA

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Concurring Agency: California Department of Fish and Wildlife

Leslie MacNair
Regional Manager
California Department of Fish and Wildlife

5/24/17
Date

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Concurring Agency: U.S Fish and Wildlife Service

G. Mendel Stewart — 5/15/17

G. MENDEL STEWART — Date

Field Supervisor

Carlsbad Fish and Wildlife Service Office

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EXECUTIVE SUMMARY

The Chocolate Mountain Aerial Gunnery Range (CMAGR) is a United States (U.S.) Marine Corps Range that has served as a military training facility since 1942. The CMAGR is located in Imperial and Riverside counties in the southeast corner of California and east of the Salton Sea. Historically, the CMAGR consisted of approximately 460,349 acres of rugged desert terrain. This terrain included about 229,903 acres of federal land administered by the Department of the Navy (DoN), about 230,284 acres of withdrawn federal public land administered by the Bureau of Land Management (BLM), and about 162 acres of land not withdrawn but administered by the Bureau of Reclamation (BOR).

In April 2013, the DoN published the *Final Legislative Environmental Impact Statement for the Renewal of the Chocolate Mountain Aerial Gunnery Range Land Withdrawal* requesting that Congress renew the California Military Lands Withdrawal and Overflights Act of 1994, which was set to expire on 31 October 2014. On 26 December 2013, President Barack Obama signed the National Defense Authorization Act (NDAA) for Fiscal Year (FY) 2014. Title XXIX, Subtitle E, of the FY 2014 NDAA directed the BLM to transfer the administrative jurisdiction of approximately 228,324 acres of land previously withdrawn in support of the military operations on the CMAGR to the DoN. The northwest boundary was realigned to the edge of the Bradshaw Trail, so the trail is now entirely on public land under the jurisdiction of the BLM. The DoN relinquished 629 acres of DoN land and 1,960 acres of BLM public land withdrawn for military use that is located immediately north of the Bradshaw Trail, and BLM will manage the land in accordance with the applicable Land Use Plan developed under Section 202 of the Federal Land Policy and Management Act of 1976, Title 43 United States Code (U.S.C.) Section 1712. Post-NDAA acreage of the CMAGR is approximately 457,760.

Because military lands often contain significant natural resources, Congress enacted the Sikes Act in 1960 (16 U.S.C. 670-670f) to address wildlife conservation and public access on military installations. The Sikes Act, as amended, requires the Secretary of Defense to carry out a program to provide for the conservation and rehabilitation of natural resources on military installations in cooperation with the U.S. Fish and Wildlife Service and state fish and wildlife agencies. The 1997 amendments to the Sikes Act require the Department of Defense (DoD) to develop and implement an Integrated Natural Resources Management Plan (INRMP) for each military installation with significant natural resources. The FY14 NDAA also mandates that the DoN, in coordination with the BLM, prepare an INRMP for the newly configured and administered CMAGR. This INRMP has been prepared in cooperation with the USFWS and California Department of Fish and Wildlife, in coordination with the BLM and BOR, and it reflects a mutual agreement of the signatory parties concerning conservation, protection, and management of fish and wildlife resources on the CMAGR.

This INRMP is a living document that will be reviewed annually and periodically updated to provide for the proper and sustainable management of natural resources on the CMAGR. The goal of ecosystem management, as established by the DoD, is to ensure that military lands support present and future training requirements while preserving, improving, and enhancing ecosystem integrity. Over the long term, this approach maintains and improves the sustainability

and biological diversity of terrestrial and aquatic ecosystems while supporting sustainable economies, human use, and the environment required for realistic training operations (DoD 2013). To ensure frequent and continued use of land for military training now and in the future, management programs and actions in this INRMP prescribe natural resource conservation/management on the CMAGR that is: 1) sustainable; 2) in accordance with laws and regulations; and 3) integrated with existing military installation plans and mission requirements. This INRMP will ensure that lands remain available and in good condition to support the CMAGR's military mission with "no net loss" of military training capability.

This INRMP provides a brief summary of the CMAGR's history and current land uses, natural resources, natural resource management programs, and their goals, and objectives. Also developed is a list of actions planned for the next five years to implement this INRMP including a timeframe that outlines each project activity and how often it will occur (Table ES-1). Actions are listed by program area and include priority classification, frequency, and legal drivers.

Table ES-1. CMAGR INRMP 5-Year Action Plan: FY17-22

Program Area	Action Step	FY	COLS Level	Frequency	Legal Driver and Comments
INRMP Implementation	4.1-1: Prioritize, pursue funding opportunities, and implement projects as outlined in this INRMP.	17-22	3	Annual	Sikes Act (16 U.S.C. 670), DoDI 4715.03, and MCO P5090.2A w/changes 1-3
	4.1-2: Review the INRMP annually for Operation and Effect.	17-22	3	Annual	Sikes Act (16 U.S.C. 670), DoDI 4715.03, and MCO P5090.2A w/changes 1-3
NEPA Review	4.2-1: Provide expert review of potential impacts of federal actions on the CMAGR.	17-22	3	Ongoing	NEPA of 1969 (42 USC 4321–4370h; 40 CFR Parts 1500–1508), DoDI 4715.03 and MCO P5090.2A w/changes 1-3
ESA Compliance	4.3-1: Adhere to conservation measures and relevant avoidance measures identified in all applicable USFWS BOs (see Appendix E for all applicable BOs).	17-22	2	Ongoing	ESA of 1973, as amended (16 U.S.C. 1531, et seq.), DoDI 4715.03, MCO P5090.2A w/changes 1-3, and 1996 USFWS BO
	4.3-2: Manage federally listed threatened or endangered species and their habitats to prevent jeopardy to the species and to assist in their conservation and recovery.	17-22	2	Ongoing	ESA of 1973, as amended (16 U.S.C. 1531, et seq.), DoDI 4715.03, and MCO P5090.2A w/changes 1-3
	4.3-3: Manage federally listed threatened or endangered species and their habitats in a manner that minimizes impacts to both mission and species.	17-22	2	Ongoing	ESA of 1973, as amended (16 U.S.C. 1531, et seq.), DoDI 4715.03, and MCO P5090.2A w/changes 1-3

BGEPA – Bald and Golden Eagle Protection Act; **BO –** Biological Opinion; **BLM** – Bureau of Land Management; **CDFW** – California Department of Fish and Wildlife; **CMAGR** – Chocolate Mountain Aerial Gunnery Range; **DoDI** – DoD Instruction; **FY** – fiscal year; **ESA** – Endangered Species Act: **EO** - Executive Order; **FWCA** - Fish and Wildlife Conservation Act; **GIS** – geographic information system; **MCO** - Marine Corps Order; **MBTA** – Migratory Bird Treaty Act; **DoDI** – DOD Instruction; **TBD** – to be determined; **T&E**-Threatened and Endangered; **U.S.C.** – United States Code; **USGS** – United States Geological Survey

Table ES-1. CMAGR INRMP 5-Year Action Plan: FY17-22 (cont.)

Program Area	Action Step	FY	COLS Level	Frequency	Legal Driver and Comments
	4.3-4: Proactively collect information on presence or absence, location, habitat availability and suitability, and life history requirements of federally listed threatened or endangered species and maintain and update these data.	17-22	3	Ongoing	ESA of 1973, as amended (16 U.S.C. 1531, et seq.), DoDI 4715.03, and MCO P5090.2A w/changes 1-3
	4.3-5: Develop and maintain a robust GIS database that will be updated as survey data become available, to document spatial and temporal distribution of federally listed threatened or endangered species.	17-22	3	Ongoing	ESA of 1973, as amended (16 U.S.C. 1531, et seq.), DoDI 4715.03, and MCO 11000.25, Installation Geospatial Information and Services
Threatened or Endangered Species, Critical Habitat	4.4-1: Continue participation in annual desert tortoise surveys in support of inventory, monitoring, and mapping efforts.	17-22	3	Annual	ESA of 1973, as amended (16 U.S.C. 1531, et seq.), DoDI 4715.03, MCO P5090.2A w/changes 1-3, and 1996 USFWS BO
	4.4-2: Map desert tortoise population, densities, habitat parameters, and threats across the range.	17-22	3	Ongoing	ESA of 1973, as amended (16 U.S.C. 1531, et seq.), DoDI 4715.03, MCO P5090.2A w/changes 1-3, and 1996 USFWS BO
	4.4-3: Continue to participate in the Desert Tortoise Management Oversight Group and the California Recovery Implementation Team. Develop project proposals to assist with the species recovery.	17-22	3	Ongoing	ESA of 1973, as amended (16 U.S.C. 1531, et seq.), DoDI 4715.03, MCO P5090.2A w/changes 1-3, and 1996 USFWS BO

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Table ES-1. CMAGR INRMP 5-Year Action Plan: FY17-22 (cont.)

Program Area	Action Step	FY	COLS Level	Frequency	Legal Driver and Comments
	4.4-4: Pending decisions of other State and Federal lead agencies, determine whether the reintroduction of a nonessential experimental population of Sonoran pronghorn will be compatible with training mission objectives and designed to avoid conflicting with range operations.	17,18	2	One-time	ESA of 1973, as amended (16 U.S.C. 1531, et seq.), DoDI 4715.03, and MCO P5090.2A w/changes 1-3
	4.4-5: Assist in coordination and provide in-kind and financial support, if available, to the Sonoran pronghorn recovery team.	17-22	2	Varies	ESA of 1973, as amended (16 U.S.C. 1531, et seq.), DoDI 4715.03, and MCO P5090.2A w/changes 1-3
Other Special Status Species	4.5-1: Inventory and monitor special status species to establish a baseline from which conservation and management strategies can be devised.	17-19	2	Ongoing	FWCA of 1980 (16 U.S.C. 2901 *et seq*.), DoDI 4715.03, and MCO P5090.2A w/changes 1-3
Migratory Birds and Eagles	4.6-1: Avoid or minimize impacts to migratory birds and eagles and their habitat.	17-22	2	Ongoing	MBTA of 1918 (16 U.S.C. 703-712), BGEPA of 1940 (16 U.S.C. 668), EO 13186 - Responsibilities of Federal Agencies to Protect Migratory Birds, DoDI 4715.03, and MCO P5090.2A w/changes 1-3
	4.6-2: Conduct presence/absence surveys periodically as part of an adaptive management strategy to better inform migratory bird management on the range.	17-22	2	Ongoing	MBTA of 1918 (16 U.S.C. 703-712), BGEPA of 1940 (16 U.S.C. 668), EO 13186 - Responsibilities of Federal Agencies to Protect Migratory Birds, DoDI 4715.03, and MCO P5090.2A w/changes 1-3

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Table ES-1. CMAGR INRMP 5-Year Action Plan: FY17-22 (cont.)

Program Area	Action Step	FY	COLS Level	Frequency	Legal Driver and Comments
	4.6-3: Develop, implement, and evaluate conservation measures for management actions to avoid or minimize incidental take of migratory birds and eagles.	17-22	2	One-time	MBTA(MBTA) of 1918 (16 U.S.C. 703-712), Bald and Golden Eagle Protection Act (BGEPA) of 1940 (16 U.S.C. 668), EO 13186 - Responsibilities of Federal Agencies to Protect Migratory Birds, DoDI 4715.03, and MCO P5090.2A w/changes 1-3
	4.6-4: Participate in regional or national inventory and monitoring programs.	17-22	2	Ongoing	MBTA of 1918 (16 U.S.C. 703-712), BGEPA of 1940 (16 U.S.C. 668), EO 13186 - Responsibilities of Federal Agencies to Protect Migratory Birds, DoDI 4715.03, and MCO P5090.2A w/changes 1-3
BASH Program	4.7-1: Maintain the existing MBTA depredation permit(s).	17-22	3	Annual	MBTA of 1918, MCO P5090.2A w/changes 1-3, and MCAS Yuma StaO 3750.1B
	4.7-2: Update as necessary and periodically evaluate possible improvements to this successful program that might further reduce BASH incidents.	17-22	3	Varies	MCO P5090.2A w/changes 1-3 and MCAS Yuma StaO 3750.1B
General Wildlife	4.8-1: Inventory and monitor distribution and abundance of reptiles, birds, amphibians, and small mammals.	17-21	2	Ongoing	FWCA of 1980 (16 U.S.C. 2901 *et seq*.), DoDI 4715.03, and MCO P5090.2A w/changes 1-3
	4.8-2: Maintain vegetation known to support wildlife.	17-22	2	Ongoing	DoDI 4715.03 and MCO P5090.2A w/changes 1-3

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Program Area	Action Step	FY	COLS Level	Frequency	Legal Driver and Comments
	4.8-3: Restore or enhance vegetation outside of heavy-use areas.	17-22	2	Ongoing	DoDI 4715.03 and MCO P5090.2A w/changes 1-3
Nonnative and Nuisance Wildlife	4.9-1: Work in partnership with the BLM to control the wild burro populations.	17-22	2	Ongoing	DoDI 4715.03, MCO P5090.2A w/changes 1-3, EO 11987 Exotic Organisms and EO 13112 Invasive Species
	4.9-2: Inventory, monitor and control raven populations.	17-22	2	Ongoing	DoDI 4715.03, MCO P5090.2A w/changes 1-3, EO 11987 Exotic Organisms and EO 13112 Invasive Species
	4.9-3: Develop pest species management programs as needed to include pest mammals such as rabbits, skunks, raccoon, squirrels, coyotes, feral dogs, feral cats, and pest birds.	17-22	2	Ongoing	DoDI 4715.03, DoDI 4150.07, MCO P5090.2A w/changes 1-3, EO 11987 Exotic Organisms and EO 13112 Invasive Species
Vegetation	4.10-1: Complete vegetation mapping.	17-22	2	Ongoing	DoDI 4715.03, MCO P5090.2A w/changes 1-3, and MCO 11000.25, Installation Geospatial Information and Services
	4.10-2: Identify essential habitats for rare plants and wildlife.	17-22	2	Varies	DoDI 4715.03 and MCO P5090.2A w/changes 1-3,
Invasive and Nonnative Plant Species	4.11-1: Acquire reliable baseline data on the presence and abundance of invasive and nonnative plant species.	17-19	2	Ongoing	Federal Noxious Weed Act of 1974, as amended (7 U.S.C. 2801 et seq.); DoDI 4715.03; DoDI 4150.07; MCO P5090.2A w/changes 1-3; EO 11987 Exotic Organisms; and EO 13112 Invasive Species

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Program Area	Action Step	FY	COLS Level	Frequency	Legal Driver and Comments
	4.11-2: Survey and map the location, abundance, and distribution of invasive and nonnative plant species most likely to impact ecosystem health or mission readiness.	17-22	2	Ongoing	Federal Noxious Weed Act of 1974, as amended (7 U.S.C. 2801 et seq.); DoDI 4715.03; DoDI 4150.07; MCO P5090.2A w/changes 1-3; EO 11987 Exotic Organisms; and EO 13112 Invasive Species
	4.11-3: Treat and monitor areas most likely to impact ecosystem health or mission readiness.	17-21	2	Ongoing	Federal Noxious Weed Act of 1974, as amended (7 U.S.C. 2801 et seq.); DoDI 4715.03; DoDI 4150.07; MCO P5090.2A w/changes 1-3; EO 11987 Exotic Organisms; and EO 13112 Invasive Species
Wildland Fire Management	4.12-1: Develop and implement a Wildland Fire Management Plan.	17	2	One-time	Sikes Act (16 U.S.C. 670), DoDI 4715.03, DoDI 6055.06, and MCO 5090.2A
Wildlife Watering Sources	4.13-1: Maintain access to the guzzlers along the Coachella Canal to allow large mammals to move onto and off the CMAGR to use these guzzlers.	17-22	2	Ongoing	Sikes Act (16 U.S.C. 670), DoDI 4715.03, and MCO P5090.2A w/changes 1-3
Ecosystem Management	4.14-1: Support research to gain the best available scientific information to guide natural resource and conservation decisions.	17-22	2	Ongoing	Sikes Act (16 U.S.C. 670), DoDI 4715.03, and MCO P5090.2A w/changes 1-3
	4.14-2: Define and understand CMAGR's regional relevance and responsibility towards regional conservation efforts.	17-22	2	Ongoing	Sikes Act (16 U.S.C. 670), DoDI 4715.03, and MCO P5090.2A w/changes 1-3

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Program Area	Action Step	FY	COLS Level	Frequency	Legal Driver and Comments
	4.14-3: Update aerial orthographic photographs over time to determine a baseline and to document landscape changes.	20	2	Once per 5 years	Sikes Act (16 U.S.C. 670), DoDI 4715.03, and MCO P5090.2A w/changes 1-3
	4.14-4: Utilize aerial orthographic imagery to conduct anthropogenic-impact-specific studies.	21	2	Once per 5 years	MCO P5090.2A w/changes 1-3, MCO 11000.25 Installation Geospatial Information and Services
Soils	4.15-1: Establish a soils and erosion monitoring framework to measure and assess changes to soil resources over time.	17-18	2	Ongoing	Soil Conservation Act (16 U.S.C. 590a *et seq.*), DoDI 4715.03, and MCO P5090.2A w/changes 1-3
	4.15-2: Assess current erosion status within the watershed and evaluate possible engineering management practices that will mitigate erosion.	17-18	2	One-time	Soil Conservation Act (16 U.S.C. 590a *et seq.*), DoDI 4715.03, and MCO P5090.2A w/changes 1-3
	4.15-3: Develop spatial data related to soil associations and characteristics.	17-22	2	One-time	Soil Conservation Act (16 U.S.C. 590a *et seq.*), DoDI 4715.03, and MCO P5090.2A w/changes 1-3
Climate Change	4.16-1: Conduct an assessment of sustainability objectives and strategies in the context of climate change relevant to natural resources on the CMAGR	18	2	One-time	DoDI 4715.03 and DoD's 2014 Climate Change Adaptation Roadmap

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Table ES-1. CMAGR INRMP 5-Year Action Plan: FY17-22 (cont.)

Program Area	Action Step	FY	COLS Level	Frequency	Legal Driver and Comments
	4.16-2: Conduct vulnerability assessments of species and habitats most at risk, coordinating with other DoD installations for guidance.	18	2	Varies	DoDI 4715.03 and DoD's 2014 Climate Change Adaptation Roadmap
	4.16-3: Collaborate with DoD mission leads, wildlife agencies, and other relevant partners to optimize the value of strategies developed for adaptation to climate change.	17-22	2	Ongoing	DoDI 4715.03 and DoD's 2014 Climate Change Adaptation Roadmap
	4.16-4: Install and maintain weather stations, including rain gauges at specific study locations.	17-22	2	Ongoing	DoDI 4715.03 and DoD's 2014 Climate Change Adaptation Roadmap
Conservation Program GIS	4.18-1: Continue development of natural resource GIS data, with an emphasis on vegetation, general wildlife, special status species, anthropogenic resources and impacts, and soils.	17-22	3	Ongoing	DoDI 4715.03 and MCO 11000.25 Installation Geospatial Information and Services
Cooperative Initiatives	4.19-1: Cooperate with internal stakeholders (i.e., Environmental, Installations and Logistics, and Planning), cooperating agencies, and external stakeholders on natural resource management issues of mutual interest.	17-22	3	Ongoing	Sikes Act (16 U.S.C. 670), DoDI 4715.03, and MCO P5090.2A w/changes 1-3

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Table ES-1. CMAGR INRMP 5-Year Action Plan: FY17-22 (cont.)

Program Area	Action Step	FY	COLS Level	Frequency	Legal Driver and Comments
Law Enforcement	4.21-1: Establish and maintain adequate control measures (signs, gates, fences, etc.) to provide for security, safety, and protection of natural resources.	17-22	3	Ongoing	Sikes Act (16 U.S.C. 670), Assimilative Crimes Act (18 U.S.C. 13), Uniformed Code Of Military Justice (10 U.S.C. 807B)

BGEPA – Bald and Golden Eagle Protection Act; **BO –** Biological Opinion; **BLM** – Bureau of Land Management; **CDFW** – California Department of Fish and Wildlife; **CMAGR** – Chocolate Mountain Aerial Gunnery Range; **DoDI** – DoD Instruction; **FY** – fiscal year; **ESA** – Endangered Species Act: **EO** - Executive Order; **FWCA** - Fish and Wildlife Conservation Act; **GIS** – geographic information system; **MCO** - Marine Corps Order; **MBTA** – Migratory Bird Treaty Act; **DoDI** – DOD Instruction; **TBD** – to be determined; **T&E**-Threatened and Endangered; **U.S.C.** – United States Code; **USGS** – United States Geological Survey

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LIST OF ACRONYMS AND ABBREVIATIONS

°C	Celsius
°F	Fahrenheit
AML	Appropriate Management Level
ATCAA	Air Traffic Control Assigned Air Space
BASH	Bird/Animal Aircraft Strike Hazard
BGEPA	Bald and Golden Eagle Protection Act
BMP	Best Management Practice
BLM	Bureau of Land Management
BMGR	Barry M. Goldwater Range
BO	Biological Opinion
BOR	Bureau of Reclamation
BSTRC	Bob Stump Training Range Complex
CAAQS	California Ambient Air Quality Standards
CDCA	California Desert Conservation Area
CDFW	California Department of Fish and Wildlife
CDWR	California Department of Water Resources
CFR	Code of Federal Regulations
CH_4	Methane
CMAGR	Chocolate Mountain Aerial Gunnery Range
CMBC	Circle Mountain Biological Consultants, Inc.
CMLWOA	California Military Lands Withdrawal and Overflights Act of 1994
CNPS	California Native Plant Society
CO	Carbon Monoxide
CO_2	Carbon Dioxide

COLS	Common Output Level Standards
CVMSHCP	Coachella Valley Multiple Species Habitat Conservation Plan
dB	Decibel
DoD	Department of Defense
DoDI	Department of Defense Instruction
DoI	Department of the Interior
DoN	Department of the Navy
DRECP	Desert Renewable Energy Conservation Plan
DTC	Desert Training Center
DTC/C-AMA	Desert Training Center California – Arizona Maneuver Area
DTRO	Desert Tortoise Recovery Office
DWMA	Desert Wildlife Management Area
EA	Environmental Assessment
ECE	Environmental Compliance Evaluation
ECR	El Centro Ranges
EIS	Environmental Impact Statement
EOD	Explosive Ordnance Disposal
EPA	United States Environmental Protection Agency
ESA	Endangered Species Act
FARP	Forward Arming and Refueling Point
FLPMA	Federal Lands Policy and Management Act
FLTFA	Federal Land Transaction Facilitation Act
FONSI	Finding of No Significant Impact
FR	Federal Register
FY	Fiscal Year
FYDP	Future Years Defense Program
GIS	Geographic Information System
GPS	Global Positioning System
HA	Herd Area
HMA	Herd Management Area
HQMC	Marine Corps Headquarters
INRMP	Integrated Natural Resources Management Plan
ISDRA	Imperial Sand Dunes Recreational Area
LEIS	Legislative Environmental Impact Statement for the Renewal of the Chocolate Mountain Aerial Gunnery Range Land Withdrawal

LF	Facilities and Services Division
MAGTF	Marine Air-Ground Task Force
MBTA	Migratory Bird Treaty Act
MCAS	Marine Corps Air Station
MCIWest	Marine Corps Installations West
MCO	Marine Corps Order
MOA	Military Operations Area
MOU	Memorandum of Understanding
N_2O	Nitrous Oxide
NAVFAC SW	Naval Facilities Engineering Command Southwest
NAAQS	National Ambient Air Quality Standards
NDAA	National Defense Authorization Act
NECO	Northern and Eastern Colorado Desert Coordinated Management Plan
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NO_2	Nitrogen Dioxide
NO_X	Oxides of Nitrogen
NRCS	Natural Resources Conservation Service
NSW	Naval Special Warfare
NWR	National Wildlife Refuge
O_3	Ozone
OHV	Off-Highway Vehicle
Pb	Lead
$PM_{2.5}$	Fine Particulate Matter Less Than or Equal to 2.5 Microns in Diameter
PM_{10}	Suspended Particulate Matter Less Than or Equal to 10 Microns in Diameter
RCNPPA	Rare California Native Plant Protection Act
REEA	West Chocolate Mountains Renewable Energy Evaluation Area
RETI	Renewable Energy Transmission Initiative
ROI	Region of Influence
SCAG	Southern California Association of Governments
SEAL	Sea, Air and Land
SEINet	Southwest Environmental Information Network
SO_2	sulfur dioxide
STATSGO2	State Soil Geographic Database

SWAT	Special Warfare Training Area
UPRR	Union Pacific Railroad
U.S.	United States
USAF	United States Air Force
U.S.C.	United States Code
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
USMC	United States Marine Corps
VegCAMP	Vegetation Classification and Mapping Program
WECO	Western Colorado Desert Routes of Travel Designations
WFMP	Fire Management Plan
WWII	World War II

1.0 INTRODUCTION

The Chocolate Mountain Aerial Gunnery Range (CMAGR) in southeastern California has served as a military training range since 1942. The CMAGR is located in Imperial and Riverside counties in the southeast corner of California, east of the Salton Sea and west of Arizona. Historically, the CMAGR consisted of approximately 460,349 acres of rugged desert terrain. This terrain included about 229,903 acres of federal land administered by the Department of the Navy (DoN), about 230,284 acres of withdrawn federal public land administered by the Bureau of Land Management (BLM), and about 162 acres of land not withdrawn but administered by the Bureau of Reclamation (BOR).

The training range, which is a component of the national defense training infrastructure, is indispensable to the continued and future readiness of DoN and United States Marine Corps (USMC) air and ground forces, including Naval Special Warfare (NSW) Sea, Air and Land (SEAL) units. The need for quality training that provides a realistic approximation of the conditions that Marines, Sailors, Airmen, and Soldiers will face in combat as individuals and in small or large units cannot be overstated. The United States (U.S.) military is fully invested in the principle that high-quality training is essential to success and survival in combat. Access to ranges that offer flexible, diverse, and realistic training is essential to preparing tactical forces of the highest possible quality. Thus, the necessity of keeping the CMAGR fully in service can best be understood from two main perspectives: (1) the necessity of providing high-quality training and (2) the superlative qualities of the CMAGR for supporting that training.

In April 2013, the DoN published the *Final Legislative Environmental Impact Statement for the Renewal of the Chocolate Mountain Aerial Gunnery Range Land Withdrawal* (LEIS) requesting that Congress renew the California Military Lands Withdrawal and Overflights Act of 1993 (CMLWOA), which was set to expire on 31 October 2014 (DoN et al. 2013). This included the withdrawal, reservation, and transfer of public lands in support of military readiness and security for the DoN and the U.S. Army. Title XXIX of the act established general provisions with respect to military land withdrawals as well as specific obligations and authorities for the CMAGR, which is managed by the Marine Corps Air Station (MCAS) Yuma, Arizona, as part of the Bob Stump Training Range Complex (BSTRC). Subtitle E of Title XXIX required the transfer of 228,324 acres of withdrawn land within the CMAGR from the administrative jurisdiction of the Department of the Interior (DoI) to the DoN. The BOR retained administrative jurisdiction of its 162 acres within the CMAGR because that land was not withdrawn for military purposes.

On 26 December 2013, President Barack Obama signed the National Defense Authorization Act for Fiscal Year 2014 (FY14 NDAA). Title XXIX, Subtitle E, of the FY14 NDAA directed the BLM to transfer administrative jurisdiction to the DoN for approximately 228,324 acres of land previously withdrawn in support of the military operations on the CMAGR. The northwest boundary was realigned to the edge of the Bradshaw Trail so the trail is entirely on public land under the jurisdiction of the BLM. The DoN relinquished 629 acres of DoN land and 1,960 acres of BLM land, withdrawn for military use, that are immediately north of the Bradshaw Trail to the BLM. The BLM will manage the land in accordance with the applicable Land Use Plan developed under Section 202 of the Federal Land Policy and Management Act of 1976 (FLPMA), Title 43 United States Code (U.S.C.) 1712.

The FY14 NDAA also mandated the DoN, in coordination with the BLM, prepare an Integrated Natural Resources Management Plan (INRMP). The 2014 CMAGR INRMP was revised to satisfy this requirement. Figure 1-1 shows the previous CMAGR boundary and Figure 1-2 shows the current boundary approved by Congress.

Because military lands often contain significant natural resources, Congress enacted the Sikes Act in 1960 to address wildlife conservation and public access on military installations. The Sikes Act (16 U.S.C. 670-670f), as amended, requires the Secretary of Defense to carry out a program to provide for the conservation and rehabilitation of natural resources on military installations in cooperation with the U.S. Fish and Wildlife Service (USFWS) and state fish and wildlife agencies. The 1997 amendments to the Sikes Act require the Department of Defense (DoD) to develop and implement an INRMP for each military installation with significant natural resources. This INRMP was prepared in cooperation with the USFWS and the California Department of Fish and Wildlife (CDFW), in coordination with the BLM and BOR, and reflects a mutual agreement of these parties concerning the conservation, protection, and management of fish and wildlife resources on the CMAGR.

This INRMP will provide for the management of natural resources of the CMAGR. It continues to incorporate, to the maximum extent practicable, ecosystem management principles and adaptive strategies and provides the landscape necessary for the sustainment of military land uses. This INRMP is intended to guide the effective management of the Installation's natural resources so as to ensure its lands remain available and in good condition to support the CMAGR's military mission with "no net loss" of military training capability.

This INRMP provides a brief description of the CMAGR and its natural resources as well as a list of natural resource management programs and their goals. Also developed is a list of actions planned for the next five years to implement these programs and goals including a timeframe that outlines each project activity and how often it will occur (Appendix A). Actions are listed by program area and include priority classification, frequency, and regulatory requirements.

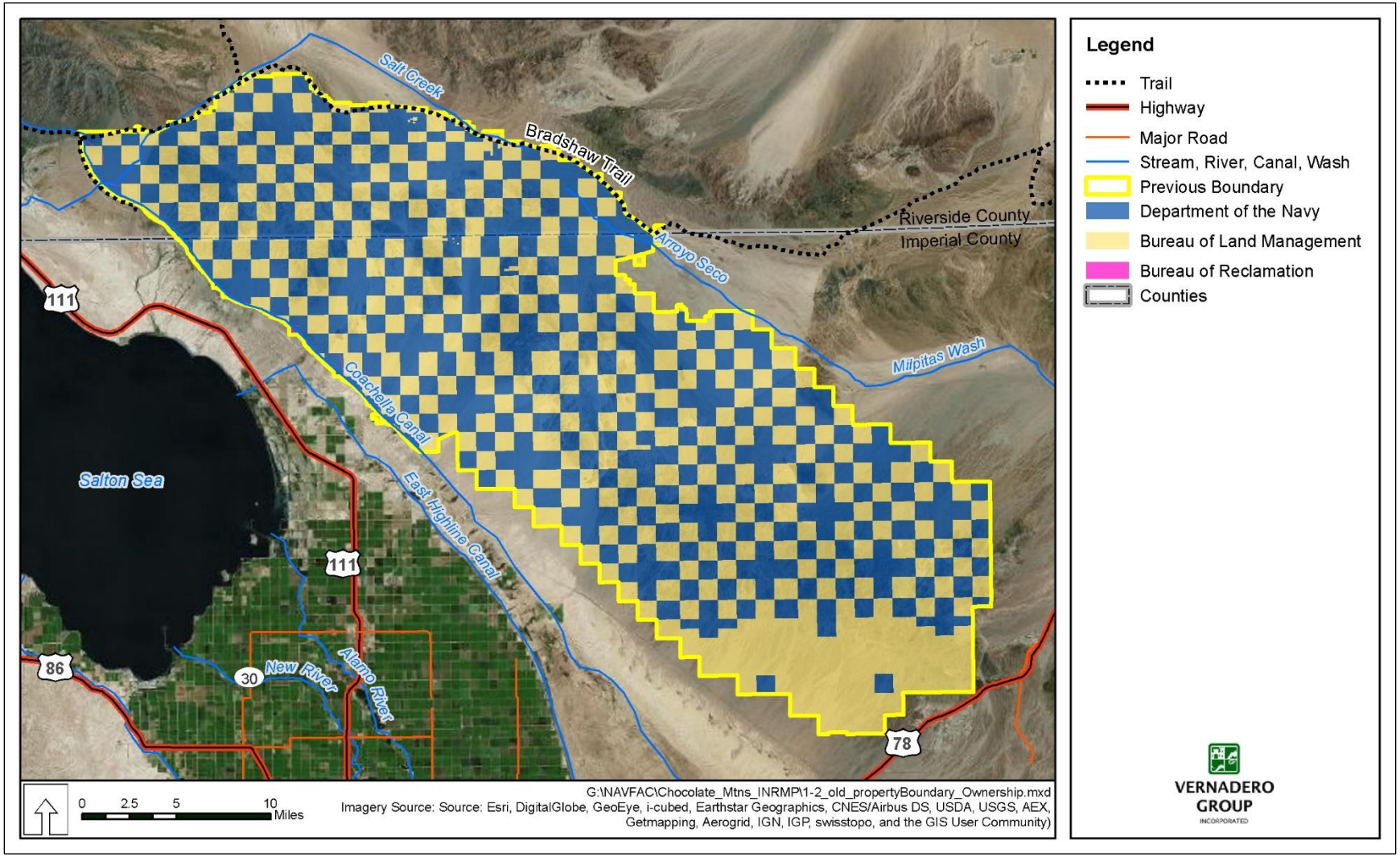


Figure 1-1. Administrative Jurisdiction and Range Boundary of the CMAGR Prior to FY14 NDAA and LEIS Approval

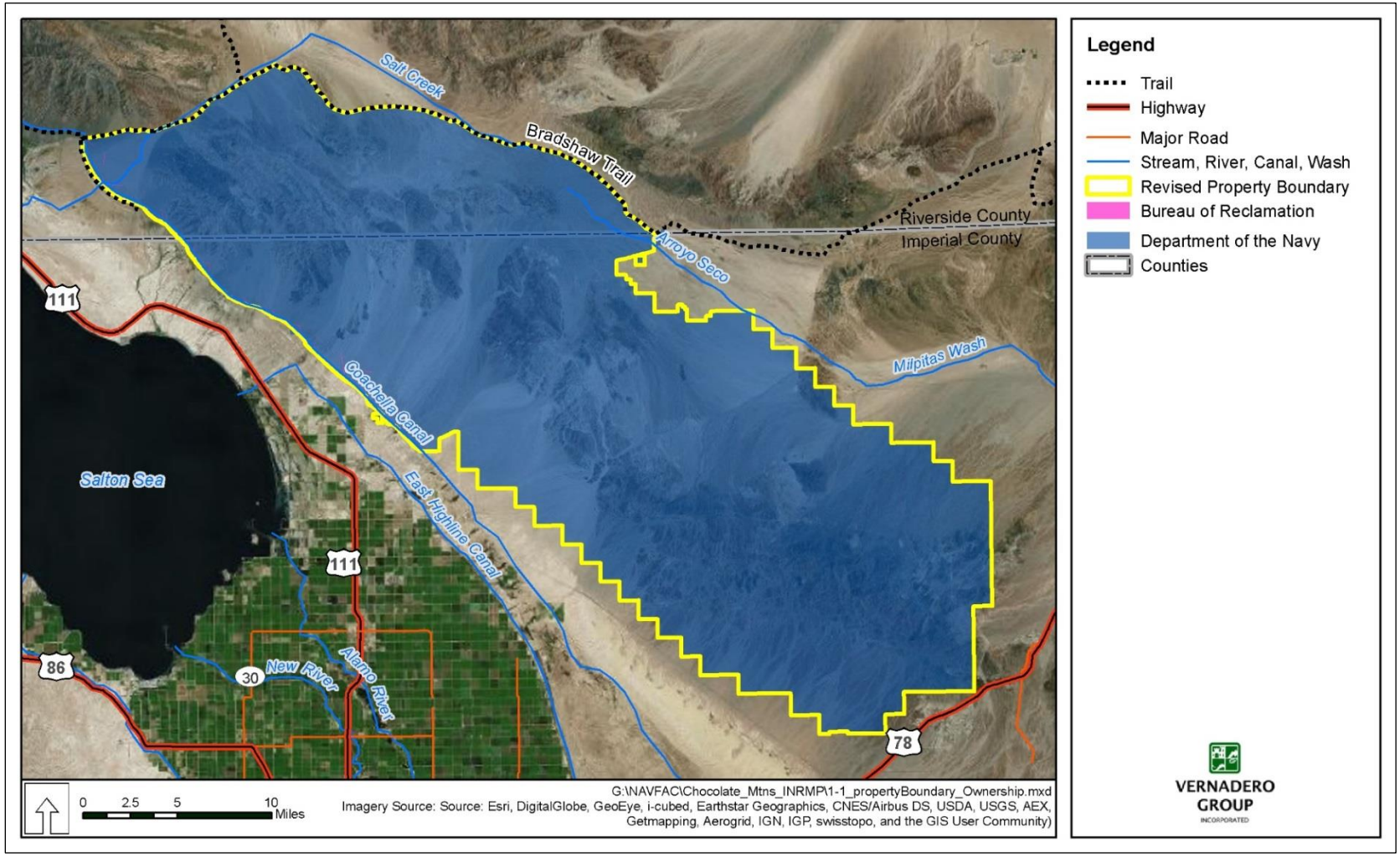


Figure 1-1-2. Administrative Jurisdiction and Range Boundary Changes on the CMAGR following the FY14 NDAA and LEIS Approval

1.1 Purpose

The purpose of this INRMP is to guide implementation of an integrated, comprehensive plan for managing natural resources of the CMAGR. This INRMP is needed to comply with the FY14 NDAA and congressional mandate to revise the 2014 CMAGR INRMP to reflect changes in boundary, ownership, and administrative jurisdiction that could affect natural resource management strategies. This INRMP is also needed to integrate any updates to natural resources management strategies that have been developed since the 2014 INRMP was written.

Under this INRMP, natural resources and military use will continue to be managed to ensure there is no net loss in the capability of the CMAGR to support its military purposes in a manner consistent with DoD ecosystem management principles. Further, this INRMP benefits threatened and endangered species consistent with federal and state recovery actions for these species under the Endangered Species Act (ESA) of 1973 (16 U.S.C. 1531, *et seq.*). The stated purpose and scope for this INRMP are in accordance with the guidance provided by the Sikes Act, as most recently amended by the Sikes Act Improvement Act, 16 U.S.C. 670a, *et seq.*

This INRMP fulfills other responsibilities with regard to DoD and USMC policies and legal requirements regarding natural resource planning, including DoD Instruction (DoDI) 4715.03, *Natural Resource Conservation Program* (DoD 2013), and Marine Corps Order (MCO) P5090.2A with Changes (w/ch) 1 through 3 of the *Environmental Compliance and Protection Manual* (Headquarters, USMC [HQMC] 2013). This INRMP has been prepared using the *Handbook for Preparing, Revising and Implementing Integrated Natural Resources Management Plans on Marine Corps Installation*s (HQMC 2007), hereafter referred to as the *Handbook.* This INRMP continues to deliver the benefits provided to species by the Northern and Eastern Colorado Desert Coordinated Management Plan (NECO).

This INRMP provides technical guidance for individuals planning and/or preparing Installation approvals, management actions, orders, instructions, guidelines, standard operating procedures. It is not intended, however, for use by military personnel operating in the field. Field operations and activities are directed to adhere to guidelines, plans, orders, or other approvals that have been developed using this INRMP and have already had environmental compliance review and, where applicable, regulatory approvals and/or permitting. This INRMP does not dictate land use decisions, but rather provides important information to support sound land use and natural resources management decisions. National Historic Preservation Act requirements are not addressed in this INRMP. Cultural resources management issues (archaeological and historical) are addressed, more appropriately, within a separate Integrated Cultural Resources Management Plan for the CMAGR.

1.2 Authority

Legal authority for this INRMP is provided by the Sikes Act. The Sikes Act sets forth resource management policies and guidance for U.S. military installations and requires the preparation of INRMPs for installations with significant natural resources —including those composed of withdrawn lands. The Sikes Act requires that the "Secretary of Defense shall carry out a

program to provide for the conservation and rehabilitation of natural resources" [16 U.S.C. 670a (a)(1)(A) and (B)]. The Sikes Act further specifies in 16 U.S.C. 670a that:

> Consistent with the use of military installations to ensure the preparedness of the Armed Forces, the Secretaries of the military departments shall carry out [a natural resources management program] to provide for—
>
> i. the conservation and rehabilitation of natural resources on military installations;
> ii. the sustainable multipurpose use of the resources, which shall include hunting, fishing, trapping, and non-consumptive uses; and
> iii. subject to safety requirements and military security, public access to military installations to facilitate the use.

The Sikes Act also requires that INRMPS are consistent with military installations use to ensure the preparedness of the Armed Forces. Each INRMP will, where appropriate and applicable, provide for:

- Fish and wildlife management, land management, forest management, and fish- and wildlife-oriented recreation
- Fish and wildlife habitat enhancement or modifications
- Wetland protection, enhancement, and restoration where necessary for support of fish or wildlife
- Integration of, and consistency among, the various activities conducted under the INRMP
- Establishment of specific natural resources management objectives and time frames for proposed action
- Sustained use by the public of natural resources to the extent such use is not inconsistent with the needs of fish and wildlife resources management
- Public access to the military installation that is necessary or appropriate for sustained use by the public of natural resources to the extent that the use is not inconsistent with the needs of fish and wildlife resources, subject to requirements necessary to ensure safety and military security
- Enforcement of natural resource laws and regulations
- No net loss in the capability of military installation lands to support the military mission of the installation
- Such other activities as the Secretary of the military department considers appropriate

1.2.1 Marine Corps Order P5090.2A

MCO P5090.2A w/changes 1-3 (HQMC 2013) requires all USMC installations having water and land suitable for the conservation and management of natural resources to prepare and implement a comprehensive INRMP that includes all elements of natural resources management applicable to the installation. An INRMP must accomplish the following:

- Preserve access to air, land, and sea space to meet military readiness requirements

- Comply with applicable natural resources protection requirements (e.g., laws, Executive Orders, and regulations)
- Provide public access to installation lands, where practicable, provided such access does not conflict with military readiness and does not harm sensitive installation natural resources
- Participate in regional ecosystem management partnerships provided such participation does not conflict with military readiness and does not harm installation natural resources

1.3 Scope

This INRMP was developed in cooperation with USFWS and CDFW, and in coordination with the BLM and BOR. It presents the DoN/USMC's proposed natural resources management program following the transfer of 228,324 acres of withdrawn land within the CMAGR from the administrative jurisdiction of the DoI to the DoN. This INRMP reduces the potential adverse effects on the species and habitat to simultaneously conserve the range biodiversity. INRMP implementation will improve long-range planning, decrease long-term environmental costs, reduce liabilities from environmental noncompliance, and improve the overall condition of natural resources to support the military mission. INRMP implementation will also increase knowledge of the CMAGR ecosystems through surveys, research, internal environmental awareness, and public outreach programs.

1.4 Roles and Responsibilities

1.4.1 Marine Corps Air Station Yuma

The CMAGR falls under the jurisdiction and control of the Commanding Officer of the MCAS Yuma, Arizona, who reports to the Commanding General of Marine Corps Installations West (MCIWest) at Camp Pendleton, California, for administrative and facilities support. Figure 1-3 shows the chain of command for Commanding General MCIWest, including the MCAS Yuma, and other installations such as Marine Corps Logistics Base Barstow, Marine Corps Base Camp Pendleton, MCAS Camp Pendleton, and MCAS Miramar. The Commanding Officer and Executive Officer administer the Installation while other departments provide support to users, including tenants and other transient personnel and activities.

USMC environmental management policy states (HQMC 2013):

> *The USMC is committed to mission accomplishment and to environmental protection. Minimizing adverse environmental impacts helps the Marine Corps to be a good steward, win hearts and minds, and sustain its combat capability into the future. The Marine Corps is committed to protecting the health and integrity of the environment, both at home and abroad, complying with the Nation's laws, conserving our natural resources and national treasures, preventing pollution through best management practices (BMP) consistent with mission requirements, and consistent with mission objectives. The Marine Corps shall continue to refine environmental management programs, proactively mitigate environmental and health risks, and ensure individuals are appropriately trained*

and empowered to provide stewardship of the lands to which the Marine Corps is entrusted.

The Commanding Officer ensures that activities and operations fully comply with federal, state, and local laws/regulations and with written DoD, DoN, and USMC policy. The Commanding Officer is charged with 19 tasks under MCO P5090.2A w/changes 1-3 (HQMC 2013), to oversee the natural resources program and ensure the Installation's ability to carry out its military mission. The Commanding Officer also ensures that the INRMP is consistent with the use of military installations to ensure the preparedness of the Armed Forces and fulfills the requirements of the Sikes Act (16 United States Code Section 670a, et seq.) as amended.

The Commanding Officer's signature on the INRMP constitutes a commitment to seek funding and execute, subject to the availability of funding, all "must fund" projects and activities in accordance with the timeframes identified (MCO P5090.2A w/changes 1-3 [HQMC 2013]).

The Range Management Department advises the Commanding Officer, MCAS Yuma, in order to assist him in attaining the following objectives:

- Meet the military mission of the CMAGR
- Minimize conflicts between the military mission and the natural resources and wildlife on the range
- Maintain active and thoughtful compliance with the appropriate natural resources law and regulations, agency guidance, relevant orders and binding regulatory opinions
- Remain cognizant of regional natural resources initiatives and trends, maintaining involvement in such as they relate to the CMAGR's specific situation
- Remain cognizant of public opinion and interest groups where these intersect with the CMAGR's specific situation, interacting with them when circumstances demand
- Maintain an active, professional and mutually productive relationship with the regulatory authorities who monitor and advise on the CMAGR's specific situation
- Anticipate and mitigate for the effects of infrastructure improvements and development on the natural resources on the CMAGR
- Inventory and evaluate the natural resources on the CMAGR
- Evaluate and set long-term management and conservation goals
- Based upon the analysis of the CMAGR's experiences (both positive and negative) in natural resource management and conservation combined with new information, research findings, regulatory advice, etc. develop future goals, objectives, and actions to improve the CMAGR's stewardship of its natural resources
- Maintain natural resources management information systems and programmatic guidance to meet the above aims
- Maintain an array of relationships with other USMC and DoD installations in order to share information and experiences and coordinate actions on matters of mutual interest
- Participate in regional ecosystem partnerships, provided such participation does not conflict with military readiness requirements and does not harm sensitive natural resources managed by the USMC

1.4.2 Federal and State Wildlife Agencies

This document was prepared in cooperation with the USFWS Pacific Southwest Region's Regional Director. The Regional Director in turn designated the Field Assistant Supervisor of the Palm Springs Office as the local USFWS representative. Congress has directed the DoN to utilize USFWS resources "to the maximum extent practical" to provide natural resources research on DoD installations in accordance with 16 U.S.C. 670c-670f(b). The INRMP was also prepared in cooperation with the CDFW Region 6 Office in Bermuda Dunes, California. The CDFW has primary jurisdiction over resident wildlife management within the CMAGR and shares a role in the recovery of endangered and threatened species.

The Sikes Act, 16 U.S.C. 670a(a)(2), states that the INRMP will reflect the "mutual agreement" of the USFWS, the state fish and wildlife agency, and the DoD "concerning conservation, protection, and management of fish and wildlife resources." The requirement for mutual agreement is further clarified by Section 670a(a)(4)(A)(ii), which states that "nothing in this subchapter enlarges or diminishes the responsibility and authority of any state for the protection and management of fish and resident wildlife."

Mutual agreement with the USFWS and the CDFW is met through the participation of these agencies in the review/update process, involvement throughout any revision development, and by signature to this INRMP. Coordination with the USFWS and the CDFW is expected to continue indefinitely as the review, planning, and revision cycle for this document will be ongoing. To the extent practicable, these agencies will participate in an ongoing review process by providing comments, recommendations, and input on the status of regional processes, surveys, and species.

1.4.3 Naval Facilities Engineering Command Southwest

Naval Facilities Engineering Command Southwest (NAVFAC SW) is responsible for planning, engineering, design, construction, real estate acquisition and disposal, and environmental services in a six-state area on the West Coast. NAVFAC SW also provides public works services such as transportation, maintenance, utilities/energy delivery, facilities management, and base operations support to DoN and USMC installations within its geographic area of responsibility, as well as support to other federal agencies in California. NAVFAC SW provides resource management technical and contracting support for MCAS Yuma.

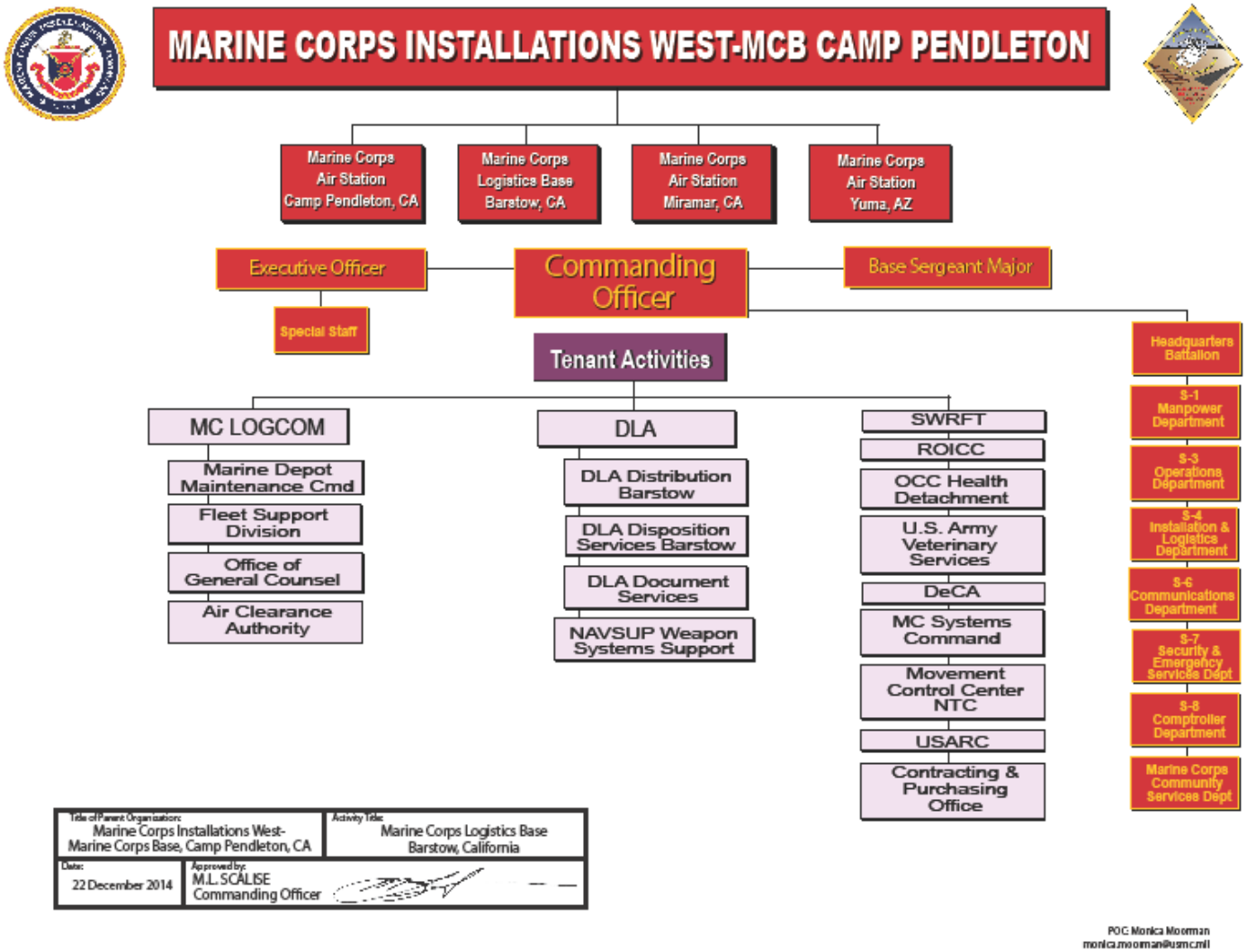


Figure 1-3. Chain of Command of MCIWest

1.4.4 Department of Interior

The BLM was formerly a participant in the management of the CMAGR due to the shared nature of the resource. The LEIS (DoN et al. 2013) transferred the land under the administrative jurisdiction of the BLM to the DoN and realigned the northwest boundary to exclude an established hiking trail from the DoN range. The BLM no longer maintains any administrative role with regards to CMAGR's land use or operations. The BLM was provided the opportunity to review and comment on this INRMP.

The BOR maintains a series of scattered dikes along the western boundary of the range. A Memorandum of Understanding (MOU) is being prepared between the DoN and BOR to formalize the process that the BOR would use to access and conduct maintenance activities on the dikes. The MCAS Yuma provided the BOR with an opportunity to review and comment on this INRMP.

1.4.5 INRMP Tribal Consultation

DoDI 4710.02, *DoD Interactions with Federally-Recognized Tribes,* states that DoD Components will afford tribes that have a cultural or historical affiliation with lands encompassed by an installation an opportunity to consult on the development of INRMPs where tribal treaty rights or other rights to natural resources may potentially be affected. If such tribes are identified, DoD Components will incorporate a standard process for consultation in INRMPs whenever issues arise between the tribe and the Component. DoD Components will involve tribal governments early in the planning process and will endeavor to complete consultations prior to implementation of the proposed action. Early involvement means that a tribal government is given an opportunity to comment on a proposed action in time for the tribal government to provide meaningful comments that may affect the decision. The MCAS Yuma provided federally-recognized tribes with an interest in the CMAGR an opportunity to comment on this INRMP.

1.4.6 Public Review

Section 2905(d)(1) of the Sikes Act requires each military department to provide "an opportunity for the submission of public comments" for new and revised INRMPs. An Environmental Assessment (EA) associated with this INRMP was completed in accordance with the guidelines established by the National Environmental Policy Act (NEPA) of 1969. NEPA requires federal agencies to consider the environmental impacts of their actions before they are implemented, document those considerations, and involve the public in the process. NEPA applies to the approval of formal plans, programs, and specific projects. An EA is required when the action sponsor is uncertain as to whether or not the proposed action would significantly affect the Installation's environment. An EA results in either a Finding of No Significant Impact (FONSI) or a requirement to prepare an Environmental Impact Study (EIS), the most detailed NEPA requirement. If the outcome of the EA is a FONSI, then the proposed action can continue, perhaps subject to specific conditions. This section summarizes these activities.

The Draft Revised INRMP and Draft EA were available for a 30-day review period commencing with the Notice of Availability publication in the Yuma Sun Newspaper on October 28-30, 2016. Hardcopies were made available for review at the Main Branch of the Yuma County Library District (2951 S. 21st Dr., Yuma, AZ 85364) and at the City of El Centro Public Library (1140 N. Imperial Ave., El Centro, CA 92243). In addition, the Draft Revised INRMP and Draft EA were available online at http://www.mcasyuma.marines.mil/Staff-and-Agencies/Range-Natural-and-Cultural-Resources.

Cooperating Agencies

On November 21, 2014, the CDFW hosted the kick off meeting in coordination with the USFWS. Other participants included NAVFAC, MCIWest, and BLM to discuss specific tasks associated with the revised INRMP. The USFWS and CDFW were provided an opportunity to review an early draft INRMP and a meeting was held at the Bermuda Dunes Office on August 9, 2016. The MCAS Yuma solicited another review of the Draft Revised INRMP and Draft EA via email on October 26, 2016.

Native American Tribes

The MCAS Yuma solicited reviews of the Draft Revised INRMP and Draft EA from partner agencies and Tribes via email on October 26, 2016. These tribes included the following:

- Agua Caliente Band of Cahuilla Indians
- Ak-Chin Indian Community
- Cocopah Indian Tribe
- Colorado River Indian Tribes
- Fort Mojave Indian Tribe
- Gila River Indian Community
- Quechan Indian Tribe
- Salt River Pima-Maricopa Indian Community
- Tohono O'Odham Nation
- Torres Martinez Desert Cahuilla Indian

1.4.7 List of Preparers, Planning Team Members, and Persons/Agencies Consulted

Several agencies and individuals contributed to this INRMP.

Marine Corps Air Station Yuma

Randy English, Conservation Program Manager
Abigail Rosenberg, Natural Resource Specialist
Bobby Law, Natural Resource Specialist
Jonathan Gholson, GIS Analyst
Karla James, Cultural Resource Manager
Leo Williams, Law Enforcement Officer
Del Maslen, Law Enforcement Officer

Marine Corps Installations - West

Bill Berry, Regional Conservation Program Manager

Naval Facilities Command Southwest

Cece Dahlstrom, Natural Resources Specialist

U.S. Fish and Wildlife Service

Pete Sorensen, Division Chief, Renewable Energy, and Federal and State lands
Kerry Holcomb, Biologist
Jody Fraser, Biologist

California Department of Fish and Wildlife

Jack Crayon, Biologist

Bureau of Land Management

Nichole Gaddis, Environmental Scientist

Vernadero Group Incorporated (Contractor)

Michael Collins, Principal Planner (Project Manager)
Dan Becker, GIS Analyst
Maggie Fulton, Technical Editor
Nicole Kimball, Wildlife Biologist
Anicka Kratina-Hathaway, Wildlife Biologist
Kyle McCann, Wildlife Biologist
Terry Powers, Environmental Planner

1.5 Management Approach

The MCAS Yuma implements ecosystem management principles that are consistent with DoD and USMC policy. The ecosystem management approach seeks to balance the dual goals of maximizing land use for military readiness and maintaining native habitats. The overriding focus is to develop, promote, and refine a comprehensive, ecosystem-based management program for resource conservation. Such an ecosystem-based approach is intended to facilitate maximum support of the USMC military training mission and infrastructure, while simultaneously promoting both the sustainability of native species and habitat diversity, and compliance with applicable laws and regulations.

Guidance for the USMC's INRMP process is provided in the *Handbook* (HQMC 2007), which guides the preparation, revision, and implementation of INRMPs. This is done in compliance with the MCO P5090.2A w/changes 1-3, (HQMC 2013), 2013 MOU among the DoD, USFWS, and the Association of Fish and Wildlife Agencies and in accordance with the Sikes Act as

implemented by the Office of Secretary of Defense in *Updated Guidance on Implementation of the Sikes Act Improvement Act* (10 October 2002).

1.5.1 Principles of Ecosystem Management

An ecosystem can be defined as a dynamic, natural complex of living organisms interacting with each other and with their associated nonliving environment. Ecosystem management has been defined in various ways (e.g., Benton et al. 2008); however, all encompass a similar management approach.

The goal of ecosystem management, as established by the DoD, is to ensure that military lands support present and future training requirements while preserving, improving, and enhancing ecosystem integrity. Over the long term, this approach maintains and improves the sustainability and biological diversity of terrestrial and aquatic ecosystems while supporting sustainable economies, human use, and the environment required for realistic training operations (DoD 2013). DoDI 4715.03, *Natural Resource Conservation Program,* established the following principles and guidelines (DoD 2013):

- Maintain and improve the sustainability and native biological diversity of ecosystems.
- Administer with consideration for ecological units and timeframes. Ecosystem management requires consideration of the effects of installation programs and actions at spatial and temporal ecological scales that are relevant to natural processes.
- Support sustainable human activities. People and their social, economic, and national security needs are an integral part of ecological systems, and management of ecosystems depends upon sensitivity to these issues.
- Develop a vision of ecosystem health. Existing social and economic conditions should be factored into the vision.
- Develop priorities and reconcile conflicts.
- Develop coordinated approaches to work toward ecosystem health. Since ecosystems rarely coincide with ownership and political boundaries, cooperation across ownership is an important component of ecosystem management.
- Rely on best science and available data.
- Use benchmarks to monitor and evaluate outcomes.
- Use adaptive management. Ecosystems are recognized as open, changing, and complex systems. Management should be flexible to accommodate the evolution of scientific understanding of ecosystems.
- Implement through installation plans and programs. An ecosystem’s desirable range of future conditions should be achieved through linkages with other stakeholders.

The DoD continues to shift its focus to provide for the protection of individual species through management of ecosystems. This approach requires land managers to form partnerships for information exchange, pool resources to conduct mitigation and study natural resources, and collaborate to develop a shared vision for ecosystems.

1.5.2 Key Issues

Cooperation between the MCAS Yuma and the USFWS and CDFW, with coordination with the BLM and BOR, during the scoping of this INRMP led to the identification and development of key issues for ecosystem management of the CMAGR. These key issues are identified in this section and incorporated into the CMAGR Conservation Program described in Section 4.0.

Presence of Desert Tortoise and its Critical Habitat on the CMAGR

One federally threatened species, the Mojave Desert population of the Agassiz desert tortoise (*Gopherus agassizii*), hereafter referred to as "desert tortoise," is known to inhabit and has designated critical habitat on the CMAGR. Nothing in the transfer of withdrawn lands will affect the prior critical habitat designation for the desert tortoise. The USMC recognizes the need for an ecosystem approach to best manage the desert tortoise and other natural resources, as it is more efficient, balances ecosystem components (i.e., mission, biological, economic, and human elements), provides comprehensive ESA compliance, and integrates both DoD and DoI guidelines.

Potential Future Reintroduction of Sonoran Pronghorn in the Region

The draft Recovery Plan (USFWS 2015) for the federally endangered Sonoran pronghorn (*Antilocapra americana sonoriensis*) specifies a list of objectives to achieve its goal of protecting the species and its habitat for the eventual delisting. Two of those objectives are to ensure rangewide viable populations and the availability of abundant, unfragmented habitat. The Recovery Plan intends to reintroduce Sonoran pronghorn onto additional sites within their historic range. This may include areas within the vicinity of the CMAGR, which would necessitate further analysis and discussion between project stakeholders.

The Presence of other Special Status Species on the CMAGR

The CMAGR sustains numerous sensitive plant and animal species although a range-wide survey has not been completed. The USMC's natural resources conservation and management strategy includes habitat enhancement (e.g., exotics control, erosion control) and the avoidance and minimization of adverse impacts through implementation of programmatic instructions (published rules and guidelines for range land users). Additional information and data on the potential presence of other special status species is required and identified in Section 4.0.

Lack of Natural Resource Information

Thorough knowledge of the abundance, diversity, and status of resources both on and off the CMAGR is essential to good ecosystem management. Development and maintenance of such inventories is aided by the use of geographic information system (GIS), global positioning system (GPS), and remote sensing technologies, combined with periodic surveys and monitoring. The routine collection of data and technology applications maximize the quality and quantity of information that allows the evaluation of potential impacts, biological trends, management initiative efficiencies, and identification of deficiencies. Updated information and "lessons learned" are then incorporated into the Installation's management protocols and

programmatic instructions. This ability to evaluate compatible and adaptive land use optimizes ecological conservation, while maximizing the land area available for training.

Military Mission and Public Access

Public access is precluded by safety and security requirements related to the aerial gunnery mission and potential for unexploded ordnance at the range. Therefore, this INRMP focuses solely on natural resource conservation and rehabilitation.

For public safety, flight safety, and operational security reasons, public recreational activities are prohibited, whether they are military personnel or civilians. This restricted access reduces the scope of natural resource management challenges.

1.5.3 INRMP Implementation

INRMP implementation requires a commitment of intent, time, and money. Funding of strategies and projects are guided by the budget priorities assessed for environmental work on DoD installations. The funding priorities and process are described in DoDI 4715.03 (DoD 2011a) and MCO P5090.2A w/changes 1-3 (HQMC 2013). An installation is not required to fund all of its projects to fully implement an INRMP. An INRMP is considered implemented if an installation:

- Actively requests, receives, and uses funds for “must fund” projects and activities
- Ensures that sufficient numbers of professionally trained natural resources management staff are available to perform the required tasks
- Annual coordination with all cooperating offices
- Documents specific actions accomplishments undertaken each year

The Commanding Officer’s signature on the final INRMP constitutes a commitment to seek funding and execute, subject to the availability of funding, all “must fund” projects and activities in accordance with the timeframes identified (MCO P5090.2A w/changes 1-3 [HQMC 2013]).

1.5.4 INRMP Review and Revision

Section 101(b)(2) of the Sikes Act [16 U.S.C. 670a(b)(2)] states that each INRMP “must be reviewed as to operation and effect by the parties thereto on a regular basis, but not less often than every 5 years.” The Sikes Act specifically directs reviews of the operation and effect, emphasizing whether existing INRMPs are current and implemented.

Annual Review and Reporting

In the third quarter of the FY, the MCAS Yuma provides progress reports of on-going and proposed projects to the USFWS and CDFW and seeks their input. In addition, conservation metrics are submitted to the Commandant of the Marine Corps Facilities and Services Division for the preceding FY.

Annual reviews are intended to assess the status of key focus areas: INRMP implementation, status of federally listed species and habitat, ecosystem integrity, partnership effectiveness, recreational use and access, INRMP team adequacy, and impacts on the mission.

Although not expressly required by the Sikes Act, the outcome of this joint review is typically documented in a memorandum or letter summarizing the rationale for the conclusions the parties have reached. This documentation is then jointly executed to reflect the parties' mutual agreement and added to the INRMP in Appendix D.

Five-Year Review

No less than every five years, the INRMP is reviewed for operation and effect to determine if the Installation is complying with the Sikes Act. The review is conducted by representatives of the three cooperating parties: MCAS Yuma's Commanding Officer, USFWS's Regional Director, and CDFW's Director. While these are the responsible parties, designated technical representatives generally are the personnel who actually conduct the review.

The review for operation and effect of the INRMP either concludes that is 1) meeting the intent of the Sikes Act, in which case it is updated and the prescribed implementation continues, or 2) not meeting Sikes Act stipulations and must be revised.

INRMP Update

If updates are all that is needed, they are made in a manner agreed upon by all parties. The conclusions are documented in a jointly executed memorandum, meeting minutes, or in some other record that reflects mutual agreement and incorporated into Appendix D.

INRMP Revision

INRMP revision is a formal process that is nearly as detailed as initial INRMP development. Detailed reviews confirm that Installation mission, USFWS, and CDFW concerns are adequately addressed and the intent of the Sikes Act met. MCO P5090.2A w/changes 1-3 (HQMC 2013) provides the following guidance:

- Identify stakeholders
- Identify military readiness mission and other land use requirements
- Identify installation management requirements
- Identify natural resources management objectives
- Develop and evaluate natural resources management courses of action
- Select and implement the natural resources management course of action
- Monitor and assess results
- Review the installation INRMP annually and update it as necessary to maintain relevance and avoid extensive, costly INRMP revisions

The existing INRMP remains in effect until the USFWS and CDFW have formally concurred with the final revised INRMP. There is no deadline for completion of the INRMP revision.

1.5.5 USMC Environmental Compliance Evaluation

The USMC conducts internal environmental and natural resource audits and inspections through an Environmental Compliance Evaluation (ECE) Program. The MCAS Yuma's program is consistent with USMC guidance and includes benchmark ECE assessments and annual self-audits.

Working in conjunction with the Commandant -sponsored ECE, an annual ECE is completed as part of the Self-Audit Program. The Self-Audit Program goal is to assess compliance by reviewing all natural resource projects and programs. These annual self-audits ensure requirements are met and the effectiveness of environmental programs.

HQMC-sponsored benchmark ECEs are normally conducted once every three years, with a formal annual validation and report provided during intervening years. The results are used as a tool to plan, program, budget, and execute initiatives to achieve compliance. Comparisons of the benchmark ECE results are made for USMC-wide trend analysis. HQMC has established the following ECE Program goals:

- Provide the Commander with a tool to evaluate the Command's environmental compliance
- Assess compliance levels and, as required, provide recommended corrective actions or improvements
- Provide a forum for the exchange of ideas and successes
- Provide the Commandant with a broad evaluation of environmental compliance across the USMC
- Provide a formal interface among installations, Fleet Marine Forces Commanders, and the Inspector General
- Integrate environmental awareness into every facet and function of the USMC way of life
- Improve overall compliance efforts through a continuous, integrated program

The ECE is similar to those conducted by the Inspector General or Field Supply Maintenance Analysis. They assess the Command's level of compliance, identifies corrective actions, confirms the implementation of those proposed actions, and facilitates continuous improvement in compliance efforts through the Self-Audit Program. The most recent ECE for the CMAGR was conducted in 2015.

2.0 CMAGR SETTING, LAND USE, AND MILITARY MISSION

2.1 CMAGR Setting

The CMAGR lies on a southeast-northwest axis and is located in north-central Imperial County and south-central Riverside County, California. The range is bounded on the west by the Salton Sea Basin and on the east by the Chuckwalla and Palo Verde mountains. The northern border is separated from the Orocopia Mountains by Salt Creek and includes part of the Chuckwalla Bench. The range extends south to Highway 78 near Glamis, California (Figure 2-1).

Due to the range's relatively remote location in a desert region, it has very few direct access points. The one exception is the Bradshaw Trail, located along the northernmost boundary of the CMAGR, and the rural road network associated with Camp Billy Machen and Slab City.

2.2 Regional Land Use

The CMAGR is located in a remote region of the eastern California desert. Land use around the CMAGR has not changed appreciably over the last century. Along the northernmost section is a series of geologic features with basin and range formations. These stark natural features create a natural buffer along the boundary of the CMAGR. Toward the western region, the lands remain primarily undeveloped with small nodes of scattered residential dwellings, recreational activities, and renewable natural resource exploration. Toward the southernmost region is the largest node of development activity, which is primarily industrial with active recreation areas and utility and transportation corridors. This area includes the Union Pacific Railroad (UPRR) right-of-way and the BOR's Coachella and Highline Canal systems, ultimately expanding toward the Imperial Valley agricultural belt and the Salton Sea State Recreational Area.

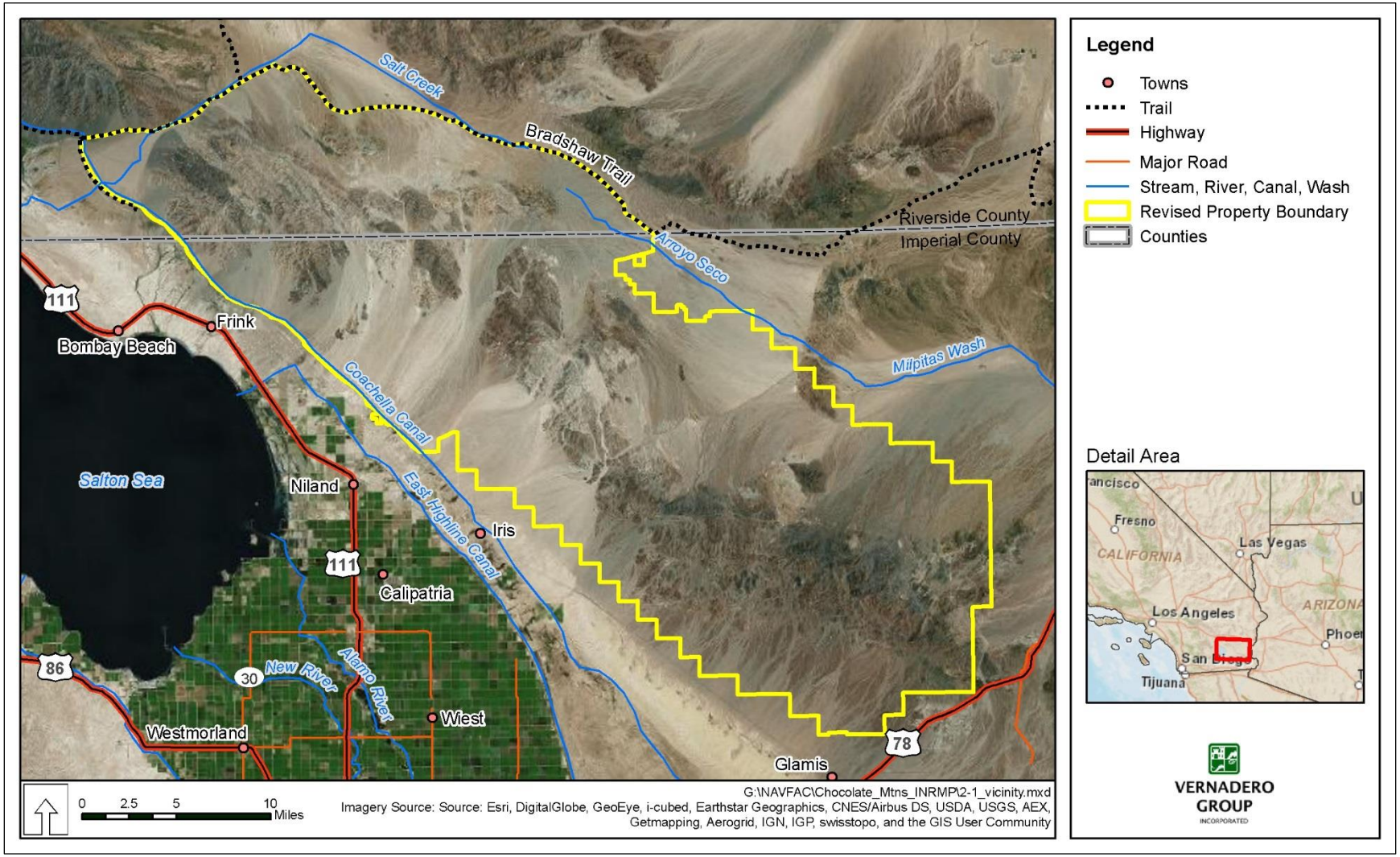


Figure 2-1. CMAGR Vicinity Map

2.2.1 Land Status and Management Responsibilities

Lands within and along the perimeter of the CMAGR are described in this section in terms of land status or jurisdiction. Land status depicts the limits of administration or jurisdiction maintained by the major landholders or administrators. Land status designations are important as they directly determine agency jurisdiction, expenditure of management funds, and basic land use and resource management.

Northern Section

These lands are located toward the northern boundary of the CMAGR, adjacent to the Dos Palmas Preserve Area of Critical Environmental Concern (ACEC), and the western tip of the range, north and east toward the Little Chuckwalla Mountains. This section is within the planning boundaries of the BLM's Palm Springs-South Coast Field Office and Riverside County. The vast majority of the land in this area is administered by the BLM, much of the land is designated as an ACEC. This land is generally undeveloped and used primarily as open space for conservation with some recreational uses such as hiking, camping, bird watching, hunting, and rock hounding.

Eastern Midsection

This area is located toward the east and south of the midsection of the CMAGR, adjacent to the Riverside and Imperial county divide. The BLM El Centro Field Office manages the area south of the county divide. The existing land use in this area is heavily associated with renewable natural resources and utility infrastructure, with land ownership divided between public and private ownership (see Figures 1-1 and 1-2). Residential dwellings are scattered throughout this area. Based on a review of aerial photography and limited field reconnaissance, it is difficult to discern if the dwellings on certain privately held parcels are abandoned or seldom used, perhaps as a weekend retreat.

Southeastern Section

The land use pattern associated with the southeast ROI (outside of the CMAGR) is generally industrial, with some recreational uses. The Mesquite Gold Mine, which abuts the CMAGR, is operated as an open-pit mine with leaching pads for processing. It is considered to be one of the largest active gold mines in the country (New Gold 2011). Adjacent to the mine site is the newly permitted Mesquite Regional Landfill administered by the Sanitation Districts of Los Angeles County. The landfill covers approximately 4,245 acres and is permitted to receive waste by rail. A 5-mile-long rail spur connects the landfill to the UPRR main line, near the destinations of Glamis, Algodones Dunes, and the Imperial Sand Dunes Recreational Area (ISDRA).

Southwestern Section

The BLM El Centro Field Office and Imperial County previously held jurisdiction within the southwestern CMAGR and currently hold jurisdiction in the ROI (outside the CMAGR). The existing land use patterns are diverse and include several regionally significant destinations and

culturally relevant attractions. The UPRR and the Coachella Canal act as physical barriers for land use transition. Land use along the CMAGR ROI is primarily uninhabited and transitions from generally recreational in nature to agricultural near the UPRR-Coachella Canal junction.

2.2.2 Regional Federal and State Jurisdiction and Management Plans

California Desert Conservation Area Plan (CDCA): Designated by the FLPMA in 1976, the CDCA is a 25-million-acre expanse of land in southern California. About 10 million acres are administered by the BLM. The range and surrounding region are included in the CDCA. Congress directed the BLM to prepare and implement a comprehensive, long-range plan for the management, use, development, and protection of the public lands within the CDCA based on the concepts of multiple use, sustained yield, and maintenance of environmental quality. The CDCA establishes goals for protection and use of the desert, designates distinct multiple-use classes for the lands involved, and establishes a framework for managing the various resources within these classes. These lands are managed in a controlled balance between higher-intensity use and protection. A wide variety of uses, such as mining, livestock grazing, recreation, energy, and utility development, are allowed. Damage created by permitted uses must be mitigated (BLM 1980).

The Northern and Eastern Colorado Desert Coordinated Management Plan: The NECO (BLM 2002b) is an amendment to the 1980 CDCA. The NECO is a landscape-scale, multiagency planning effort that protects and conserves natural resources while simultaneously balancing human uses within a planning area that encompasses over 5 million acres. Lands within the NECO area are popular for hiking, hunting, rock hounding, and driving for pleasure. Several commercial mining operations, livestock grazing, off-highway vehicle (OHV) recreational areas, and utility transmission corridors exist in the area as well. The NECO's planning boundary extends from the southwestern alignment of the CMAGR northeast toward Interstate 40 and southwest to Interstate 10.

Western Colorado Desert Routes of Travel Designations Amendment: The Western Colorado Desert Routes of Travel Designations (WECO) is an amendment to the CDCA that was approved in 2003. The WECO designates preferred travel routes across BLM lands in the WECO Planning Area. The planning area covers approximately 475,000 acres and approximately 2,320 miles of OHV routes in parts of Imperial and San Diego counties. The WECO's planning boundary extends south and west of the CMAGR toward the Salton Sea. Following the CDCA, as amended, the BLM manages the type and level of OHV use to create an environment that promotes the health and safety of visitors and employees and alleviates conflict between nearby residents and recreational users (BLM 2002d).

Coachella Valley Multiple Species Habitat Conservation Plan: The Coachella Valley Multiple Species Habitat Conservation Plan (CVMSHCP) establishes a reserve system to protect biodiversity while facilitating development in other parts of the Coachella Valley. The CVMSHCP provides for the protection and enhancement of biological values, with emphasis on the Big Morongo, the Fringe-Toed Lizard Preserve, and the Dos Palmas ACECs. The BLM provides a

portion of the federal funding toward development and implementation of the CVMSHCP (BLM 2002c).

Regional Comprehensive Plan and Regional Transportation Plan: The Southern California Association of Governments' (SCAG's) Intergovernmental Review section, part of the Environmental Planning Division of Planning and Policy, is responsible for performing consistency reviews of regionally significant local plans, projects, and programs. The CMAGR is located within the regional planning boundary of the SCAG. Regionally significant projects are required to be consistent with SCAG's adopted regional plans and policies such as the Regional Comprehensive Plan and the Regional Transportation Plan. The criteria for projects of regional significance are outlined in California Environmental Quality Act guidelines, Sections 15125 and 15206 (SCAG 2008).

Riverside County General Plan: The CMAGR is located within both Riverside and Imperial counties. Both counties have adopted General Plans, which are described below The Riverside County General Plan covers the entire unincorporated portion of Riverside County and is augmented by 19 detailed Area Plans covering the County's territory with the exception of the undeveloped desert areas. The goal of the General Plan is to manage the overall pattern of development more effectively. The Area Plans provide a clear and more focused opportunity to enhance community identity within Riverside County and stimulate quality of life at the community level. The Eastern Riverside County Desert Area (Non-Area Plan) governs the land densities north of the Riverside/Imperial County boundary line west toward Coachella Valley and east toward Blythe, California (Riverside County 2008).

The Imperial County General Plan: The Imperial County General Plan consists of nine elements: 1) Land Use, 2) Housing, 3) Circulation and Scenic Highways, 4) Noise, 5) Seismic and Public Safety, 6) Agricultural, 7) Conservation and Open Space, 8) Geothermal and Transmission, and 9) Water. Also included in the General Plan is a land use map designating a series of land use categories; the map identifies locations and indicates the type and anticipated maximum allowable density of ultimate development within the County (Imperial County 1993).

2.3 Military Use

During World War II (WWII), shortly after the bombing of Pearl Harbor and the U.S. entry into the war, Lieutenant General Lesley J. McNair, Director of Army Ground Forces and Combat Training for the War Department, established the Desert Training Center (DTC) in southeastern California, Arizona, and Nevada to train U.S. troops who might be sent to North Africa to fight the Germans (Henley 1992). General George S. Patton, Jr., was tasked with overseeing the transformation of the desert stretching from the California- Arizona border and the Mexican border up to lower Nevada. General Patton scouted the area by plane, jeep, and horseback beginning in March 1942. The area was suitable for training because of its general lack of human habitation, established railroads and highways, and the presence of several nearby military installations.

After 19 months of training and expansion, the DTC was officially renamed "The Desert Training Center California-Arizona Maneuver Area" (DTC/C-AMA) and had grown to an area twice the

size of Maryland. The center included tank, infantry, and air units all training for desert warfare. Patton established his base of operations at Shaver's Summit (now Chiriaco Summit) at Camp Young. Troops began arriving at the center in April 1942 and endured harsh physical training that included restricted access to water, physical endurance training, and lack of sleep. Life at the DTC/C-AMA was so difficult that the officers and enlisted men came to refer to the area as "the place that God forgot." Patton commanded the DTC until July 1942, when he was placed in charge of "Operation Torch," the Allied invasion of North Africa. Patton was replaced by Major General Alvan Gillem, Jr. Twelve thousand troops were stationed at the DTC when Patton left. As WWII continued, that number grew to over 200,000 by May 1943. The need for troops around the world during WWII required that troops be trained for combat in places other than North Africa. In light of this need, the California-Arizona Maneuvers Area was closed in April 1944.

To support the mission of the DTC/C-AMA, several desert airfields were taken over and significantly improved by the Army between 1942 and 1944. One of these wartime training bases was the Blythe Army Air Base, California, which was originally constructed by the Civil Aeronautics Administration in 1940 as Intermediate Flying Field Site 21. With the development of the DTC, the little airfield west of Blythe was identified as an excellent candidate for U.S. Army use, and it was officially taken over by the Army in April 1942, under the direction of General Henry H. Arnold, Commanding General of the Army Air Forces. One month later, the first airmen deployed to the DTC, the 46th Bombardment Group, arrived in Blythe, California, where they continued the work of building base housing, bringing in utilities, and significantly improving the airfield. By September 1942, the airfield was formally designated the Blythe Army Air Base, with paved runways suitable for heavy aircraft. From the fall of 1942 to 1945, the Blythe Army Air Base supported numerous training exercises in the DTC/C-AMA, and became known for its excellent training of heavy bomber crews who went on to complete hundreds of successful bombing missions in Europe during WWII.

With the end of WWII came a reduction in the military activity in the Colorado Desert region. Civilian buildings and airports converted for use by the military during the war years returned to civilian use. Surplus military barracks were recycled for a variety of uses throughout the local communities. The primary post-war activities in the area were mining and agriculture. Agricultural practices were primarily confined to the mid- to western side of the county, but also developed in the Palo Verde Valley along the lower Colorado River and centered on the city of Blythe, California.

2.3.1 Current and Future Military Mission

As an individual range, the CMAGR serves multiple training purposes. Its land and airspace, however, have been configured principally for live-fire training with aircraft weapons in an environment that realistically simulates a tactically diverse and complex air-ground battlefield. Figure 2-2 shows the CMAGR training and support facilities.

USMC ground combat activities are conducted on the CMAGR in support of aviation training and include artillery and mortar fires and the insertion and extraction of ground combat forces.

NSW forces conduct basic individual and advanced small unit training in two ground-training areas that abut restricted airspace on the north and west perimeters of the CMAGR. These areas contain a variety of individual and small unit ranges used for USMC and Naval land combat forces. Typically, these forces are battalion sized and smaller for the USMC and NSW teams. All ground-based training on the CMAGR occurs in designated locations that are consistent with the priority needs of aviation training. As an individual range, key assets and capabilities of the CMAGR include:

- Restricted land and airspace
- Supporting special use airspace
- Varied terrain
- Authorization for live-fire training with live ordnance
- Ability to train with precision guided munitions
- Close proximity to air stations and bases

The CMAGR is, and will remain, indispensable to the DoN and USMC aviation and ground forces training into the foreseeable future. The USMC currently relies and will continue to depend on the CMAGR to support training of operational and student aircrews stationed in the local operating area. In addition to these local squadrons, training deployments by USMC, DoN, U.S. Air Force (USAF), Air National Guard, and Reserve Component units will continue to use the CMAGR on a frequent basis. The continuing need for the CMAGR is also indicated by active plans to replace the AV-8B and F/A-18 aircraft flown by USMC squadrons at the MCAS Yuma and MCAS Miramar with F-35 aircraft, which began in 2012 and will extend through 2023. Most aircraft that are used in training at the range originate from squadrons based at the MCAS Yuma and MCAS Miramar. Other regionally based squadrons that regularly use the CMAGR are stationed in California at MCAS Camp Pendleton and Naval Air Station North Island, or on detachment to training at Naval Air Facility El Centro. Aircraft also originate from Luke Air Force Base in Arizona. Aircraft that originate from other USMC and Naval air stations and USAF bases or that are launched from DoN aircraft carriers in the Pacific Ocean are also frequently flown in training missions on the CMAGR. In total, roughly 100 squadrons from throughout the nation collectively fly more than 11,500 training flights annually on the CMAGR.

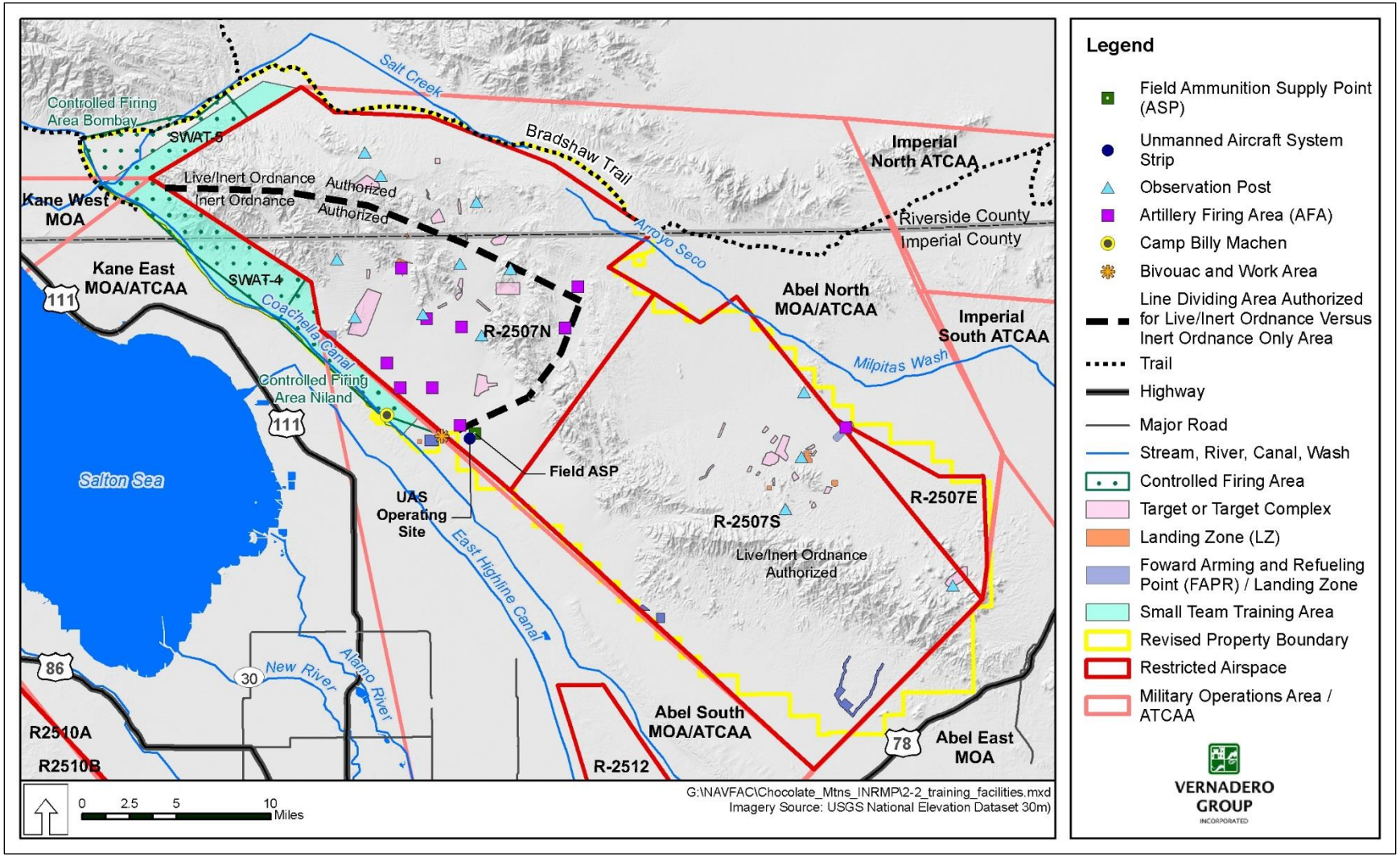


Figure 2-2. CMAGR Training and Support Facilities

Training operations flown by F-35 aircraft stationed at the MCAS Yuma are expected to occur 99 percent of the time within the BSTRC, including the CMAGR, and the Barry M. Goldwater Range (BMGR) West (DoN 2010). Further, planning has been completed to station up to eight squadrons of MV-22 aircraft at MCAS Miramar and up to two squadrons of MV-22 aircraft at MCAS Camp Pendleton. The MV-22s will replace current CH-46E aircraft and will conduct training operations on the CMAGR. Transitioning to MV-22s has already begun for some squadrons at MCAS Miramar. The decisions for basing MV-22s at MCAS Miramar and MCAS Camp Pendleton and the decisions for basing F-35s at the MCAS Yuma and MCAS Miramar demonstrate a long-term DoN commitment to these air stations and to the CMAGR and other components of the BSTRC. The CMAGR is also an important training range asset for USMC and Navy ground forces, including NSW units, due to its close proximity to the USMC ground forces and NSW units stationed in the San Diego area.

2.3.2 Military Land and Airspace Use

Training for tactical air and ground combat occurs on the CMAGR both as separate and combined arms elements. Air combat training also occurs in the military operations areas (MOAs) and air traffic control assigned air space (ATCAA) areas that are adjacent to the CMAGR and at the nearby El Centro Ranges (ECR). Twenty-five types of tactical aviation training activities currently occur on a regular basis on the CMAGR, adjacent MOAs and ATCAAs, and/or ECR to provide aircrews with the repertoire of combat skills they need (Table 2-1). Types of tactical aviation training other than those listed in Table 2-1 may also occur on an infrequent or as-needed basis. Future requirements for new types of training also will likely emerge to prepare aircrews to meet developing threats or to employ new aircraft, such as the MV-22 and F-35, and weapons systems as they come on line and mature operationally. Of the 25 air combat training activities listed in Table 2-1**,** 21 are supported on the CMAGR. Most training sorties involve more than one type of tactical aviation activity and many involve the delivery of one or more types of ordnance.

Table 2-1. Common Aviation Training Activities on the CMAGR, El Centro Ranges, and Adjacent Military Operations Areas/Air Traffic Control Assigned Air Space

Air Combat Training Activity	Abel/Kane MOAs/ATCAAs			
	R-2512 at ECR			
	R-2510A/B at ECR			
	R-2507N/S/E at CMAGR			
Aerial Delivery: aircraft release parachuting personnel, sensors, equipment, or supplies.	X		X	
Aerial Photography: develop proficiency with handheld cameras.	X			
Aerial Refueling: develop proficiency in day and night aerial refueling.	X			X
Air Combat Maneuvering: offensive and defensive air-to-air combat tactics.	X	X	X	X
Air-to-Air Gunnery: air-to-air gunnery at an airborne target.	X			
Air-to-Air Missile Firing: engaging an airborne target with an air-to-air missile.	X			
Air-to-Ground Inert Ordnance Delivery: ground attack with conventional inert ordnance at day or night or in instrument weather conditions.	X	X	X	
Air-to-Ground Live Ordnance Delivery: ground attack with conventional live ordnance at day or night or in instrument weather conditions.	X			
All-Weather Operations: missions under all weather conditions, including air-to-air intercepts started beyond visual range where weapons engagement does not depend on visual identification. No weapons are launched or fired.				X
Close Air Support: flights designed to support friendly ground forces by delivering conventional air-to-ground ordnance, as directed by a forward air controller, on enemy positions in close proximity to the supported friendly forces.	X			
Combined Strike Tactics: combined air-to-ground strike with coordination of several types of aircraft and aircraft weapons.	X			
Direct Air Support Holding: develop proficiency in the tactics of timing a supporting air-to-ground strike from a nearby holding position.				X
Fighter Intercepts: air-to-air weapons intercepts started beyond visual range where weapons engagement depends on visual identification.				X
Formation Flight: develop day or night proficiency in tactical formations and maneuvers.				X
Forward Air Control Airborne: control attack/fighter aircraft in close air support or direct air support missions.	X			
Helicopter Attack: teach the fundamentals of or develop tactical proficiency in any aspect of helicopter attack.	X			
Helicopter/MV-22 External Cargo Lifts: flights in which weights, personnel, cargo, vehicles, or aircraft are suspended from a helicopter or MV-22 and transported.	X			
Helicopter/MV-22 Forward Arming and Refueling: develop tactical proficiency in FARP operations.	X			
Helicopter/MV-22 Insertions and Extractions: develop tactical proficiency in inserting and extracting ground forces in battlefield areas.	X			

ATCAA – air traffic control assigned air space; **CMAGR** – Chocolate Mountain Aerial Gunnery Range; **ECR** – El Centro Ranges; **FARP** – Forward Arming and Refueling Point; **MOA** – military operations area

Table 2-1. Common Aviation Training Activities on the CMAGR, El Centro Ranges, and Adjacent Military Operations Areas/Air Traffic Control Assigned Air Space (cont.)

Air Combat Training Activity	Abel/Kane MOAs/ATCAAs			
	R-2512 at ECR			
	R-2510A/B at ECR			
	R-2507N/S/E at CMAGR			
Helicopter/MV-22 Night Vision Goggle Operations: day or night flying with helmet-mounted thermal imaging devices.	X	X	X	
Helicopter/MV-22 Landing Zone Operations: flights designed to develop tactical proficiency in forward landing zone operations.	X			
Laser Targeting: use of weapons systems with laser target designators to attack ground targets.	X	X		
Post Maintenance Check Flight: review and validate the conditions of an aircraft following maintenance.	X			X
Unmanned Aircraft Systems Operations: flight operations conducted using remotely controlled unmanned aircraft systems.	X			
Visual Reconnaissance: visually locating targets, assessing topography, or assessing enemy order of battle.	X			

ATCAA – air traffic control assigned air space; **CMAGR** – Chocolate Mountain Aerial Gunnery Range; **ECR** – El Centro Ranges; **FARP** – Forward Arming and Refueling Point; **MOA** – military operations area

2.3.3 Military Surface Use

An inventory of military surface use was prepared for the CMAGR's *Draft LEIS* to identify and quantify areas of the range used to support training operations (Figure 2-3). Surface use was categorized by activity and levels of physical disturbance that various activities have on the ground surface, vegetative communities, and surface drainages.

The inventory found that 99.44 percent of the range surface is used to support the military mission and only 0.56 percent, or about 2,571 acres, has no assigned military mission. Previous to the 2014 approval of the CMAGR Land Withdrawal, the area of the range north of the Bradshaw Trail land had no assigned military mission. This portion of withdrawn public land has been returned to the BLM. Only a small proportion of the range (about 5 percent) supports surface uses that cause or may cause moderate to complete levels of physical disturbances. The military surface uses listed in Table 2-2 that cause or may cause moderate-to-high to complete levels of physical disturbance include:

- Target simulations and other earthwork features
- Core weapons impact areas
- Secondary weapons impact areas
- Some ground support sites
- Camp Billy Machen and its adjacent operating areas

- Range road corridors

The areas identified in the military surface use inventory (Table 2-2) include areas that are external to either its restricted airspace or controlled firing areas and, therefore, cannot support live-fire training. However, these areas can be used for various ground-based training or range management activities such as offsite helicopter or MV-22 landings for troop insertions or extractions, cross-country navigation, path finding exercises for small infantry teams, staging sites for target maintenance, or clearance activities. These peripheral areas are also managed to uses that are compatible with the CMAGR training mission.

A road network has been established to provide access for constructing and maintaining its infrastructure, conducting range operational clearances, training, and managing natural and cultural resources. Only designated roads and trails are used. Any new routes must be preapproved by the MCAS Yuma Range Management Department. Gas Line and Niland-Blythe roads are used by commercial utility companies to access, inspect, maintain, and/or repair the gas line and overhead electric transmission lines that cross the range.

Secondary weapons impact areas are included in this list because the interior areas closest to the target are moderately to highly impacted by ordnance deliveries; however, the level of disturbance sharply decrease with increasing distance from the target such that the levels of disturbance at their outer perimeters is negligible (DoN et al. 2013). As a result, more than half the area of the secondary weapons impact areas can be estimated to exhibit less than moderate levels of disturbance (DoN et al. 2013). Thus, the proportion of the CMAGR surface that is moderately to completely disturbed by military activities is likely no more than 2 percent, although the LEIS conservatively reported it as about 5 percent.

2.3.4 Nonmilitary Surface Use and Roadless Areas

BOR maintains dikes to protect the Coachella Canal and the inactive Eagle Mountain Railroad from uncontrolled surface runoff; both the canal and inactive railroad are within the CMAGR along its western and northern boundaries. Together, these two nonmilitary surface uses encompass less than 100 acres. Three other nonmilitary surface uses cross the CMAGR, including a natural gas pipeline and two electric power transmission lines. Although these utilities are designated as avoidance areas for ordnance delivery training, the roads that were developed for constructing and servicing these utilities are also used for military transportation. These dual-purpose road corridors are therefore included in the inventory of military, rather than nonmilitary, surface uses.

Although affected by and needed to support military use, the 95 percent of the range that is roadless remains in a relatively undeveloped, unstructured, and undisturbed condition. Military purposes served by these areas include weapons delivery containment areas; non-live-fire training, support, and range access control areas; and Special Warfare Training Areas (SWATs) 4 or 5. There are 14 roadless areas (Figure 2-5) on the CMAGR that are 5,000 acres or larger. Most of these areas, including the largest area (about 139,430 acres), are classified as weapons delivery containment areas.

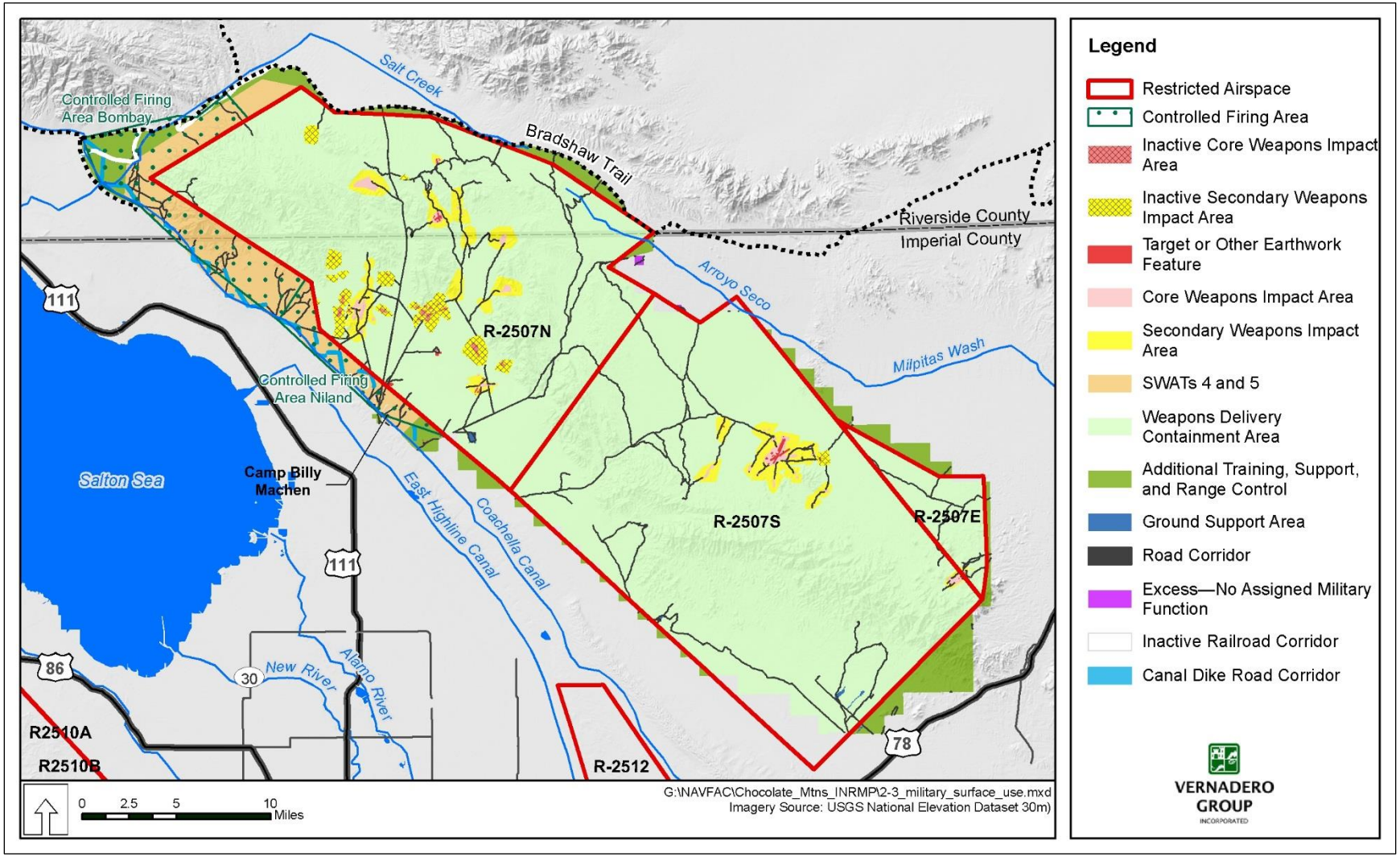


Figure 2-3. Military Surface Use on the CMAGR

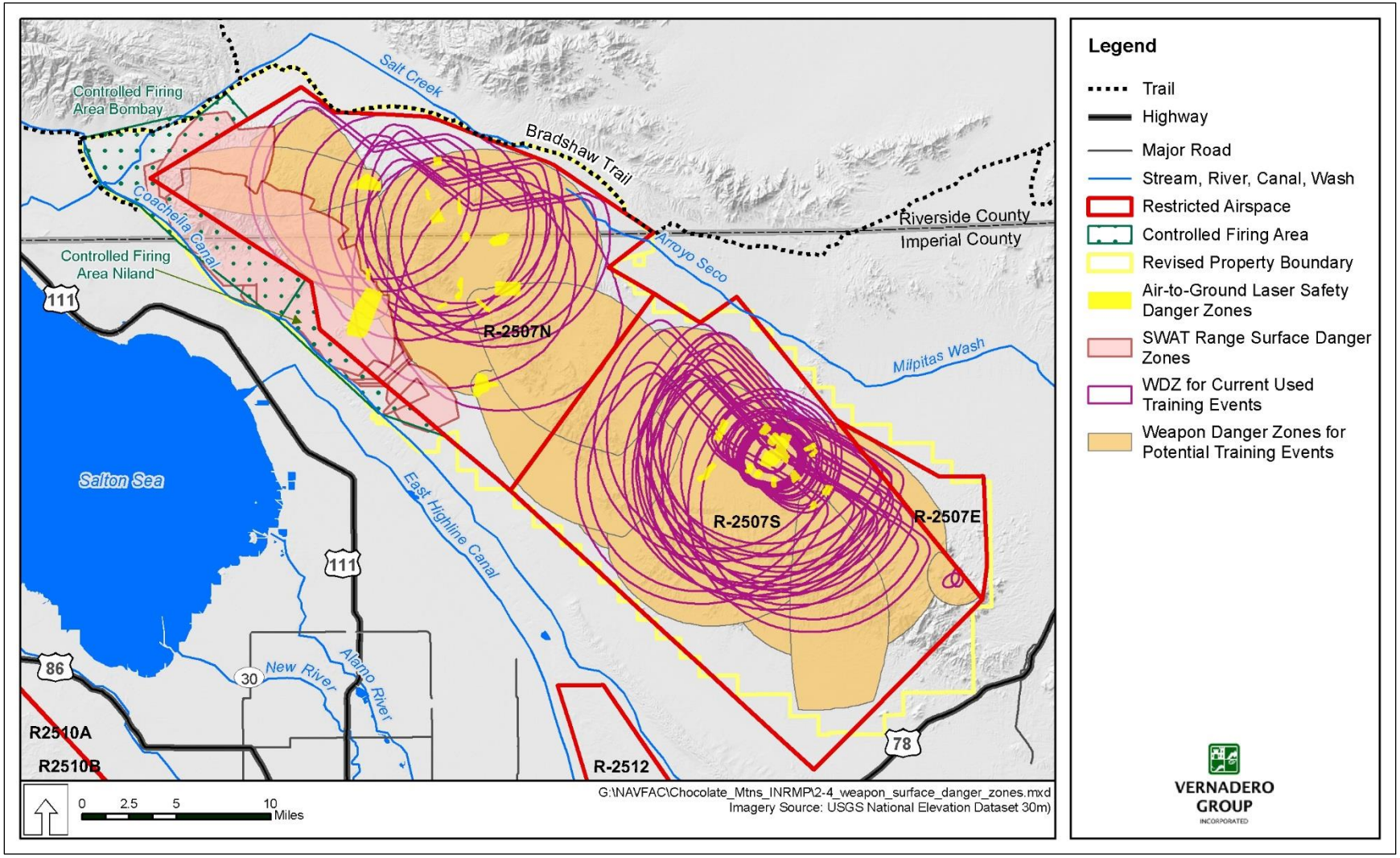


Figure 2-4. Weapon and Surface Danger Zones and Laser Safety Danger Zones on the CMAGR

Table 2-2. Military and Nonmilitary Surface Use Areas on the CMAGR

	Surface Use Area	Associated Surface Disturbance	Pre-NDAA Total Area in Acres (% CMAGR)	Post-NDAA Total Area in Acres (% CMAGR)
Military Surface Use				
1	Target Simulations and Other Earthwork Features	Physical disturbance of entire ground surface, extensive alteration of surface drainage, and complete removal of native vegetation community. Periodic regrading of target simulations/earthworks keeps vegetation communities from reestablishing and disrupting surface drainage.	200 (0.04)	200 (0.04)
2	Core Weapons Impact Area	Disturbance of ground surface at or near some targets is extensive to complete where high-yield, high-explosive ordnance detonations over time result in concentrated and coalescing craters that may reach depths in excess of 10 feet. Vegetative communities are eliminated near targets. Natural surface drainage patterns can be substantially altered. In areas farther from targets where impact craters densities are lower and do not overlap, ground surfaces between craters and vegetative communities are still subject to ordnance blast and shrapnel effects and ejecta from craters. Use over time is likely to subject nearly any ground location in the core weapons impact area to ordnance delivery effects.	2,309 (0.5)	2,309 (0.5)
3	Secondary Weapons Impact Area	Clusters of high-yield, high-explosive impact craters cause concentrated ground disturbance in some localized areas, especially at and near individual targets, but impact craters numbers and densities generally decrease sharply with increasing distance from targets. Physical disturbance of the ground surface also generally decreases sharply with distance from individual targets, and the natural processes shaping ground/soil surfaces, surface drainages, and vegetative communities become increasingly predominant. Physical disturbance in the regions of this area closest to the target is moderate to complete; disturbance in the outer region decreases from moderate to negligible with increasing distance from the target.	19,391 (4.21)	19,391 (4.24)

BLM – Bureau of Land Management; **CMAGR** –Chocolate Mountain Aerial Gunnery Range; **FARP** – Forward Arming and Refueling Point; **NDAA** – National Defense Authorization Act; **OHV** – off-highway vehicle; **SEAL** – Sea, Air and Land; **SWAT** – Special Warfare Training Area

Table 2-2. Military and Nonmilitary Surface Use Areas on the CMAGR (cont.)

	Surface Use Area	Associated Surface Disturbance	Pre-NDAA Total Area in Acres (% CMAGR)	Post-NDAA Total Area in Acres (% CMAGR)
4	Weapons Delivery Containment Area	Some scattered ordnance impacts craters but, in the context of the broader landscape disturbances to ground surfaces and vegetative and wildlife communities, these impacts are negligible. Natural processes shaping ground/soil surfaces, surface drainages, and vegetative and wildlife communities function without discernible constraint from ordnance delivery.	368,607 (80.07)	368,607 (80.52)
5	Ground Support Sites (21 individual sites including FARPs, Firebase Burt/Staging Area, Siphon 8 Bivouac and Work Area, Field Alcohol Screening Program, unmanned aircraft system airstrip, and additional training sites)	Moderate to complete levels of disturbance to ground surfaces, surface drainages, and vegetative communities. Disturbances in FARPs, Firebase Burt/Staging Area, and additional training sites result in moderate to high levels of disturbances in areas of concentrated and repeated use by vehicles, troop bivouacs, aircraft landings and takeoffs, aircraft refueling and rearming, and other ground unit work areas such as communications or air control sites. Construction/grading of the Siphon 8 Bivouac and Work Area, Field Alcohol Screening Program, and the unmanned aircraft system airstrip required complete reshaping of the existing ground surface; however, the airstrip and associated ground troop bivouac and work areas are located within a larger inactive and historic rock quarry site in which the ground surfaces, surface drainages, and vegetative communities had been previously and completely altered from the undisturbed natural condition.	429 (0.09)	429 (0.09)
6	Camp Billy Machen and Associated Static Ranges	High to complete levels of disturbance to ground surfaces, surface drainages, and vegetative communities as a result of the construction and use of the Camp Billy Machen and associated static ranges.	134 (0.03)	134 (0.03)
7	SWATs 4 and 5	Negligible to low levels of disturbance to ground surfaces, surface drainages, and vegetative communities over most of the SWAT live-fire training area. Moderate to high levels of disturbance to ground surfaces, surface drainages, and vegetative communities in some small and dispersed areas (individually less than an acre) where concentrated or repeated use by Navy SEALs has occurred.	31,593 (6.86)	31,593 (6.90)

BLM – Bureau of Land Management; **CMAGR** –Chocolate Mountain Aerial Gunnery Range; **FARP** – Forward Arming and Refueling Point; **NDAA** – National Defense Authorization Act; **OHV** – off-highway vehicle; **SEAL** – Sea, Air and Land; **SWAT** – Special Warfare Training Area

Table 2-2. Military and Nonmilitary Surface Use Areas on the CMAGR (cont.)

	Surface Use Area	Associated Surface Disturbance	Pre-NDAA Total Area in Acres (% CMAGR)	Post-NDAA Total Area in Acres (% CMAGR)
8	Additional Training, Support, and Range Access Control Areas	Negligible levels of disturbance to ground surfaces, surface drainages, and vegetative communities over most of areas as a result of military training and range support activities. Low to moderate levels of disturbance in some dispersed perimeter areas near public use roads outside of the range likely due to trespass OHV use by nonmilitary users.	31,490 (6.84)	31,490 (6.88)
9	Range Road Corridors (427 miles of road segments in aggregate with a standardized corridor width of 15 feet, excludes road segments that traverse target simulations or core weapons impact areas, Lines 1 and 2)	High to complete levels of disturbance to ground surfaces, surface drainages, and vegetative communities within road corridors. Corridors vary in width as they result from lightly used, single-lane tracks to frequently used graded roads. Area calculations are based on a standard corridor width of 15 feet to represent an average disturbance and influence zone associated with road maintenance and use.	740 (0.16)	740 (0.16)
10	**Total Military Surface Use (Sum of Lines 1 - 9)**		**454,893 (99.99)**	**454,893 (>99.99)**
Nonmilitary Surface Use				
11	Excess Area (Includes 2,000 acres of land to the north of the Bradshaw Trail reverted to the BLM. Since this land had no assigned military function, there will be no net loss of military training aboard CMAGR.)	Negligible levels of disturbance to ground surfaces, surface drainages, and vegetative communities over most of areas; low to moderate levels of disturbance in some small and dispersed areas likely due to nonmilitary activities, including OHV use.	5,367 (1.17)	2,778 (0.61)
12	Inactive Railroad Corridor (9.28 miles of corridor with a width of 40 feet)	Complete levels of disturbance to ground surfaces, surface drainages, and vegetative communities within the railroad corridor.	44 (<0.01)	44 <0.01

BLM – Bureau of Land Management; **CMAGR** –Chocolate Mountain Aerial Gunnery Range; **FARP** – Forward Arming and Refueling Point; **NDAA** – National Defense Authorization Act; **OHV** – off-highway vehicle; **SEAL** – Sea, Air and Land; **SWAT** – Special Warfare Training Area

Table 2-2. Military and Nonmilitary Surface Use Areas on the CMAGR (cont.)

	Surface Use Area	Associated Surface Disturbance	Pre-NDAA Total Area in Acres (% CMAGR)	Post-NDAA Total Area in Acres (% CMAGR)
13	Canal Dike Corridors (27 miles of aggregate corridor with a width of 15 feet)	Complete levels of disturbance to ground surfaces, surface drainages, and vegetative communities within these graded canal dike corridors.	45 (<0.01)	45 <0.01
14	**Total Nonmilitary Surface Use (Sum of Lines 11 and 15)**		**5,456 (.01)**	**2,867 (<0.01)**
15	**Total Military and Nonmilitary Surface Use (Sum of Lines 10 and 16)**		**460,349 (100)**	**457,760 (100)**

BLM – Bureau of Land Management; **CMAGR** –Chocolate Mountain Aerial Gunnery Range; **FARP** – Forward Arming and Refueling Point; **NDAA** – National Defense Authorization Act; **OHV** – off-highway vehicle; **SEAL** – Sea, Air and Land; **SWAT** – Special Warfare Training Area

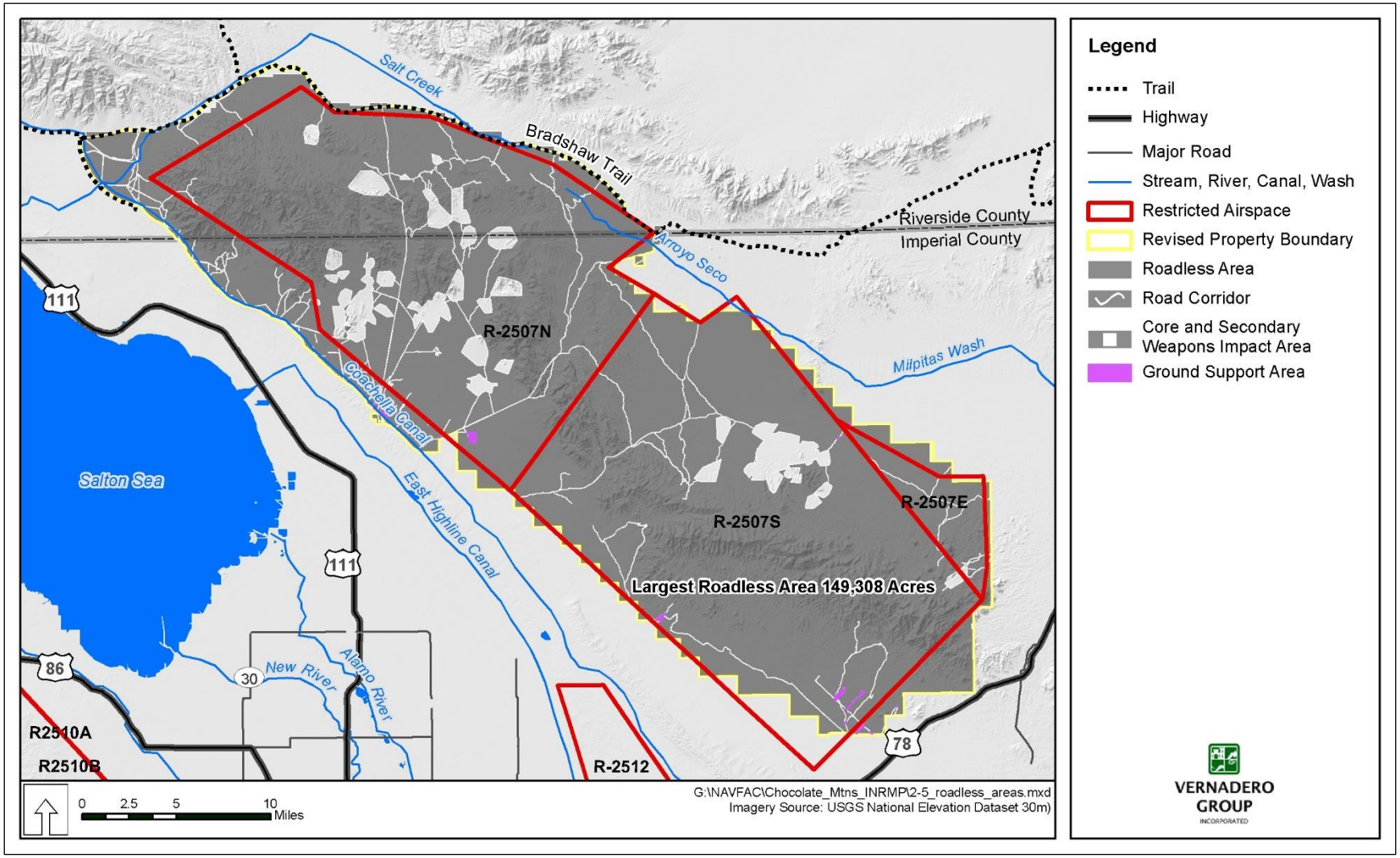


Figure 2-5. Roadless Areas on the CMAGR

Table 2-3. Numbers of Roadless Areas on the CMAGR

Roadless Area Category*	Number of Roadless Areas	Comments
Less than 1,000 Acres	241	
1,000 Acres to 5,000 Acres	15	
5,001 Acres to 10,000 Acres	7	
10,001 Acres to 20,000 Acres	2	Roadless areas of 15,954 and 17,690 acres
20,001 Acres to 40,000 Acres	3	Roadless areas of 22,752, 24,538, and 36,160 acres
40,001 Acres to 100,000 Acres	1	Roadless area of 73,814 acres
Greater than 100,001 Acres	1	Largest roadless area is 139,430 acres

* Figure 2-5 shows roadless areas on the CMAGR.

2.4 Public Access and Safety

Public access is not permitted within the CMAGR, therefore, there are no recreational opportunities within the range's boundaries. Public access to its road network is prohibited at all times because of live ordnance hazards and to prevent interruption of military training. Niland-Blythe Road and Gas Line Road receive periodic commercial use to service transmission and gas pipe lines that cross the range through R-2507N. Commercial entry to the CMAGR to service these utilities is only on an as-authorized basis.

2.4.1 Unauthorized Access

A series of signs warning unauthorized personnel not to enter the Range Training Area are posted along the range perimeter to protect the general public from intentional or accidental entry onto the CMAGR. The signs are placed so an individual standing anywhere along the range perimeter would be able to see a sign when looking to the left or right. The warnings are written in both English and Spanish. The MCAS Yuma Range Maintenance is responsible for keeping warning signs up to date.

The MCAS Yuma and Imperial Valley Sheriff's Office periodically conduct physical patrols of the range boundaries to remove trespassers, as do local and federal law enforcement officials. The MCAS Yuma maintains access control gates at the entry and exit points to the CMAGR. In addition, the MCAS Yuma conducts public outreach programs to raise awareness of the military training mission and associated hazards.

Unauthorized personnel are not allowed on the CMAGR at any time, but there are occasions where trespassers or "scrappers" access the range despite patrols, arrests, verbal notices, and warning signs. Scrappers enter the CMAGR without authorization for the purpose of removing salvageable materials such as aluminum, brass, and copper. Scrappers have been known to be armed and sometimes present a danger to anyone who approach them. Under StaO 5532, requirements have been established regarding the use of force by non-law-enforcement personnel. The standard procedure is to immediately notify Range Control with a complete

description of the trespassers and their location. In accordance with StaO 3710.6I directives, any live-fire exercises are terminated until the trespassers are removed from the range. Unauthorized personnel and vehicles found within range boundaries or spotted by either an airborne crew or authorized person is reason to abort ordnance training operations in that area, thereby interfering with training activities. In calendar year 2015, there were approximately 25 recorded incidences of unauthorized users penetrating the CMAGR boundary, resulting in the loss of 20 hours of training time

2.5 Renewable Energy Impact on Regional Land Use

The lands surrounding the CMAGR have been identified by various federal, state and local agencies as highly suitable for renewable and natural resource development owing to the combination of government policies, acts, and plans; remoteness of the region; availability of water; existing infrastructures; and geographical expanse of open space.

The eastern boundary of the range is bordered by desert tortoise critical habitat, and the BLM's Chuckwalla ACEC and National Conservation Lands under the recently approved Desert Renewable Energy Conservation Plan (DRECP). On a national scale, this National Conservation Land designation is intended to provide BLM's highest level of protection for its most ecologically valuable lands. The western boundary of the range lies proximate to the Algodones Dunes Wilderness Area, but remaining portions of this area are multiple use lands with public recreation and renewable energy priorities.

The following energy policies, plans, and initiatives may influence energy development within the CMAGR ROI.

Federal Land Transaction Facilitation Act (FLTFA): The FLTFA, also referred to as the Baca Act, was signed into law on 25 July 2000 (BLM 2000). The FLTFA directs revenues generated from the sale or disposal of certain public lands to an acquisition account. Four agencies, including the BLM, U.S. Forest Service, National Park Service, and USFWS, can use the acquisition account to purchase lands within federally designated areas from willing sellers. The account can also be used by the BLM to place public lands for sale. The agencies entered into a national MOU in May 2003 for land purchases governed under the FLTFA. In California, the four regional offices of the agencies entered into a MOU, under a Statewide Interagency Implementation Agreement (BLM 2005).

West Chocolate Mountains Renewable Energy Evaluation Area (REEA): On 14 December 2012, the BLM released the REEA Final EIS, which is proposed to amend the CDCA. The REEA evaluates the potential environmental impacts of allocating federal mineral estate (not including acquired lands) for geothermal energy leasing, testing, and development of geothermal power generation facilities on public lands near the CMAGR. The REEA was also prepared to evaluate the potential environmental impacts of allocating the BLM-administered federal surface estate in the same planning area for testing and development of solar and wind power generation facilities (BLM 2012b). The REEA prohibits/discourages wind and other technologies by imposing height restrictions to avoid conflicts with the military mission on adjoining lands. The BLM's DRECP also precluded wind and solar development south of the

range in the Cargo Muchacho District because on conflicts with longstanding and ongoing military aerial training operations.

The Renewable Energy Transmission Initiative: California has adopted energy policies that require substantial increases in the generation of electricity from renewable resources. This statewide initiative assists the state in identifying the transmission projects needed to accommodate renewable energy goals, support future energy policy, and facilitate transmission corridor designation and transmission and generation siting and permitting (California Energy Commission 2010).

Renewable Energy at the County Level: Riverside and Imperial counties have recently adopted or are in the process of updating land use ordinances that provide for the physical land use planning criteria, development standards, and regulations for potential development pertaining to alternative energy within the CMAGR ROI (DoN et al. 2013). The County's recent renewable energy amendment to the General Plan significantly scaled back the size and amount of renewable energy development proposed on non-federal lands under the draft DRECP, and largely restricted such development to agricultural lands and closely adjoining areas distant from the CMAGR.

Renewable Energy Projects: Two major renewable energy nodes are adjacent to the CMAGR. The first node is adjacent to the northwest of the CMAGR boundary, within Riverside County and west of the Little Chuckwalla Mountains, where one wind project application for a is pending, but currently inactive, and one application was recently withdrawn, in part because of DRECP restrictions. The proposed projects in this area appear to be sited entirely on BLM-managed land outside the CMAGR. The second node is east of the southeastern section of the CMAGR, near New Gold's Mesquite Mine and east of State Route 78. This node is within the BLM California Desert District's utility corridor. Five wind energy applications and one solar energy application have been filed in this area, but may not be feasible under the DRECP land use plan amendment. These projects appear to be sited primarily on BLM- and BOR-managed lands, with some sited on privately held lands (BLM 2011a). Effects to military training will be evaluated for all future proposed renewable energy projects adjacent to the CMAGR.

2.6 Recreation Influence on Regional Land Use

Public access is not permitted within the CMAGR. Therefore, there are no recreational opportunities or other recreational uses of the natural resources within the boundaries.

Recreational uses such as hiking, camping, bird watching, hunting, rock hounding, and other recreational activities are permitted within these categories off the Range. These uses are primarily dispersed activities and are low- to moderate-level uses. Adjacent areas of public lands also are used to a moderate level by hikers. Within the BLM's California Desert District, along the northern section of the CMAGR outside the range, special recreation permits are required; these allow specified recreational uses of the public lands and related waters. They are issued as a means to manage visitor use, protect natural and cultural resources, and provide a mechanism to accommodate commercial recreational uses. These permits are authorized by the Land Water Conservation Fund Act. Five types of permits are required: 1)

commercial, 2) competitive, 3) vending, 4) individual or group use in special areas, and 5) organized group activity and events (BLM 2011b). Fourteen-day camping limits apply on public land.

The Bradshaw Trail is also in this area and is used by recreational OHV users (BLM 2012a). The BLM also grants permits for land use or special recreation along the trail and allows primitive vehicular camping within 300 feet of the trail except in designated wilderness areas. Seven CDCA wilderness areas are located along and in the vicinity of the Bradshaw Trail, including Big Maria Mountains, Chuckwalla Mountains, Little Chuckwalla Mountains, Orocopia Mountains, Palen-McCoy, Rice Valley, and Riverside Mountains. These wilderness areas are closed to all motorized and mechanical vehicles, including bicycles (BLM 2011b).

The BLM lands to the south of the CMAGR are popular areas for motorized recreational activity. Recreational OHV use in this area is moderate to high and is generally associated with the ISDRA, where it has the greatest impact. The Algodones and Imperial sand dunes systems are located along this area. Mechanized or motorized vehicles are not permitted in the Algodones wilderness area; however, the BLM does grant permits within the ISDRA for all street-legal vehicles used for transportation to recreational sites. This permit is required at all times while in the fee area. Other permits within the ISDRA include commercial, competitive, vending, individual or group use in special areas, and organized group activity and event use. These permits follow the same guidance as the permits within the California Desert District.

Table 2-4 outlines recreational resources within the ROI of the CMAGR.

Table 2-4. Recreation Resources Surrounding the CMAGR

Recreation Area	Primary Access	Facilities	Primary Season
Anza-Borrego Desert State Park	State Route 78 and State Route 86	500 miles of OHV roads, 12 wilderness areas with hiking and biking trails, and 7 areas of historic and cultural interest	October-May
Imperial Sand Dunes	Interstate 8 and State Route 78	160,000 acres interspersed with OHV and campground facilities that include Buttercup, Gecko Road, Glamis, Gordons Well/ Dunebuggy Flats, Mammoth Wash, and Ogilby, Osborne, along both sides of the Coachella Canal and Ted Kipf Road	October-May
Heber Dunes State Vehicular Recreation Area	Interstate 8	343 acres offering OHV facilities, camping, hiking and picnicking	October-May
Ocotillo Wells State Vehicular Recreation Area	State Route 78	80,000 acres offering OHV facilities, hiking and biking trails, and bird watching	October-May
Salton Sea State Recreational Area	State Route 111	Fishing, birding, camping, windsurfing, boating, hiking, picnicking, and hunting	October-May
Imperial Wildlife Area	State Route 111	Wister Unit, Finney-Ramer Unit, and Hazard Unit; bird blinds, hunting, camping, hiking, and picnicking	12 months

OHV – off-highway vehicle
Source: BLM 2015, California Department of Parks and Recreation 2015.

3.0 EXISTING ENVIRONMENT

This chapter describes existing physical and biotic environments and the status of their condition on the CMAGR.

3.1 Physical Environments

3.1.1 Earth Resources

For the purposes of this discussion, Earth Resources include regional geologic setting, geology and soils of the CMAGR.

Regional Geologic Setting

The CMAGR is in the Colorado Desert and Salton Sea geomorphic provinces of California, which are situated in the southwestern portion of the Basin and Range physiographic province. The Basin and Range province (Fenneman 1931) is characterized by generally steep, subparallel, discontinuous mountain ranges that trend northwest to southeast separated by broad, gently sloping to nearly flat, deep alluvial basins. The CMAGR is characterized by the rugged Chocolate Mountains, a range that rises abruptly from broad alluvium-filled desert basins. The Chocolate Mountains stretch more than 60 miles in a northwest to southeast direction and are east of the Salton Sea, south and west of the Chuckwalla Mountains, and southeast of the Orocopia Mountains. The Chocolate Mountains are largely tilted fault blocks composed of the Southern California batholith and Orocopia Schist of Mesozoic age (about 65 to 250 million years ago), overlain by thrust fragments of an older Precambrian metamorphic complex, with minor volcanic and intrusive rocks from the Tertiary period (about 3 to 65 million years ago). Pliocene (about 3 to 5 million years ago) and Pleistocene (about 2 to 3 million years ago) marine and nonmarine sedimentary deposits and Holocene (10,000 years ago to the present day) alluvium occur within the adjacent basins to the east and west.

The Chocolate Mountains occur along the eastern margin of the Imperial Valley and Salton Sea. The Imperial Valley and Salton Sea are in the Salton Trough, a complex pull-apart rift valley, which was formed by the right-lateral motion of the San Andreas transform fault system. That fault system runs along the western boundary of the CMAGR, and progresses northwestwardly along the spreading ridge complex of the Gulf of California segment of the Eastern Pacific Rise (Alles 2007). The Salton Trough, an extension of the Gulf of California, is separated from the Gulf of California by the Colorado River delta. The Salton Trough is a Neogene age (23 million years ago to present) basin. This basin has been filled with post-Oligocene interbedded marine and freshwater sediments, which is estimated at over 4 miles thick in some places (Eiders 1979a, b). The great thickness of these sediments demonstrates that considerable sinking of the basin floor has occurred as the sediments accumulated during the past 23 million years.

Late Pleistocene and possibly early Holocene sediments were deposited in ancient Lake Cahuilla. Lake Cahuilla, which occupied the area of the present-day Salton Sea, was a fresh-water lake that received inflow from the Colorado River and runoff from the local mountains. A change in course of the Colorado River eliminated most of the inflow to Lake Cahuilla, allowing it to evaporate.

Present-day (Holocene) surficial sediments range from clayey and silty alluvium near the Salton Sea, to alluvial and colluvial fans along the base of the Chocolate Mountains. Wind-blown (eolian) fine sands in some adjacent valleys form spectacular dunes like the Sand Hills, which occur along the southwest corner of the CMAGR. Eolian sand dunes are formed by strong desert winds that transport sand downwind until they form sheets and dunes.

Geology

The Chocolate Mountains within the CMAGR are composed of Proterozoic gneisses and associated rocks that were thrust over the Orocopia schist and subsequently intruded by at least five different granitic plutons (Norris and Webb 1990). The oldest granitic plutons are early Triassic (about 235 million years old) but most are of Mesozoic age. The Proterozoic (about 0.5 to 2.5 billion years ago) gneisses, the Orocopia schist, and the thrust fault have all been intruded by some of the youngest (23 million years) granitic intrusions in California (Norris and Webb 1990). Volcanic rocks of similar Oligocene age (about 23 to 34 million years ago) are widely distributed in the Chocolate Mountains. Miocene age (about 5 to 23 million years ago) fanglomerates, with interbedded basaltic flows, overlie these older rocks and are overlain by Miocene-Pliocene age marine, lagoonal, and nonmarine deposits of the Bouse Formation (Norris and Webb 1990). Figure 3-1 illustrates a geologic overview of the CMAGR.

Late Pliocene, Pleistocene, and Holocene alluvial deposits overlie most of the older formations in the Chocolate Mountains and form dissected piedmont slopes around the range (Norris and Webb 1990). These alluvial fan and terrace deposits have been informally designated as the older, intermediate, and younger alluvium based on their stratigraphic relationships (Dillon 1975). The older alluvium consists of poorly consolidated deposits of sand, silt, and breccia that overlie the Chocolate Mountains. Conglomerate and other rocks and forms dissected aprons and high-standing terraces. The surfaces of these fans and terraces usually have a well-developed coat of desert pavement and desert varnish. The intermediate alluvium overlies the older alluvium and consists of locally derived unconsolidated conglomerate, breccia, and sand that form dissected fans, low terraces, and abandoned channel features. The surfaces of the intermediate alluvium have poorly developed desert pavement and varnish. The younger alluvium consists of sands and gravels occurring as channel fill in the present-day washes, as sheet wash deposits on the alluvial plains, and as wind-blown sands of the Sand Hills that overlie the intermediate alluvium (Dillon 1975). The unconformable relationships between the various alluvial deposits suggest that the base level of erosion has been intermittently lowered by continued subsidence and rifting beneath the Imperial Valley.

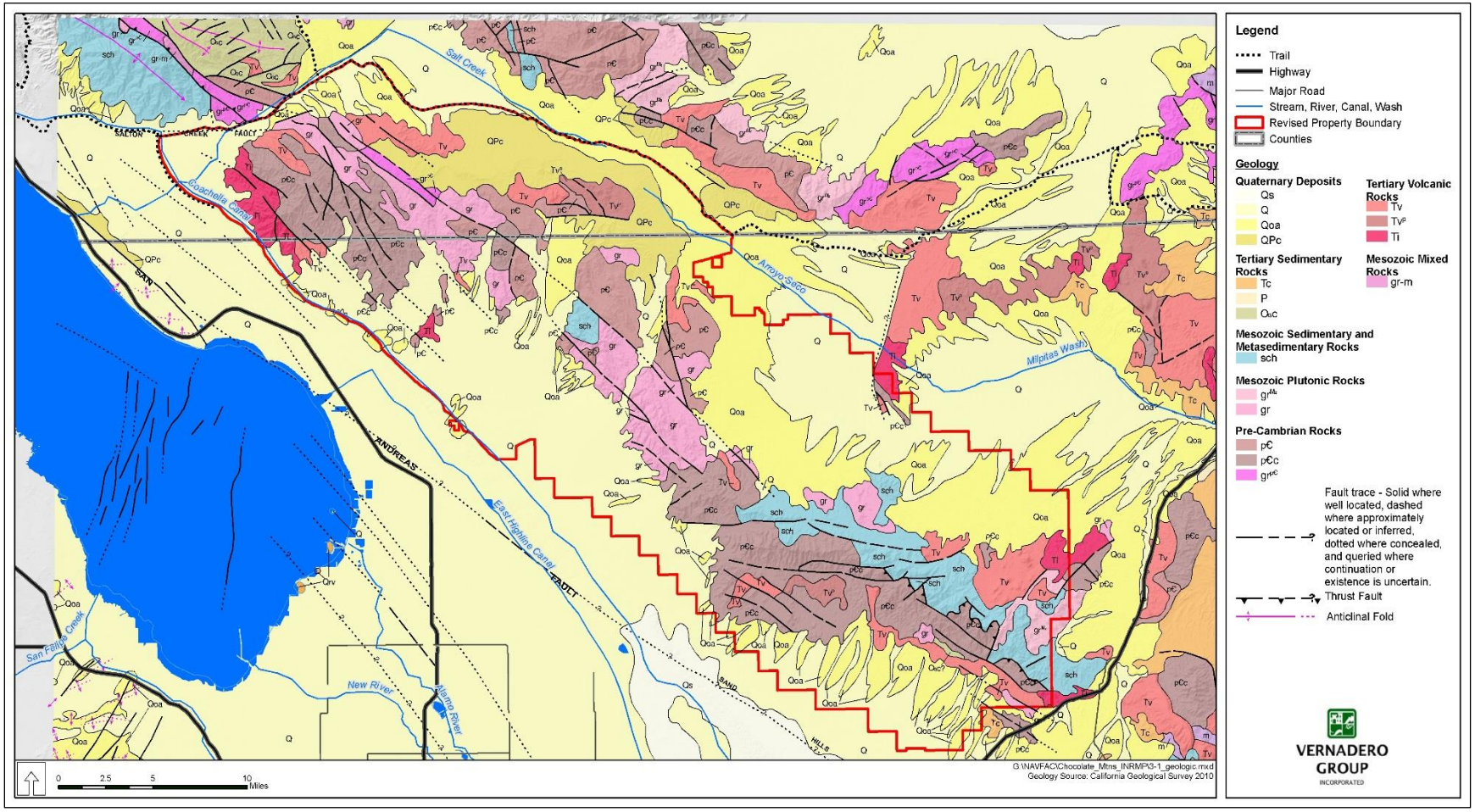


Figure 3-1. Geologic Map of the CMAGR

Soils

The Natural Resources Conservation Service (NRCS) has identified 20 soil series and 7 soil associations (i.e., groups of soil series) within the CMAGR. These soils are described in the State Soil Geographic Database (STATSGO2) developed by the NRCS (2011). The soil associations are shown on Figure 3-2 and summarized in Table 3-1. The Tecopa-Rock Outcrop-Lithic Torriorthents and the Upspring-Sparkhule-Rock Outcrop soil associations include rock outcrops and very shallow mountain soils formed in residuum and colluvium. The Vaiva-Rock Outcrop-Laposa soil association includes hill pediment and fan complex soils on foothills, pediments, and alluvial fans. The Rillito-Gunsight soil association consists of very deep soils on dissected older fans, soils on ancient fans with preserved surfaces, and young to ancient fan soil complexes. The Myoma-Carsitas-Carrizo, Vaiva-Quilotosa-Hyder-Cipriano-Cherioni, and Cajon-Bitterwater-Bitter-Badland soil associations include the following: active fan and wash soils, young fan soil complexes, and fan, lakebed, and badland soil complexes. All soils on the CMAGR are well drained to excessively well drained and primarily consist of sandy and rocky loams derived from igneous and metamorphic rocks.

Table 3-1. CMAGR Soil Associations

Soil Association	Soil Occurrence	Erosion Hazard	
		Water	Wind
Tecopa-Rock Outcrop-Lithic Torriorthents	Mountain soils found on mountain slopes and areas with rock outcrop	Slight	Moderate
Upspring-Sparkhule-Rock Outcrop			
Vaiva-Rock Outcrop-Quilotosa-Laposa	Hill pediment and fan complex soils found on foothills, alluvial fans, and pediments	Slight to moderate	Moderate to high
Rillito-Gunsight	Old alluvial fan soils found on dissected older alluvial fans, in valleys, and on pediments	High to extremely high	High to very high
Myoma-Carsitas-Carrizo	Young alluvial fan and wash soils found in mountain washes, on pediments, and on alluvial fans	Slight to moderate	Moderate to high
Vaiva-Quilotosa-Hyder-Cipriano-Cherioni			
Cajon-Bitterwater-Bitter-Badland			

Source: NRCS 2011

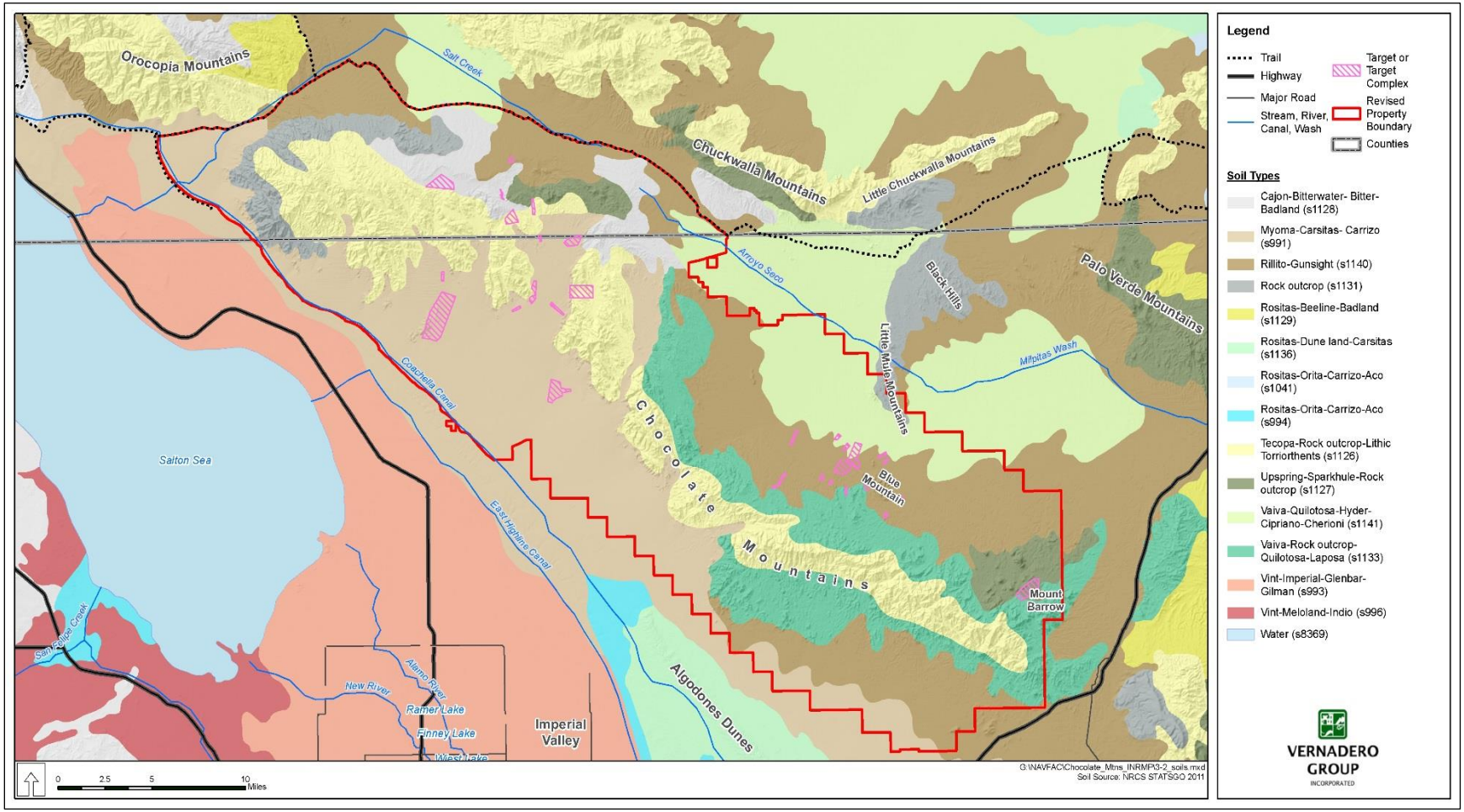


Figure 3-2. Soil Map of the CMAGR

3.1.2 Climate

The CMAGR is in the Salton Sea Air Basin, which includes all of Imperial County and the southwest third of Riverside County. The climate of the CMAGR is desert, with low humidity, high summer temperatures, and moderate winter temperatures.

Data from the Western Regional Climate Center are available for Eagle Mountain, California, which is to the west of the CMAGR near Joshua Tree National Park. Data from this location indicate that July is the hottest month, with an average maximum temperature of 104.9 degrees Fahrenheit (°F) (40.5 degrees Celsius [°C]). January is the month with the lowest average maximum temperature, 64.4°F (18°C). July has the highest average minimum temperature, 82.6°F (28.1°C). The month with the lowest average minimum temperature is January at 44.3°F (6.8°C) (DoN 2010; Western Regional Climate Center 2011).

Average precipitation measured at the Eagle Mountain meteorological station is 3.67 inches per year. The driest months are from April through June. August is the wettest month due to the influence of the summer monsoon rain pattern (DoN 2010).

3.1.3 Water Resources

Water resources are defined as sources of water available for use by humans, flora, or fauna, and include surface water, groundwater, near-shore waters, and wetlands. Surface water resources include stormwater, lakes, streams, rivers, and springs. Groundwater is defined as any source of water beneath the ground surface. Surface water and groundwater may be used for potable water, agricultural irrigation, industrial, and recreational purposes.

Water Resources Setting

The CMAGR is within the Salton Sea Transboundary and Imperial Reservoir watersheds. Surface water is extremely scarce on the CMAGR, however, and there are no naturally occurring perennial surface water features on the range (Figure 3-3). Within the CMAGR, the Salton Sea Transboundary watershed is composed of portions of four local watersheds arranged from northwest to southeast. They are the Salt Creek, Imperial Valley-Frontal Salton Sea, Alamo River, and Algodones Dunes-Chocolate Mountain watersheds. Ephemeral surface water drainages within these CMAGR watersheds flow seasonally and discharge to the Salton Sea. The Imperial Reservoir watershed within the CMAGR consists of the Arroyo Seco-Upper Milpitas Wash and Lower Milpitas Wash. Ephemeral surface-water drainages within these CMAGR watersheds flow seasonally and discharge to the Colorado River. Perennial surface waters are present outside the CMAGR and include the Salton Sea, New River, Alamo River, and Colorado River. The Salton Sea, New River, and Alamo River are largely sustained by irrigation return flows (DoN et al. 2013).

Surface Water

Surface water on the CMAGR is derived from infrequent rainfall events that produce localized flash-flooding and temporary surface water runoff, especially during thunderstorms in the monsoon seasons (Figure 3-3). Rainfall averages less than 5 inches per year, and the pan

evaporation rate is 100 inches per year, resulting in a net water loss of up to 95 inches (DoN et al. 2013). The combination of low precipitation and high evaporation prevents surface water from infiltrating deeply into CMAGR soils. Therefore, for most of the year, the desert washes on the CMAGR are dry. During heavy rainstorms, these washes drain surface water runoff from the surrounding landscape. This runoff can be captured in natural catchments such as tinajas (natural bedrock depressions), sand tanks, charcos (mud holes), and playa lakes. Natural springs or seeps are found in some locations on the CMAGR; however, for most of the year they are dry. Groundwater discharges from bedrock joints and fractures within the Chocolate Mountains also are ephemeral and short lived, occurring only after a rainfall event.

Surface water drainages are divided by the Chocolate Mountains. On the western and some of the eastern slopes, runoff drains toward the Salton Sea (Figure 3-3). Runoff from the east slope of the northern Chocolate Mountains drains to Salt Creek Wash which, in turn, drains to the Salton Sea. Runoff from the east slope of the central portion of the Chocolate Mountains drains to the Salton Sea by way of several mountain passes, the largest of which is Iris Wash. Runoff from the east slope of the south portion of the Chocolate Mountains drains northeastward into the Arroyo Seco and Milpitas washes and then southeastward to the Colorado River.

Artificial tanks, wildlife water sources (guzzlers) and tinajas are the only open water sources within the CMAGR available to wildlife. The artificial water sources have largely been constructed by Desert Wildlife Unlimited in cooperation with the CDFW, USFWS, Navy, and USMC and are designed to collect rainwater using concrete basins and/or natural topography to support on-range wildlife populations. Historically, the CDFW managed 26 existing guzzlers within the CMAGR that provide supplemental source of water for desert bighorn sheep and mule deer in the Chocolate Mountains (BLM 2009). In 2009, the USMC, BLM, USFWS, and CDFW approved the installation of eight additional guzzlers; all have been completed (BLM 2009). The storage capacity of the tanks and guzzlers ranges from 1,000 to 24,000 gallons. Water can be retained in these systems for several months to more than one year, depending on weather and wildlife use. The tinajas are ephemeral pools that develop after seasonal storm events in narrow canyons where depressions in exposed bedrock collect and hold rainfall. Within the CMAGR, Tortuga Springs is the only aquifer-fed natural spring; however, this spring has been reported as dry since 1976 (Lesicka 1990). Beal Well and Salvation Well were powered by windmills that are no longer operational or maintained.

Perennial surface water is present in the Coachella Canal, along the western range boundary. Along the length of the CMAGR boundary, portions of the Coachella Canal are lined with concrete to minimize water losses. The water in the canal is kept separate from local stormwater runoff by a series of siphons that allow the canal to flow beneath stormwater channels. Stormwater is directed toward the siphons by a series of low earthen dikes on the uphill side of the canal. Water in the Coachella Canal is derived from the Colorado River and is diverted at the Imperial Dam, approximately 20 miles upstream from Yuma, Arizona.

Beneficial uses of surface water within the region are largely associated with irrigated agriculture, mining, geothermal energy production, and recreational use (primarily the Salton Sea). Agricultural use is the predominant beneficial use of water in the region. Surface waters in

the region also provide habitat for fish and wildlife. Most of the surface water used is imported via canals from the Colorado River. According to the Water Quality Control Plan for the Colorado River Basin (California Regional Water Quality Control Board 2006), the potential existing and intermittent beneficial uses of perennial, intermittent, and ephemeral streams and washes is agriculture, municipal use, industry, groundwater recharge, contact and noncontact recreational use, warm freshwater habitat, and wildlife habitat. Beneficial uses of surface waters within the CMAGR are largely limited to groundwater recharge and wildlife habitat.

Groundwater

Groundwater resources within the CMAGR are extremely limited. Bedrock areas of the Chocolate Mountains have limited groundwater potential and are classified by the CDWR as non-water-bearing. Shallow wells in bedrock areas are assumed to tap waters in thin alluvium or fractured bedrock. The water-bearing potential of the bedrock formations is highly limited. Infiltration into bedrock formations on the CMAGR is expected to be significantly less because of the steep slopes of the Chocolate Mountains, which increase runoff and decrease percolation. More extensive groundwater resources are present in the down-faulted sedimentary basins east and west of the Chocolate Mountains. Recharge to the groundwater basins is derived chiefly from infiltration of runoff along the base of the Chocolate Mountains; however, high evaporation, low rainfall, and rapid runoff result in minimal groundwater recharge. The amount and quality of groundwater stored in the groundwater basins underlying the CMAGR are not known because very few wells have been drilled on the range.

The CMAGR is underlain by portions of four groundwater basins as defined by the CDWR (2003). These basins are part of the Colorado River Hydrologic Region. Figure 3-4 shows the groundwater basins underlying the CMAGR, which include, from north to south, the Chocolate Valley, East Salton Sea, Amos Valley, and Arroyo Seco Valley basins.

There are currently no active water supply wells on the CMAGR. Groundwater use beneath the CMAGR is precluded by Public Water Reserve 65. Water for CMAGR activities is transported to the range. Groundwater resources within the CMAGR are extremely limited. Little rainfall, high evaporation, and rapid runoff result in minimal groundwater recharge. Recharge has been estimated at 6.3 to 9.5 millimeters per year (0.24 to 0.37 inches per year), or 10 to 14 percent of precipitation (CDM Federal Programs Corporation 2003).

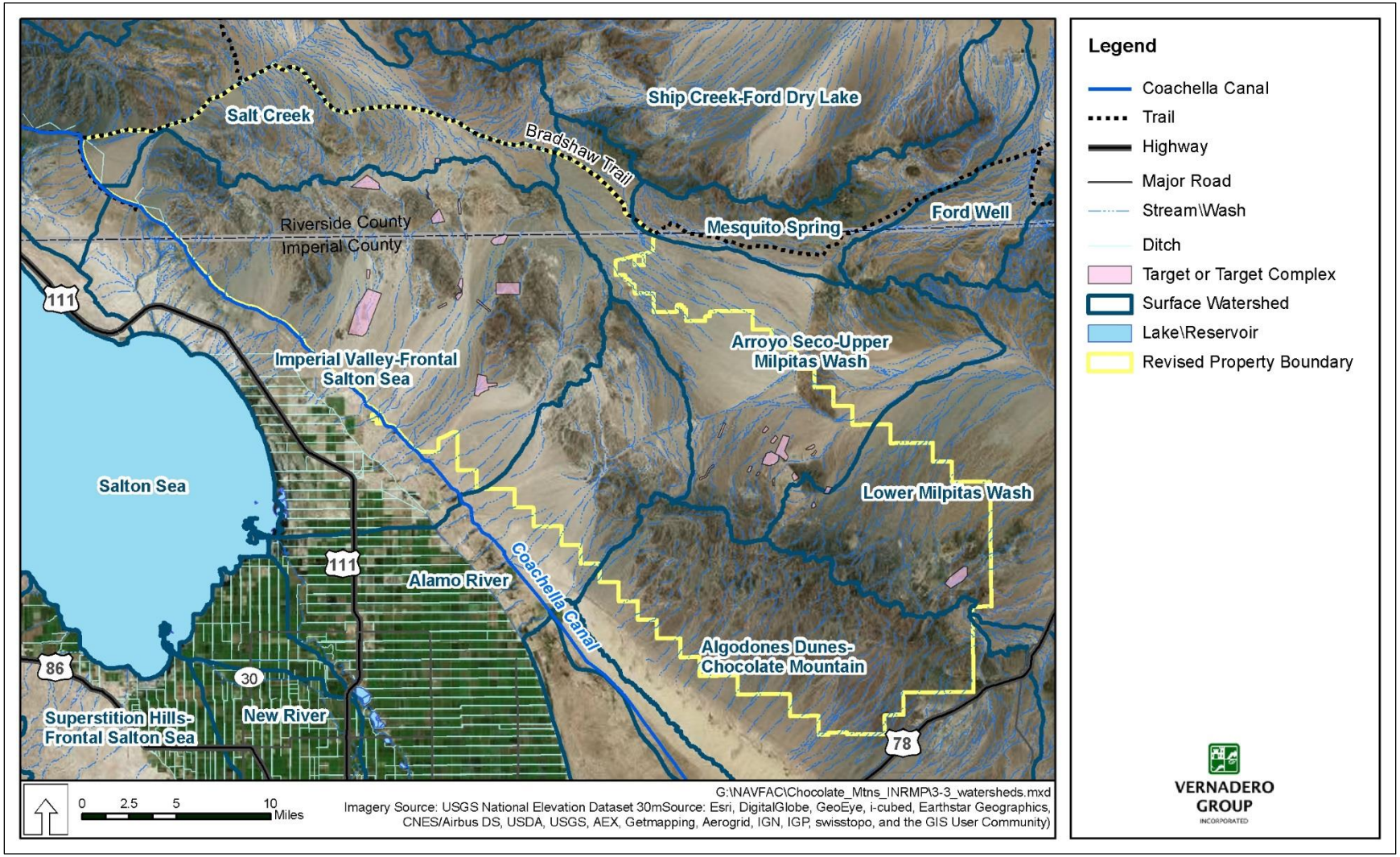


Figure 3-3. Surface Watersheds of the CMAGR

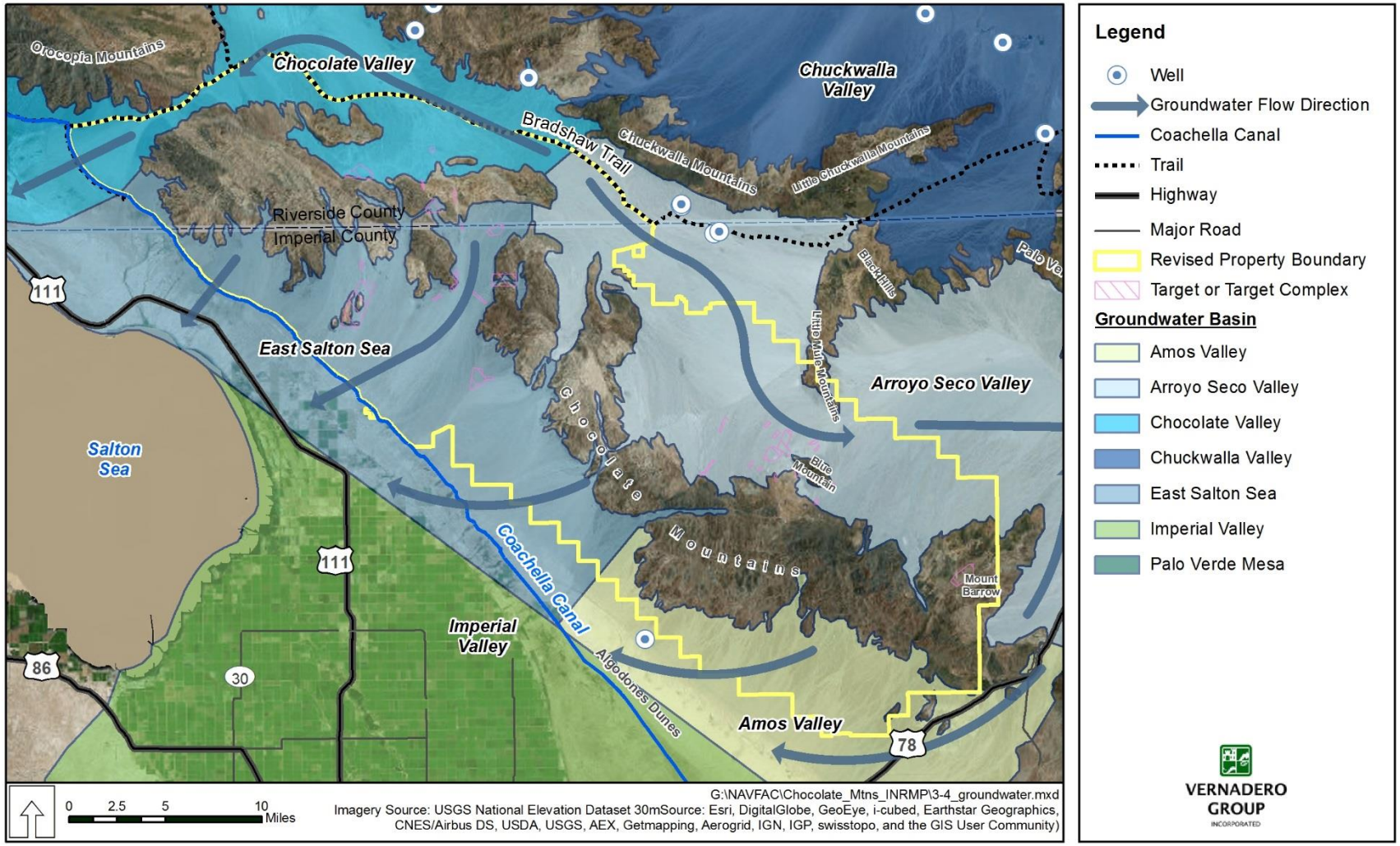


Figure 3-4. Groundwater of the CMAGR

More extensive groundwater resources are present in the down-faulted sedimentary basins east and west of the Chocolate Mountains. The most important hydrologic features of the groundwater basins are the alluvial fans. The aquifers in the intermontane sedimentary basins receive most of their recharge through the coarse sediments deposited in the fans, according to the U.S. Geological Survey (USGS 1995). Sinks are areas where runoff from the ephemeral desert washes is temporarily impounded against sand dunes; these form locally important recharge features along the northeast margin of the Sand Hills, along the southwestern corner of the CMAGR (Loeltz et al. 1975).

Several shallow wells dug in the north portion of the CMAGR were surveyed by the USGS in 1975 and found to have groundwater at depths of 10 to 38 feet below ground surface (Loeltz et al. 1975). Along the southwest border of the CMAGR, groundwater is recharged by leakage from the All-American Canal and, historically, was recharged from the Coachella Canal before it was lined. The USGS surveyed two wells along the canals within the CMAGR, completed at total depths of 550 and 1,000 feet, with water levels of 25 and 154 feet below ground surface. The USGS studies indicate that groundwater in the vicinity of the canals is chemically similar to Colorado River water and that groundwater elevations are higher along the canals, indicating that groundwater is locally derived from canal leakage (Loeltz et al. 1975). Not enough groundwater data are available for the area east of the Coachella Canal to develop potentiometric contours for the water table or characterize the groundwater quality beneath the CMAGR.

3.2 Air Quality

Air quality is defined by ambient air concentrations of specific pollutants that have been determined by the U.S. Environmental Protection Agency (EPA) to be of concern with respect to the health and welfare of the general public. This resource type considers ambient (outdoor) air quality and emissions of air pollutants regulated by the Clean Air Act of 1963, as well as the greenhouse gases: water vapor, carbon dioxide (CO_2), tropospheric ozone, nitrous oxide (N_2O), and methane (CH_4). Seven major pollutants of concern, called “criteria pollutants,” are carbon monoxide (CO), sulfur dioxide (SO_2), nitrogen dioxide (NO_2), ozone (O_3), suspended particulate matter less than or equal to 10 microns in diameter (PM_{10}), fine particulate matter less than or equal to 2.5 microns in diameter ($PM_{2.5}$), and lead (Pb). The EPA has established National Ambient Air Quality Standards (NAAQS) for these pollutants. Areas that violate a federal air quality standard are designated as nonattainment areas.

Ambient air quality refers to the atmospheric concentration of a specific compound (amount of pollutants in a specified volume of air) that occurs at a particular geographic location. The ambient air quality levels measured at a particular location are determined by the interactions of emissions, meteorology, and chemistry. Emission considerations include the types, amounts, and locations of pollutants emitted into the atmosphere. Meteorological considerations include wind and precipitation patterns affecting the distribution, dilution, and removal of pollutant emissions. Chemical reactions can transform pollutant emissions into other chemical substances. Ambient air quality data are generally reported as a mass per unit volume (e.g., micrograms per cubic meter of air) or as a volume fraction (e.g., parts per million by volume).

Pollutant emissions typically refer to the amount of pollutants or pollutant precursors introduced into the atmosphere by a source or group of sources. Pollutant emissions contribute to the ambient air concentrations of criteria pollutants, either by directly affecting the pollutant concentrations measured in the ambient air or by interacting in the atmosphere to form criteria pollutants. Primary pollutants, such as CO, SO_2, Pb, and some particulates, are emitted directly into the atmosphere.

Secondary pollutants, such as O_3, NO_2, and some particulates, are formed through atmospheric chemical reactions that are influenced by meteorology, ultraviolet light, and other atmospheric processes. PM_{10} and $PM_{2.5}$ are generated as primary pollutants by various mechanical processes (e.g., abrasion, erosion, mixing, or atomization) or combustion processes; however, PM_{10} and $PM_{2.5}$ also can be formed as secondary pollutants through chemical reactions or by gaseous pollutants condensing into fine aerosols. In general, emissions that are considered "precursors" to secondary pollutants are those evaluated to control O_3 levels in the ambient air, such as reactive organic gases and oxides of nitrogen (NO_X).

Air quality at a given location can be described by the concentrations of pollutants in the atmosphere. Pollutants are defined as having two general types: 1) criteria pollutants and 2) toxic compounds. Criteria pollutants have national and/or state ambient air quality standards. The EPA establishes the NAAQS, while the California Air Resources Board establishes the state standards, termed the California Ambient Air Quality Standards (CAAQS). The NAAQS represent maximum acceptable concentrations that generally may not be exceeded more than once per year, except for annual standards, which may never be exceeded. The CAAQS represent maximum acceptable pollutant concentrations that are not to be equaled or exceeded. Areas that do not meet the air quality standard are designated as "nonattainment" areas.

A portion of the CMAGR lies within Imperial County and a portion lies within Riverside County. Both counties are considered to be nonattainment areas for respirable particulate matter (PM_{10}), NO_X, and O_3 precursors (EPA 2015). The *de minimis* thresholds for the Imperial County portion of the CMAGR are 100 tons per year for O_3 precursors, including NO_X and reactive organic gases, and 70 tons per year for PM_{10}. The thresholds for the Riverside County portion of the CMAGR are 25 tons per year for O_3 precursors and 70 tons per year for PM_{10}. The California Air Resources Board is responsible for enforcing both the federal and state air pollution standards (EPA 2015).

3.3 Biotic Environment

Biotic environment in this INRMP refers to the vegetation, general wildlife, special status species and invasive species of the CMAGR.

3.3.1 Vegetation

The best available data for vegetation on the CMAGR is the Vegetation Classification and Mapping Program (VegCAMP) land cover data (VegCAMP et al. 2013).

The VegCAMP program focuses on developing and maintaining maps and the classification of all vegetation and habitats in the state to support conservation and management decisions at the local, regional and state levels. The VegCAMP map is derived from remotely sensed data and field observations, with the latter being mostly absent from the CMAGR, due to access restrictions. The vegetation was mapped at the ecosystem level which defines mapping units based on location, landform, dominant plant physiognomy, or life form (e.g., shrub or tree), and most common suites of species. Ecological systems are generally equivalent with the National Vegetation Classification System's "group."

Four natural communities dominate the CMAGR (Figure 3-5): 1) Lower Bajada and Fan Mojavean – Sonoran Desert Scrub, 2) Madrean Warm Semidesert Wash Woodland/Scrub, 3) North American Warm Desert Bedrock Cliff and Outcrop, and 4) Shadscale - Saltbush Cool Semidesert Scrub (California Energy Commission 2014).

Lower Bajada and Fan Mojavean – Sonoran Desert Scrub

Lower Bajada and Fan Mojavean – Sonoran Desert Scrub occurs on lower slopes, fans, and small sheet flow areas, but does not occur in well-defined washes or arroyos with defined banks and channels. The extent of this ecological system on CMAGR is 31.3 percent of the total area (calculated by pixel count).

This natural community is dominated or codominated by the following small to moderately sized shrubs (or perennial grasses): ragweed (*Ambrosia* spp.), brittlebush (*Encelia* spp.), creosote bush (*Larrea tridentata*), senna (*Senna* spp.), palo verde (*Parkinsonia* spp.), desert ironwood (*Olneya tesota*), barrel cactus (*Ferocactus* spp.), dalea (*Psorothamnus* spp.), and ratany (*Krameria* spp.). Where yucca (*Yucca spp*.), Mexican bladdersage (*Salazaria mexicana)*, hopsage (*Grayia spinosa*), or Mormon tea (*Ephedra nevadensis*) are present, they have equal or lower cover. Winters where Lower Bajada and Fan Mojavean – Sonoran Desert Scrub occurs may experience short frosts, but typically do not experience persistent freezes or snow accumulation (VegCAMP et al. 2013).

Madrean Warm Semidesert Wash Woodland/Scrub

Madrean Warm Semidesert Wash Woodland/Scrub is mapped in defined desert washes that are distinctly different in plant composition and/or cover compared to adjacent upland communities, in areas that did not receive alliance-level mapping. A conglomerate group has been defined as a natural community and is mapped, but is most common in the Cadiz, Chocolate Mountains, and Imperial Borrego Valley. The extent of this ecological system on CMAGR is 32.5 percent of total area.

The washes where this community is found are variable and can range from broad and many channeled to narrow with a singular or few channels. Washes where Madrean Warm Semidesert Wash Woodland/Scrub occurs may be found in hills, across moderate sloping fans, or in relatively flat lower toeslopes or basins. Diagnostic species include jointfir (*Ephedra californica* or *E. trifurca*), California broomsage (*Lepidospartum squamatum*), Mojave rabbitbrush (*Ericameria paniculata*), burrobrush (*Ambrosia salsola*), desert almond (*Prunus*

fasciculata), woolly brickellbush (*Brickellia incana*), big sagebrush (*Artemisia tridentata* ssp. *parishii*), catclaw acacia (*Acacia greggii*), desert lavender (*Hyptis emoryi*), honey mesquite (*Prosopis glandulosa*), screwbean mesquite (*Prosopis pubescens*), desert willow (*Chilopsis linearis*), smoketree (*Psorothamnus spinosus*), blue palo verde (*Parkinsonia florida*), and desert ironwood (*Olneya tesota*) (VegCamp et al. 2013).

North American Warm Desert Bedrock Cliff and Outcrop

North American Warm Desert Bedrock Cliff and Outcrop is characterized by areas where vegetation is largely absent. The extent of this ecological system on CMAGR is 35.7 percent of total area. Vegetation is not uniformly distributed across a landscape surface and generally consists of less than 5 percent cover. There are no evenly spaced trees or shrubs. While North American warm desert bedrock cliff and outcrop is not characterized by herbaceous species most of the time, in years of substantial precipitation, herbaceous annual species may be abundant and evenly distributed (VegCAMP et al. 2013).

Shadscale - Saltbush Cool Semidesert Scrub

Shadscale – Saltbush Cool Semidesert Scrub is dominated or codominated by fourwing saltbush (*Atriplex canescens*), shadscale saltbush (*Atriplex confertifolia*), or greasewood (*Sarcobatus vermiculatus*). Shadscale-saltbush is a cool semidesert scrub that generally occurs in dry lakebeds, low dunes adjacent to lakebeds, rocky uplands, or sandy washes (VegCAMP et al. 2013). The extent of this ecological system on CMAGR is 0.5 percent of the total area.

3.3.2 General Flora and Fauna

General flora and fauna are considered to be all species observed on CMAGR that are not considered to be special status species (Sections 3.3.3 and 3.3.4) or rare plants. A table showing the variety of general flora and fauna species that have been documented on the CMAGR is provided as Table A-1 in Appendix A. The species listed in this table have been officially documented with a published reference; is by no means this list a comprehensive list of all species found on CMAGR. Secretive and/or smaller taxa, particularly small mammals and reptiles may be underrepresented on this list.

3.3.3 Special Status Species

Special status species include federally threatened or endangered species protected by the ESA, as well as species protected by the California ESA. This definition also includes species that are considered Species of Special Concern by either the USFWS or CDFW, are considered rare plants by the California Native Plant Society (CNPS), or are considered BLM special status species. No range-wide surveys for special status species have been conducted. Special status species reported have been historically observed during focused surveys (e.g., the desert tortoise) or by incidental observations (e.g., Cooper’s hawk observed by CMBC; 2013). Figure 3-6 shows recorded locations for special status species on and in the vicinity of the CMAGR. Special status species discussed in this section have all been recorded on the range.

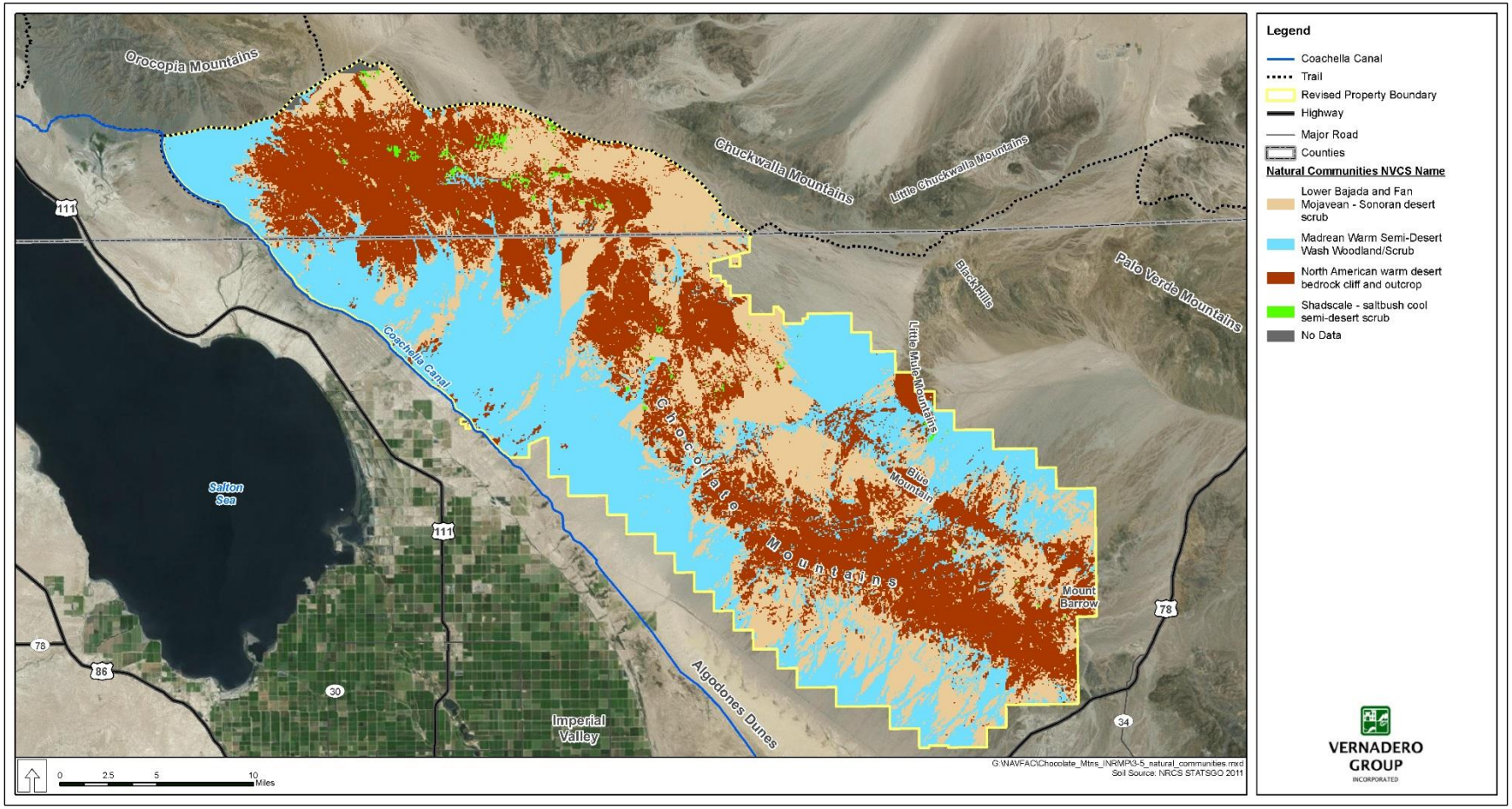


Figure 3-5. Ecological Systems of the CMAGR as Mapped by VegCAMP et al. 2013

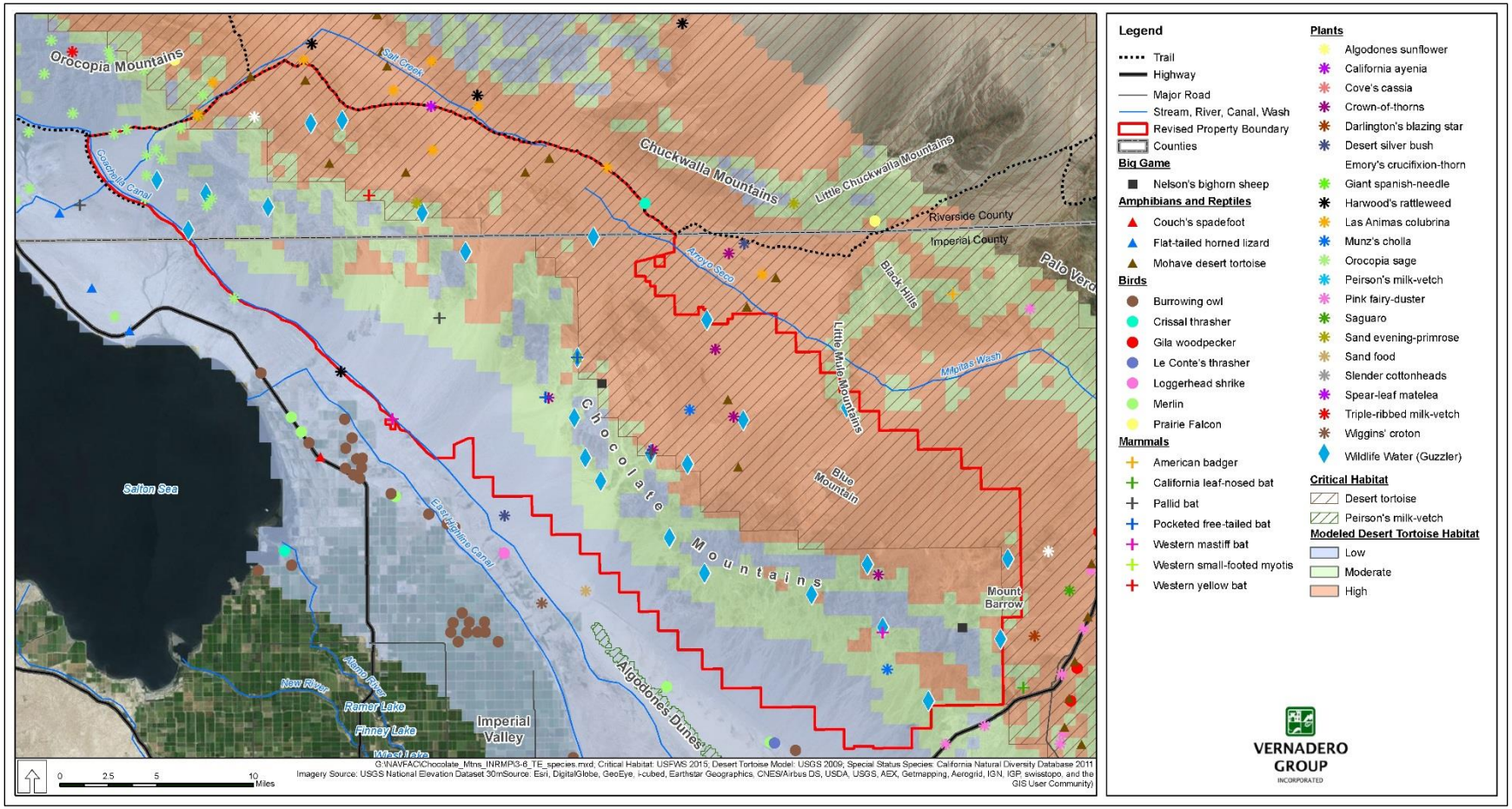


Figure 3-6. Special Status Species Recorded within the Vicinity of the CMAGR

Agassiz Desert Tortoise (Gopherus agassizii)

On 4 August 1989, the USFWS published an emergency rule listing the Mojave population of the desert tortoise as Endangered (54 FR 42270). On 2 April 1990, the USFWS determined the Mojave population of the desert tortoise to be Threatened (55 FR 12178). Reasons for the determination included significant population declines; loss of habitat from construction projects (e.g., roads, housing and energy developments); conversion of native habitat to agriculture; livestock grazing and OHV activity; illegal collection by humans for pets or consumption; upper respiratory tract disease; predation on juvenile desert tortoises by common ravens, coyotes, and kit foxes; fire; and collisions with vehicles on paved and unpaved roads.

The Mojave Desert population of the Agassiz desert tortoise ("desert tortoise") primarily occurs in the bajadas, mountain foothills, and valleys of the Mojave and Colorado deserts west of the Colorado River. This species usually occurs below 4,000 feet in creosote bush and saltbush scrub habitats, tree yucca (Joshua tree and Mojave yucca) communities, and some ocotillo-creosote habitats (Stebbins 2003, Brennan and Holycross 2006). Creosote bush, white bursage, tree yucca, galleta grass (*Pleuraphis rigida)*, and blackbrush (*Coleogyne ramosissima*) are indicator species of overall desert tortoise habitat (Brennan and Holycross 2006, Nussear et al. 2009). The desert tortoise occupies a wide variety of soil types and substrates that include sand dunes, rocky hillsides, and caliche caves in washes, sandy soils, and desert pavements. Tortoises must have suitable substrates and terrain for digging burrows (Stebbins 2003, Brennan and Holycross 2006). The availability of adequate forage resources consisting of native grasses, herbaceous perennials and annuals, and cacti are important for determining desert tortoise habitat suitability (Stebbins 2003, Brennan and Holycross 2006, Nussear et al. 2009).

On 8 February 1994, the USFWS designated approximately 6.44 million acres of critical habitat for the Mojave population of the desert tortoise in portions of California (4,750,000 acres), Nevada (1,220,000 acres), Arizona (339,000 acres), and Utah (129,000 acres) (59 FR 5820-5846, also see corrections in 59 FR 9032-9036). These designations became effective on 10 March 1994. A desert tortoise Recovery Plan was published in June 1994 (USFWS 1994a). The Recovery Plan is the basis and key strategy for recovery and delisting. The Recovery Plan identified six recovery units and recommended the establishment of 14 Desert Wildlife Management Areas (DWMA) within the recovery units. DWMA surveys began in 1996. The 1994 Recovery Plan for the desert tortoise was recently updated in 2011 (USFWS 2011).

Regional pressures on desert tortoises and their habitats include the illegal collection, trash dumping, increased raven populations, domestic predators, OHV use, exposure to disease, mortality (USFWS 1994a, Krzysik 1998, Boarman 2002), and large-scale and dispersed renewable energy development. The value that military lands can provide for conservation has long been recognized (Stein et al. 2008). Restricted-access military lands provide an extensive network of tortoise habitats that are managed either directly or indirectly for desert tortoise conservation. Military lands with conservation objectives expressed through compliance with Sikes Act include a great deal of desert tortoise habitat outside of and contiguous with designated tortoise conservation areas (USFWS 2011).

The USFWS programmatic Biological Opinion (BO 1-6-95-F-40) addressed the existing and proposed military use activities for the Yuma Training Range Complex Environmental Impact Statement (EIS) (1994). The USFWS's opinion was that the CMAGR activities would not jeopardize the desert tortoise or result in significant destruction or adverse modification of its critical habitat (USFWS 1996). The USFWS based its opinion on the percentage of the CMAGR critical habitat affected by training and conservation measures enacted by the MCAS Yuma.

Figure 3-7. Agassiz Desert Tortoise (*Gopherus agassizii*)

Conservation measures executed by the MCAS Yuma to reduce potential impacts to the species are based upon the 1996 BO and other project specific BOs and are incorporated into this INRMP as follows:

1. The MCAS Yuma will designate a Tortoise Management Representative (TMR) within the Range Management Department whose duty will be to ensure compliance with protective stipulations by all Range users. This TMR will have the authority to halt activities that may be in violation of such provisions. The TMR also will coordinate with

the designated USFWS representative on all matters concerning desert tortoise handling (if necessary)[1], mitigation, and management responsibilities.

2. All ground users accessing the CMAGR will participate in the MCAS Yuma tortoise education program, which has been developed cooperatively with the USFWS and will be updated as new data are obtained. The program will include, at a minimum, the following topics: 1) occurrence of desert tortoises; 2) sensitivity of the species to human activities; 3) legal protection for desert tortoises; 4) penalties for violations of federal laws; 5) general tortoise activity patterns; 6) reporting requirements; 7) measures to protect tortoises; 8) personal measures that users can take to promote desert tortoise conservation; and 9) procedures and a point of contact if a desert tortoise is observed on site.

3. All ground users of the Range will be informed of their responsibilities to avoid injury and/or harm to desert tortoises and to report any form of take to the TMR.

4. Explosives Ordnance Disposal (EOD) personnel will monitor take as part of their target area sweeps. EOD personnel will report to the TMR any injured or dead tortoises located during EOD sweeps, as well as habitat damage outside of designated target areas. Each EOD crew will fill out a form after each sweep, reporting any take. The TMR or qualified appointee(s) will be available or on call to respond to any tortoise incidents.

5. All roads entering and within designated desert tortoise critical habitat will have signs posted with speed limits of 20 miles per hour. To the extent practicable, vehicles will remain on established roads except as required for specific training activities. To reduce potential impacts, vehicles used during specified training activities will stay within the confines of road boundaries until the destination is reached.

6. All personnel operating vehicles within desert tortoise habitat on the Range will inspect underneath their parked vehicle, prior to moving it. If a desert tortoise is observed beneath the vehicle, the tortoise will be allowed to move away on its own or the TMR or qualified appointee(s) will be contacted to move the animal out of harm's way.

[1] Tortoise Handling Procedures

a. Only biologists authorized by the USFWS shall handle desert tortoises, except in circumstances in which the life of the desert tortoise is in immediate danger (see item 5d, below). For biologists not already authorized, the MCAS Yuma shall submit their credentials to the USFWS for review and approval at least 30 days before the initiation of any activity within desert tortoise habitat.

b. Desert tortoises shall be moved only by an authorized biologist and solely for the purpose of moving the animals out of harm's way. Desert tortoises shall be moved the minimum distance to ensure their safety.

c. All handling of tortoises and their eggs and excavation of burrows are to be conducted by an authorized biologist in accordance with up-to-date protocols accessed at the USFWS website (http://www.fws.gov/carlsbad/PalmSprings/DesertTortoise.html).

d. If an emergency situation exists and a tortoise must be moved out of immediate danger, the animal may be moved to an adjacent shaded area (normally plant cover) out of direct sunlight. Desert tortoises shall only be moved the minimum distance to ensure their safety. Range Management shall be notified.

7. No pets will be permitted at any time within desert tortoise habitat. Military working dogs will be permitted under control of their handler.

8. All ground personnel that enter the Range will be required to remove all food stuffs, trash or other waste that may attract ravens, coyotes, or other desert tortoise predators. Any trash receptacles used for extended stays will be equipped with latching/locking lids. Waste management will be guided by the Range and Training Areas Standard Operating Procedures under Chapter 2 environmental procedures.

Raven Measures:

- Any raven or raven nests discovered (including, on transmission infrastructure) will be evaluated by the MCAS Yuma biologists for desert tortoise predation. If any evidence of predation is observed, the surrounding area will be searched for raven and raven nests. Any predatory ravens and their nests will be removed using methods identified in the USFWS's environmental assessment (USFWS 2008).
- Wildlife guzzlers will be monitored periodically by biologist, range inspectors, and range wardens for water availability and raven usage. Observations of desert tortoise carcasses and raven nests near guzzlers will prompt further evaluation.
- Construction personnel, range wardens, range inspectors, and troops using the training areas will be educated and instructed to report any raven sightings, which will be investigated and documented by a MCAS Yuma biologist.
- Public use is restricted and will continue to be restricted within the CMAGR, thus reducing the attraction of ravens.
- Range signs and fencing will be minimized to reduce perching.
- Abandoned vehicles found on the CMAGR will be inventoried and removed as appropriate.

9. New Construction and/or Ground-disturbing Activities:

- Pre project clearance surveys conforming to the USFWS recommendations will be followed for new construction or other ground disturbing activity (i.e., new target site designation). Clearance surveys will be conducted by the TMR or other qualified tortoise biologist.
- A qualified desert tortoise biologist will be "on-call" and available during any new construction and/or ground-disturbing activities to address the situation if a desert tortoise must be moved out of harm's way.
- New construction boundaries and/or other ground-disturbing activities will be determined in the field, mapped, and marked with monuments or flagging prior to the onset of any disturbance. New construction or other ground-disturbing activity will be placed outside and away from surface drainages, when feasible.
- Any excavations associated with construction and maintenance that will be left open in areas that are not being monitored will either be fenced temporarily to exclude desert tortoises, covered at the close of each work day, or provided with ramps so

desert tortoises can escape. All excavations will be inspected for desert tortoises before filling.

- Desert tortoise exclusion fencing will be installed, when feasible, around each new construction site prior to construction. The TMR or qualified desert tortoise monitor will be present during the initial activity at each construction site. Once the desert tortoise fence is installed around each construction site and the clearance surveys are completed, the monitor would no longer need to be present. If a desert tortoise is located in the project area during construction activities, it will be allowed to move away on its own or safely moved by a qualified desert tortoise biologist. The desert tortoise fences will be removed upon completion of construction activities.
- A Field Contact Representative (FCR) will be designated once ground clearing is completed and the desert tortoise fences are installed. The FCR will be responsible for overseeing compliance with biological resources conservation measures and any other required terms and conditions resulting from consultation between the MCAS Yuma and USFWS. The FCR will be on-site during all construction activities and have a copy of all avoidance and minimization measures available at all times. The FCR may be a crew chief, field supervisor, project manager, or a contracted biologist. The FCR will have the authority to halt construction, operation, or maintenance activities that are in violation of these requirements. A representative from the MCAS Yuma Range Management Department will make bi-weekly visits to ensure compliance.

14. The TMR or appointee(s), will survey all ground support areas for dead or injured tortoises after the completion of each ground operation.

15. The TMR will notify the USFWS within three working days of the discovery of any desert tortoise death or injury caused by military activity. Notification will include the date, time, circumstances, and location. Dead tortoises will be left in situ. Injured tortoises will be taken to an approved USFWS veterinarian. This information will also be included in the USFWS's annual report.

16. An annual monitoring report will be prepared and delivered to the USFWS on or before January 15 of each year. The report will briefly outline the effectiveness of the desert tortoise conservation and/or mitigation measures and summarize the mortality or injury to desert tortoises. The report will make recommendations for modifying or refining the terms and conditions to enhance desert tortoise protection, herein.

17. Depending on available funding, Line Distance Sampling surveys (LDS) will be completed annually under the direction of the USFWS (Desert Tortoise Recovery Team) and implement current USFWS methods. The desert tortoise surveys will take place during regularly scheduled spring range closures. These surveys will be used to define tortoise densities within the critical habitat and monitor population trends within the Range. Surveys will be conducted annually until the desert tortoise Mojave population, or the East Colorado Recovery Unit, is removed from the list of threatened and

endangered species. All survey data will be entered into the MCAS Yuma GIS desert tortoise database.

18. This INRMP will serve as the Desert Tortoise Management Plan, which was originally identified in the programmatic BO as a conservation measure. The conservation measures and metrics to monitor the Plan's effectiveness are identified herein and will supersede the need to develop a separate Plan. The Plan objectives were as follows and will be incorporated into this revised and future INRMPs:
    - Identify ways to minimize impacts on desert tortoises from ongoing activities within the Range
    - Manage the species and designated critical habitat in a manner consistent with the most up-to-date Desert Tortoise Recovery Plan (USFWS 2011)

The CMAGR is the primary military installation harboring desert tortoise habitat in California's Colorado Desert (USFWS 1990, 1994a) which consists of approximately 187,842 acres of critical habitat The critical habitat designation and publication of the first recovery plan (USFWS 1994) established the Chuckwalla DWMA (and others) based on the presence of critical and large contiguous areas of desert tortoise habitat. Approximately 40 percent of the Range occurs within designated desert tortoise critical habitat—that is, most of the Range east of the Chocolate Mountains (USFWS 1994b). Approximately 2,866 acres (1.5 percent) of military training sites are within the designated critical habitat boundaries and exempted from critical habitat due to their lack of constituent elements and previous military training activities (USFWS 1994a).

For those areas that do experience ground-based training pressure, the activities range from ordnance impacts related activities in target areas; vehicular and foot traffic on designated roads and in authorized areas used for drop zones and ground support. Desert tortoise occurrences are reported from the northeastern side of the Chocolate Mountains and southward along State Route 78 (CDFW 2011). Suitable habitat occurs for the species throughout the CMAGR, but density estimates are low for the west side of the Chocolate Mountains (Dames and Moore 1995, Nussear et al. 2009, CMBC 2013).

Primary constituent elements of desert tortoise critical habitat include:

- Sufficient space to support viable populations within each of the six recovery units and to provide for movement, dispersal, and gene flow
- Sufficient quality and quantity of forage species and the proper soil conditions to provide for the species growth
- Suitable substrates for burrowing, nesting, and overwintering
- The presence of burrows, caliche caves, or other shelter sites
- Sufficient vegetation to provide shelter from temperature extremes and predators
- Habitat protected from disturbance and human-caused mortality

Table 3-2. Military Surface Use in CMAGR Critical Habitat

Military Surface Use	Total Acres Intersecting Desert Tortoise Critical Habitat
Additional Training, Support, and Range Control	13,801.80
Core Weapons Impact Area *	1,105.18
Ground Support Area *	33.45
Secondary Weapons Impact Area	9,254.51
SWATs 4 and 5 *	4,311.80
Target or Other Earthwork Feature *	123.47
Weapons Delivery Containment Area	157,297.18
Dike Road Corridor	3.29
Excess – No Assigned Military Function	246.17
Railroad Corridor	28.55
Road Corridor *	290.68

* Activity results in ground-based training pressure

Nelson's Desert Bighorn Sheep (*Ovis canadensis nelsoni*)

Nelson's desert bighorn sheep (desert bighorn) (Figure 3-8) are considered a Sensitive Species by the BLM but not otherwise designated by the State of California or USFWS. These desert bighorn sheep are found in the desert mountains of southeastern California and favor open, rocky, and steep terrain and avoid dense vegetation that blocks visibility (CDFG 2011b). Habitat used by desert bighorn also includes springs and plateaus (BLM 2002a). The CMAGR subpopulation is part of a larger Sonoran metapopulation.

Figure 3-8. Nelson's Desert Bighorn Sheep (*Ovis canadensis nelsoni*)

Long-term survival of local subpopulations of bighorn sheep requires movement of individuals among regional subpopulations to prevent genetic bottlenecks, maintain viable population numbers, and recolonize vacant or formerly occupied areas (Schwartz et al. 1986, Bleich et al. 1990, BLM 2002a). Desert bighorn sheep move from mountains through valleys to reach preferred habitat sites (Bleich et al.1990, BLM 2002a). The Coachella Canal, Interstate 10, and State Route 78 are filter-barriers that inhibit or prevent the historical movement of bighorn sheep between regional mountain ranges (BLM 2002a). Historical movement corridors from the Chocolate Mountains to the Orocopia Mountains, Chuckwalla Mountains, and Palo Verde Mountains likely remain intact because there is little to no developed land between these mountain ranges.

CDFW offers limited hunting of this subspecies; the agency allowed 12 tags in 2015 (CDFW 2015). Desert bighorn on the CMAGR cannot be hunted because of the safety hazards associated with military training that necessarily keeps the area closed to public use.

American Badger (*Taxidea taxus*)

The American badger (Figure 3-9) is designated as a California Species of Special Concern but has no federal special status. The presence or absence of the American badger on the CMAGR is not well understood, and there are very few entries for the species in the California Natural Diversity Database. Although no incidental observations of badgers were made during a focused desert tortoise survey and habitat assessment in SWATs 4 and 5 in 2012, badgers were detected by diagnostic digs along 52 of 179 (29 percent) of all desert tortoise transects conducted by CMBC (2013). It is not unusual to detect American badger and not see the animals. For example, during spring and summer 2011 surveys of the Marine Corps Air Ground Combat Center in Twentynine Palms, California, CMBC biologists detected 990 badger digs (and several diagnostic scat) while seeing only one animal (LaRue 2012).

Figure 3-9. American Badger (*Taxidea taxus)*

Couch's Spadefoot (*Scaphiopus couchii*)

Couch's spadefoot (Figure 3-10) is a California Species of Special Concern and considered a Sensitive Species by the BLM. It has no other federal special status species designation. Couch's spadefoot inhabits desert and arid regions of grassland, prairie, mesquite, creosote bush, thorn forest, and sandy washes. In California, it is present in these habitats in the Colorado and Sonoran deserts. Its occurrence in Imperial County is probably not fully documented, although well-known and well-documented habitat exists along the UPRR right-of-way on the CMAGR's southern border. Couch's spadefoot may spend most of the year buried underground, emerging only to feed and breed after monsoonal rains have created temporary ponds used for breeding. Larvae are capable of maturing and leaving the ponds within eight days. Since the breeding ponds are ephemeral, and larvae are only present for a short time, Couch's spadefoot is not easily detected unless targeted surveys are conducted.

Figure 3-10. Couch's Spadefoot (*Scaphiopus couchii*)

Golden Eagle (*Aquila chrysaetos*)

The golden eagle (Figure 3-11) is on the CDFW watch list and is federally protected under the Bald and Golden Eagle Protection Act (BGEPA) and the Migratory Bird Treaty Act (MBTA). It is also considered a Sensitive Species by the BLM. Golden eagles are upper-trophic aerial predators that forage on small to midsized reptiles, birds, and mammals up to the size of mule deer fawns and coyote pups (Bloom and Hawks 1982). They also are known to scavenge and utilize carrion (Kochert et al. 2002). Golden eagles inhabit a variety of habitats, including forests, canyons, shrub lands, grasslands, oak woodlands, and arid deserts. Golden eagles are not documented at CMAGR although they are of increasing concern to the USFWS.

Figure 3-11. Golden Eagle (*Aquila chrysaetos*)

Cooper's Hawk (*Accipiter cooperii*)

Cooper's hawk (Figure 3-12) is on the CDFW watch list and is federally protected under MBTA. One was observed by CMBC in SWAT 4 flying through a microphyllous woodland on the afternoon of 28 April 2012. This medium-sized raptor can be both resident and migratory, preying upon small passerines. Cooper's hawks are more likely to nest in larger landscaped trees, such as various palm species in the region, than in the smaller ironwoods and palo verdes on the CMAGR. They are likely to forage throughout the CMAGR, particularly in microphyllous woodlands, where they may seek both cover and prey species, but are not likely to nest (CMBC 2013).

Figure 3-12. Cooper's Hawk (*Accipiter cooperii*)

Vaux's Swift (*Chaetura vauxi*)

Vaux's swift (Figure 3-13) is designated as a California Species of Special Concern and is federally protected under the MBTA. Individual birds and one small flock of three were observed on three occasions on the CMAGR, twice on 13 April 2012 and once on 4 May 2012 (CMBC 2013). This migratory species is considered to be incidental to the CMAGR, foraging over the area as it passes through, but is not expected to nest.

Figure 3-13. Vaux's Swift (*Chaetura vauxi*)

Swainson's Hawk (*Buteo swainsoni*)

Swainson's hawk (Figure 3-15) is designated as a California Threatened Species and as a Bird of Conservation Concern by USFWS. It is also federally protected under MBTA and considered a Sensitive Species by the BLM. Swainson's hawks were observed by CMBC on two occasions over SWAT 4: once on 8 April 2012, and a second time on 13 April 2012 (CMBC 2013). As a migrant, Swainson's hawks likely occur throughout the CMAGR during spring and fall migration periods when they may forage but do not nest. The migration pathway of the Swainson's hawks is not well characterized in this region. As of yet, no migratory roosting sites on the CMAGR have been discovered.

Figure 3-14. Swainson's Hawk (*Buteo swainsoni*)

Loggerhead Shrike (*Lanius ludovicianus*)

The loggerhead shrike (Figure 3-15) is designated a California Species of Concern, a Bird of Conservation Concern by the USFWS, and is federally protected under MBTA. The loggerhead shrike is a commonly encountered bird species on the CMAGR, having been detected in 24 different locations by CMBC in April 2012 (CMBC 2013). They are likely to nest in microphyllous woodland and forage throughout SWATs 4 and 5 (CMBC 2013).

Figure 3-15. Loggerhead Shrike (*Lanius ludovicianus*)

Burrowing Owl (*Athene cunicularia*)

The burrowing owl (Figure 3-16) is designated as a California Species of Special Concern, a Bird of Conservation Concern by the USFWS, and is federally protected under MBTA. Burrowing owls were detected in 14 different locations on the CMAGR in 2012 (CMBC 2013). Diagnostic signs of this special status bird species included whitewash (feces), feathers, regurgitated pellets, and zygodactyl (x-shaped) tracks at suitable burrows and cover sites in CMBC's April 2012 field surveys (CMBC 2013). Although three signs of burrowing owl were observed on the CMAGR, they were most often encountered and detected at caliche caves in the northeastern portions of SWAT 5.

Figure 3-16. Burrowing Owl (*Athene cunicularia*)

Orocopia Sage (*Salvia greatae*)

Designated by California Native Plant Society (CNPS) as a List 1B.3 species, Orocopia sage (Figure 3-17) is considered to be rare, threatened, or endangered in California and elsewhere, but not very threatened in California (low degree/immediacy of threats or no threats known). It is also considered a Sensitive Species by the BLM. It was observed in 2008 along 23 different survey transects on the northern portions of SWAT 4 (one transect) and western portions of SWAT 5 (22 transects) (Woodman 2008). In 2012, this medium-sized shrub was observed along two transects in SWAT 4 and five transects in SWAT 5. Based on current information, Orocopia sage occurs most commonly on the southwestern portions of SWAT 5 (CMBC 2013). The MCAS Yuma is currently conducting vegetation mapping on the CMAGR.

Figure 3-17. Orocopia Sage (*Salvia greatae*)

Sand Evening Primrose (*Camissonia arenaria*)

The CNPS considers the sand evening primrose (Figure 3-18) to be a List 2.2 species, meaning it is rare, threatened, or endangered in California but more common elsewhere and, specifically, fairly threatened in California (moderate degree/immediacy of threat). Sand evening primrose was observed in 2012 at one location in SWAT 4 and one location in SWAT 5. The plants may mostly occur in foothills and mountainous areas, where the two specimens were found. They may be less likely to be found on mid- to low *bajadas* where most of the survey effort occurred without finding any of these plants (CMBC 2013).

Figure 3-18. Sand Evening Primrose (*Camissonia arenaria*)

3.3.4 Other Special Status Species

Certain other special status species are not known to occur on the CMAGR, are occasional visitors such as migratory birds or bats, or if they are present, they are unlikely to be affected by CMAGR activities; these species are summarized in Table B-1 in Appendix B.

3.4 Invasive Species

Executive Order 13112 requires Federal agencies to (1) identify actions that may affect invasive species, (2) use relevant programs to prevent introduction of invasive species, (3) detect, respond, and control such species, (4) monitor invasive species populations, (5) provide for restoration of native species, (6) conduct research on invasive species, and (7) promote public education (Executive Order 13112, 1999).

Human-induced and natural biological invasions into new regions, whether accidental or deliberate, persist both locally and globally, for both plants and animals (Fronhofer and Altermatt, 2015; Zeirtz et. al., 2016; Li et. al., 2015). Once established, nonnative-species often lead to changes in ecosystem processes (such as fire frequency, size, and intensity, or altered nutrient levels) that are self-maintaining and evolving, leading to functional as well as compositional ecosystem change (Brooks et al., 2004; Adair and Burke, 2010). In addition to competing with and displacing native species, these introduced species can hybridize with native species and alter conditions to promote the establishment and spread of other nonnative species. They also bring their respective pathogens and parasites (Warburton et al. 2002; Kuperman et al. 2004).

In the case of plants, several studies have pointed to various environmental and climatic variables as potential drivers for sustaining or increasing nonnative plant dominance in semiarid ecosystems (Shinneman and Baker 2009; Li et al 2015). Nonnative species often garner a foothold over native species due to their ability to thrive under harsher conditions with fewer resources and their ability to be prolific reproducers (Marushia et. al., 2012).

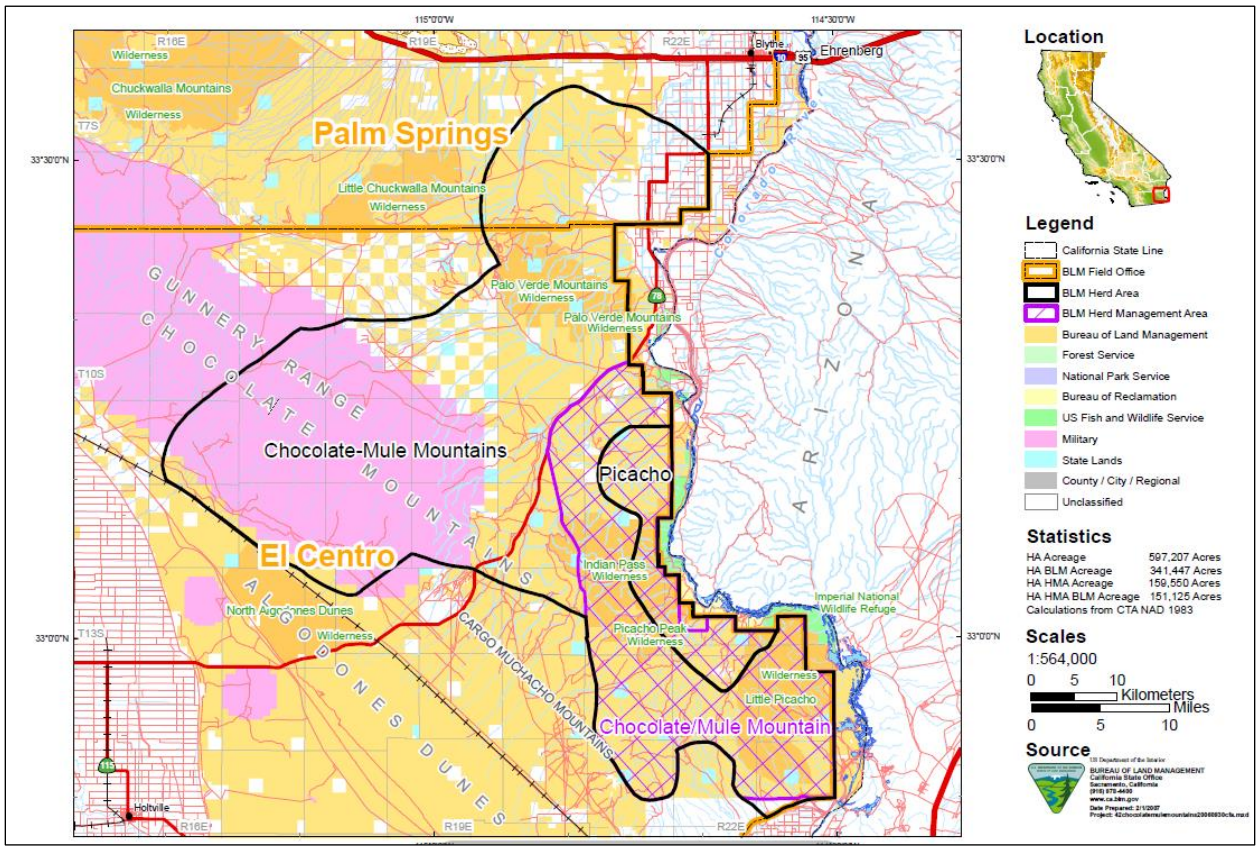
The collection of baseline information allows managers to track the spread of known populations and identify new infestations in order to evaluate the effectiveness of management actions or treatments. Early detection allows managers to employ a rapid response while the populations are still small (Hamilton et. al., 2013).

3.4.1 Nuisance and Nonnative Wildlife

Wild horses and burros are protected by the Wild Free-Roaming Horses and Burros Act of 1971 (16 U.S.C. 1331-1340), as amended by the FLPMA and the Public Rangelands Improvement Act of 1978. The Act requires for the protection, management, and control of wild free- roaming horses and burros on public lands. It is the policy of Congress that wild free-roaming horses and burros shall be protected from capture, branding, harassment, or death; and to accomplish this they are to be considered in the area where presently found, as an integral part of the natural system of the public lands. The BLM actively manages wild horse and burro herds.

California contains 33 geographic herd areas where wild horses and burros lived when the Wild Free-Roaming Horse and Burro Act was passed in 1971. In a subset of herd areas, known as herd management areas (HMAs), through its land use plans, the BLM has identified HMAs that are suitable for the long-term management of wild horses and burros.

California has 22 HMAs on the BLM-administered lands. Each HMA has been studied to determine appropriate management levels for its wild horses and burros. The Chocolate–Mule Mountains HMA is located east of the CMAGR, along the Colorado River bordering the Picacho State Recreation Area west of Yuma, Arizona (Figure 3-19). As of 2012, this HMA contained 121 wild burros. The burros in these areas are believed to originate from mining operations in the 1800s. With introduction of the railroad and abandonment of the mines, miners abandoned their animals into the foothills (BLM 2012[a] and 2012[b]). This HMA encompasses a total of 159,000 acres; 127,600 acres are within the BLM-administered lands (BLM 2007).



Source: http://www.blm.gov/style/medialib/blm/ca/pdf/caso/WHB.Par.6996.File.dat/chocolatemulemtns.pdf

Figure 3-19. Detail Map of Herd Areas on and near CMAGR

Nuisance or introduced bird species and others typically associated with or tolerant of human development, include the Eurasian collared-dove (*Streptopelia decaocto*), and common raven (*Corvus corax*) (CMBC 2013). Common raven, which has been implicated throughout southern California deserts as a predator of desert tortoises, is relatively common, having been detected on 23% of transects surveyed (CMBC 2013).

3.4.2 Invasive and Nonnative Vegetation

A 2014 INRMP working group identified 11 invasive plant species of concern for the CMAGR, including: Sahara mustard, red brome (*Bromus madritensis rubens*), Lehmann lovegrass *(Eragrostis lehmanniana*), Arabian grass (*Schismus arabicus*), Russian thistle *(Salsola tragus*), buffelgrass (*Pennisetum ciliare*), storksbill (*Erodium circutarium*), tamarisk (*Tamarix* spp.), Mediterranean splitgrass (*Schismus barbatus*), tansy mustard (*Descurainia pinnata*), and flixweed (*Descurainia sophia*). In 2015, field work began on mapping the vegetation of the CMAGR, along with creating a flora specimen collection (Malusa and Sanders, in progress). The range is visited in January, March, and September, during which specimens are collected. The structure and relative dominance of perennial species within a vegetation type are recorded while taking samples called “Rapid Assessment” plots. Time permitting, annuals are also recorded, and note is taken of invasives. For example, of the 95 plots sampled across the CMAGR thus far, 16 plots held invasive plant species (Figure 3-20). Nine held Sahara mustard, six plots with Arabian grass red brome, one plot with red brome, one plot with storksbill, and one with *Tamarix*.

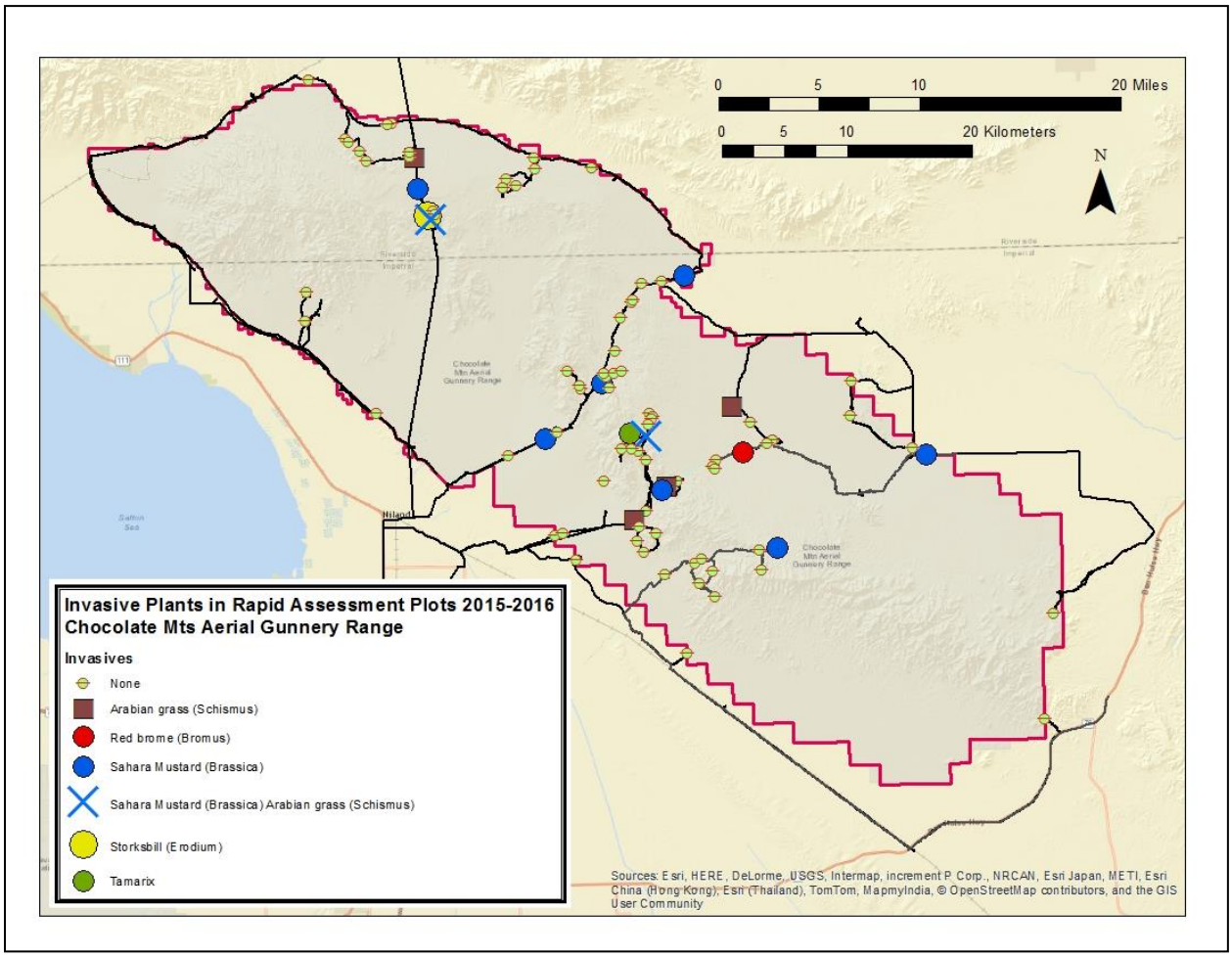


Figure 3-20. Invasive plant species encountered and recorded during 2015-2016 on the CMAGR by Malusa and Sanders (in progress).

In addition to the locations recorded while taking plot data, Malusa and Sanders also utilized a smartphone app called GISCloud. This method was pioneered on the Barry M. Goldwater Range – West, and allows anyone with the app on their phone to rapidly take georeferenced photos and data. Once within cell range, the data are automatically uploaded on a web map at editor.GISCloud.com. Using this method, an additional 22 locations with invasive species were documented; these data are summarized for the CMAGR in Figure 3-21. The combined data from the 95 plots and GISCloud is shown in Figure 3-22.

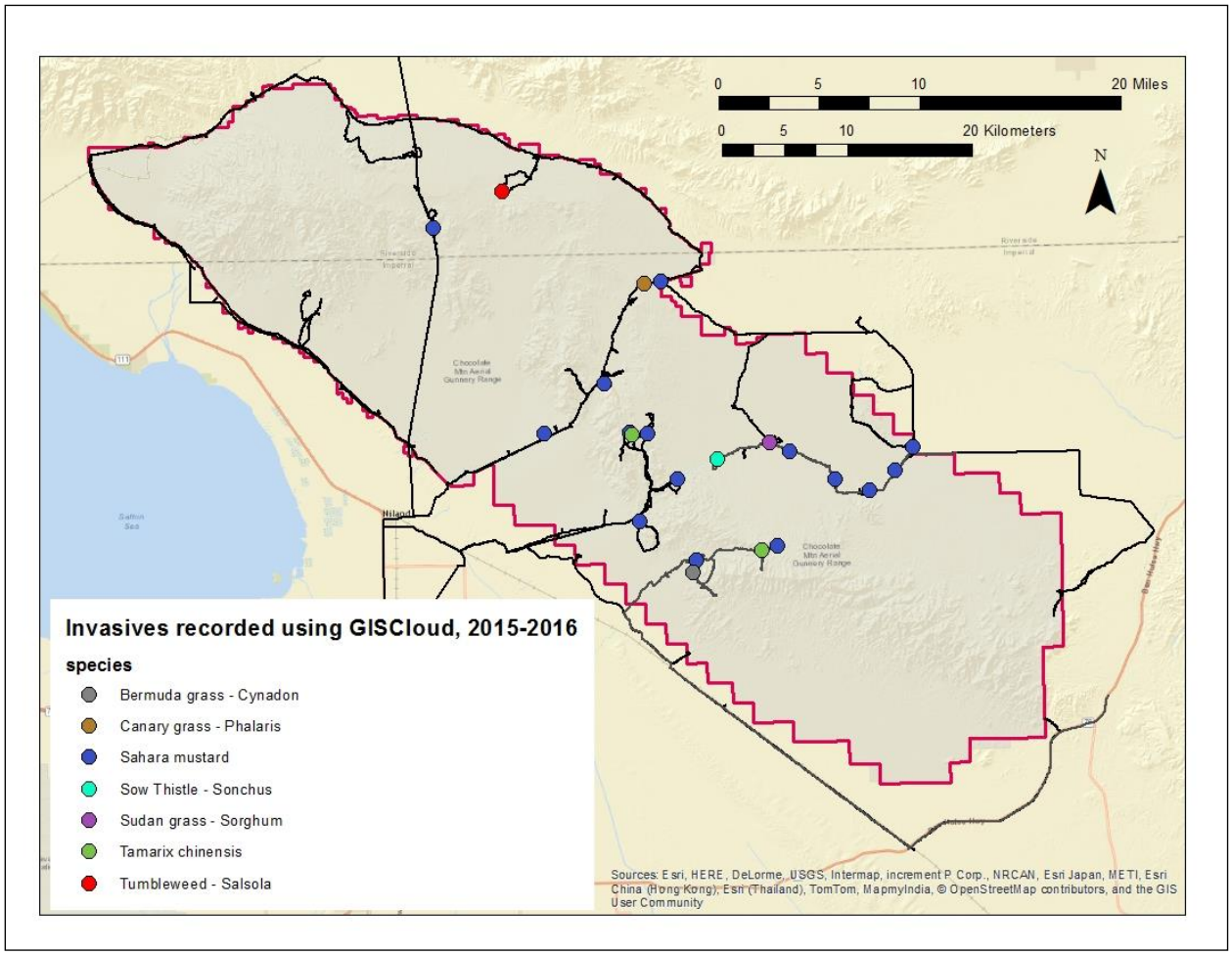


Figure 3-21. Locations of invasives discovered outside of study plots in 2015-2016. The black lines indicate routes traveled by Malusa and Sanders.

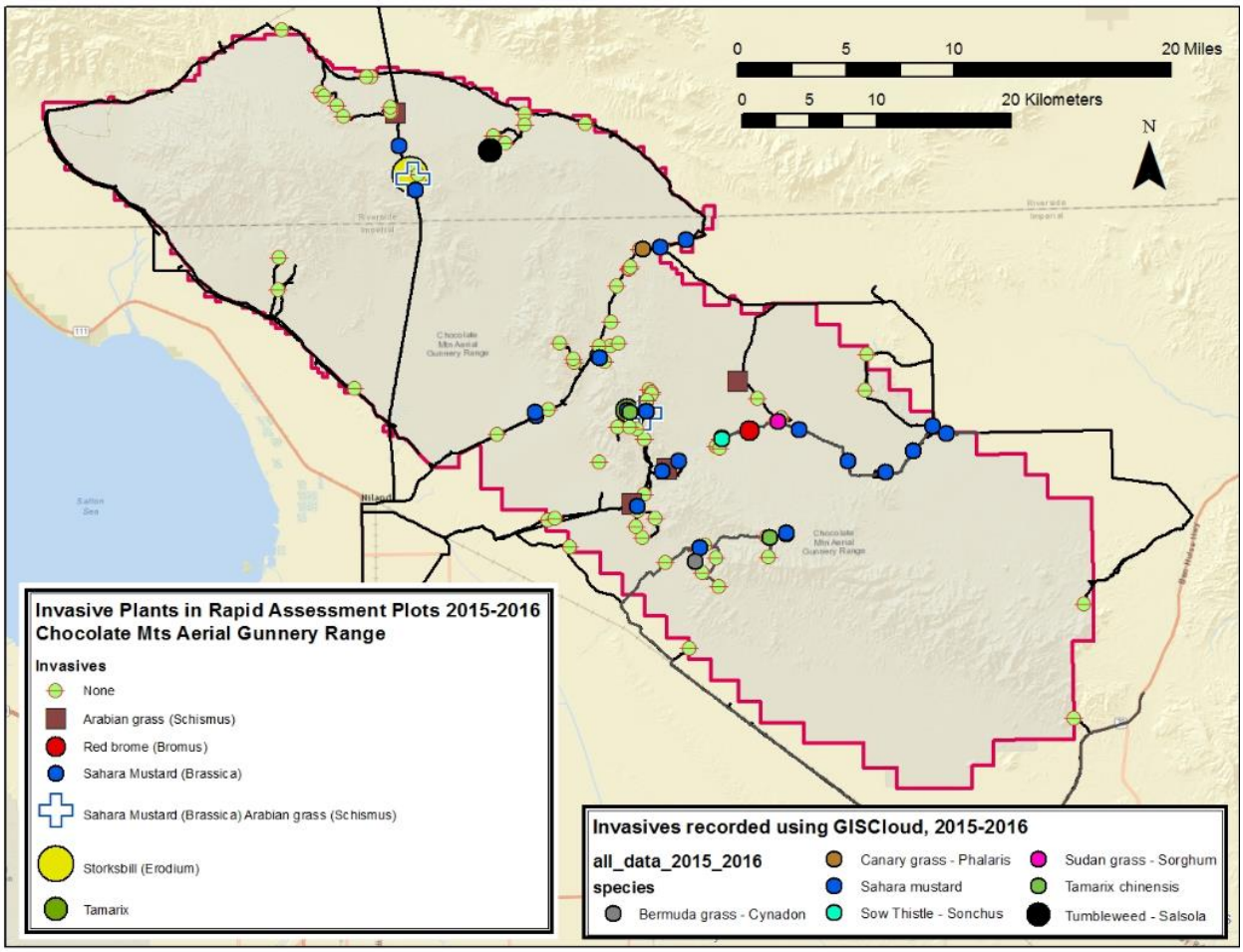


Figure 3-22. Combined data showing all invasives recorded in 2015-2016. The black lines indicate routes traveled by Malusa and Sanders.

As can be seen in Figure 3-22, Sahara mustard is the only widespread species on the CMAGR. It was noted in a variety of habitats, from roadsides to rocky hillsides far from roads, suggesting that it has been present in the CMAGR long enough to disperse from disturbed areas. It was common only in disturbed areas, such as berms and targets and the southwestern boundary of the range, especially along the Coachella Canal. This boundary is much disturbed, with significant infestations of *Tamarix* that are not shown in the data above. These, however, do not appear to extend far into the range, where *Tamarix* was found at only two locations.

The 11 species documented on the range to date are listed below (note the presence of new species not anticipated by the 2014 INRMP working group, and the absence of others).

- Sahara mustard (*Brassica tournefortii*)
- Red brome (*Bromus madritensis rubens*)
- Russian thistle/tumbleweed *(Salsola tragus*)
- Tamarisk (*Tamarix* chinensis*)*
- Sow thistle (*Sonchus asper, S. oleraceus)*

- Bermuda grass (*Cynodon dactylon)*
- Canary grass (*Phalaris minor)*
- Sudan grass (*Sorghum sudanense)*
- Storksbill (*Erodium circutarium*)

All of these invasive species were collected and curated by the researchers, with the exception the *Sorghum*, which was in poor condition. The records can be found in Consortium of California Herbaria at http://ucjeps.berkeley.edu/consortium/.

Funds permitting, Malusa and Sanders will continue recording the presence of invasive species on the CMAGR. When these data are combined with the vegetation map and flora, range management will be able to focus control efforts, if any, on areas known to be at high risk of invasion, a metric which can vary with the dispersal capabilities of the invasive (Brooks and Berry 2006: Minor, E. S. and Gardner, R. H., 2011).

4.0 CMAGR NATURAL RESOURCE MANAGEMENT PROGRAM

The MCAS Yuma's natural resources management philosophy towards the CMAGR is to maintain processes and programs that prevent long-term damage or degradation of the range, allow the range to sustain current and future military training requirements, and achieve the conservation objectives of relevant regulatory requirements. Goals that the MCAS Yuma has for the CMAGR's natural resources conservation and management programs include:

- Meeting the military mission of the CMAGR
- Avoiding and minimizing adverse effects to federally listed species and other significant natural resources through the implementation of programmatic instructions (published rules and guidelines for land users) and the evaluation of potential impacts of new activities and projects through the NEPA process (MCO P5090.2a with Changes 1-3)
- Improving native habitat maintenance, restoration, and enhancement through the implementation of programmatic conservation plans, fire management, nonnative species control, erosion control, pollution prevention, etc. (MCO P5090.2a with Changes 1-3)
- Inventorying, monitoring, and surveying to understand and track the Range's species and habitats, and using these data to evaluate the status, quality, distribution, and trends of those resources and management plans (e.g., vegetation mapping, desert tortoise surveys, and anthropogenic impact study)
- Ensure compliance with the appropriate natural resources laws and regulations, agency guidance, relevant orders, and binding regulatory opinions permits
- Remaining cognizant of regional natural resources initiatives and trends, maintaining involvement in those that relate to the CMAGR (e.g., DRECP and desert tortoise and pronghorn recovery plans)
- Remaining cognizant of public opinion and interest groups where these intersect with the MCAS Yuma or the CMAGR
- Maintaining a professional, and mutually productive relationship with the regulatory authorities who monitor and advise on the CMAGR
- Achieving long-term desert tortoise management and conservation goals and objectives defined in the most up-to-date recovery plan (USFWS 2011
- Maintaining current natural resources data inventories that support mission planning and land use decision making on the CMAGR (see Table 4-1 below)
- Maintain open lines of communication with MCIWest and other DoD organizations in order to share information and experiences and coordinate actions on matters of mutual interest

Natural resource management programs, policies, objectives and action items developed specifically for the CMAGR are discussed in this section. The discussion of each existing or proposed program addresses existing or potential management issues as well as program objectives, metrics for evaluating the effectiveness of the program, and specific actions necessary to implement each program. These programs have been developed and prioritized to sustain the military's operational and support requirements, to achieve overarching natural

resources management goals, and incorporate the principles of ecosystem management including adaptive strategies.

Program areas include:

4.1 INRMP Implementation
4.2 NEPA Review
4.3 Federal ESA Compliance
4.4 Threatened or Endangered Species, Critical Habitat
4.5 Other Special Status Species
4.6 Migratory Birds and Eagles
4.7 Bird/Animal Aircraft Strike Hazard Reduction Program
4.8 General Wildlife
4.9 Nuisance and Nonnative Wildlife
4.10 Vegetation
4.11 Invasive Plant Species
4.12 Wildland Fire Management
4.13 Wildlife Watering Sources
4.14 Ecosystem Management
4.15 Soils
4.16 Climate Change
4.17 Cultural Resources
4.18 Conservation Program Geographic Information Services
4.19 Cooperative Initiatives
4.20 Recreation
4.21 Law Enforcement and Control of Public Access

In compliance with MCO P5090 2.A w/changes 1-3, Chapter 3 (USMC 2013), this chapter provides performance-based objectives, metrics, and actions to ensure natural resource management programs are planned, funded, executed, periodically evaluated for efficacy, and adjusted as necessary to meet evolving military mission requirements, as well as natural and anthropogenic changes to the CMAGR landscape. Terminology used in the context of natural resource management programs in this section are as follows:

- **Objectives:** Description of a desired future end-state or successful outcome that supports a CMAGR INRMP goal or USMC/DoN policy or other relevant law or regulation
- **Metrics:** Description of a standard, quantity, or timeframe for attaining the objective
- **Actions:** Description of a specific step, practice or method for satisfying an objective

Information and data gaps relevant to the management of resources such as ecosystem health and biodiversity at CMAGR identified during the planning process for this INRMP are summarized in Table 4-1.

Table 4-1. Information and Data Gaps Identified during the Integrated Natural Resource Management Plan Planning Process

Resource	Incomplete or Unavailable Information/Data
Earth Resources	Soil series data are incomplete.
Water Resources	Mapping of certain water features (e.g., tinajas and playas) is incomplete and water quality data are limited. Actual water volume, water quality, and sustained renewability of the basins are poorly known because a limited number of wells have been drilled on the range.
Climate and Air Resources	Data is available for the general region but there are no weather stations located on the CMAGR, therefore, site specific data is not available.
Vegetation	Field work for a comprehensive vegetation map and GIS database for the CMAGR began in early 2015. The final report will also include a dichotomous key to the vegetation associations. All plant species on the range shall be documented by specimens made available to the Installation Representative as a herbarium collection at University of California Riverside, and Arizona Western College, in Yuma, Arizona.
General Wildlife and Wildlife Habitat	The occurrence, distribution, and overall health of many wildlife species on the CMAGR, including invertebrate species, reptiles, and game species have been detailed in general and species-specific surveys, EAs, and clearance surveys. The effects of nonnative or nuisance species (e.g., common ravens and wild burros) on native wildlife are not completely understood. The locations and characteristics of wildlife movement corridors within the CMAGR and from adjacent areas are not well documented.
Special Status Species	Data continue to be collected for protected species, but the potential occurrence and distribution of such species cannot be known definitively because some are migrants. The effects of military and unauthorized uses on migratory birds, bat roosts, sensitive habitats over time are not well understood; however, long-term monitoring of species (e.g., desert tortoise) can help determine overall population trends.
Wildland Fire Management	The extent to which invasive plants have spread across the CMAGR is ongoing and the development of a Wildland Fire Management Plan is of high priority.
Law Enforcement Management	Law enforcement actions are tracked, but the extent to which unpermitted access or unlawful activities are occurring is difficult to quantify. Similarly, while the extent and type of unauthorized activity can only be documented based on apprehensions, the magnitude, location, and resource damage effects can only be interpolated based on known data.

Natural Resource Management Program objectives, metrics for success, and actions presented in this section were developed through meetings and discussions with the MCAS Yuma, USFWS, CDFW, and BLM resource managers, monitoring experts, and other stakeholders. This INRMP stresses the importance of regional monitoring partnerships and protocol standardization for understanding landscape-scale ecosystem changes on the CMAGR and Mojave Desert.

Natural resources management programs are driven by the need to maintain sufficient natural areas and varied vegetation that will allow sound and realistic tactical training, as well as support sound ecological management. Natural resource management programs must balance military mission requirements established under Title 10 U.S.C. with federal resource conservation laws such as the Sikes Act, ESA, and MBTA.

4.1 INRMP Implementation

Land jurisdiction within the CMAGR previous to the FY14 NDAA followed a complicated checkerboard pattern with only approximately 51 percent of the land administered by the DoN. Having multiple jurisdictions with varied administrative oversight of the CMAGR led to challenging land management. Following the FY14 NDAA, all withdrawn land previously administered by the BLM within the CMAGR is now managed by the DoN in accordance with this INRMP.

The CMAGR's natural resource management has been mostly limited to actions taken for the benefit of protected or special status species (e.g., desert tortoise) and no comprehensive inventories or surveys are available. This revised INRMP continues to rely heavily on the most current tortoise survey reports, regional data sets (e.g., USFWS, VegCAMP, NRCS, and USGS) and 2013 LEIS (DoN et al. 2013).

Over the next five-year period, factors upon which this INRMP is based on may change, including military mission requirements, federal list of threatened and endangered species, information available for listed species and their ecosystems, as well as an understanding of anthropogenic impacts. The implementation of this INRMP, will follow an adaptive management approach that acknowledges uncertainty, monitors the various INRMP components, and lessons learned with the end goal of improving the CMAGR's future management actions and ecosystem health.

Objective: Long-term sustainability of mission capability, species populations and ecosystem functions, and regulatory compliance

Metric: Execution of natural resource programs, action items and projects, as well as successful completion of prescribed interagency annual reviews and five-year review for operation and effect.

Action 1: Prioritize, pursue funding opportunities, and implement projects as outlined in this INRMP.

Action 2: This INRMP is to be reviewed annually for operation and effect. The parties in the review process should at a minimum include the MCAS Yuma, USFWS, and CDFW. The annual review is intended to assess its overall effectiveness, verify there has been no net loss in the capability to support the military mission has occurred, and provide information to support a comprehensive review for operation and effect as required by the Sikes Act. Annual reviews will assess the focus areas discussed in Sections 4.2 through 4.21. Annual review results will be provided to all parties and will be catalogued in Appendix D.

4.2 NEPA Review

All major federal actions are subject to the NEPA review process that considers the potential environmental impacts on natural resources and reasonable alternatives that would meet the action's purpose and need.

Objective: Provide timely, data-driven analysis of the potential effects from federal actions.

Metric: Consistently follow the NEPA planning process, applicable laws and regulations to evaluate potential impacts from an ecosystem management perspective, thereby mitigating risk or liability.

Action 1: REIR, EA, and/or EIS reviews will 1) identify potential effects of the proposed action from a local and regional ecosystems management perspective, 2) identify less damaging alternatives, 3) identify other laws and regulations that may be applicable, 4) ensure that adequate mitigation is planned, if required, 5) assess the level of regulatory interface required, and 6) assess consistency with natural resources management goals, objectives, BOs, and conservation programs.

4.3 Federal ESA Compliance

The MCAS Yuma regularly consults with the USFWS to ensure that USMC actions on the CMAGR are not likely to jeopardize the continued existence of any federally listed endangered, threatened, or proposed species and comply with Sections 7 and 9 of the ESA. Pursuant to Section 7 of the ESA, federal agencies must consult with USFWS if their action “may affect” a federally listed endangered or threatened species (50 CFR 402). Such consultations may be formal or informal. When required by Section 7 of the ESA, the installation prepares a Biological Assessment of the effects of a proposed action on listed species. Section 9 of the ESA prohibits the “take” of a threatened or endangered species. A take includes the direct killing, harming, or harassing of a species, or destruction of habitat that may be important for the species’ survival or recovery.

Objective: Maintain viable populations of federally listed threatened or endangered species and participate in regional recovery efforts.

Metric: Implementation of management practices that protect and enhance the recovery of federally listed threatened or endangered species. USFWS BO conservation measures are consistently implemented, and regional conservation efforts supporting delisting or down listing of federally listed species are considered.

Action 1: Adhere to conservation measures and relevant avoidance measures identified in all applicable USFWS BOs (see Appendix E for all applicable BOs).

Action 2: Manage federally listed threatened or endangered species and their habitats to prevent jeopardy to the species and to assist in their conservation and recovery.

Action 3: Manage federally listed threatened or endangered species and their habitats in a manner that minimizes impacts to both mission and species.

Action 4: Proactively collect information on presence or absence, location, habitat availability and suitability, and life history requirements of federally listed threatened or endangered species and maintain and update these data.

Action 5: Develop and maintain a robust GIS database that will be updated as survey data become available, to document spatial and temporal distribution of federally listed threatened or endangered species.

4.4 Threatened or Endangered Species, Critical Habitat

4.4.1 Desert Tortoise

The MCAS Yuma has historically contributed to the USFWS's long-term monitoring program, which includes annual desert tortoise surveys that are supervised by the USFWS Desert Tortoise Recovery Office (DTRO). The DTRO was established to address population declines and focus on recovery subsequent to the General Accounting Office's December 2002 audit of recovery actions and 2004 *Desert Tortoise Recovery Plan Assessment* (USFWS 2013).

The desert tortoise recovery program includes range-wide, long-term monitoring to determine whether recovery goals are met based on population trends. The USFWS oversees the implementation of the line-distance sampling protocol and establishes the number and location of transects to be surveyed based on available funding from recovery partners, including MCAS Yuma.

Objective 1: Maintain compliance with all applicable desert tortoise BOs (see Appendix E).

Objective 2: Improve and maintain existing populations of desert tortoise and improve and maintain designated critical habitat.

Action 1: Continue to participate in annual desert tortoise surveys. These surveys will continue to inform population trends in accordance with the requirements of all applicable USFWS BOs (see Appendix E).

Action 2*.* Map desert tortoise population, densities, habitat parameters, and threats across the range.

Action 3. Continue to participate in the Desert Tortoise Management Oversight Group and the California Recovery Implementation Team. Develop project proposals to assist with the species recovery.

4.4.2 Sonoran Pronghorn

The Sonoran pronghorn subspecies was one of the first species to gain ESA protection in the U.S. and is recognized by a number of federal, state, and international lists. It was listed as endangered throughout its range on 11 March 1967 (32 FR 4001) under the Endangered Species Preservation Act of 15 October 1966. It was subsequently included on a list of endangered species published in 1967, and in the Endangered Species Conservation Act of 1970. When the ESA was signed into law in 1973, the Sonoran pronghorn was placed on the list as an endangered species under Section 4(c)(3) of the ESA, the "grandfather clause." Sonoran pronghorn historically occurred throughout most of southwestern Arizona, southeastern California, and northwestern Sonora, Mexico,

Recovery efforts officially began in 1975 with the first meeting of the Sonoran pronghorn recovery team. The *Sonoran Pronghorn Recovery Plan,* dated 30 December 1982, was prepared for USFWS by the recovery team (USFWS 2015). In summer 2002, the U.S. population of Sonoran pronghorn was almost extirpated due to the most severe drought on record in southern Arizona. In response to the near extirpation of the U.S. population, the USFWS, Arizona Game and Fish Department, MCAS Yuma, and other cooperating agencies began aggressive conservation actions including construction of water developments and forage enhancement plots, supplemental feeding, and a captive breeding program (USFWS 2013).

With the success of the captive breeding pen, the Sonoran pronghorn recovery team initiated releases into the wild in 2006. As of January 2015, 105 pronghorn have been released. Under Section 10(j) of ESA, the USFWS established a nonessential, experimental population in historical habitat in the Kofa National Wildlife Refuge (NWR) and the BMGR East (76 FR 25593). Nine pronghorn were released onto the Kofa NWR in January 2013. Since 2002, the wild endangered population in Arizona has rebounded to 202 animals (as of December 2014). The population at Kofa NWR currently has 58 animals (USFWS 2015).

The Recovery Plan is currently under revision. The revised plan sets objective population goals and thresholds in the U.S. and Mexico and provides objective, measurable criteria for down listing and delisting the species; incorporates expanded threat and viability analyses; includes existing, expanded, and new site-specific management and recovery actions, emphasizing habitat management; estimates time and cost required for recovery, identifies partners and parties responsible for implementation of recovery actions; identifies gaps in the information needed for management and recovery; and pending genetic support from ongoing research, recommends establishment of a California Reintroduction Management Unit on the Chuckwalla Bench (USFWS 2015). At the 8 March 2012 meeting to discuss a potential nonessential experimental population, staff at the Palm Springs USFWS office mentioned the success of the captive breeding program and the possibility of establishing a nonessential experimental population in the Chuckwalla Bench. An analysis of habitat variables (e.g., vegetation composition and landscape) was conducted for three sites in southern California for determining their suitability for reintroducing Sonoran pronghorn (USFWS 2015). The Chuckwalla Bench ranked highest, with suitable amounts of forage, water, and land protection. Rice Valley ranked second, and Anza Borrego State Park ranked third (USFWS 2015).

Objective: Maintain participation in discussions related to regional Sonoran pronghorn recovery efforts.

Metric: Participation in regional Sonoran pronghorn recovery efforts

Action 1: Pending decisions of other State and Federal lead agencies, determine whether the reintroduction of a nonessential experimental population of Sonoran pronghorn will be compatible with training mission objectives and designed to avoid conflicting with range operations.

Action 2: Assist in coordination and provide in-kind and financial support, if available, to the Sonoran pronghorn recovery team in any future efforts to support the management of a nonessential experimental population on the Chuckwalla Bench.

4.5 Other Special Status Species

For the purposes of this discussion, other special status species are those plants and animals that are proposed or identified as a candidate species for listing by the USFWS, listed as species of concern by the USFWS and/or CDFW, and/or California BLM's designated sensitive species list. Federally listed threatened or endangered species are not included here, as they were mentioned in Sections 4.4.1 and 4.4.2.

Couch's spadefoot toad, which occurs along the UPRR railroad tracks on the CMAGR's southwestern boundary, may occur on the range but surveys are problematic due to the specific meteorological conditions necessary for successful detection (i.e., monsoonal rains that leave standing water for breeding pools). Golden eagle populations may occur on and around the Range, however, it has not been reported on the CMAGR. Other species that may occur on the Range include Colorado fringe-toed lizard and burrowing owl.

Objective: Manage the habitat and populations of special status species known to occur or likely to occur on the CMAGR to reduce conflicts between military mission and the environment.

Metric: Actions comply with all applicable federal laws and regulations for the protection of special status species.

Action 1: Inventory and monitor special status species to establish a baseline from which conservation and management strategies can be devised.

4.6 Migratory Birds and Eagles

The MBTA of 1918 is the primary legislation established to conserve migratory birds in the U.S. It implements the U.S.'s commitment to four bilateral treaties, or conventions, for the protection of a shared migratory bird resources. The MBTA prohibits the taking, killing, or possessing of migratory birds unless permitted by regulation. The species of birds protected by the MBTA appear in 50 CFR 10.13. The FY03 NDAA directed the Secretary of the Interior to exercise his/her authority under the MBTA to prescribe regulations that exempt the Armed Forces from the incidental taking of migratory birds during military readiness activities authorized by the Secretary of Defense. An MOU outlining agency responsibilities between the DoD and USFWS was signed on 31 July 2006 (USFWS 2006). Effective 30 March 2007, the USFWS published a rule authorizing the take of migratory birds in the course of military readiness activities provided such actions do not have a significant adverse effect the population (72 FR 8931).

In addition to the MBTA, BGEPA (16 U.S.C. 668) as amended in 1972 prohibits any form of possession or taking of bald or golden eagles (i.e., any part, nest, or egg), unless allowed by permit. The BGEPA defines "take" as to pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb. In September 2009, the USFWS announced a final rule on two new permit regulations that would allow for the take of eagles. The permits will authorize limited,

non-purposeful take of bald and golden eagles, which includes authorizing government agencies to disturb or otherwise take eagles in the course of conducting lawful activities (e.g., airport operations).

Objective 1: Maintain, restore, and enhance habitats upon which resident and migratory bird and eagle populations depend, emphasizing those that may be affected by military activities in compliance with EO 13186, USFWS-DoD MOU (2006), and 72 FR 8931.

Metric: Compliance with all applicable laws and regulations for the protection of migratory birds and eagles, including the MBTA and the BGEPA.

Action 1: Avoid or minimize impacts to migratory birds and eagles and their habitats.

Action 2: Conduct presence/absence surveys periodically as part of an adaptive management strategy to better inform migratory bird management on the range.

Action 3: Develop, strive to implement, and periodically evaluate conservation measures for management actions to avoid or minimize incidental take of migratory birds and eagles, and, if necessary, confer with the USFWS on revisions to these conservation measures.

Action 4: Participate in regional or national inventory and monitoring programs (e.g., Breeding Bird Surveys, Breeding Biology Research and Monitoring Databases (i.e., BBIRD), Christmas bird counts, bird atlas projects, or game bird surveys) where practicable, feasible, and accessible with consideration toward safety and security.

4.7 Bird/Animal Aircraft Strike Hazard Reduction Program

The Bird/Animal Aircraft Strike Hazard (BASH) Reduction Program (StatO 3750.1C) was created to ensure an integrated bird control, hazard abatement, and incident reporting. It is designed to minimize aircraft exposure to potentially hazardous bird and animal strikes. It's governed by the BASH Working Group and chaired by the Installation's Commanding Officer. The BASH Working Group meets quarterly to assess the status of the BASH Reduction Program and recommend improved procedures and coordination. The Installation's Aviation Safety Officer coordinates these meetings in conjunction with the Commanding Officer's Safety Council meetings. The BASH Working Group consists of:

- Commanding Officer (Chairperson)
- Airfield Operations Officer
- Air Traffic Control Facility Officer
- Range Director
- Aviation Safety Officer
- Natural Resources Specialist
- Pest Management Officer
- Tenant Unit Representatives (e.g., MAG-13, MAWTS-1, VMFT-401)

The BASH Reduction Program requires the Range Director to maintain permits for dispersal and depredation programs, ensure properly trained personnel are available when required, and

records maintenance. The Range Director also maintains necessary nonlethal equipment and devices for bird abatement and dispersal, advises the Airfield Operations Officer, and attends BASH Working Group meetings.

The Range Management Department maintains the MBTA depredation permit, liaises with CDFW, USFWS, U.S. Department of Agriculture's Animal and Plant Health Inspection Service, Audubon Society, and other agencies to provide additional information on migratory, local, and seasonal bird activities, and mails avian remains to the Smithsonian Institute for official cataloging.

Objective: Minimize bird strikes from aircraft on the CMAGR.

Metric: Implement efforts to minimize the possibility of harm to life, property and the environment through compliance with the BASH Reduction Program (StatO 3750.1C).

Action 1: Maintain the existing MBTA depredation permit(s).

Action 2: Update as necessary and periodically evaluate possible improvements to this successful program that might further reduce BASH incidents.

4.8 General Wildlife

Wildlife species management is primarily accomplished by managing the habitat on which wildlife depends. The MCAS Yuma will coordinate with the CDFW and USFWS to identify, prioritize, and implement habitat enhancement projects targeted for particular species or broad classifications of species (e.g., birds, reptiles, and invertebrates). Programs to manage wildlife habitat include invasive plant control, population density surveys, and provision of guzzlers in strategic locations.

Objective: Implement various wildlife management strategies (e.g., inventory, monitoring, population modeling, assessment, and evaluation) to better understand local and regional wildlife dynamics.

Metric: Understand and support wildlife distributions.

Action 1: Inventory and monitor distribution and abundance of reptiles, birds, amphibians, and small mammals.

Action 2: Maintain vegetation known to support wildlife.

Action 3: Restore or enhance vegetation outside of heavy-use areas where appropriate, especially in degraded xeroriparian or upland areas that serve as wildlife corridors.

4.9 Nonnative and Nuisance Wildlife

Wild burro signs were recorded on the CMAGR in September 2015 by the MCAS Yuma's Cultural Resources Manager. Nonnative and nuisance bird species include the Eurasian collared-dove and common raven (CMBC 2013). The common raven, which has been

implicated throughout southern California deserts as a predator of small desert tortoises, is relatively common, having been detected on 23 percent of transects surveyed in 2013 (CMBC 2013). Water sources are few and far between, and there are relatively few large trees, a handful of abandoned vehicles, and one electrical utility line runs through the center of the range to provide nesting. The CMAGR is surrounded by large parcels of uninhabited, BLM- and State-owned lands. In an effort to thwart raven establishment, measures will be employed to discourage further settlement by common ravens, as discussed in Section 3.3.3, “Special Status Species” (CMBC 2015).

Objective: Develop a nonnative and nuisance species management program.

Metric: Nonnative and nuisance species monitoring metrics and set targets are developed to ensure management strategies are meeting goals and objectives.

Action 1: Work in partnership with the BLM to control the wild burro populations.

Action 2: Inventory, monitor and control raven populations.

Action 3: Develop pest species management programs as needed to include pest mammals (e.g., rabbits, skunks, raccoon, squirrels, coyotes, feral dogs, feral cats, and ravens).

4.10 Vegetation

Field work for a comprehensive vegetation map and GIS database was initiated in early 2015. The GIS database will include a dichotomous key of vegetation associations. Plant specimens will be delivered to the herbarium collection at the University of California at Riverside and Arizona Western College, in Yuma, Arizona.

Vegetation field sampling and mapping will follow the protocols established for the BMGR-West (Malusa 2012), which were developed from similar mapping efforts on the BMGR East, Cabeza Prieta National Wildlife Refuge, and Organ Pipe Cactus National Monument (Warren et al. 1981, Malusa 2003, McLaughlin et al. 2007; Osmer et al. 2009). It is expected that these protocols will be modified by new developments or innovations in desert vegetation field sampling and mapping methodologies. It is also expected that the map will be similar in detail to those published for Joshua Tree National Park (Keeler-Wolf et al. 2005), and Anza Borrego Desert State Park (Keeler-Wolf et al. 1998). The field effort will include the collection of with invasive vegetation information that will record the extent and distribution patterns of invasive species, including areas where they are still absent.

Objective: Establish a baseline inventory of vegetation on the CMAGR through mapping and GIS data development

Metric: Maintain quality vegetation mapping.

Action 1: Complete vegetation mapping.

Action 2: Identify essential habitats for rare plants and wildlife. Monitor the condition of protected areas, areas at risk for type conversion, and invasive species distribution. Support the

development of higher resolution habitat maps. Mapping efforts may be focused on areas known to be at high risk of invasion (Brooks and Berry 2006), including:

- Roads, trails, campsites and wash corridors
- Areas in proximity to other nonnative plant populations
- Recently or continually disturbed areas
- Areas of high management priority and protection (sensitive or endangered species communities)

4.11 Invasive and Nonnative Plant Species

The collection of baseline information allows managers to track the spread of known populations and identify new infestations to evaluate the effectiveness of management actions. Early detection of new species or infestations coordinated with a rapid management while the populations are still small and manageable is the ideal course of action.

Objective: Control the proliferation of invasive and nonnative vegetation so as to maintain mission capability and ecosystem health for threatened and endangered species, other special status species, and wildlife.

Metric: Invasive and nonnative plant species abatement.

Action 1: Acquire reliable baseline data on the presence and abundance of invasive and nonnative plant species.

Action 2: Survey and map the location, abundance, and distribution of invasive and nonnative plant species most likely to impact ecosystem health or mission readiness.

Action 3: Treat and monitor areas most likely to impact ecosystem health or mission readiness.

4.12 Wildland Fire Management

Wildland fires on military lands are a risk to human lives, natural resources, military assets, and military mission. Wildland fires contribute to soil erosion after the vegetative ground cover stabilizing the soil is removed. This loss of topsoil can lead to increased sedimentation and turbidity in surface water, loss of soil moisture and nutrients, and ground fires. Such fires leave the burned area vulnerable to the spread of exotic plants.

In accordance with DoDI 6055.06, MCO P5090.2A w/changes 1-3 (HQMC 2013), and the Sikes Act, a Wildland Fire Management Plan (WFMP) will be developed for the CMAGR to assess the risks to natural resources and military training.

Objective. Conduct wildland fire management on the CMAGR.

Metric. Reduce wildfire potential, protect military assets, and protect and enhance natural resources.

Action 1: Develop and implement a WFMP that identifies regional fire attributes and guidance for managing wildfires. The WFMP development will be a collaborative effort with local firefighting agencies, a fire ecologist, and MCAS Yuma Conservation Program. It will incorporate new and historical aerial photography of fuel loads, historic burns, vegetation recovery, and vegetation type (noting potential vulnerability of type conversion or invasion of nonnative vegetation).

4.13 Wildlife Watering Sources

Most wildlife species are able to survive by evading the hot and dry extremes of the Colorado Desert's climate through behavioral and physiological adaptations. Many species are adapted to survive without free water in their environment.

The CMAGR largely lacks surface waters for wildlife with the exception of ephemeral pools that develop after seasonal storms. The only water sources are from artificial tanks (guzzlers) and tinajas.

Objective: Provide and maintain an adequate water supply for wildlife on and transiting through the CMAGR.

Metric: Continue to support efforts to provide wildlife watering sources and maintain existing sources.

Action 1: Maintain access to the guzzlers along the Coachella Canal to allow large mammals to move onto and off the CMAGR to use these guzzlers.

4.14 Ecosystem Management

The DoD recognizes the value of ecosystem management by establishing natural resource principles and guidelines for managers. Ecosystem management requires a shift from the management of single to multiple species and habitats. Since knowledge of the range's ecological system and funding is limited, resource management practices will be continuously reevaluated as new information becomes available. Flexibility and adaptation in the face of uncertainty are critical (Benton et al. 2008).

Objective: Implement an ecosystem approach to promote the conservation of native species and habitats, ensure sustainability and biological diversity, support the military's training mission, and compliance with applicable laws and regulations.

Metric: Acquire, develop, and maintain project and conservation information and GIS data relating to the physical environment and ecosystem management.

Action 1: Support research to gain the best available scientific information to guide natural resource and conservation decisions.

Action 2: Define and understand CMAGR's regional relevance and responsibility towards regional conservation efforts.

4.14.1 Aerial Orthophotography and Evaluation of Anthropogenic Impacts

Human activities can directly impact soils, vegetation, and local hydrology. Aerial photography and high-spatial-resolution satellite imagery can be used to monitor changes using repeated imagery acquisitions. With georeferenced imagery, surface disturbances (e.g., road widening, new spurs, vegetation damage, and damage to desert pavements) can be identified, quantified, and compared from one period to another. In 2009, the MCAS Yuma contracted company to collect aerial photography, in color and infrared, at 1-foot resolution. In 2015, the MCAS Yuma acquired 1-foot-resolution, 4-band, direct-digital-stereo imagery.

Objective: Maintain aerial orthographic imagery.

Metric: Update aerial orthographic imagery at least once every five-years.

Action 1: Establish current baseline and update aerial orthographic photographs over time to document landscape changes resulting from military activities and other land uses. This effort will allow the identification of well-managed and areas of concern resulting from the creation of new roads, military exercise, and erosion from overland flow.

Action 2: Utilize aerial orthographic imagery to conduct anthropogenic-impact-specific studies.

4.15 Soils

The Sikes Act and MCO P5090.2A w/changes 1-3 (HQMC 2013) dictate the implementation of BMPs to control and prevent excessive soil erosion, implement soil conservation measures, and restore or rehabilitate degraded landscapes wherever practicable, subject to budgetary constraints. Adequate soil information is critical to determining those BMPs and implementing comprehensive environmental and natural resource monitoring.

Objective: Conserve soil resources by implementing effective BMPs to prevent soil erosion that may impede mission capacity or capability or adversely impact designated critical habitat or protected natural or cultural resources.

Metric: Conserve soil resources by mapping existing resources, preventing additional erosion where possible, and restoring eroded sites as practical.

Action 1: Develop spatial data related to soil associations and characteristics.

Action 2: Establish a soils and erosion monitoring framework to measure and assess changes over time (i.e., disturbance to soil, water runoff and flow regime, wind erosion and air quality).Remote-sensing methods, spatial-temporal models that are calibrated with ground measurements will be used to document changes in soil resources resulting from natural and human land use.

Action 3: Assess watershed erosion status and evaluate possible engineering solutions by 1) developing a GIS-based watershed model, 2) identifying areas of severe erosion, 3) installing erosion monitoring devices, and 4) evaluating erosion control alternatives.

4.16 Climate Change

DoD's 2014 *Climate Change Adaptation Roadmap*, details the impacts of global climate change on operations, adaptation, mitigation, and inter-agency coordination. The first step is to climate change identify the effects on the Department with tangible and specific metrics, using the best available science (DoD 2014). Currently, baseline surveys are being conducted at more than 7,000 military installations and facilities worldwide to assess the effects of climate change and integrate these findings into military plans, operations, and training (DoD 2014).

DoD guidance encourages installations to adapt installation-specific conservation strategies by monitoring historical regional trends and climate or sea-level rise projections.

Objective: Develop and implement conservation strategies for adapting to global climate change as applicable laws and regulations.

Metric. Develop monitoring metrics and set targets to meet goals and objectives as they relate to the military mission and ecosystem management.

Action 1: Assess sustainability objectives and strategies in the context of climate change relevant to natural resources.

Action 2: Conduct vulnerability assessments of species and habitats most at risk in coordination with other DoD installations, CDFW and USFWS.

Action 3: Collaborate with relevant partners to optimize the value of strategies developed for adaptation to climate change.

Action 4: Install and maintain weather stations, including rain gauges at specific study locations

4.17 Cultural Resources

MCO P5090.2A w/changes 1-3 (HQMC 2013) dictates consultation with federally recognized Indian tribes in INRMP preparation or revisions. Tribes were provided the opportunity to review and comment on this INRMP and will be invited to participate in future revisions. However, formal consultation will be initiated if any projects are determined to fall under Section 106d of the National Historic Preservation Act.

4.18 Conservation Program Geographic Information Services

The GIS program mission is to create, analyze, manage, and distribute authoritative standardized geospatial information, products, and services. A well-maintained and accessible GIS-based data also improve the likelihood of success for long-term planning.

Objective: Acquire, develop, and maintain spatial data for improved efficiency of natural resource management.

Metric: Support the military training exercises, improve natural resource management and protect the environment in supporting the military mission.

Action 1: Continue the development of natural resource GIS data, with an emphasis on vegetation, general wildlife, special status species, anthropogenic resources and impacts, and soils.

4.19 Cooperative Initiatives

The MCAS Yuma looks to internal stakeholders, cooperating agencies and external stakeholders for specialist advice, best practices, and natural resource management assessments which has proven to be mutually beneficial.

Objective: Improve natural resource management strategies through effective communication with stakeholders and cooperating agencies.

Metric: Effective communication with stakeholders and cooperating agencies regarding resource management on the CMAGR.

Action 1: Cooperate with internal stakeholders (i.e., Environmental, Installations and Logistics, and Planning), cooperating agencies, and external stakeholders on natural resource management issues of mutual interest.

4.20 Recreation

Public safety and the protection of military missions are the principal reason no public access to the CMAGR is permitted Public access is also restricted in the regions surrounding the range (e.g., BOR land) and there are no designated wilderness or wildlife areas within the range. The 2014 LEIS renewed the withdrawal of a major portion of the public land withdrawn under the CMLWOA, but reverted 2,589 acres to the BLM that realigns the CMAGR boundary with the Bradshaw Trail, improving public access to the trail.

4.21 Law Enforcement and Control of Public Access

The Commanding Officer of the MCAS Yuma is responsible for land management, environmental compliance, security, training procedures, and safety on the CMAGR. The authorities available to the Commander in meeting these responsibilities include the Sikes Act, 16 U.S.C. 670; Assimilative Crimes Act, 18 U.S.C. 13; Uniformed Code Of Military Justice, 10 U.S.C. 807B; and other applicable laws and regulations.

U.S. Conservation Law Enforcement Officers and Military Police are the tools the Commanding Officer uses to enforce these laws and regulations. Law enforcement personnel reduce the degradation of training facilities and ranges through enforcement and education of both authorized range users and the public. Areas of particular concern include trespassing, removal of materials, property damage, and poaching.

Objective 1: Provide law enforcement presence in the range training areas.

Objective 2: Protect natural and cultural resources from being exploited.

Objective 3: Reduce illegal trespass.

Metric: Maintenance of secure perimeter and provision of adequate law enforcement personnel.

Action 1: Establish and maintain adequate control measures (e.g., signs, gates, fences, etc.) to provide for security, safety, and protection of human and natural resources.

4.22 Planned Projects and Implementation Schedule

This INRMP was developed in partnership with the USFWS and CDFW to include a five year action plan (Appendix C). Actions are listed by program area and include priority classification, frequency, and regulatory requirements.

Projects are classified according to output or performance level standards established by the DoD that supports using a common framework of definitions, outputs, performance metrics, and cost drivers. These Common Output Level Standards (COLS) provide a description of the capability associated with the particular installation support function. COLS guidance is provided in DoD Instruction 4001.01 w/Change 1 (DoD 2011b). Where appropriate, standards will be tiered to provide options for managing risk. COLS ratings are assigned to each planned project in accordance with guidance provided by DoDI 4001.01 w/Change 1 (DoD 2001b) and MCO P5090.2A w/changes 1-3 (HQMC 2013).

COLS Level 1 - Low Risk (Full program health) - Program capability at COLS Level 1 provides minimized program and mission risk throughout the Future Years Defense Program (FYDP). It includes full compliance with mandated requirements and policies; protection of human health and personnel welfare; sustained strategic management and planning activities to meet future year requirements and improve or enhance program capabilities; and promotes sustainability opportunities and natural resource conservation.

COLS Level 2 Medium Risk (Moderate program health) - Program capability at COLS Level 2 provides moderate program and mission risk throughout the FYDP. It includes minimal strategic management and planning activities that place the Marine Corps at risk of being unprepared for future environmental requirements and threats to the mission. It funds only those policy requirements that are directly related to operational readiness and human health, leaving other BMPs unfunded. It does not include ability to assess and implement program efficiencies or process improvements. In addition, it does not address initiatives to promote sustainability opportunities and natural resource conservation.

COLS Level 3 High Risk (Low program health) - Program capability at COLS Level 3 provides high program and mission risk throughout the FYDP. It does not fund policy requirements that have a direct impact on operational readiness and human health. It does not fund all anticipated mandated emergent requirements based on historical execution, leaving full compliance subject to availability of discretionary funding through Current Year Deficiencies. It includes only strategic management and planning activities that are directly tied to explicit mandated requirements by established deadlines, placing the Installation at risk of being unprepared for future environmental requirements, threating mission requirement. In addition, it does not fund policy requirements, including those that are directly related to operational readiness and human health and BMPs. It does not include ability to assess and implement

program efficiencies or process improvements. Finally, it does not address initiatives to promote sustainability opportunities and natural resource conservation.

Implementation of this INRMP is subject to the availability of annual funding appropriated by Congress, and none of the proposed projects or actions shall be interpreted to require obligations or payment of funds in violation of any applicable federal law, including the Anti-Deficiency Act, 31 U.S.C. § 1341. The installation requests project validation and funding through a variety of resources. The MCAS Yuma intends to implement recommendations provided in this INRMP within the framework of regulatory compliance, national mission obligations, anti-terrorism and force protection limitations, and funding constraints.

5.0 REFERENCES

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FORMAT PAGE

Appendix A. General Flora and Fauna Found on the CMAGR

FORMAT PAGE

The following data sources documented species found on the CMAGR and inform table A-1:

- Desert Tortoise Surveys for SWATs 4 and 5 (Woodman, A.P. 2008).
- Environmental Assessment for P-771 Proposed Infrastructure Improvements, Camp Billy Machen, CA (USMC 2012).
- Focused survey and habitat assessment for Agassiz's desert tortoise on Special Warfare Training Area Ranges 4 and 5 of Chocolate Mountain Aerial Gunnery Range in Riverside and Imperial counties, California (CMBC 2013).
- Biological Resources Survey (Leidos 2014).

Table A-1. General Flora and Fauna Found on the CMAGR

Common Name	Scientific Name	Notes
Reptiles		
Colorado Desert Sidewinder	*Crotalus cerastes laterorepens*	
Common Chuckwalla	*Sauromalus ater*	
Great Basin Collared Lizard	*Crotaphytus bicinctores*	
Great Basin Gopher Snake	*Pituophis melanoleucus deserticola*	
Great Basin Whiptail	*Aspidoscelis tigris*	
Long-Nosed Leopard Lizard	*Gambelia wislizenii*	
Northern Desert Iguana	*Diposaurus dorsalis*	
Red Racer	*Coluber flagellum piceus*	
Southern Desert Horned Lizard	*Phrynosoma platyrhinos calidiarum*	
Spiny Softshell Turtle*	*Apalone spiniferus*	
Western Diamondback Rattlesnake	*Crotalus atrox*	
Western Side-Blotched Lizard	*Uta stansburiana elegans*	
Western Zebra-Tailed Lizard	*Callisaurus draconoides rhodostictus*	
Amphibians		
None observed.		
Birds		
American Kestrel	*Falco sparverius*	
Ash-Throated Flycatcher	*Myiarchus cinerascens*	
Barn Swallow	*Hirundo rustica*	
Black-Chinned Hummingbird	*Archilochus alexandri*	
Black-Gray Gnatcatcher	*Polioptila caerula*	
Black-Headed Grosbeak	*Pheuticus melanocephalus*	
Black-Tailed Gnatcatcher	*Polioptila melanura*	
Black-Throated Sparrow	*Amphispiza bilineata*	
Brewer's Sparrow	*Spizella breweri*	

sp. – only identified to genus; **ssp. –** subspecies; **var. –** variety; **c.f. –** compare with

Table A-1. General Flora and Fauna Found on the CMAGR (cont.)

Common Name	Scientific Name	Notes
Cactus Wren	*Campylorhynchus brunneicapillus*	
Chipping Sparrow	*Spizella passerina*	
Chukar	*Alectoris chukar*	
Common Barn Owl	*Tyto alba*	
Common Poorwill	*Phalaenoptilus nuttalii*	
Common Raven	*Corvus corax*	
Costa's Hummingbird	*Calypte costae*	
Eurasian Collared-Dove	*Streptopelia decaocto*	
Gambel's Quail	*Callipepla gambelii*	
Great Horned Owl	*Bubo virginianus*	
Greater Roadrunner	*Geococcyx californianus*	
Great-Tailed Grackle	*Quiscalus mexicanus*	
Hooded Oriole	*Icterus cucullatus*	
Horned Lark	*Eremophila alpestris*	
House Finch	*Carpodacus mexicanus*	
Lark Sparrow	*Chondestes grammacus*	
Lesser Nighthawk	*Chordeiles acutipennis*	
Mourning Dove	*Zenaida macroura*	
Northern Mockingbird	*Mimus polyglottos*	
Northern Rough-Winged Swallow	*Stelgidopteryx serripennis*	
Orange-Crowned Warbler	*Vermivora celata*	
Phainopepla	*Phainopepla nitens*	
Red-Tailed Hawk	*Buteo jamaicensis*	
Rock Wren	*Salpinctes obsoletus*	
Ruby-Crowned Kinglet	*Regulus calendula*	
Say's Phoebe	*Sayornis saya*	
Scott's Oriole	*Icterus parisorum*	
Townsend's Warbler	*Setophaga townsendii*	
Tree Swallow	*Tachycineta bicolor*	
Turkey Vulture	*Cathartes aura*	
Verdin	*Auriparus flavipes*	
Violet-Green Swallow	*Tachycineta thalassina*	
Warbling Vireo	*Vireo gilvus*	
Western Kingbird	*Tyrannus verticalis*	
Western Tanager	*Piranga ludoviciana*	
White-Crowned Sparrow	*Zonotrichia leucophrys*	
White-Throated Swift	*Aeronautes saxatalis*	
White-Winged Dove	*Zenaida asiatica*	
Wilson's Warbler	*Wilsonia pusilla*	
Yellow-Headed Blackbird	*Xanthocephalus*	
Yellow-Rumped Warbler	*Dendroica coronate*	

sp. – only identified to genus; **ssp. –** subspecies; **var. –** variety; **c.f. –** compare with

Table A-1. General Flora and Fauna Found on the CMAGR (cont.)

Common Name	Scientific Name	Notes
Mammals		
Antelope Ground Squirrel	*Ammospermophilus leucurus*	
Audubon's Cottontail	*Sylvilagus audobonii*	
Black-Tailed Jackrabbit	*Lepus californicus*	
Bobcat	*Lynx rufus*	
Botta Pocket Gopher	*Thomomys bottae*	
Coyote	*Canis latrans*	
Desert Wood Rat	*Neotoma lepida*	
Gray Fox	*Urocyon cinereoargenteus*	
Kangaroo Rat	*Dipodomys sp.*	
Kit Fox	*Vulpes macrotis*	
Mule Deer	*Odocoileus hemionus*	
Round-Tailed Ground Squirrel	*Spermophilus tereticaudis*	
Wild Burro	*Equus astinus*	
Plants		
Anderson's Box-Thorn	*Lycium andersonii*	
Barrel Cactus	*Ferocactus cylindraceus*	
Beavertail Cactus	*Opuntia basilaris*	
Beetle Spurge	*Euphorbia eriantha*	
Big Galleta	*Pleuraphis (Hilaria) rigida*	
Bladderpod	*Isomerus arborea*	
Blazing Star	*Mentzelia laevicaulis*	
Brittle Spineflower	*Chorizanthe brevicornu*	
Brittlebush	*Encelia farinose*	
Brown-Eyed Primrose	*Cammisonia claviformis*	
Buckwheat	*Eriogonum pusillum*	
Burrobush	*Ambrosia dumosa*	
California Trixis	*Trixis californica*	
Catclaw Acacia	*Senegalia (Acacia) greggii*	
Cheesebush	*Ambrosia (Hymenoclea) salsola*	
Chia	*Salvia columbariae*	
Climbing Milkweed	*Funastrum cyanchoides*	
Cooper's Strangler	*Orobanche cooperi*	
Cottontop Cactus	*Echinocactus polycephalus*	
Coyote Gourd	*Cucurbita palmate*	
Creosote Bush	*Larrea tridentate*	
Dalea	*Dalea mollis*	
Desert Chicory	*Rafinesquia neomexicana*	
Desert Dandelion	*Malacothrix glabrata*	

sp. – only identified to genus; **ssp. –** subspecies; **var. –** variety; **c.f. –** compare with

Table A-1. General Flora and Fauna Found on the CMAGR (cont.)

Common Name	Scientific Name	Notes
Desert Holly	*Atriplex hymenelytra*	
Desert Indianwheat	*Plantago ovata*	
Desert Ironwood	*Olneya tesota*	
Desert Lavender	*Hyptis emoryi*	
Desert Mallow	*Sphaeralcea ambigua*	
Desert Milk Aster	*Stephanomeria pauciflora*	
Desert Pincushion	*Chaenactis fremontii*	
Desert Sand Verbena	*Abronia villosa*	
Desert Skeleton Weed	*Eriogonum deflexum*	
Desert Spanish-Needles	*Palafoxia linearis*	
Desert Sunflower	*Geraea canescens*	
Desert Tea	*Ephedra californica*	
Desert Tobacco	*Nicotiana obtusifolia*	
Desert Trumpet	*Eriogonum inflatum*	
Desert Willow	*Chilopsis linearis* ssp. *arcuata*	
Dicoria	*Dicoria canescens*	
Ditaxis	*Ditaxis lanceolate*	
Ditaxis	*Ditaxis neomexicana*	
Emory Rock Daisy	*Perityle emoryi*	
Fagonia	*Fagonia laevis*	
Fiddleneck	*Amsinckia tessellata*	
Flixweed	*Descurainia sophia*	Nonnative
Forget-Me-Not	*Cryptantha micrantha*	
Four-Winged Saltbush	*Atriplex canescens*	
Fuzzy Forget-Me-Not	*Cryptantha barbigera*	
Grama	*Bouteloua* sp.	
Gray Desert Star	*Monoptilon bellioides*	
Green Joint-Fir	*Ephedra viridis*	
Hedgehog Cactus	*Echinocereus englemannii*	
Honey Mesquite	*Prosopis glandulosa*	
Honeysweet	*Tidestromia oblongifolia*	
Indigo Bush	*Psorothamnus schottii*	
Jimsonweed	*Datura wrightii (meteloides)*	
Jojoba	*Simmondsia chinensis*	
Little Blazing Star	*Mentzelia albicaulis*	
Little Gold-Poppy	*Eschscholzia minutiflora*	
Little Trumpet	*Eriogonum trichopes*	
Lotebush	*Ziziphus parryi*	
Low Fluffgrass	*Erioneuron pulchellum*	

sp. – only identified to genus; **ssp. –** subspecies; **var. –** variety; **c.f. –** compare with

Table A-1. General Flora and Fauna Found on the CMAGR (cont.)

Common Name	Scientific Name	Notes
Lupine	*Lupines* sp.	
Matchweed	*Gutierrezia sarothrae*	
Mesquite Mistletoe	*Phorodendron californicum*	
Milkweed	*Asclepias subulata*	
Milkweed	*Brandegea bigelovii*	
Mohave Ghost Flower	*Mohavea confertifolia*	
Mohave Prickly Poppy	*Argemone corymbosa*	
Mojave Yucca	*Yucca schidigera*	
Narrow-Leaved Forget-Me-Not	*Cryptantha angustifolia*	
Ocotillo	*Fouquieria splendens*	
Odora	*Porophyllum gracile*	
Palo Verde	*Cercidium floridum*	
Paper-Bag Bush	*Salazaria Mexicana*	
Parish Golden-Eye	*Viguiera deltoidea* var. *parishii*	
Pebble Pincushion	*Chaenactis* c.f. *carphoclinia*	
Pencil Cholla	*Cylindropuntia ramosissima*	
Phacelia	*Phacelia vallis-mortae*	
Pickleweed	*Salicornia bigelovii*	
Pigmy-Cedar	*Peucephyllum schottii*	
Pima Rhatany	*Krameria erecta*	
Purple Phacelia	*Phacelia crenulata* var. *ambigua*	
Rayless Encelia	*Encelia fructescens*	
Red Primrose	*Camissonia boothii*	
Red-Stemmed Filaree	*Erodium cicutarium*	Nonnative
Rigid Spineflower	*Chorizanthe rigida*	
Rock Hibiscus	*Hibiscus denudatus*	
Saharan Mustard	*Brassica tournefortii*	Nonnative
Salt Cedar	*Tamarix ramosissima*	Nonnative
Sandmat	*Chamaesyce polycarpa*	
Sandpaper Plant	*Petalonyx linearis*	
Senna	*Senna (Cassia) armata*	
Silver Cholla	*Cylindropuntia echinocarpa*	
Smoke Tree	*Psorothamnus spinosus*	
Stick-Leaf	*Mentzelia* sp.	
Sunbonnets	*Loeseliastrum matthewsii*	
Sweetbush	*Bebbia juncea*	
Tansy Mustard	*Descurainia pinnata*	Nonnative
Thick-Leafed Ground-Cherry	*Physalis crassifolia*	
Three-Awned Grass	*Aristida* c.f. *purpurea*	

sp. – only identified to genus; **ssp. –** subspecies; **var. –** variety; **c.f. –** compare with

Table A-1. General Flora and Fauna Found on the CMAGR (cont.)

Common Name	Scientific Name	Notes
Thurber's sandpaper	*Petalonyx thurberi*	
Torrey's Sea-Blight	*Suaeda moquinii*	
Trailing Windmills	*Allionia incarnate*	
Velvet Rosettes	*Psathyrotes ramosissima*	
Wash Rabbitbush	*Chrysothamnus paniculatus*	
White Rhatany	*Krameria grayi*	
Wing-Nut Forget-Me-Not	*Cryptantha pterocarya*	
Wooly Star	*Eriastrum* c.f. *sapphirinum*	
Yaqui Mammillaria	*Mammillaria tetrancistra*	
Yellow Cups	*Camissonia brevipes*	
Yellow Dome	*Trichoptilium incisum*	

sp. – only identified to genus; **ssp. –** subspecies; **var. –** variety; **c.f. –** compare with

*The spiny softshell turtle (*Apalone spiniferus*) record is that of a carcass transported by a predator, most likely from canals found off CMAGR. There is no spiny softshell turtle habitat found on CMAGR.

Appendix B. Other Special Status Species

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Table B-1. Other Special Status Species

Common Name Scientific Name	Federal Status	BLM Status	State Status	Species or Habitat		Habitat Association
				Present	Potential	
Reptiles						
Colorado Desert Fringe-Toed Lizard (*Uma notata*)	CA	S	SSC		x	Occurs in open dune fields, washes, river banks, and shrub-invaded sand hummocks with at least sporadic, open patches of fine, unconsolidated or wind-blown sand (Stebbins 2003, Brennan and Holycross 2006,).
Mojave Fringe-Toed Lizard (*Uma scoparia*)	CA	S	SSC		x	Occurs in low, wind-blown sandy washes and dunes associated with creosote scrub habitat. Habitat can be found on dune complexes, margins of dry lake beds and washes, and in isolated pockets within hillsides (Stebbins 2003).
Amphibians						
Sonoran Desert Toad *Incilius alvarius*	None	None	SSC		x	Occurs in the irrigated lowlands of the extreme southeast portion of Imperial Co. It can be found in a variety of desert and semi-arid habitats: brushy desert with creosote bush and mesquite washes, semi-arid grasslands and woodlands. It is semi-aquatic and is usually associated with large, somewhat permanent streams (Arnold 1943, Wright and Wright 1949, Behler and King 1979).
Birds						
Crissal Thrasher (*Toxostoma crissale*)	None	None	SSC	x		Uses a variety of vegetation communities but consistently inhabits tall, dense brush and shrub thickets in dry desert washes irrespective of the plant composition (WFO and CDFW 2008). Individuals have been encountered in mountain chaparral and oak-piñon-juniper woodlands in parts of Arizona (Corman and Wise-Gervais 2005).
Ferruginous Hawk (*Buteo regalis*)	None	None	SSC, FP	x		Overwinters in desert scrub and agricultural areas of the Imperial Valley (WFO and CDFW 2008).
Gila Woodpecker (*Melanerpes uropygialis*)	BCC	S	E		x	Occurs in low desert scrub with saguaro, palo verde, ironwood, or mesquite trees (WFO and CDFW 2008). Also frequents riparian woodlands and dry desert washes with a high density of trees and treelike shrubs.

BLM – Bureau of Land Management; **CMAGR** – Chocolate Mountain Aerial Gunnery Range; **USFWS** – United States Fish and Wildlife Service; **°F** – degrees Fahrenheit; **CNPS** – California Native Plant Society; **SEINet** – Southwest Environmental Information Network; **RCNPPA** – Rare California Native Plant Protection Act

Table B-1. Other Special Status Species (cont.)

Common Name Scientific Name	Federal Status	BLM Status	State Status	Species or Habitat		Habitat Association
LeConte's Thrasher (*Toxostoma lecontei*)	BCC	None	SSC	x		Inhabits sparse desert scrub habitats with few scattered trees or tall shrubs (Corman and Wise-Gervais 2005). It often nests in spiny shrubs or densely branched cactus. Uses scattered shrubs and cactus for cover, most frequently saltbush and cholla.
Lucy's Warbler (Vermivora luciae)	None	S	None	x		Occurs in riparian mesquite woodlands (Johnson, et al.1997).
Merlin (*Falco columbarius*)	None	None	Watch List, FP		x	Occurs in grasslands, shrub lands, woodlands, and agricultural areas with suitable perch sites (Ferguson-Lees 2001).
Northern Harrier (*Circus cyaneus*)	None	None	SSC, FP	x		Prefers open habitats with lookout perches such as shrubs or fence posts. These habitats include weedy borders of rivers, lakes, streams, freshwater marshes, grasslands, weed fields, pastures, and some croplands i.e., alfalfa and melons) (Ferguson-Lees 2001).
Peregrine Falcon (*Falco peregrinus*)	None	None	FP		x	Occurs in areas with rocky, steep cliffs, primarily near water, where prey (shorebirds, songbirds, and waterfowl) concentrations are high. Nests are found on ledges of cliffs, and sometimes on man-made structures such as office towers and bridge abutments (USFWS 2001).
Prairie Falcon (*Falco mexicanus*)	BCC	None	FP	x		Found in areas where cliffs provide secure nesting sites (WFO and CDFW 2008). This species occurs in all vegetation types in the desert, although sparse vegetation provides the best foraging habitat (WFO and CDFW 2008). Predominantly a winter resident in the Colorado Desert (WFO and CDFW 2008).
Mammals						
Big Free-Tailed Bat (*Nyctinomops macrotis*)	None	None	SSC	x		Primarily inhabits rugged, mountainous terrain in desert and semidesert habitats. Occurs in desert scrub, woodlands, and evergreen forests and roosts in rock crevices where cliffs occur and occasionally roosts in buildings, caves, and tree cavities (Adams 2003).

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Table B-1. Other Special Status Species (cont.)

Common Name Scientific Name	Federal Status	BLM Status	State Status	Species or Habitat		Habitat Association
California Leaf-Nosed Bat (*Macrotus californicus*)	None	S	SSC	x		Mating, maternity, and overwintering roosts are in caves or mines that provide a warm temperature of about 80°F (Adams 2003). Forages almost exclusively along dry desert washes within about 6 miles of the roost site (Adams 2003).
Pallid Bat (*Antrozous pallidus*)	None	S	SSC	x		Occurs in desert scrub, piñon-juniper woodlands, and transition forest habitats. Roosts in small colonies of up to 20 individuals in rock crevices, buildings, and other built structures (Adams 2003), and occasionally in caves, mines, rock piles, and tree cavities.
Pocketed Free-Tailed Bat (*Nyctinomops femorosaccus*)	None	None	SSC	x		Occurs in a variety of plant communities from desert scrub through pine-oak forests, but the species is most common in desert and semidesert environments. In California, found primarily in creosote bush and chaparral habitats in or near granite boulders, cliffs, or rocky canyons and roosts primarily in crevices of rugged cliffs, high rocky outcrops, and slopes (Adams 2003).
Townsend's Big-Eared Bat (*Plecotus townsendii)*	None	S	SSC		x	Occurs primarily in rural settings from the inland deserts to the cool, moist coastal redwood forests, in oak woodlands of the inner coast ranges and Sierra Nevada foothills, and lower to mid-elevation mixed coniferous-deciduous forests. Its distribution, however, tends to be geomorphically determined, and is strongly correlated with the availability of caves or cave-like roosting habitat (SSC CA list)
Western Mastiff Bat (*Eumops perotis*)	None	S	SSC	x		Most common in areas with desert scrub and broad open expanses. Foraging habitat includes dry desert washes, flood plains, chaparral, oak woodland, open ponderosa pine forest, grassland, and agricultural areas (Adams 2003). Primarily a cliff-dwelling species that roosts in rock crevices, under exfoliating slabs of rock, in shallow cliffside caves, and in buildings (Adams 2003).

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Table B-1. Other Special Status Species (cont.)

Common Name Scientific Name	Federal Status	BLM Status	State Status	Species or Habitat		Habitat Association
Western Small-Footed Myotis (Bat) (*Myotis ciliolabrum*)	None	S	None	x		Occurs in deserts, chaparral, riparian zones, and western coniferous forests; it is most common above the piñon-juniper woodland zone. Individuals are known to roost singly or in small groups in cliff and rock crevices, buildings, concrete overpasses, caves, and mines (Adams 2003).
Western Yellow Bat (*Lasiurus xanthinus*)	None	None	SSC	x		Occurs in desert and semidesert habitats of the southwestern U.S. Commonly roosts beneath dead palm fronds in both native and nonnative palm trees, in cottonwoods in riparian gallery forests and woodlands, and in treelike yuccas (Adams 2003).
Plants						
Algodones Sunflower (*Helianthus niveus* ssp. *tephrodes*)	None	S	E		x	Occurs in the Algodones Dunes in dune environments with fine sands and a cover of creosote bush desert scrub (CNPS 2015, SEINet 2011).
California Ayenia (*Ayenia compacta*)	None	None	CNPS 2.3, SH S3?1[1]		x	Occurs on *bajadas* and rocky slopes (CNPS 2015, SEINet 2011).
Cove's Cassia (*Senna covesii*)	None	None	CNPS 2.2, SH S1	x		Grows in Sonoran desert scrub or near dry desert washes or slopes with sandy soil (CNPS 2015, SEINet 2011).
Crown-of-Thorns (*Koeberlinia spinosa* var. *tenuispina*)	None	None	CNPS 2.2, SH S2.2	x		Occurs in the Colorado Desert on rocky or gravelly soils in washes and ravines within Sonoran desert scrub and within dry desert wash woodland dominated by blue palo verde, ironwood, and smoketree (CNPS 2015, SEINet 2011).

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[1] Adding an "?" to the rank represents more certainty than S3S4 (in the range of vulnerable to apparently secure), but less certainty than S3 (vulnerable).

Table B-1. Other Special Status Species (cont.)

Common Name Scientific Name	Federal Status	BLM Status	State Status	Species or Habitat		Habitat Association
Darlington's Blazing Star (*Mentzelia puberula [oreophila]*)	None	None	CNPS 2.2, SH S2		x	Grows commonly on rock outcrops and talus along canyon walls in creosote bush desert scrub, primarily in the Mojave Desert (CNPS 2015, SEINet 2011).
Desert Silver Bush (*Ditaxis claryana*)	None	None	CNPS 2.2, SH S1		x	Grows on sandy substrates in Sonoran and Mojave desert scrub, often near dry washes and on *bajadas* (CNPS 2015, SEINet 2011).
Desert Spike Moss (*Selaginella eremophila*)	None	None	CNPS 2B.2, SH S2S3		x	Desert scrub, rocky habitats (CNPS 2015).
Emory's Crucifixion-Thorn (*Castela emoryi*)	None	None	CNPS 2.3, SH S2S3		x	Occurs on sandy to gravelly substrates on *bajadas* and in dry washes (CNPS 2015, SEINet 2011).
Giant Spanish-Needle (*Palafoxia arida* var. *gigantea*)	None	S	CNPS 1B.3, SH S2		x	Grows in Colorado Sonoran desert scrub and desert dunes with deep, fine, sandy soils (CNPS 2015, SEINet 2011).
Harwood's Rattleweed (*Astragalus insularis* var. *harwoodii*)	None	None	CNPS 2.2, SH S2.2		x	Occurs in Sonoran desert scrub in dunes and other areas with a sandy substrate (CNPS 2015, SEINet 2011).
Las Animas Colubrine (*Colubrina californica*)	None	None	CNPS 2.3, SH S2S3.3	x		Occurs along washes and dry slopes with coarse substrates (CNPS 2015, SEINet 2011).
Munz's Cholla (*Cylindropuntia munzii*)	None	S	CNPS 1B.3, SH S1.2	x		Grows in Sonoran desert scrub on sandy to gravelly substrates along washes and canyon walls (CNPS 2015, SEINet 2011).

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Table B-1. Other Special Status Species (cont.)

Common Name Scientific Name	Federal Status	BLM Status	State Status	Species or Habitat		Habitat Association
Peirson's Milk-Vetch (*Astragalus magdalenae* var. *peirsonii*)	T	None	E		x	Occurrence limited to the Algodones Dunes and Gran Desierto. (CNPS 2015, SEINet 2011). Designated critical habitat for the species occurs in the Algodones Dunes from State Route 78 to approximately Mammoth Wash.
Pink Fairy-Duster (*Calliandra eriophylla*)	None	None	CNPS 2.3, SH S2S3		x	Occurs on sandy, rocky soils in washes, gullies, and mesas and in dry desert wash woodlands with blue palo verde, ironwood, and smoketree (CNPS 2015, SEINet 2011).
Sand Food (*Pholisma sonorae*)	None	S	CNPS 1B.2, SH S2		x	Occurrence restricted to the Algodones Dunes and deep sands in the Imperial Valley in California, as well as dunes in southwestern Yuma County, Arizona, and northwestern Sonora, Mexico (CNPS 2015, SEINet 2011).
Slender Cottonheads (*Nemacaulis denudata* var. *gracilis*)	None	None	CNPS 2.2, SH S2		x	Grows in sand dunes and deep sandy soil and associates with sparse desert scrub and coastal strand plant communities (CNPS 2015, SEINet 2011).
Spear-Leaf Matelea (*Matelea parvifolia*)	None	None	CNPS 2.3, SH S2.2	x		Occurs in Sonoran and Mojave deserts on gravelly, rocky soils in hills and mountains in desert scrub plant communities and associates with creosote bush (CNPS 2015, SEINet 2011).
Triple-Ribbed Milk-Vetch (*Astragalus tricarinatus*)	E	None	SH S1.2		x	Occurs on rocky, exposed slopes, ridges, and rockslides in upland areas with a decomposed granite substrate (Amsberry and Meinke 2007).
Wiggins' Croton (*Croton wigginsii*)	None	S	CNPS 2.2, SH S1.2, RCNPPA		x	Grows in the Colorado Desert within Sonoran desert scrub on fine sandy soils of dunes and sand fields in the Algodones Dunes (CNPS 2015, SEINet 2011).

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Federal Status: Endangered Species Act of 1973: T = Threatened, E = Endangered, CA = Candidate; BGEPA: Bald and Golden Eagle Protection Act of 1940
Bureau of Land Management (BLM) Status: S = sensitive
State Status: California Department of Fish and Wildlife: SSC = Species of Special Concern, FP = Fully Protected. Fully protected species may not be taken or possessed at any time and no licenses or permits may be issued for their take except for collecting these species for necessary scientific research and relocation of the bird species for the protection of livestock.
California Native Plant Society Rankings:
CNPS 1B.2: 1 = rare, threatened, or endangered in California and elsewhere; 2 = fairly threatened in California (20%-80% of occurrences threatened/moderate degree and immediacy of threat)
CNPS 1B.3: 1 = rare, threatened, or endangered in California and elsewhere; 3 = not very threatened in California (less than 20% of occurrences threatened/low degree and immediacy of threat or no current threats known)
CNPS 2.2: 2 = rare, threatened, or endangered in California but common elsewhere; 2 = fairly threatened in California (20%-80% of occurrences threatened/ moderate degree and immediacy of threat)
CNPS 2.3: 2 = rare, threatened, or endangered in California but common elsewhere; 3 = not very threatened in California (less than 20% of occurrences threatened/low degree and immediacy of threat or no current threats known)
California State Heritage Rankings:
SH S2.2: S2 = imperiled; 2 = fairly endangered in California (20%-80% of occurrences threatened)
SH S1.2: S1 = critically Imperiled; 2 = fairly endangered in California (20%-80% of occurrences threatened)
SH S3: S3 = vulnerable
SH S2S3: S2 = imperiled; S3 = vulnerable
SH S2S3.3: S2= imperiled; S3 = vulnerable; .3 = not very endangered in California (less than 20% of occurrences threatened)

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Appendix C. CMAGR INRMP 5-Year Action Plan: FY17-22

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Table C-1. CMAGR INRMP 5-Year Action Plan: FY17-22

Program Area	Action Step	FY	COLS Level	Frequency	Legal Driver and Comments
INRMP Implementation	4.1-1: Prioritize, pursue funding opportunities, and implement projects as outlined in this INRMP.	17-22	3	Annual	Sikes Act (16 U.S.C. 670), DoDI 4715.03, and MCO P5090.2A w/changes 1-3
	4.1-2: Review the INRMP annually for Operation and Effect.	17-22	3	Annual	Sikes Act (16 U.S.C. 670), DoDI 4715.03, and MCO P5090.2A w/changes 1-3
NEPA Review	4.2-1: Provide expert review of potential impacts of federal actions on the CMAGR.	17-22	3	Ongoing	NEPA of 1969 (42 USC 4321–4370h; 40 CFR Parts 1500–1508), DoDI 4715.03 and MCO P5090.2A w/changes 1-3
ESA Compliance	4.3-1: Adhere to conservation measures and relevant avoidance measures identified in all applicable USFWS BOs (see Appendix E for all applicable BOs).	17-22	2	Ongoing	ESA of 1973, as amended (16 U.S.C. 1531, et seq.), DoDI 4715.03, MCO P5090.2A w/changes 1-3, and 1996 USFWS BO
	4.3-2: Manage federally listed threatened or endangered species and their habitats to prevent jeopardy to the species and to assist in their conservation and recovery.	17-22	2	Ongoing	ESA of 1973, as amended (16 U.S.C. 1531, et seq.), DoDI 4715.03, and MCO P5090.2A w/changes 1-3
	4.3-3: Manage federally listed threatened or endangered species and their habitats in a manner that minimizes impacts to both mission and species.	17-22	2	Ongoing	ESA of 1973, as amended (16 U.S.C. 1531, et seq.), DoDI 4715.03, and MCO P5090.2A w/changes 1-3
	4.3-4: Proactively collect information on presence or absence, location, habitat availability and suitability, and life history requirements of federally listed threatened or endangered species and maintain and update these data.	17-22	3	Ongoing	ESA of 1973, as amended (16 U.S.C. 1531, et seq.), DoDI 4715.03, and MCO P5090.2A w/changes 1-3

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Table C-1. CMAGR INRMP 5-Year Action Plan: FY17-22 (cont.)

Program Area	Action Step	FY	COLS Level	Frequency	Legal Driver and Comments
	4.3-5: Develop and maintain a robust GIS database that will be updated as survey data become available, to document spatial and temporal distribution of federally listed threatened or endangered species.	17-22	3	Ongoing	ESA of 1973, as amended (16 U.S.C. 1531, et seq.), DoDI 4715.03, and MCO 11000.25, Installation Geospatial Information and Services
Threatened or Endangered Species, Critical Habitat	4.4-1: Continue participation in annual desert tortoise surveys in support of inventory, monitoring, and mapping efforts.	17-22	3	Annual	ESA of 1973, as amended (16 U.S.C. 1531, et seq.), DoDI 4715.03, MCO P5090.2A w/changes 1-3, and 1996 USFWS BO
	4.4-2: Map desert tortoise population, densities, habitat parameters, and threats across the range.	17-22	3	Ongoing	ESA of 1973, as amended (16 U.S.C. 1531, et seq.), DoDI 4715.03, MCO P5090.2A w/changes 1-3, and 1996 USFWS BO
	4.4-3: Continue to participate in the Desert Tortoise Management Oversight Group and the California Recovery Implementation Team. Develop project proposals to assist with the species recovery.	17-22	3	Ongoing	ESA of 1973, as amended (16 U.S.C. 1531, et seq.), DoDI 4715.03, MCO P5090.2A w/changes 1-3, and 1996 USFWS BO
	4.4-4: Pending decisions of other State and Federal lead agencies, determine whether the reintroduction of a nonessential experimental population of Sonoran pronghorn will be compatible with training mission objectives and designed to avoid conflicting with range operations.	17,18	2	One-time	ESA of 1973, as amended (16 U.S.C. 1531, et seq.), DoDI 4715.03, and MCO P5090.2A w/changes 1-3
	4.4-5: Assist in coordination and provide in-kind and financial support, if available, to the Sonoran pronghorn recovery team.	17-22	2	Varies	ESA of 1973, as amended (16 U.S.C. 1531, et seq.), DoDI 4715.03, and MCO P5090.2A w/changes 1-3

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Table C-1. CMAGR INRMP 5-Year Action Plan: FY17-22 (cont.)

Program Area	Action Step	FY	COLS Level	Frequency	Legal Driver and Comments
Other Special Status Species	4.5-1: Inventory and monitor special status species to establish a baseline from which conservation and management strategies can be devised.	17-19	2	Ongoing	FWCA of 1980 (16 U.S.C. 2901 *et seq*.), DoDI 4715.03, and MCO P5090.2A w/changes 1-3
Migratory Birds and Eagles	4.6-1: Avoid or minimize impacts to migratory birds and eagles and their habitat.	17-22	2	Ongoing	MBTA of 1918 (16 U.S.C. 703-712), BGEPA of 1940 (16 U.S.C. 668), EO 13186 - Responsibilities of Federal Agencies to Protect Migratory Birds, DoDI 4715.03, and MCO P5090.2A w/changes 1-3
	4.6-2: Conduct presence/absence surveys periodically as part of an adaptive management strategy to better inform migratory bird management on the range.	17-22	2	Ongoing	MBTA of 1918 (16 U.S.C. 703-712), BGEPA of 1940 (16 U.S.C. 668), EO 13186 - Responsibilities of Federal Agencies to Protect Migratory Birds, DoDI 4715.03, and MCO P5090.2A w/changes 1-3
	4.6-3: Develop, implement, and evaluate conservation measures for management actions to avoid or minimize incidental take of migratory birds and eagles.	17-22	2	One-time	MBTA(MBTA) of 1918 (16 U.S.C. 703-712), Bald and Golden Eagle Protection Act (BGEPA) of 1940 (16 U.S.C. 668), EO 13186 - Responsibilities of Federal Agencies to Protect Migratory Birds, DoDI 4715.03, and MCO P5090.2A w/changes 1-3
	4.6-4: Participate in regional or national inventory and monitoring programs.	17-22	2	Ongoing	MBTA of 1918 (16 U.S.C. 703-712), BGEPA of 1940 (16 U.S.C. 668), EO 13186 - Responsibilities of Federal Agencies to Protect Migratory Birds, DoDI 4715.03, and MCO P5090.2A w/changes 1-3

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Table C-1. CMAGR INRMP 5-Year Action Plan: FY17-22 (cont.)

Program Area	Action Step	FY	COLS Level	Frequency	Legal Driver and Comments
BASH Program	4.7-1: Maintain the existing MBTA depredation permit(s).	17-22	3	Annual	MBTA of 1918, MCO P5090.2A w/changes 1-3, and MCAS Yuma StaO 3750.1B
	4.7-2: Update as necessary and periodically evaluate possible improvements to this successful program that might further reduce BASH incidents.	17-22	3	Varies	MCO P5090.2A w/changes 1-3 and MCAS Yuma StaO 3750.1B
General Wildlife	4.8-1: Inventory and monitor distribution and abundance of reptiles, birds, amphibians, and small mammals.	17-21	2	Ongoing	FWCA of 1980 (16 U.S.C. 2901 *et seq*.), DoDI 4715.03, and MCO P5090.2A w/changes 1-3
	4.8-2: Maintain vegetation known to support wildlife.	17-22	2	Ongoing	DoDI 4715.03 and MCO P5090.2A w/changes 1-3
	4.8-3: Restore or enhance vegetation outside of heavy-use areas.	17-22	2	Ongoing	DoDI 4715.03 and MCO P5090.2A w/changes 1-3
Nonnative and Nuisance Wildlife	4.9-1: Work in partnership with the BLM to control the wild burro populations.	17-22	2	Ongoing	DoDI 4715.03, MCO P5090.2A w/changes 1-3, EO 11987 Exotic Organisms and EO 13112 Invasive Species
	4.9-2: Inventory, monitor and control raven populations.	17-22	2	Ongoing	DoDI 4715.03, MCO P5090.2A w/changes 1-3, EO 11987 Exotic Organisms and EO 13112 Invasive Species

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Table C-1. CMAGR INRMP 5-Year Action Plan: FY17-22 (cont.)

Program Area	Action Step	FY	COLS Level	Frequency	Legal Driver and Comments
	4.9-3: Develop pest species management programs as needed to include pest mammals such as rabbits, skunks, raccoon, squirrels, coyotes, feral dogs, feral cats, and pest birds.	17-22	2	Ongoing	DoDI 4715.03, DoDI 4150.07, MCO P5090.2A w/changes 1-3, EO 11987 Exotic Organisms and EO 13112 Invasive Species
Vegetation	4.10-1: Complete vegetation mapping.	17-22	2	Ongoing	DoDI 4715.03, MCO P5090.2A w/changes 1-3, and MCO 11000.25, Installation Geospatial Information and Services
	4.10-2: Identify essential habitats for rare plants and wildlife.	17-22	2	Varies	DoDI 4715.03 and MCO P5090.2A w/changes 1-3,
Invasive and Nonnative Plant Species	4.11-1: Acquire reliable baseline data on the presence and abundance of invasive and nonnative plant species.	17-19	2	Ongoing	Federal Noxious Weed Act of 1974, as amended (7 U.S.C. 2801 et seq.); DoDI 4715.03; DoDI 4150.07; MCO P5090.2A w/changes 1-3; EO 11987 Exotic Organisms; and EO 13112 Invasive Species
	4.11-2: Survey and map the location, abundance, and distribution of invasive and nonnative plant species most likely to impact ecosystem health or mission readiness.	17-22	2	Ongoing	Federal Noxious Weed Act of 1974, as amended (7 U.S.C. 2801 et seq.); DoDI 4715.03; DoDI 4150.07; MCO P5090.2A w/changes 1-3; EO 11987 Exotic Organisms; and EO 13112 Invasive Species
	4.11-3: Treat and monitor areas most likely to impact ecosystem health or mission readiness.	17-21	2	Ongoing	Federal Noxious Weed Act of 1974, as amended (7 U.S.C. 2801 et seq.); DoDI 4715.03; DoDI 4150.07; MCO P5090.2A w/changes 1-3; EO 11987 Exotic Organisms; and EO 13112 Invasive Species

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Table C-1. CMAGR INRMP 5-Year Action Plan: FY17-22 (cont.)

Program Area	Action Step	FY	COLS Level	Frequency	Legal Driver and Comments
Wildland Fire Management	4.12-1: Develop and implement a Wildland Fire Management Plan.	17	2	One-time	Sikes Act (16 U.S.C. 670), DoDI 4715.03, DoDI 6055.06, and MCO 5090.2A
Wildlife Watering Sources	4.13-1: Maintain access to the guzzlers along the Coachella Canal to allow large mammals to move onto and off the CMAGR to use these guzzlers.	17-22	2	Ongoing	Sikes Act (16 U.S.C. 670), DoDI 4715.03, and MCO P5090.2A w/changes 1-3
Ecosystem Management	4.14-1: Support research to gain the best available scientific information to guide natural resource and conservation decisions.	17-22	2	Ongoing	Sikes Act (16 U.S.C. 670), DoDI 4715.03, and MCO P5090.2A w/changes 1-3
	4.14-2: Define and understand CMAGR's regional relevance and responsibility towards regional conservation efforts.	17-22	2	Ongoing	Sikes Act (16 U.S.C. 670), DoDI 4715.03, and MCO P5090.2A w/changes 1-3
	4.14-3: Update aerial orthographic photographs over time to determine a baseline and to document landscape changes.	20	2	Once per 5 years	Sikes Act (16 U.S.C. 670), DoDI 4715.03, and MCO P5090.2A w/changes 1-3
	4.14-4: Utilize aerial orthographic imagery to conduct anthropogenic-impact-specific studies.	21	2	Once per 5 years	MCO P5090.2A w/changes 1-3, MCO 11000.25 Installation Geospatial Information and Services
Soils	4.15-1: Establish a soils and erosion monitoring framework to measure and assess changes to soil resources over time.	17-18	2	Ongoing	Soil Conservation Act (16 U.S.C. 590a *et seq.*), DoDI 4715.03, and MCO P5090.2A w/changes 1-3

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Table C-1. CMAGR INRMP 5-Year Action Plan: FY17-22 (cont.)

Program Area	Action Step	FY	COLS Level	Frequency	Legal Driver and Comments
	4.15-2: Assess current erosion status within the watershed and evaluate possible engineering management practices that will mitigate erosion.	17-18	2	One-time	Soil Conservation Act (16 U.S.C. 590a *et seq.*), DoDI 4715.03, and MCO P5090.2A w/changes 1-3
	4.15-3: Develop spatial data related to soil associations and characteristics.	17-22	2	One-time	Soil Conservation Act (16 U.S.C. 590a *et seq.*), DoDI 4715.03, and MCO P5090.2A w/changes 1-3
Climate Change	4.16-1: Conduct an assessment of sustainability objectives and strategies in the context of climate change relevant to natural resources on the CMAGR	18	2	One-time	DoDI 4715.03 and DoD's 2014 Climate Change Adaptation Roadmap
	4.16-2: Conduct vulnerability assessments of species and habitats most at risk, coordinating with other DoD installations for guidance.	18	2	Varies	DoDI 4715.03 and DoD's 2014 Climate Change Adaptation Roadmap
	4.16-3: Collaborate with DoD mission leads, wildlife agencies, and other relevant partners to optimize the value of strategies developed for adaptation to climate change.	17-22	2	Ongoing	DoDI 4715.03 and DoD's 2014 Climate Change Adaptation Roadmap
	4.16-4: Install and maintain weather stations, including rain gauges at specific study locations.	17-22	2	Ongoing	DoDI 4715.03 and DoD's 2014 Climate Change Adaptation Roadmap

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Table C-1. CMAGR INRMP 5-Year Action Plan: FY17-22 (cont.)

Program Area	Action Step	FY	COLS Level	Frequency	Legal Driver and Comments
Conservation Program GIS	4.18-1: Continue development of natural resource GIS data, with an emphasis on vegetation, general wildlife, special status species, anthropogenic resources and impacts, and soils.	17-22	3	Ongoing	DoDI 4715.03 and MCO 11000.25 Installation Geospatial Information and Services
Cooperative Initiatives	4.19-1: Cooperate with internal stakeholders (i.e., Environmental, Installations and Logistics, and Planning), cooperating agencies, and external stakeholders on natural resource management issues of mutual interest.	17-22	3	Ongoing	Sikes Act (16 U.S.C. 670), DoDI 4715.03, and MCO P5090.2A w/changes 1-3
Law Enforcement	4.21-1: Establish and maintain adequate control measures (signs, gates, fences, etc.) to provide for security, safety, and protection of natural resources.	17-22	3	Ongoing	Sikes Act (16 U.S.C. 670), Assimilative Crimes Act (18 U.S.C. 13), Uniformed Code Of Military Justice (10 U.S.C. 807B)

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Appendix D. Results of Annual Review

FORMAT PAGE

Appendix E. Biological Opinions for Species on the CMAGR

FORMAT PAGE

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Ecological Services
Carlsbad Field Office
2730 Loker Avenue West
Carlsbad, California 92008

April 18, 1996

Major J.D. Cox
Director, Range Management
U.S. Marine Corps
Marine Corps Air Station
Box 99100
Yuma, Arizona 85369-9100

Re: Biological Opinion for the Military use of the Chocolate Mountain Aerial Gunnery Range, California (1-6-95-F-40).

Dear Major Cox:

This Biological Opinion responds to your request for formal consultation with the Fish and Wildlife Service (Service) pursuant to section 7 of the Endangered Species Act of 1973, as amended (Act). The Marine Corps Air Station, Yuma (MCAS, Yuma) request was dated July 5, 1995, and was received by our office on August 17, 1995. At issue are the effects of all existing and proposed military use activities of the Chocolate Mountain Aerial Gunnery Range, California (Range), on the federally listed threatened desert tortoise (*Gopherus agassizii)*.

This Biological Opinion was prepared using the following information: 1) Desert Tortoise Survey Results, Chocolate Mountain Aerial Gunnery Range, Yuma Training Range Complex, Marine Corps Air Station Yuma (Dames & Moore 1994); 2) Biological Assessment for the Desert Tortoise for the military use of the Chocolate Mountains Aerial Gunnery Range, California (BA) (Dames & Moore 1995); 3) draft Yuma Training Range Complex Environmental Impact Statement (EIS) (May 1994); and 4) other materials contained in our files.

BIOLOGICAL OPINION

It is the opinion of the Service that the proposed project is not likely to jeopardize the continued existence of the desert tortoise, nor is it likely to result in the significant destruction or adverse modification of critical habitat for the desert tortoise.

DESCRIPTION OF THE PROPOSED ACTION

The Range is located in north-central Imperial County and south-central Riverside County, California. The Range encompasses approximately 387,200 acres (605 square miles). It is bound on the west by the Salton Sea Basin and on the east by the Chuckwalla and Palo Verde Mountains. The northern border is separated from the Orocopia Mountains by Salt Creek and includes part of the Chuckwalla Bench. From the northern border, the Range extends south to State Route 78 near Glamis. A map of the Range is included at the end of this document.

The primary function of the Range is to provide realistic targets for training Marine and Naval aircrews in the tactics of air-to-ground attack.

Current Activities

Current on-going activities occur on five Close Air Support (CAS) target ranges, a Rockeye munitions range, and 31 other individual targets dispersed throughout the Range. Fifteen of the individual targets are within, or in close proximity to the CAS ranges. There are 9 observation posts, 11 ground support areas, and 11 sites designated as artillery firing positions.

CAS is the tactic of delivering ordnance from aircraft in near proximity to friendly forces. Rockeye munitions are cluster bombs composed of hundreds of individual bomblets enclosed in a larger bomb case that bursts over the target to distribute the bomblets over a broad area before they detonate. The individual targets are used by aircraft for delivering ordnance with no CAS activities. The total area of the CAS ranges and Rockeye munitions range combined is about 15,360 acres (24 square miles). The 16 individual targets outside of CAS range areas combined cover less than 2560 acres (4 square miles).

Observation posts are positions where forward air controllers direct air strikes onto targets. Ground support areas vary in size, but most are less than 249.6 acres (0.39 square mile). The 11 ground support areas, average 250 acres each, and total approximately 2,746 acres. Ground support areas are used interchangeably as base camps for Forward Arming and Refueling Points, mobile radar, communications, and anti-aircraft missile sites. All of these support areas are located adjacent to established roads. The 11 artillery sites are used to fire spotting rounds into the Iris Pass, Punch Bowl, or Deadman CAS ranges to mark targets for air strikes. Spotting rounds are artillery shells containing white phosphorous, that burn on impact to provide a bright plume of white smoke to mark enemy positions for aircrew attack. No acreage was provided for observation posts or artillery sites in the BA.

Ordnance delivery by fixed-wing aircraft is authorized at Dead Man, Irish Wash, Punch Bowl, and Blue Mountain CAS ranges. Mount Barrow is restricted to ordnance delivery by helicopter. Currently only inert ordnance may be delivered within Range area underlying R-2507N southwest of a line running along the axis of the Chocolate Mountains. Inert and live ordnance may be used throughout R-2507S.

SEALs training by Naval Special Warfare Group-1 (NSWG-1) is also conducted on the

Range. NSWG-1 operates Camp Billy Machen, a training camp located near the southwestern boundary of the Chocolate Mountain Range. SEAL training areas include Training Areas 1 and 2, Firing Zones 1 and 2, and a Fast Attack Vehicle (FAV) driving course. Training Area 1, excluding Firing Zone 2, is approximately 80,000 acres (125 square miles), Training Area 2, excluding Firing Zone 1, is about 29,440 acres (46 square miles). Firing Zones 1 and 2 are about 32,640 acres (51 square miles). SEAL training involves activities such as combat on foot, light vehicle use, parachute drops, and insertions/extractions.

The current ground use, excluding roads, encompasses at least 16,2746 acres of the 387,200 acre Range. Almost one half of these current activities occur in desert tortoise critical habitat (See Maps 1 & 2).

Proposed Activities

The proposed activities for the Range include an increase in net explosive weight limits, night attack training, live ordnance authorization, target development, relocation of training support areas, and relocation of NSWG-1 training activities.

Current net-explosive weight limits for air-to-ground ordnance delivery are 2,000 pounds per bomb and 3,000 pounds total for all bombs released per aircraft pass in fixed-wing aircraft. The proposed action is to increase these weights to 12 MK 82(500 pound) bombs, 6 MK 83(1,000 pound) bombs, or 4 MK 84(2,000 pound) bombs per aircraft pass.

The proposed action also includes implementation of night ordnance delivery training between 2200 and 0600 hours. (Currently training is permitted between 0600 and 2200 hours only.) Another proposal is to authorize R-2507N section for possible future live ordnance. Three new individual targets are proposed for development as well as redeveloping seven inactive individual target sites in R-2507N.

Currently two ground support areas and a parachute drop zone are located outside of the southern end of the Range boundaries. The proposed action also includes the relocation of these activities to new on-Range positions and the creation of an additional parachute drop zone.

Training Area 1 and Firing Zones 1 and 2 are proposed for closure. Training Area 1 lies in desert tortoise critical habitat. If Training Area 1 closes to SEAL activity, ground activity will be eliminated in 80,000 acres of desert tortoise critical habitat. To continue NSWG-1 training within the Range, further development is proposed for Training Area 2, which will be renamed, "Special Warfare Training Area 4". Existing operations on the current FAV course will be modified to limit use along the Coachella Canal. Use of the FAV course along Salt Creek, the Bradshaw Trail, and the Nyland-Blythe Road is being eliminated.

More detailed descriptions of current and proposed activities in the Range can be found in the BA and draft EIS.

Measures proposed by the MCAS, Yuma to reduce potential impacts to desert tortoise from training activities are as follows:

1. MCAS, Yuma will designate a tortoise management representative within the Range Management Department whose duty will be to ensure compliance with protective stipulations by all users of the Range. This representative will have the authority to halt activities that may be in violation of such provisions. The tortoise management representative also will coordinate with the designated Service representative on all matters concerning desert tortoise mitigation and management responsibilities.

2. All ground users of the Range will participate in a tortoise education program. MCAS, Yuma will develop the educational program, including a video, for the Range users. The educational program will be developed cooperatively with the Service. The program will include, at a minimum, the following topics: 1) occurrence of desert tortoises; 2) sensitivity of the species to human activities; 3) legal protection for desert tortoises; 4) penalties for violations of federal laws; 5) general tortoise activity patterns; 6) reporting requirements; 7) measures to protect tortoises; and 8) personal measures that users can take to promote the conservation of desert tortoises.

3. All users of the Range will be informed of their responsibility to report any form of take to the tortoise management representative.

4. Explosive Ordnance Disposal (EOD) personnel will be responsible for periodically reminding all escorted Range users of the prohibitions regarding off-road vehicular travel and other protective measures for tortoises.

5. All personnel operating vehicles within tortoise habitat on the Range will inspect underneath their parked vehicle, prior to moving it. If a desert tortoise is found beneath the vehicle, the tortoise management representative, or qualified appointee(s), will be contacted to remove the animal from harms way.

6. No pets will be permitted at anytime within desert tortoise habitat. Military working dogs will be permitted, under control of their handler.

7. All ground personnel that enter the Range will be required to remove all food stuffs, trash or other waste that may attract predators. Any trash receptacles used for extended stays will be equipped with latching/locking lids.

8. All roads entering critical habitat will be posted with speed limits of 20 miles per hour.

9. Clearance surveys conforming to Service recommendation will be followed for new construction or other ground disturbing activity, including new target site designation.

10. Surveys will be conducted of existing military activity sites, using Service recommended methods by qualified desert tortoise biologists to the extent funds are made available. The objective will be to walk two hundred miles of transect per year

until all activity sites have been surveyed. Each activity site will require only one survey. Surveys will be conducted during regularly scheduled Range closures in the spring. The survey results, along with data on take at activity sites, will serve as the basis for identifying which, if any activity sites should be relocated. All data will be entered in the MCAS, Yuma geographic information system (GIS) data base. Any changes in survey methodology will be reported to the Service in an annual monitoring report.

11. Boundaries of all target sites, existing and proposed, will be determined in the field, mapped and flagged. All new target constructions will be placed within the boundaries of the designated target site. There will be an on-site tortoise monitor during target placement.

12. A Desert Tortoise Management Plan will be implemented in part, to identify ways to minimize impacts on tortoises from ongoing activities. This will include the relocation of some activities to areas of lower tortoise densities, based on the results of ongoing surveys.

13. EOD personnel will monitor take as part of their sweeps of target areas. EOD personnel will report to the tortoise management representative any injured or dead tortoises located during EOD sweeps, as well as habitat damage outside of designated target areas. Each EOD crew will fill out a form after each sweep, reporting any take. The tortoise management representative (or appointee) will accompany EOD crews on all sweeps.

14. The tortoise management representative, or appointee(s), will survey all ground support areas for dead or injured tortoises after the completion of each ground operation.

15. The Service will be notified by the tortoise management representative within three working days of the discovery of any tortoise death or injury caused by military activity. Notification will include the date, time, circumstances, and location of any injury or death. Dead animals will be left in situ. Injured animals will be taken to a veterinarian approved by the Service.

16. An annual monitoring report will be prepared and delivered to the Service on or before January 15 of each year. The report will briefly outline the effectiveness of the desert tortoise mitigation measures and summarize the mortality or injury to desert tortoises. To enhance desert tortoise protection, the report will make recommendations for modifying or refining the terms and conditions, herein.

17. Surveys will be conducted to further refine tortoise density estimates within critical habitat on the Range and to monitor and determine population trends using the most current methods accepted by the Service, Bureau of Land Management (BLM), and National Biological Survey. The primary objective of surveys would be to evaluate the effectiveness of management prescriptions set forth in the Desert Tortoise

Management Plan. Since there are currently no established survey methods for achieving these objectives, the Marine Corps will develop a survey program for the Range in consultation with the Service. Surveys will be conducted each year until the Mojave population of desert tortoise, or the East Colorado Recovery Unit, is removed from the list of threatened and endangered species. All survey data will be entered into the MCAS, Yuma GIS desert tortoise database.

18. A Desert Tortoise Management Plan (Management Plan) will be created (It is currently being developed in cooperation with the Service and BLM).

18.1. The objective of the Management Plan will be to manage critical habitat for the desert tortoise within the Range in a manner consistent with recommendations presented in the *Desert Tortoise (Mojave Population) Recovery Plan* (U.S. Fish and Wildlife Service 1994).

18.2. The Management Plan will be developed as part of the Northern and Eastern Colorado Desert Coordinated Management Plan being formulated by the BLM. The Management Plan will only address the management of desert tortoises and their habitat within the Range.

18.3. The Management Plan will establish a portion of the Range as part of the Chuckwalla Desert Wildlife Management Area (DWMA). Established within the Chuckwalla DWMA will be Limited Use Zones (LUZs) where military activity will be excluded. The Management Plan will also establish experimental management zones within the Chuckwalla DWMA. These would be within critical habitat where military activities would continue.

18.4. Surveys to monitor tortoise population trends would be used to evaluate the effectiveness of protective measures. Survey results could be used to compare population trends on the Range with areas receiving other management prescriptions on BLM lands, and to evaluate tortoise management practices based on the results of these comparisons.

18.5. The Management Plan would also establish protective measures in areas of the Range outside of critical habitat.

EFFECTS OF THE PROPOSED ACTION ON THE LISTED SPECIES

Species Account

The desert tortoise is a large, herbivorous reptile. Optimal habitat for this species has been characterized as creosote bush scrub in which precipitation ranges from two to eight inches, diversity of perennial plants is relatively high, and production of ephemerals is high (Luckenbach 1982, Turner and Brown 1982, Turner 1982, and Schamberger and Turner 1986). Soils must be friable enough for digging of burrows, but firm enough so that burrows do not collapse. In California, desert tortoises are typically associated with gravelly flats or

sandy soils with some clay, but are occasionally found in windblown sand or in rocky terrain (Luckenbach 1982). Live desert tortoises have been found in the California desert from below sea level to an elevation of 2,190 meters (7,300 ft), but the most favorable habitat occurs at elevations of about 300 to 900 meters (1,000 to 3,000 ft) (Luckenbach 1982; Schamberger and Turner 1986).

Desert tortoises are most active in California during the spring and early summer when annual plants are most common. Additional activity occurs during warmer fall months and occasionally after summer rain storms. Desert tortoises spend the remainder of the year in burrows, escaping the extreme conditions of the desert. Further information on the range, biology, and ecology of the desert tortoise can be found in Burge (1978), Burge and Bradley (1976), Hovik and Hardenbrook (1989), Luckenbach (1982), Weinstein et al. (1987), and U.S. Fish and Wildlife Service (1994).

Desert tortoises are found in portions of the California, Arizona, Nevada, and Utah deserts. They also occur in Sonora and Sinaloa, Mexico. In California, the desert tortoise occurs primarily within the creosote, shadscale, and Joshua tree series of Mohave desert scrub, and the lower Colorado River Valley subdivision of Sonoran desert scrub.

On April 2, 1990, the Service determined the Mojave population of the desert tortoise to be threatened (Service 1990). The Mojave population includes those animals living north and west of the Colorado River in the Mojave Desert of California, Nevada, Arizona, southwestern Utah, and in the Colorado Desert in California (a division of the Sonoran Desert). Reasons for the determination included loss and degredation of habitat from construction projects such as roads, housing and energy developments, and conversion of native habitat to agriculture. Grazing and off-highway vehicles have degraded additional habitat. Also cited as threatening the desert tortoise's continuing existence were illegal collection, upper respiratory tract disease, and predation on juvenile desert tortoises by northern ravens (Corvus corax).

On February 8, 1994, the Service designated approximately 6.4 million acres of critical habitat for the Mojave population of the desert tortoise (U.S. Fish and Wildlife Service 1994). The designation became effective on March 10, 1994. A final Recovery Plan (U.S. Fish and Wildlife Service 1994) for the desert tortoise was published in June 1994. The recovery plan is the basis and key strategy for recovery and delisting of the desert tortoise. Following the recommendations of the desert tortoise recovery team, the Recovery Plan identifies six Recovery Units and recommends establishment of 14 Desert Wildlife Management Areas (DWMA) within the recovery units. The six recovery units represent the biotic and abiotic variability found in desert tortoise habitat. The boundaries of DWMAs were to follow accepted concepts of reserve design and, as part of the actions needed to accomplish desert tortoise recovery, the Plan recommends that human activities that negatively affect desert tortoises in DWMAs should be restricted (U.S. Fish and Wildlife Service 1994). Within each, the recovery plan recommends specific management actions to achieve recovery of desert tortoises.

The Chocolate Mountain Gunnery Range is situated with the eastern Colorado Desert

recovery unit. The Recovery Plan has recommended establishment of the Chuckwalla DWMA which would encompass a portion of the Range. The proposed Chuckwalla DWMA is composed of critical habitat for the desert tortoise. Approximately 40 percent of the Range lies within designated desert tortoise critical habitat, that is, most of the Range east of the Chocolate Mountains. Approximately 30 percent of the designated critical habitat on the Range is currently used for military activity. The proposed actions will affect less than 10 percent of this critical habitat, that is already in use on the Range.

Between 1992 and 1993, surveys for desert tortoises using strip transects were conducted over the Range. These surveys focused on military activity sites (e.g., targets), and provide the most current data on tortoise distribution and densities on the Range. Other desert tortoise surveys have been conducted since 1982. Survey results and maps depicting estimates of desert tortoise density appeared in the BA. These results are depicted in Table 1. Density estimates of tortoise and burrows on the Range are low, west of the Chocolate Mountains (SEAL Camp CCC & CP Bull) . The highest densities of tortoise, and tortoise burrows, occurred in the Chuckwalla Bench area in the northeast portion of the Range (HAWK site, Target 2N, Target 9N, & Deadman CAS). There are also estimated high densities of tortoises on the east-central border of the Range (Gun Pos. 9A & Gun Pos. 8). Burrows and tortoise densities tended to be higher in the Chuckwalla Bench area than in the southeastern and western portions of the Range (Dames & Moore 1994). Detailed descriptions of survey sites can be found in Dames & Moore (1994). Of the 605 square miles in the Range, approximately 242 square miles are in designated critical habitat. Using an average density figure of 35 tortoises per square mile, there are approximately 8,470 individuals in critical habitat on the Range.

Table 1. Estimated Density of Desert Tortoise and Burrows at Target Sites

Activity Site	Tortoises Per Sq. Mile	Burrows Per Sq. Mile	Year of Survey
HAWK Site	101-250	301-400	1993
Target 2N	21-50	201-300	1993
Gun Pos. 9A	21-50	201-300	1993
Target 9N	51-100	101-200	1993
Deadman CAS	21-50	101-200	1993
Gun Pos. 8	21-50	101-200	1993
SEAL Camp CCC	0-20	0-100	1993
Target 1S	21-50	0-100	1993
Targets 12S, 13S, & 15S	0-20	0-100	1993
Targets 4S & 5S	21-50	0-100	1993
Targets 10S & 11S	21-50	0-100	1993
FARP South	21-50	0-100	1993

Activity Site	Tortoises Per Sq. Mile	Burrows Per Sq. Mile	Year of Survey
CP BULL	0-20	0-100	1993
Target 4N	21-50	0-100	1992
Target 1S	0-20	0-100	1992
Target 5S	0-20	0-100	1992
Target 11S	21-50	0-100	1992

Analysis of Impacts

Current Activities

Continued use of CAS, Rockeye munitions ranges, and target sites may kill or injure desert tortoises. Collapsed burrows from activities could trap individual animals. Desert tortoises may be killed or injured by gunnery and explosive ordnance activities within unfenced target impact zones. Potential mortality or injury to tortoises from bombing is likely to be proportional to the densities of tortoise burrows at and in the vicinity of the targets.

Current activities may further degrade disturbed desert tortoise habitat associated with target impact zones. Impact craters and debris from bombs and other ordnance have altered the plant composition in some areas (Dames & Moore 1994). Desert tortoises that cross these areas, denuded of natural vegetation, could become more vulnerable to predation and thermal stress in the absence of shrub cover. The craters and debris may also serve as a barrier to the movement of desert tortoise which are resident in the vicinity. The effects of bombing on substrate with well developed desert pavement may persist for hundreds of years (Dames & Moore 1995).

Although uncommon in desert areas, wildfires caused by ordnance may degrade or destroy desert tortoise habitat and may kill individuals. Larger fires could fragment desert tortoise habitat and recurrent fires may reduce the abundance and diversity of native forbs which are the major food source of the desert tortoise.

Desert tortoises may be harmed from noise and ground disturbance generated from: 1) gunnery or explosive ordnance activities; and 2) low-level subsonic or supersonic aircraft flights. An increase in the net explosive weight limit may proportionately increase the impacts associated with noise and ground disturbance. Specific effects of increased noise levels on desert tortoise are not known. However, noise and vibration generated by off-highway vehicles have caused physical damage and behavioral modification in other desert species, such as the desert kangaroo rat (Dipodomys deserti), Mojave fringe-toed lizard (Uma scoparia), and Couch's spadefoot toad (Scaphiopus couchi) (Brattstrom and Bondello 1983). It is likely that desert tortoises are also subjected to some physical damage and stress from these impacts.

SEAL's training conducted by NSWG-1 in its current locations has the potential to result in high mortality and injuries to tortoises. The eastern portions of Training Area 1 support estimated high densities of tortoises, and the FAV training course traverses an area of estimated high densities in the northeast portion of the Range (Dames & Moore 1995). This portion of Training Area 1 occurs in desert tortoise critical habitat. The potential for mortality and injury to tortoises from use of this portion of the FAV training course appears to be high since these vehicles travel at speeds of approximately 55 miles per hour.

Desert tortoises may be killed or injured by vehicles that use existing maintenance roads or travel off-road to retrieve ordnance debris (Bury 1978; Luckenbach 1975; Nicholson 1978). /Tortoises that are removed from harms way in impact zones and off maintenance roads may be affected directly by physical stress of the relocation, and by associated stresses, such as lack of knowledge of cover sites, nest sites, foraging areas, and loss of bodily fluids.

Individual desert tortoise could be taken by predators such as common ravens or coyotes (Canis latrans), that can be attracted to sites by human activities. Also, if populations of the coyote and northern raven increase due to these activities, the desert tortoise population at the Chuckwalla Bench could be adversely affected through increased predation.

Proposed Activities

The proposed delivery of ordnance (bombing) between 2200 and 0600 hours would increase noise and vibration impacts to 24 hours per day from the current 16 hour per day.

The proposed increase in net weight limit of bombs, the proposed use of live ordnance in R-2507N section, the redevelopment of seven inactive target sites in R-2507N, and the development of three new individual target sites could cause an increase in the noise and vibration levels, as well as new ground disturbance. The relocation of two ground support areas and a drop zone will increase ground disturbance in new areas and alter habitat. Tortoise mortality could occur in the course of this disturbance. Current desert tortoise habitat could be adversely modified. Wildfires could increase in number and could occur in new areas. Clearance sweeps could kill, injure, or harass tortoises and possibly prevent habitat from recovering.

On a more positive note, the reconfiguring of the SEALs training area may reduce potential adverse affects of SEAL training on desert tortoises and critical habitat, as will eliminating the FAV training course.

Density of tortoises (from 0-20 to 101-250 individuals/square mile) and tortoise burrows (from 0-100 to 301-400 individuals/square mile) at target sites is extremely variable (See Table 1). In order to estimate the take from the current and proposed activities, the Service looked at the following variables: total Range size; proportion of Range in and out of critical habitat; 1992-93 tortoise density estimates over various parts of the Range; and magnitude and frequency of impacts. Without empirical data, the Service is using a probability of tortoise mortality resulting from ordnance impact of one in one hundred over the course of a year. This would result in the take of approximately eleven individuals annually in the form

of mortality over the 32 square miles directly affected by current and proposed activities. Using a probability for harassment of one in ten over the course of a year, this would result in a take of one hundred twelve individuals annually in the form of harassment associated with current and proposed activities..

CUMULATIVE EFFECTS

Cumulative effects are those impacts of future non-Federal (State, local government, or private) activities on endangered or threatened species or critical habitat that are reasonably certain to occur during the course of the Federal activity subject to consultation. Future Federal actions are subject to the consultation requirements established in section 7 of the Act and, therefore, are not considered cumulative with the proposed project.

Many of the actions that are reasonably expected to occur within the vicinity of the Range will be subject to future section 7 consultations because the Federal government administers large portions of the desert. Activities such as grazing, ground-water pumping, and recreational use, and events such as fire, that occur on private lands may not be subject to section 7 requirements and can contribute to continued desert tortoise take and habitat degradation. To the extent that the effects of these activities are foreseeable, they are subject to the prohibitions of sections 9 and 10 of the Act. The Service is unaware of any proposed activities on private lands in the action area that are not subject to Federal oversight.

BIOLOGICAL OPINION

The Service does not believe that the impacts of the proposed action, in conjunction with cumulative effects, are sufficient to jeopardize the continued existence of the Mojave population of the desert tortoise or result in significant destruction or adverse modification of its critical habitat. We base this conclusion on the following facts:

1. The approximate acreage of disturbed desert tortoise critical habitat from current activities is less than 93,000 acres. However, only 13,000 acres of desert tortoise critical habitat will continue to be degraded by activities due to the proposed closing of Training Area 1 (80,000 acres). This is a relatively small fraction (0.013 percent) of the overall acreage of critical habitat within the Chuckwalla Critical Habitat Unit (1,020,600 acres). Current plus proposed training actions are estimated to affect only 20,480 acres (32 square miles) which represents only two percent of the critical habitat.

2. MCAS, Yuma has incorporated several actions to minimize the take of desert tortoise and compensate the loss of habitat value.

3. Areas will be established that will be protected for the long-term conservation of desert tortoises on the Range.

4. A Management Plan will be developed and adaptively implemented, to actively pursue efforts to conserve desert tortoises and their habitat on the Range.

INCIDENTAL TAKE

Section 9 of the Act prohibits the take of listed species without special exemption. Taking is defined as harassing, harming, pursuing, hunting, shooting, wounding, killing, trapping, capturing, collecting, or attempting to engage in any such conduct. Harm is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavior patterns, including breeding, feeding, or sheltering. Under the terms of section 7(b)(4) and 7(o)(2) of the Act, taking that is incidental to and not intended as part of the proposed action is not considered to be prohibited taking under the Act provided that such taking is in compliance with this Incidental Take statement. The terms and conditions described below are nondiscretionary and must be undertaken.

Based on the analysis of impacts provided above, mitigation measures proposed by MCAS, Yuma, desert tortoise surveys conducted by consultants, and anticipated project duration, the Service anticipates that the following take could occur as a result of the proposed action:

1. Eleven (11) desert tortoises may be incidentally injured or killed by ordnance or vehicles during training activities each year.

2. One hundred twelve (112) desert tortoises may be harassed by removal from target impact zones or roads during military activities each year.

If, during the course of the action, this level of incidental take is exceeded, such incidental take represents new information requiring review of the reasonable and prudent measures provided. MCAS, Yuma shall immediately provide an explanation of the causes of the taking and review with the Service the need for possible modification of the reasonable and prudent measures and re-initiation of consultation.

Reasonable and Prudent Measures

The Service believes that the following Reasonable and Prudent Measures are necessary and appropriate to minimize incidental take.

1. Measures shall be taken to minimize mortality or injury of desert tortoises due to military activities in the Chocolate Mountain Range.

Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the Act, MCAS, Yuma is responsible for compliance with the following terms and conditions, which implement the reasonable and prudent measure described above.

1. The following Terms and Conditions will implement Reasonable and Prudent Measure

should any listed species be found dead or injured in or adjacent to the action area. Notification must include the date, time, and location of the carcass, cause of death or injury, and any other pertinent information. In the event that MCAS, Yuma suspects that a species has been taken in violation of the terms and conditions contained within this biological opinion, such situation shall be reported to the Service's, Divisions of Law Enforcement, San Diego, California at (619) 557-5063.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. The term "conservation recommendations" has been defined as Service suggestions regarding discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat or regarding the development of information.

1. The Service recommends that MCAS, Yuma initiate a study to determine the effects of noise and ground vibrations generated from: (1) gunnery or explosive ordnance activities, and (2) low-level aircraft flights on desert tortoises living on the Range.

2. The Service recommends that MCAS, Yuma develop a habitat restoration plan to rehabilitate closed target sites, training areas, and unnecessary roads in desert tortoise critical habitat.

CONCLUSION

This concludes the formal consultation on the current and proposed military use of the Chocolate Mountain Aerial Gunnery Range, California. As required by 50 CFR 402.16, reinitiation of formal consultation is required if the action is significantly modified in a manner not discussed above, if new information becomes available on the listed species, or if the incidental take limit is exceeded. We would appreciate notification of your final decision on this matter. Any questions or comments should be directed to Karen Jensen of my staff at (619)431-9440.

Sincerely,

Gail C. Kobetich
Field Supervisor

cc: Bill Fisher (SWDIV)
Ron L. Pearce (MCAS, Yuma)

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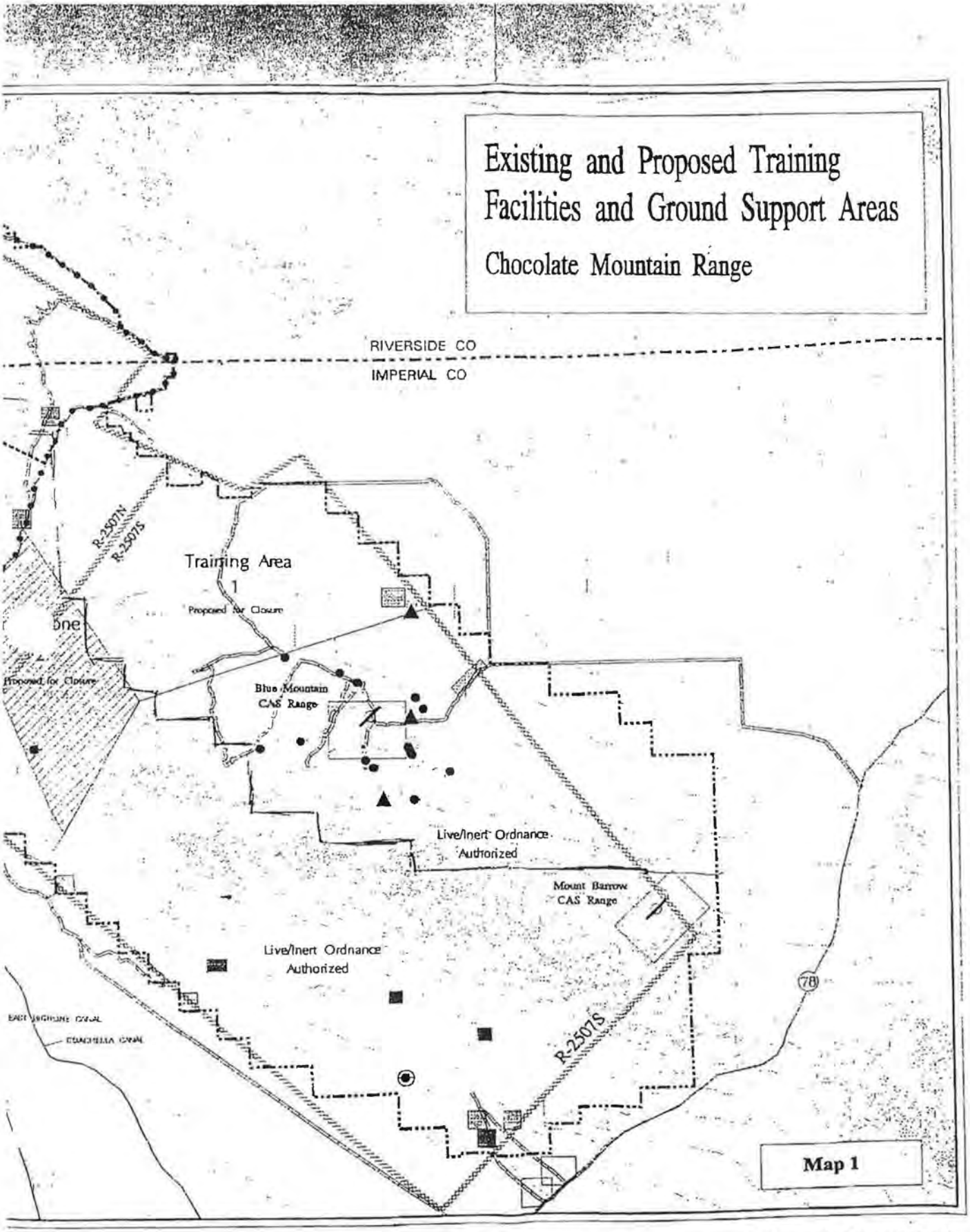
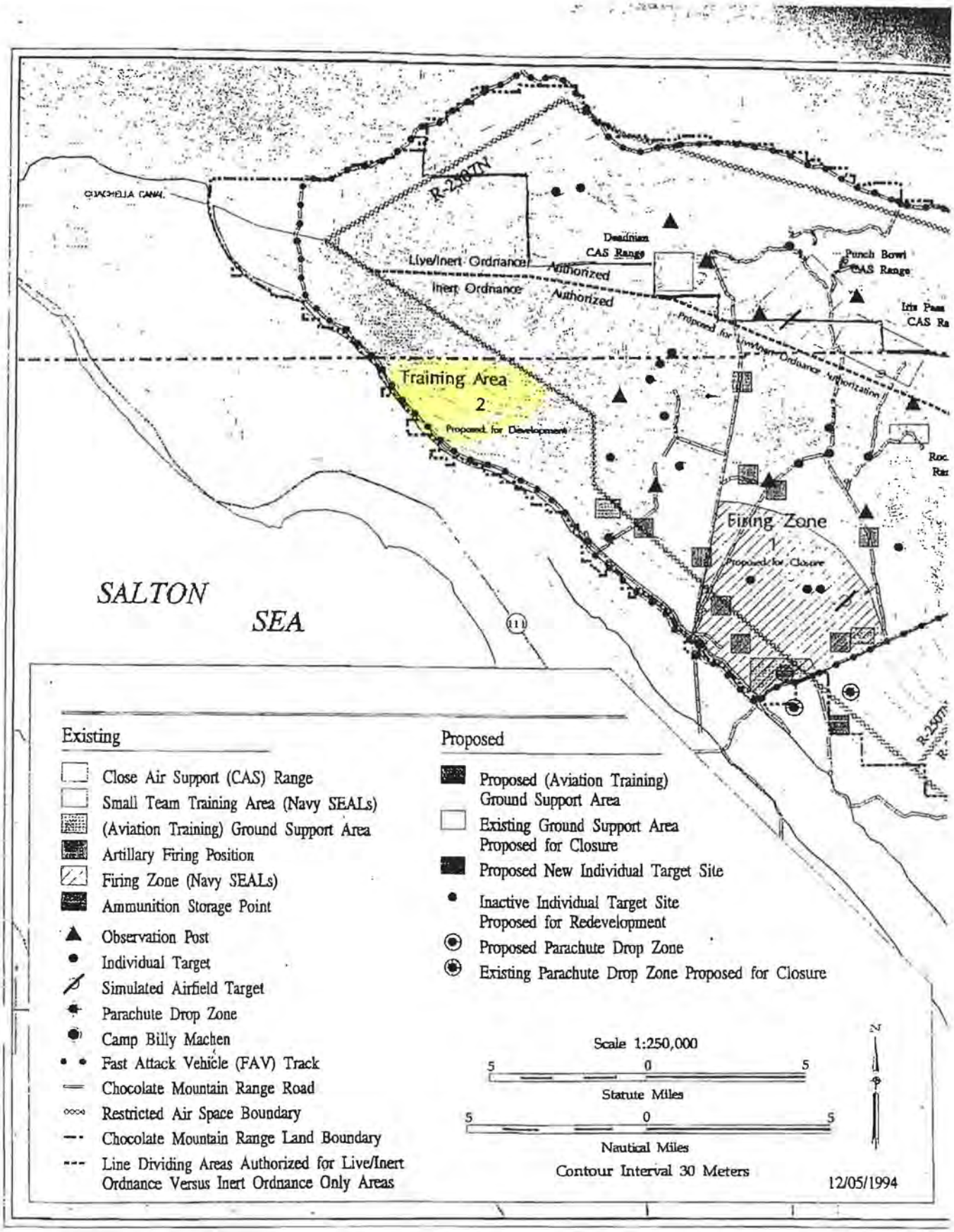


Obtained from Biological Assessment (Dames & Moore, 1995)


R-2507N
Live/Inert Ordnance Authorized
Inert Ordnance Authorized
Deadman CAS Range
Punch Bowl CAS Range
Iris Pass CAS Ra
Proposed for Limited Ordnance Authorization
Training Area 2
Proposed for Development
Firing Zone 1
Proposed for Closure
SALTON SEA
Existing
Close Air Support (CAS) Range
Small Team Training Area (Navy SEALs)
(Aviation Training) Ground Support Area
Artillary Firing Position
Firing Zone (Navy SEALs)
Ammunition Storage Point
Observation Post
Individual Target
Simulated Airfield Target
Parachute Drop Zone
Camp Billy Machen
Fast Attack Vehicle (FAV) Track
Chocolate Mountain Range Road
Restricted Air Space Boundary
Chocolate Mountain Range Land Boundary
Line Dividing Areas Authorized for Live/Inert Ordnance Versus Inert Ordnance Only Areas
Proposed
Proposed (Aviation Training) Ground Support Area
Existing Ground Support Area Proposed for Closure
Proposed New Individual Target Site
Inactive Individual Target Site Proposed for Redevelopment
Proposed Parachute Drop Zone
Existing Parachute Drop Zone Proposed for Closure
Scale 1:250,000
5 0 5
Statute Miles
5 0 5
Nautical Miles
N
Contour Interval 30 Meters
12/05/1994

Appendix F. Environmental Assessment

FORMAT PAGE