Final
Environmental Assessment

ESTABLISHMENT AND USE OF TRAINING SUPPORT AREAS IN THE BOB STUMP TRAINING RANGE COMPLEX MARINE CORPS AIR STATION, YUMA

January 2022

DEPARTMENT OF DEFENSE
UNITED STATES MARINE CORPS
FINDING OF NO SIGNIFICANT IMPACT
FOR ESTABLISHMENT AND USE OF TRAINING SUPPORT AREAS
IN THE BOB STUMP TRAINING RANGE COMPLEX
CHOCOLATE MOUNTAIN AERIAL GUNNERY RANGE AND
BARRY M. GOLDWATER RANGE-WEST
IMPERIAL COUNTY, CALIFORNIA AND
YUMA COUNTY, ARIZONA

In accordance with the National Environmental Policy Act (NEPA) of 1969 (42 U.S. Code §§ 4321-4370h), as implemented by the Council on Environmental Quality regulations (40 Code of Federal Regulations [CFR] §§ 1500-1508); Department of the Navy procedures for implementing NEPA (32 CFR § 775); and Marine Corps Order 5090.2, dated 11 June 2018, *Environmental Compliance and Protection Program*, the U.S. Marine Corps (USMC) gives notice that an Environmental Assessment (EA) has been prepared and an Environmental Impact Statement (EIS) will not be prepared for the establishment and use of landing zones (LZs), an assault landing zone (ALZ), drop zones (DZs), and an artillery firing area (AFA) at the two tactical ranges within the Bob Stump Training Range Complex (BSTRC): the Chocolate Mountain Aerial Gunnery Range (CMAGR), California and the Barry M. Goldwater Range (BMGR)-West, Arizona.

Purpose of and Need: The purpose of the Proposed Action is to optimize mission-critical training capabilities within the BSTRC for Marine Corps and Naval aviators and Marine Air-Ground Task Force artillery cannoneers (ground troops who fire artillery). The Proposed Action is needed to establish LZs, an ALZ, DZs, and an AFA at the BSTRC, which would provide MV-22 aircraft similar flexibility to existing Legacy Rotary-Wing Aircraft Policy and Procedures and provide a safer and more realistic artillery firing training environment. The Proposed Action is also needed to accomplish critical Marine Corps and Naval Tactical Training Procedures, Training and Readiness Codes, and Large Force Exercises.

Proposed Action: Under the Proposed Action, the USMC proposes to establish and use LZs, an ALZ, DZs, and an AFA at the BSTRC. The USMC would not increase the quantity of sorties flown, increase the amount and/or types of ordnance expended, increase artillery training tempo, or alter the existing facilities or airspace within the BSTRC as part of the Proposed Action. Implementation of the Proposed Action would facilitate maintaining Marine Corps and other forces at an optimal state of readiness to support current and emerging contingency and wartime requirements.

Alternatives: The USMC considered multiple potential action alternatives for implementing the Proposed Action; however, as presented in the EA, after careful consideration none of the potential alternatives would meet the purpose and need of the Proposed Action. Therefore, the EA analyzed the Proposed Action and the No-Action Alternative in detail.

Under the No-Action Alternative, the USMC would not establish the proposed LZs, ALZ, DZs, and AFA within the BSTRC. Consequently, training challenges at the CMAGR and BMGR-West would persist. This situation would continue to affect the capability of forces to achieve training requirements needed to support current and emerging contingency and wartime requirements. The EA includes the No-Action Alternative as a baseline for comparison to the Proposed Action for determining project effects.

Summary of Environmental Effects: The EA analyzed the environmental impacts that would potentially result from the implementation of the Proposed Action and the No-Action Alternative. The Proposed Action

had the most potential to affect the following resources, which were consequently analyzed in-depth in the EA: air quality, biological resources, cultural resources, and geological resources. Potential impacts to all other resource areas were determined to be negligible or non-existent from implementation of the Proposed Action.

Air Quality: The Proposed Action would not have a significant impact on air quality. Windblown dust generated by the Proposed Action would be negligible. Air quality impacts from the Proposed Action would not exceed any conformity *de minimis* thresholds for the Salton Sea Air Basin. A Record of Non-Applicability for Clean Air Act General Conformity requirements has been prepared and approved for the Proposed Action.

Biological Resources: The Proposed Action would not have a significant impact on biological resources. Approximately 58 acres of desert scrub/wash vegetation would be permanently impacted by grading at the CMAGR. Vegetation and wildlife would temporarily be impacted during training activities, including landings/takeoffs of MV-22s. The desert tortoise would be adversely affected; however, all applicable terms, conditions, and measures identified in previous and recent consultations with the U.S. Fish and Wildlife Service, including the 1996 Biological Opinion and the amendment to the 1996 Biological Opinion issued for the Proposed Action on 24 January 2022, would be implemented to minimize impacts to the desert tortoise.

Cultural Resources: The Proposed Action would not impact historic properties and would therefore not have a significant impact on cultural resources. The EA did not identify any resources of traditional knowledge within the project area. The Proposed Action would have no impact on archaeological resources or historical buildings or structures.

Geological Resources: The Proposed Action would not have a significant impact on geological resources. Grading and training activities would result in surface soil disturbance and a potential localized increase in erosion. The overall impact to topography would be minimal as the topography of the project area is relatively flat.

Conclusion: The Proposed Action will not result in significant impacts on the quality of the local environment. There will not be any disproportionate high and adverse human health or environmental effects from the Proposed Action on minority or low-income populations. Nor will there be any impacts associated with the protection of children from environmental health and safety risks. Therefore, and with incorporation of the conservation measures identified in the EA, impacts to all resources will not be significant with implementation of the Proposed Action.

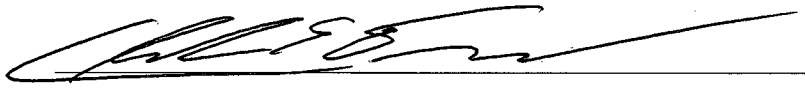
Agency Coordination and Public Involvement: MCAS Yuma completed Endangered Species Act section 7 consultation for the Proposed Action with the U.S. Fish and Wildlife Service on 24 January 2022 via a Biological Opinion Amendment to the 1996 Biological Opinion. The EA reflects the inclusion of conservation measures identified in the 1996 and 2022 Biological Opinions. In accordance with section 106 of the National Historic Preservation Act, the USMC initiated consultation with the Arizona and California State Historic Preservation Officers (SHPOs) and regional federally recognized Tribal Nations. The SHPOs concurred with MCAS Yuma's determinations of eligibility and finding of No Historic Properties Affected. Therefore, MCAS Yuma has completed the Section 106 process in accordance with 36 CFR 800.4(d)(1).

MCAS Yuma received a request from the Quechan Tribal Nation to include cultural sensitivity training as a conservation measure in the EA. Accordingly, MCAS Yuma included a conservation measure as part of the Proposed Action to continue to provide cultural sensitivity training for all personnel accessing the BSTRC.

The USMC published a notice of availability for the review of the Public Draft EA in the Imperial Valley Press on 6, 7, and 8 August 2021, in the Yuma Sun on 6, 7, and 8 August 2021, and in the Adelante Valle (Spanish language newspaper) on 6, 13, and 20 August 2021. The 15-day public comment period was from 6 August to 21 August 2021. The USMC did not receive any comments during the public review period.

Findings: After careful review of the EA, I have selected to implement the Proposed Action, and find that it will have no significant impact on the human environment. This finding of no significant impact is based on the attached EA. The EA provides sufficient evidence and analysis for determining that an EIS is not required.

The EA addressing this Proposed Action may be obtained by contacting Mr. Jesse Martinez, Senior NEPA Planner/Project Manager, Naval Facilities Engineering Systems Command Southwest, 750 Pacific Highway, Floor 12, San Diego, CA 92132, telephone (619) 705-5573.



27 Apr 22

CHARLES E. DUDIK

Date

Colonel, U.S. Marine Corps
Commanding Officer
Marine Corps Air Station Yuma

Final
Environmental Assessment
ESTABLISHMENT AND USE OF TRAINING SUPPORT AREAS IN THE BOB STUMP TRAINING RANGE COMPLEX MARINE CORPS AIR STATION YUMA, ARIZONA

Action Proponent:	United States Marine Corps
Title of Proposed Action:	Establishment and Use of Training Support Areas in the Bob Stump Training Range Complex
Project Location:	Imperial County, California and Yuma County, Arizona
Document Type:	Environmental Assessment

Abstract

This Environmental Assessment (EA) has been prepared by the United States (U.S.) Marine Corps (USMC) in accordance with the National Environmental Policy Act (NEPA) of 1969 (42 U.S. Code §§ 4321-4370h), as implemented by the Council on Environmental Quality regulations (40 Code of Federal Regulations [CFR] §§ 1500-1508); Department of the Navy procedures for implementing NEPA (32 CFR § 775); and Marine Corps Order 5090.2, dated 11 June 2018, *Environmental Compliance and Protection Program*. The USMC proposes to establish and use landing zones, an assault landing zone, drop zones, and an artillery firing area at the two tactical ranges within the Bob Stump Training Range Complex: the Chocolate Mountain Aerial Gunnery Range and the Barry M. Goldwater Range-West. Implementation of the Proposed Action is essential to accomplishing critical Marine Corps and Naval Tactical Training Procedures, Training and Readiness Codes, and Large Force Exercises to support current and emerging contingency and wartime requirements. The USMC considered multiple potential action alternatives for implementing the Proposed Action; however, after careful consideration, none of the potential alternatives would meet the purpose and need of the Proposed Action. Therefore, this EA analyzes the Proposed Action and the No-Action Alternative in detail.

Prepared By: USMC

Point of Contact: **Department of the Navy**
Naval Facilities Engineering Systems Command
Attention: Jesse Martinez, Senior NEPA Planner/Project Manager
750 Pacific Highway, Floor 12
San Diego, California 92132-0058

January 2022

EXECUTIVE SUMMARY

The United States (U.S.) Marine Corps (USMC) has prepared this Environmental Assessment (EA) in accordance with the National Environmental Policy Act (NEPA) of 1969 (42 U.S. Code §§ 4321-4370h), as implemented by the Council on Environmental Quality regulations (40 Code of Federal Regulations [CFR] §§ 1500-1508); Department of the Navy procedures for implementing NEPA (32 CFR § 775); and Marine Corps Order 5090.2, dated 11 June 2018, *Environmental Compliance and Protection Program*.

Under the Proposed Action, the USMC proposes to establish and use landing zones (LZs), an assault landing zone (ALZ), drop zones (DZs), and an artillery firing area (AFA) at the two tactical ranges within the Bob Stump Training Range Complex (BSTRC): the Chocolate Mountain Aerial Gunnery Range (CMAGR), California and the Barry M. Goldwater Range (BMGR)-West, Arizona. The USMC does not propose to increase the quantity of aircraft sorties flown, increase the amount and/or types of ordnance expended, increase artillery training tempo, or alter the existing facilities or airspace within the BSTRC under the Proposed Action.

The purpose of the Proposed Action is to optimize mission-critical training capabilities within the BSTRC for Marine Corps and Naval aviators and Marine Air-Ground Task Force artillery cannoneers. The Proposed Action is needed to establish LZs, an ALZ, DZs, and an AFA at the BSTRC, which would provide MV-22 aircraft similar flexibility to existing Legacy Rotary-Wing Aircraft Policy and Procedures and provide a safer and more realistic artillery firing training environment. The Proposed Action is also needed to accomplish critical Marine Corps and Naval Tactical Training Procedures, Training and Readiness Codes, and Large Force Exercises.

Implementation of the Proposed Action would facilitate maintaining Marine Corps and other forces at an optimal state of readiness to support current and emerging contingency and wartime requirements. If the Proposed Action is not implemented, there would continue to be a negative impact on training in support of Assault Support Tactics and Training and Readiness Certifications. The USMC considered multiple potential action alternatives for implementing the Proposed Action; however, after careful consideration, none of the potential alternatives would meet the purpose and need of the Proposed Action. Therefore, this EA analyzes the Proposed Action and the No-Action Alternative in detail.

The following resource areas were evaluated for potential environmental consequences: air quality, biological resources, cultural resources, and geological resources. Resource areas that would have negligible or non-existent impacts from implementation of the Proposed Action and the No-Action Alternative, and as such have not been analyzed in detail in this EA include: airspace and air traffic, noise, visual resources, hazardous materials and wastes, utilities and infrastructure, public health and safety, socioeconomics and environmental justice, water resources, land use, recreation, and ground transportation.

Table ES-1 presents a summary of the potential impacts to each resource area resulting from implementation of the Proposed Action and the No-Action Alternative.

Table ES-1 Summary of Environmental Consequences

Resource Area	Proposed Action	No-Action Alternative
Resource Areas Eliminated from Detailed Analysis		
Airspace and Air Traffic	No change in airspace. No alteration of the existing configuration of airspaces within the BSTRC. No increase in number of sorties or in the type or amount of ordnance expended. No impact to existing airspace designations and a negligible impact to airspace operations. *Conclusion*: **Negligible Impact.**	No change from existing conditions. *Conclusion*: **No Impact.**
Noise	The airspace and artillery-related training noise from the Proposed Action would be consistent with existing training and not result in a discernable change in noise levels to off-installation receptors at the CMAGR and BMGR-West. There are no sensitive human receptors or residential communities in or adjacent to the project area. *Conclusion*: **Negligible Impact.**	No change from existing conditions. *Conclusion*: **No Impact.**
Visual Resources	No alteration of the existing visual setting of the project area and vicinity. Use of training support areas would be visually consistent with existing training activity. *Conclusion*: **Negligible Impact.**	No change from existing conditions. *Conclusion*: **No Impact.**
Hazardous Materials and Wastes	Potential for an inadvertent release of fuels, lubricants, coolants, or hydraulic fluids from vehicles and equipment. All hazardous materials and waste generated would continue to be managed and handled in accordance with applicable Marine Corps Air Station (MCAS) Yuma Environmental Standard Operating Procedures. *Conclusion*: **Negligible Impact.**	No change from existing conditions. *Conclusion*: **No Impact.**
Utilities and Infrastructure	No increase in utility demand or impact to existing regional utilities. Grading of the combat trail to the AFA would result in an incremental increase in road infrastructure. *Conclusion*: **Negligible Impact.**	No change from existing conditions. *Conclusion*: **No Impact.**
Public Health and Safety	Potential for trespassers to interrupt training activities. Potential to encounter unexploded ordnance. Consistent with current operations. *Conclusion*: **Negligible Impact.**	No change from existing conditions. *Conclusion*: **No Impact.**
Socioeconomics and Environmental Justice	No creation of new jobs. Short-term and negligible increase to the local economy during training support area development. *Conclusion*: **Negligible Impact.** The Proposed Action would be confined to the BSTRC and not adjacent to minority or low-income populations. Children (and all unauthorized people) are not allowed on lands designated for military training. *Conclusion*: **No Disproportionate Impact** to minority or low-income populations or the health and safety of children**.**	No change from existing conditions. *Conclusion*: **No Impact.**

Table ES-1 Summary of Environmental Consequences

Resource Area	Proposed Action	No-Action Alternative
Water Resources	No impacts to surface waters, groundwater, or waters of the U.S. All activities would occur in upland areas. Low potential for erosion to result in indirect impact to water resources. Application of water-permeable dust palliative would not generate additional runoff to adjacent areas. *Conclusion*: **Negligible Impact.**	No change from existing conditions. *Conclusion*: **No Impact.**
Land Use	No change to existing land use designations or incompatible effects to off-installation land uses. *Conclusion*: **No Impact.**	No change from existing conditions. *Conclusion*: **No Impact.**
Recreation	No impact to the public's ability to recreate in existing recreational areas adjacent to the CMAGR. Potential increase in public recreation area closures in BMGR-West during training. *Conclusion*: **Negligible Impact.**	No change from existing conditions. *Conclusion*: **No Impact.**
Ground Transportation	Short-term increase of a few (approximately 30) vehicle trips during initial grading and maintenance. No long-term increase in vehicle trips or impact to the existing regional surface transportation network. *Conclusion*: **Negligible Impact.**	No change from existing conditions. *Conclusion*: **No Impact.**
Resource Areas Analyzed in Detail		
Air Quality	Combined grading and operational emissions would be less than *de minimis* levels for all criteria pollutants. *Conclusion:* **No Significant Impact.**	No change from existing conditions. *Conclusion*: **No Impact.**
Biological Resources	Approximately 57.7 acres of desert scrub/wash vegetation would be permanently impacted by grading at the CMAGR. Vegetation and wildlife would temporarily be impacted during training activities, including landings/takeoffs of MV-22s. Adverse effects to the desert tortoise would be minimized by implementation of CMs (see Section 2.5.2). *Conclusion:* **No Significant Impact.**	No change from existing conditions. *Conclusion*: **No Impact.**
Cultural Resources	No impacts to cultural resources (as defined in Chapter 3.4). The Arizona and California State Historic Preservation Offices have concurred with MCAS Yuma's findings of no historic properties affected (Appendix A). *Conclusion:* **No Significant Impact.**	No change from existing conditions. *Conclusion*: **No Impact.**
Geological Resources	Grading would result in alterations to topographic features. Grading and training activities would cause compaction of soils and an increase in erosion potential. *Conclusion*: **No Significant Impact**.	No change from existing conditions. *Conclusion*: **No Impact.**

Acronyms and Abbreviations

AFA	artillery firing area
ALZ	assault landing zone
APE	area of potential effect
BMGR	Barry M. Goldwater Range
BO	Biological Opinion
BSTRC	Bob Stump Training Range Complex
CAA	Clean Air Act
CAAQS	California Ambient Air Quality Standards
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CH_4	methane
CM	conservation measure
CMAGR	Chocolate Mountain Aerial Gunnery Range
CO	carbon monoxide
CO_2	carbon dioxide
DZ	drop zone
EA	Environmental Assessment
EO	Executive Order
EOD	Explosives Ordnance Disposal
FCR	Field Contact Representative
GHGs	greenhouse gases
ICAPCD	Imperial County Air Pollution Control District
INRMP	Integrated Natural Resources Management Plan
LZ	landing zone
MAWTS-1	Marine Aviation Weapons and Tactics Squadron One
MCAS	Marine Corps Air Station
MCO	Marine Corps Order
NAAQS	National Ambient Air Quality Standards
NAVFAC	Naval Facilities Engineering Systems Command
Navy	Department of the Navy
NEPA	National Environmental Policy Act
N_2O	nitrous oxide
NO_2	nitrogen dioxide
NO_x	nitrogen oxides
O_3	ozone
PM_{10}	particulate matter less than or equal to 10
$PM_{2.5}$	particulate matter less than or equal to 2.5
ppm	parts per million
RTA	range and training area
SO_2	sulfur dioxide
SWPPP	Stormwater Pollution Prevention Plan
TTPs	Tactical Training Procedures
µg/m³	micrograms per cubic meter
U.S.	United States
USC	U.S. Code
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USMC	U.S. Marine Corps
VOCs	volatile organic compounds
WTI	Weapons and Tactics Instructor

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CHAPTER 1
PURPOSE AND NEED FOR THE PROPOSED ACTION

1.1 INTRODUCTION

The United States (U.S.) Marine Corps (USMC) proposes to establish and use landing zones (LZs), an assault landing zone (ALZ), drop zones (DZs), and an artillery firing area (AFA) at the two tactical ranges within the Bob Stump Training Range Complex (BSTRC): the Chocolate Mountain Aerial Gunnery Range (CMAGR) and the Barry M. Goldwater Range (BMGR)-West. The establishment and use of these training support areas in the BSTRC is essential to accomplishing critical Marine Corps and Naval Tactical Training Procedures (TTPs), Training and Readiness Codes, and Large Force Exercises.

Marine Corps Air Station (MCAS) Yuma manages the BSTRC, which consists of Department of Defense-controlled airspace and Department of the Navy (Navy)/USMC-controlled training ranges, including the CMAGR in southeastern California and the BMGR-West in southwestern Arizona (Figure 1-1). The BSTRC is essential for developing and maintaining the readiness of Marine Corps and Naval aviators and is vital for land warfare training conducted by select Navy (i.e., Naval Special Warfare Sea, Air, and Land units) and Marine Corps forces.

The USMC has prepared this Environmental Assessment (EA) in accordance with the National Environmental Policy Act (NEPA) of 1969 (42 U.S. Code [USC] §§ 4321-4370h), as implemented by the Council on Environmental Quality (CEQ) (40 Code of Federal Regulations [CFR] §§ 1500-1508) regulations; Department of the Navy procedures for implementing NEPA (32 CFR § 775); and Marine Corps Order (MCO) 5090.2, dated 11 June 2018, *Environmental Compliance and Protection Program*.

1.2 PROJECT LOCATION

The Proposed Action would be implemented at the two tactical ranges within the BSTRC: the CMAGR and BMGR-West (Figure 1-1).

The CMAGR, lying on a southeast-northwest axis, is located in north-central Imperial County and south-central Riverside County, California (Figure 1-1). The CMAGR is generally bound on the west by the Salton Sea Basin and on the east by the Chuckwalla and Palo Verde mountains.

The BMGR-West is located in Yuma County, Arizona and is bound on the south by the U.S.-Mexico border and Cabeza Prieta and the west by the City of Yuma (Figure 1-1). Interstate Highway 8 is adjacent to the northern boundary of the BMGR-West.

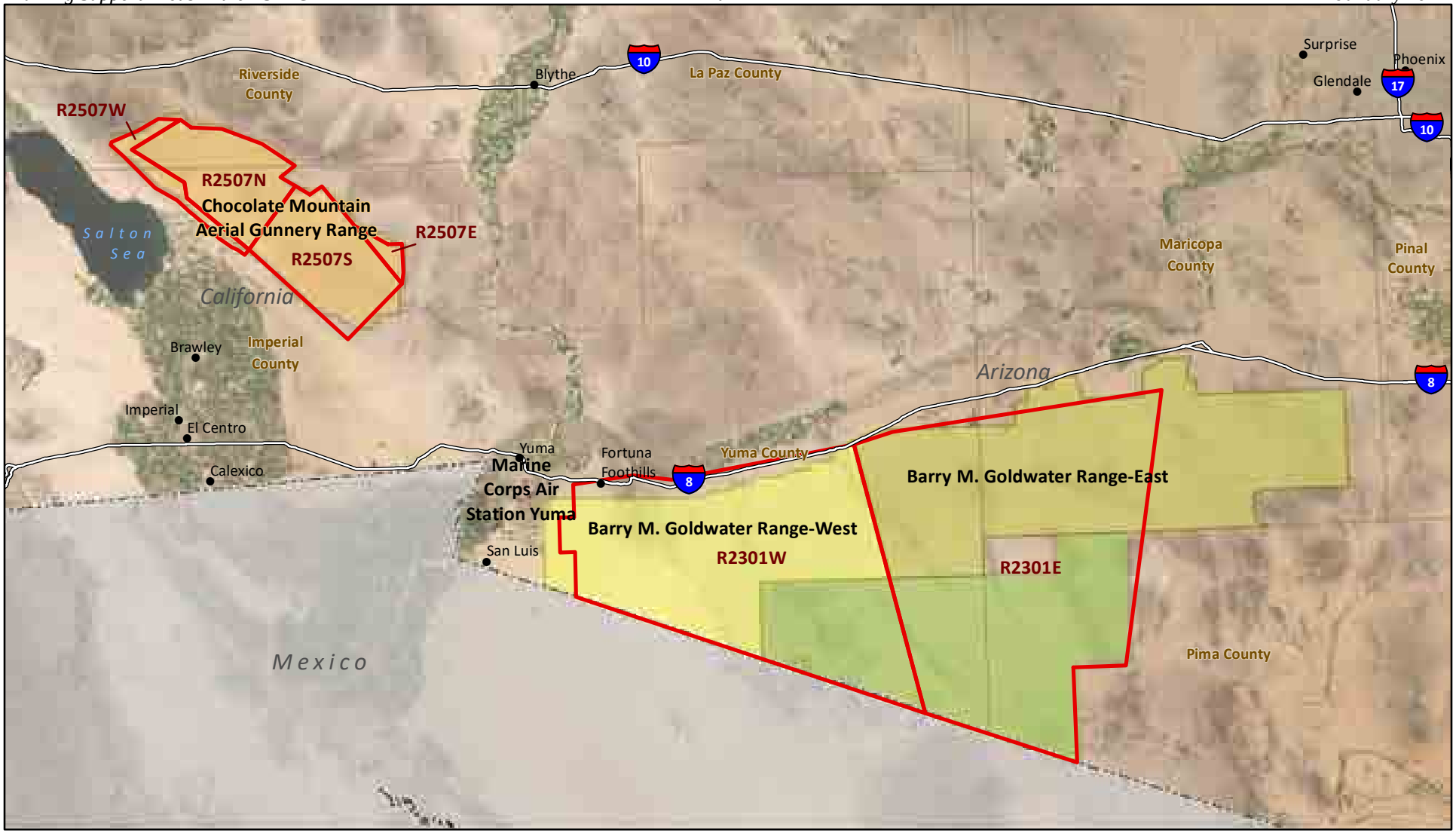
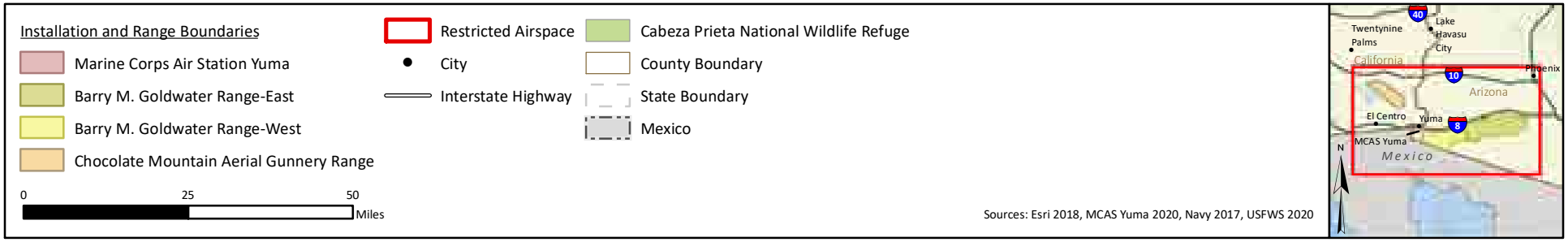


Figure 1-1. Regional Location of the Chocolate Mountain Aerial Gunnery Range and Barry M. Goldwater Range



1.3 BACKGROUND

1.3.1 Chocolate Mountain Aerial Gunnery Range

The CMAGR is the premier national live-fire training range essential for developing and maintaining the readiness of Marine Corps and Navy aviators. The range is also vital for training select Marine Corps and Navy land combat forces. The CMAGR currently supports training by units of the Navy, U.S. Air Force, U.S. Army, U.S. Reserve Components, and U.S. National Guard; however, the Marine Corps, and in particular, the 3rd Marine Aircraft Wing is the primary user of the CMAGR. Local command for military operation and administration of the CMAGR, which is approximately 459,000 acres in size, has been delegated by the Secretary of the Navy to the Commanding Officer, MCAS Yuma, Arizona (Navy 2013). Existing training support areas at the CMAGR are depicted on Figure 1-2.

Ground combat training also occurs at the CMAGR. The use of the range for ground warfare training dates from 1966, and is oriented toward individual fighting skills and unit tactics. Ground warfare, to include the use of artillery, typically involves battalion-sized or smaller units. The USMC routinely deploys small units, up to battalion in size, to MCAS Yuma for ground training, and twice annually, the USMC sends an infantry battalion to MCAS Yuma to support the Weapons and Tactics Instructor (WTI) Course. The CMAGR also has an extensive network of ground ranges for training in small arms, artillery, and explosives.

1.3.2 Barry M. Goldwater Range

The BMGR is one of the most heavily used ranges in the U.S. across all Department of Defense services and allied foreign militaries. The BMGR is a roughly 1.7-million-acre military aviation training facility composed of airspace and lands located in southwestern Arizona. BMGR is used to train military aircrews to fly air combat missions for both air-to-ground and air-to-air operations. To a lesser extent, the range is also used for other types of training, most of which support or are associated with air combat training. Examples of existing facilities used for training include an auxiliary airfield complex, realistic targets for air-to-ground attack, air-to-air firing ranges, and electronic warfare training ranges. The eastern portion of the BMGR, known as BMGR-East (see Figure 1-1), is assigned to the Secretary of the Air Force, and is not a part of the Proposed Action. MCAS Yuma operates and maintains the western portion of the BMGR, known as BMGR-West, which is approximately 700,000 acres in size. Existing training support areas at the BMGR-West are depicted on Figure 1-3.

1.3.3 Marine Aviation Weapons and Tactics Training

The mission of Marine Aviation Weapons and Tactics Squadron One (MAWTS-1) is to conduct standardized, advanced tactical training and certification of unit instructor qualifications that support Marine Aviation Training and Readiness. MAWTS-1 accomplishes this by conducting a biannual (twice a year in the spring and fall) WTI course. WTI is the Marine Corps' primary aviation weapons and tactics course and its evolutions are designed to provide the most realistic training environment possible. The WTI course is a seven-week course conducted within the BSTRC, at both the CMAGR and BMGR-West, consisting of advanced tactical aviation training designed to produce weapons and tactics instructors.

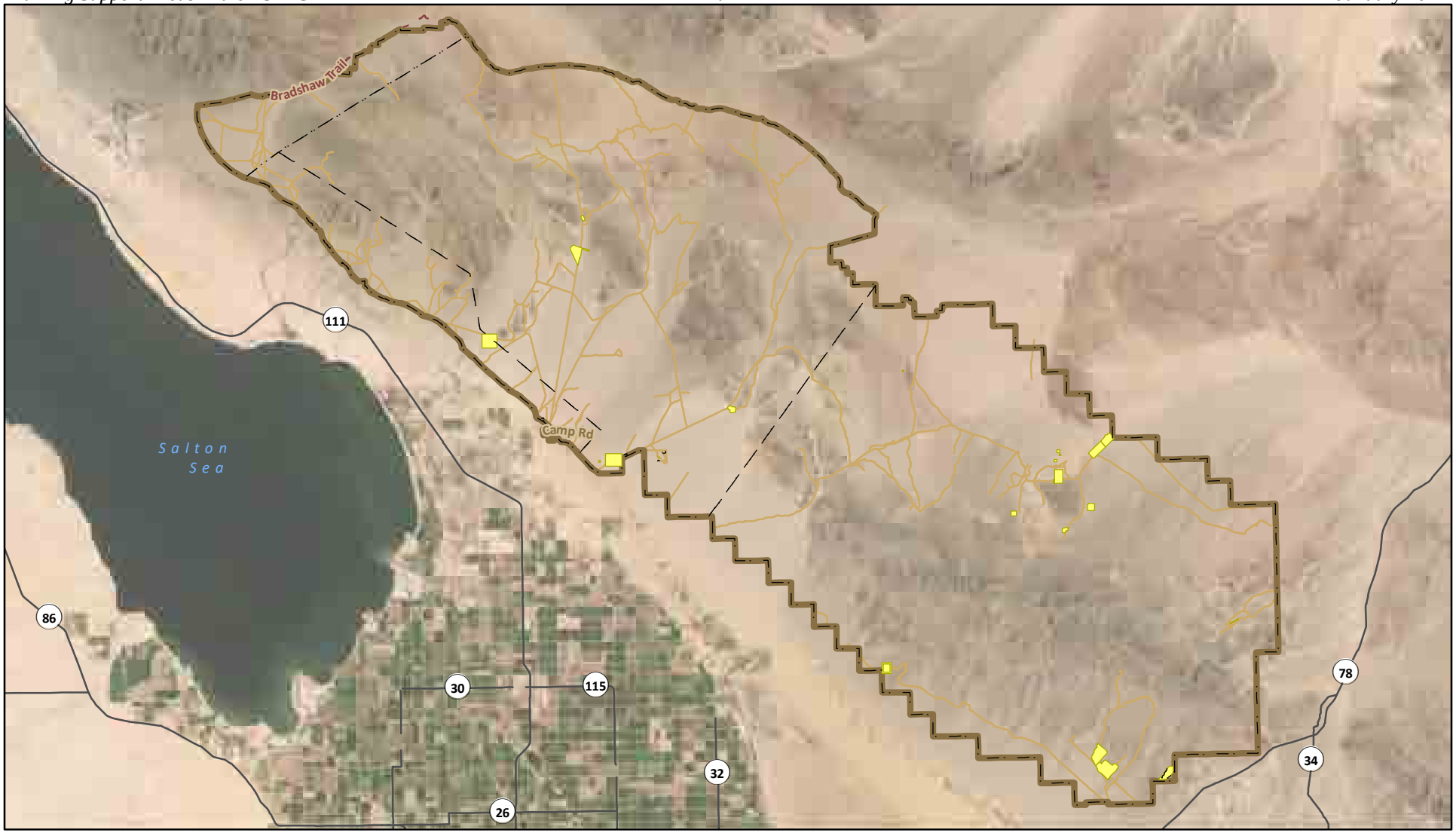


Figure 1-2. Training Support Areas at the Chocolate Mountain Aerial Gunnery Range

Figure 1-3. Training Support Areas at the Barry M. Goldwater Range-West

Installation and Range Boundaries
- Marine Corps Air Station Yuma
- Barry M. Goldwater Range-East
- Barry M. Goldwater Range-West

Training Support Areas
- Training Area
- Drop Zone
- Landing Zone

- Interstate Highway
- U.S. Highway
- State Highway
- Existing Dirt Road
- Cabeza Prieta National Wildlife Refuge
- Mexico

0 5 10 Miles

Sources: Esri 2018, MCAS Yuma 2020, Navy 2017, USFWS 2020

1.3.4 Legacy Rotary-Wing Aircraft Operations

Legacy rotary-wing aircraft landings are currently authorized in all MCAS Yuma designated LZs, with proper range clearance and scheduling (MCAS Yuma 2013). Legacy aircraft are those that are no longer in production but may still be used in military operations. In addition to designated LZs, rotary-wing aircraft are authorized to land in non-designated and/or undeveloped of the CMAGR and BMGR-West during non-emergency situations, except for certain areas, such as designated target areas, marked or fenced areas, designated areas for protected animal and plant species, and designated areas for the protection of cultural resources, as well as other off-limit areas as specified in the MCAS Yuma Standard Operating Procedures (MCAS Yuma 2013). Current operating procedures allow for legacy rotary-wing aircraft to land in and utilize a greater variety of locations at the BSTRC than tilt-rotor aircraft, such as the MV-22, which are assigned to landing in MCAS Yuma designated LZs.

1.3.5 On-Going Training Challenges

Landing zones are designated areas for landing and takeoff of aircraft. Currently at the BSTRC, as described above, tilt-rotor aircraft (i.e., the MV-22) have a fewer number of established LZs than legacy rotary-wing aircraft because MCAS Yuma Standard Operating Procedures (MCAS Yuma 2013) were written when the MV-22 was at a relatively new stage of operation. However, with the MV-22 since becoming a fully operational platform, it requires similar LZs as rotary-wing aircraft at the BSTRC to optimize the use of the training range for its intended purpose. It is critical that MV-22 aircraft have similar flexibility to legacy rotary-wing assault support aircraft in order to conduct air-to-ground embark of troops in LZs during training evolutions in support of Assault Support Tactics and Training and Readiness Certifications. This mission is prevalent in today's combat environment and supports the Air/Ground Order of Battle.

Assault Landing Zones are designated LZs that allow for landing and takeoff of fixed-wing, rotary-wing, and tilt-rotor aircraft in geographic locations that contain expeditionary or hasty landing fields that expose aircrews to maximum-effort takeoffs/landings within a rigorous setting. The Assault Support training community has critical and emergent requirements to train on unimproved surfaces for combat readiness and for expeditionary operations. Currently, there are no ALZs within the CMAGR. MAWTS-1 and fleet users have critical and emergent requirements to train on unimproved surfaces for combat readiness and for expeditionary operations in the BSTRC.

Drop Zones are designated areas for the aerial delivery of small-unit parachute operations (personnel and cargo pallets), including the pick-up of personnel and equipment following operations. Currently, the majority of DZs in the BSTRC are located in approved ground support areas. Ground support areas are multiple use areas for activities such as bivouacking, berming, trenching, Forward Logistics Base operations, field mess, field showers, and DZ and LZ operations. On occasion, DZs are required outside of the ground support areas in order to facilitate strategic locations or alternative areas based on the Air/Ground Order of Battle.

Artillery Firing Areas are on-ground areas established to support ground combat artillery (i.e., large-caliber guns, howitzers, and mortars) firing activities. During WTI courses, there are several events that require artillery live-fire support. Currently, the primary AFA at the CMAGR used during WTI courses is too close to the target impact areas, which does not allow for a realistic artillery employment scenario. In addition, the proximity to the impact area limits the targets that are able to be engaged safely when traversing the gun-target line with rotary-wing aircraft due to the maximum ordnance of the round. A new AFA at the CMAGR, established farther from the target impact areas, would extend the artillery range and associated

training envelope, which would subsequently increase the separation from the aircraft and the flight path of the round when crossing the gun-target line.

1.4 PURPOSE OF AND NEED FOR THE PROPOSED ACTION

The purpose of the Proposed Action is to optimize mission-critical training capabilities within the BSTRC for Marine Corps and Naval aviators and Marine Air-Ground Task Force artillery cannoneers (ground troops who fire artillery). The Proposed Action is needed to establish LZs, an ALZ, DZs, and an AFA at the BSTRC, which would provide MV-22 aircraft similar flexibility to existing Legacy Rotary-Wing Aircraft Policy and Procedures and provide a safer and more realistic artillery firing training environment. The Proposed Action is also needed to accomplish critical Marine Corps and Naval TTPs, Training and Readiness Codes, and Large Force Exercises.

1.5 SCOPE OF ANALYSIS

This EA describes the potential environmental consequences resulting from the Proposed Action and the No-Action Alternative on the following resource areas: air quality, biological resources, cultural resources, and geological resources. As discussed in Chapter 3, impacts to other resource areas are anticipated to be negligible or non-existent from implementation of the Proposed Action and the No-Action Alternative, and as such have not been analyzed in detail.

1.6 REGULATORY SETTING

This EA has been prepared based on NEPA requirements as outlined in the following statutes, regulations, and guidance documents:

- NEPA of 1969 (42 USC §§ 4321-4370h), which requires an environmental analysis for major federal actions that have the potential to significantly impact the quality of the human environment
- CEQ regulations (40 CFR §§ 1500-1508), which implement the requirements of NEPA
- Navy regulations for implementing NEPA (32 CFR § 775), which provide Navy policy for implementing the CEQ regulations and NEPA
- MCO 5090.2, dated 11 June 2018, *Environmental Compliance and Protection Program*

This EA has been prepared in accordance with the following additional statutory and executive requirements:

- Clean Air Act, as amended (42 USC §§ 7401-7671q), including 1990 General Conformity Rule
- Clean Water Act (33 USC §§ 1251-1387)
- Comprehensive Environmental Response, Compensation, and Liability Act (42 USC §§ 9601-9675)
- Endangered Species Act (16 USC §§ 1531-1544)
- Executive Order (EO) 12898 – *Federal Actions to Address Environmental Justice in Minority Populations and Low-income Populations*
- EO 13045 – *Protection of Children from Environmental Health Risks and Safety Risks*
- EO 13186 – *Responsibilities of Federal Agencies to Protect Migratory Birds*
- Migratory Bird Treaty Act (16 USC §§ 703-712)

- National Historic Preservation Act (54 USC §§ 300101-305306)
- American Indian Religious Freedom Act (42 USC §§ 1996 and 1996a)
- Resource Conservation and Recovery Act (42 USC §§ 6901-6992k) and governing regulations (40 CFR §§ 260-282)

1.7 ORGANIZATION OF THE ENVIRONMENTAL ASSESSMENT

Chapter 1 of this EA describes the background, purpose of, and need for the Proposed Action. Chapter 2 of this EA describes the Proposed Action and the No-Action Alternative. Chapter 3 provides a description of the affected environment and the potential impacts of each alternative on each environmental resource area. Chapter 4 provides other analyses required by NEPA (i.e., possible conflicts between the action and the objectives of federal, regional, state and local plans, policies, and controls; irreversible and irretrievable commitment of resources). Chapter 5 contains all references used in this EA. Chapter 6 provides the list of EA preparers and their qualifications. The appendices contain additional information and documentation prepared in support of this EA.

1.8 PUBLIC PARTICIPATION

As part of this EA, the USMC published a Public Notice of Availability for the Draft EA in three local newspapers: the Imperial Valley Press, the Yuma Daily Sun, and the Adelante Valle (Spanish language newspaper) (Appendix A). The Draft EA was made available for public review and comment at the Brawley Public Library, El Centro Public Library, and Yuma Main Library. In addition, the Draft EA was posted to the MCAS Yuma website. The public comment period lasted 15 days, from 6 August 2021 to 21 August 2021. No public comments were received.

CHAPTER 2
DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

2.1 OVERVIEW

Under the Proposed Action, the USMC would permanently establish and use designated LZs, an ALZ, DZs, and an AFA within the BSTRC. The USMC would not increase the quantity of sorties flown, increase the amount and/or types of ordnance expended, increase artillery training tempo, or alter the existing facilities or airspace within the BSTRC as part of this Proposed Action. Under the Proposed Action, training within the project area would continue to be consistent with activities addressed and analyzed in the Yuma Training Range Complex Environmental Impact Statement (USMC 1997).

As this Proposed Action would support on-going training activities within the BSTRC, the project team did not consider any locational alternatives other than the BSTRC. The USMC considered multiple potential action alternatives for implementing the Proposed Action; however, after careful consideration, none of the potential alternatives would meet the purpose and need of the Proposed Action. Therefore, this EA evaluates two alternatives: the Proposed Action and the No-Action Alternative. Section 2.2 describes the Proposed Action and Section 2.3 describes the No-Action Alternative. Other alternatives considered but eliminated from detailed analysis are described in Section 2.4.

2.2 PROPOSED ACTION

Under the Proposed Action, the USMC would establish five LZs, an ALZ, and an AFA at the CMAGR; and two DZs and nine LZs at the BMGR-West (Figure 2-1). The number and locations of the proposed training support areas were chosen to best support Marine Corps and Naval TTPs, Training and Readiness Codes, and Large Force Exercises. Establishment of these areas would not require any paving, permanent structures, or new utilities. Table 2-1 details the proposed training support areas at the CMAGR and BMGR-West, and they are depicted on Figures 2-2a, 2-2b, and 2-3. The proposed training support areas, specific to the Proposed Action, include:

- **LZs** established under the Proposed Action would allow for landing and takeoff of MV-22 aircraft in realistic combat scenarios in the Range and Training Areas (RTAs) consistent with Legacy Rotary-Wing Aircraft Policy and Procedures. Marine Corps Assault Support Tactics require the ability and flexibility to land aircraft while conducting evolutions within a single objective area. MV-22 aircraft require the ability to tactically ingress and egress. LZs established for use by MV-22 aircraft would largely remain in their natural states and no new roads would be established for use of the LZs. However, to reduce the threats to aircraft and aircrews posed by large, woody vegetation, minor trimming of woody vegetation may occur biannually in and in the immediate vicinity of MV-22 landing sites within the LZs. Because aircrews would intentionally not land in washes, but would land in areas that are devoid or nearly devoid of vegetation, it is expected that the need for biannual vegetation trimming would be minimal. No plants would be intentionally uprooted or removed and trimming would be done with hand tools. In addition, LZs would not be scheduled for dust abatement. However, if deemed necessary prior to training operations due to

high potential for unsafe dust conditions for aircrews, an eco-safe, biodegradable, liquid copolymer dust palliative (e.g., brand name "Envirotac II") may be applied to the LZs for dust suppression.

- **ALZs** facilitate the landing and takeoff of fixed-wing, rotary-wing, and tilt-rotor aircraft in geographic locations that contain expeditionary or hasty landing fields that expose aircrews to maximum-effort takeoffs/landings within a rigorous setting. The Assault Support training community has critical and emergent requirements to train on unimproved surfaces for combat readiness and for expeditionary operations. Although ALZs do not require the establishment of support facilities or structures, occasional maintenance grading would be required to maintain the expeditionary landing strip within the ALZ. In addition, following initial grading, the landing strip would receive an application of an eco-safe, biodegradable, liquid copolymer dust palliative (as previously discussed for LZs). The landing strip would receive re-applications of the dust palliative as needed. The dust palliative is used to provide erosion control and dust suppression. No new roads would be established for use of the ALZ.

Table 2-1 Proposed Training Support Areas Under the Proposed Action

Training Support Area Type	Training Support Area Name	Acres
CMAGR		
Landing Zone	Pina	68.3
	Salvation Northern Multi-ship	487.0
	Salvation Southern Multi-ship	738.0
	Salvation Single Ship North 1	8.8
	Salvation Single Ship North 2	8.8
Assault Landing Zone	Bull	12.9
Artillery Firing Area	AFA Burt 2.0	42.0
	Access Road	33.4
	Combat Trail	11.4
	Subtotal	**1,410.6**
BMGR-West		
Drop Zone	Remo	776.0
	Hickey	776.0
Landing Zone	No. 1	48.5
	No. 2	48.5
	No. 3	48.5
	No. 4	48.5
	No. 5	48.5
	No. 6	7.8
	No. 7	7.8
	No. 8	7.8
	No. 9	7.8
	Subtotal	**1,825.7**
	TOTAL	**3,236.3**

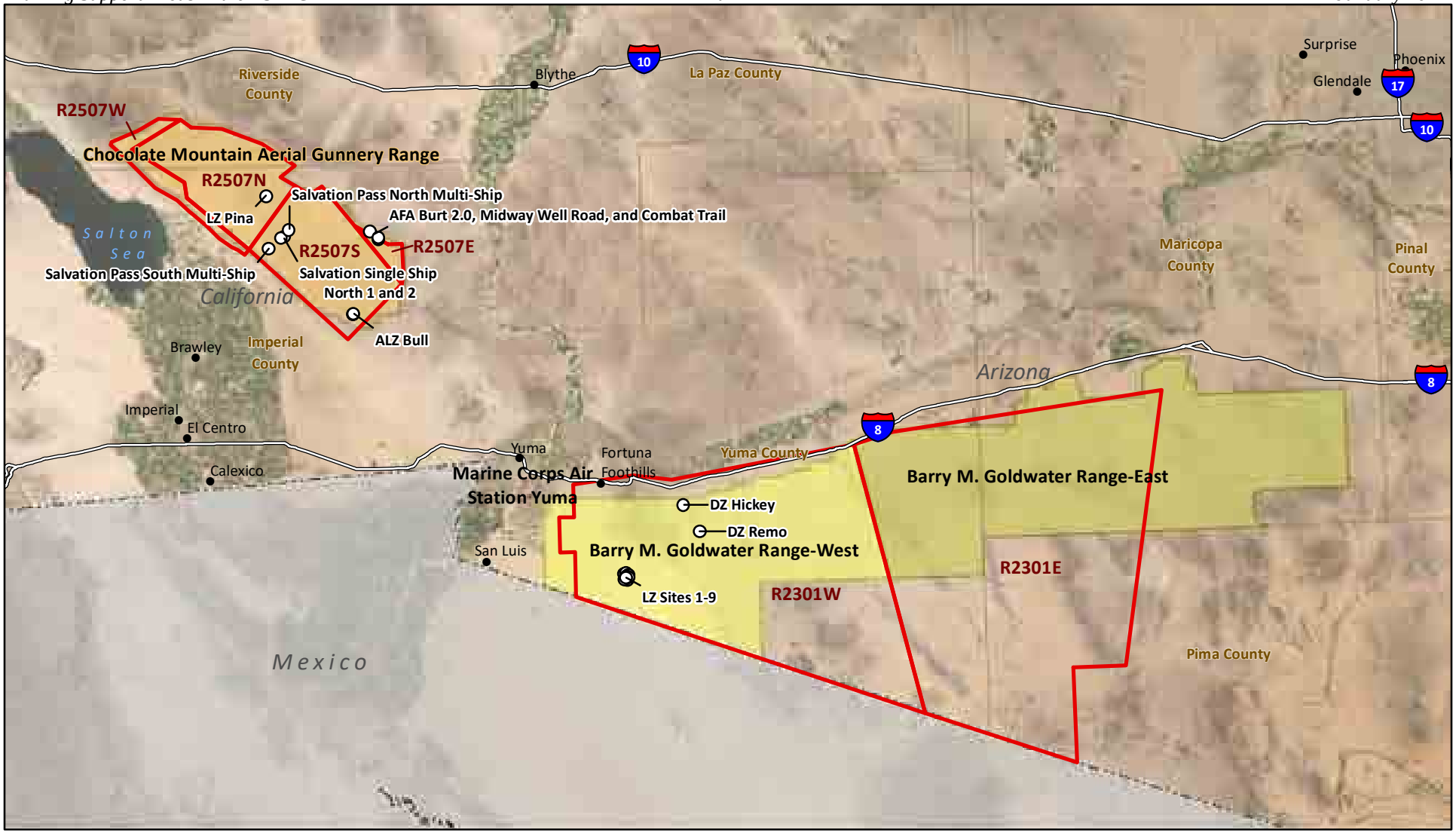


Figure 2-1. Proposed Training Support Areas

Installation and Range Boundaries
- Marine Corps Air Station Yuma
- Barry M. Goldwater Range-East
- Barry M. Goldwater Range-West
- Chocolate Mountain Aerial Gunnery Range

- Proposed Training Support Area
- Restricted Airspace
- City
- Interstate Highway
- County Boundary
- State Boundary
- Mexico

0 25 50 Miles

Sources: Esri 2018, MCAS Yuma 2020, Navy 2017

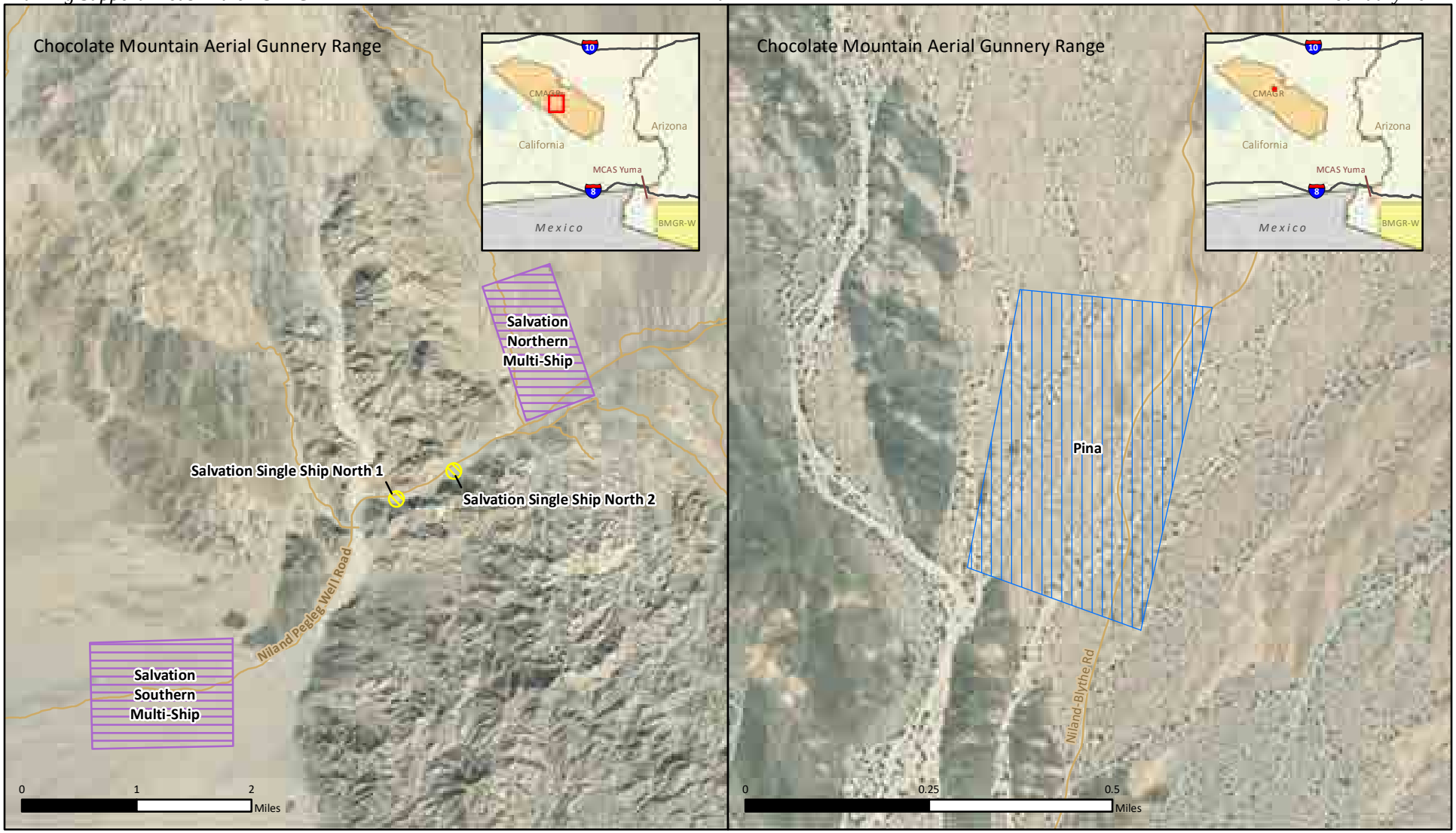


Figure 2-2a. Proposed Training Support Areas at the Chocolate Mountain Aerial Gunnery Range

Proposed Training Support Areas

- Landing Zone Pina
- Landing Zone Salvation Pass Multi-Ship
- Landing Zone Salvation Pass Single Ship

Existing Dirt Road

Sources: Esri 2018, MCAS Yuma 2020, Navy 2017

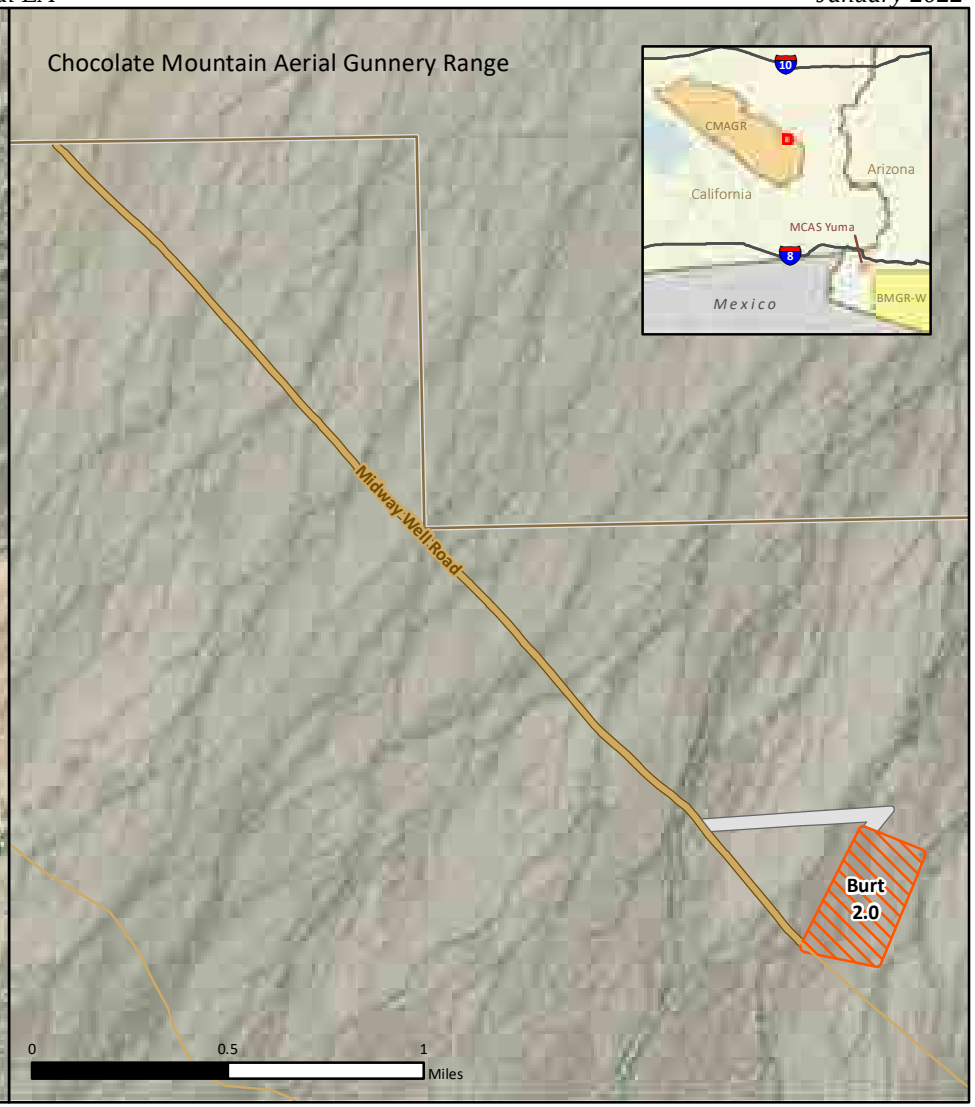


Figure 2-2b. Proposed Training Support Areas at the Chocolate Mountain Aerial Gunnery Range

Installation and Range Boundaries
- Chocolate Mountain Aerial Gunnery Range

Proposed Training Support Areas
- Artillery Firing Area Burt 2.0
- Access Road
- Combat Trail
- Assault Landing Zone Bull

Existing Dirt Road

Sources: Esri 2018, MCAS Yuma 2020, Navy 2017

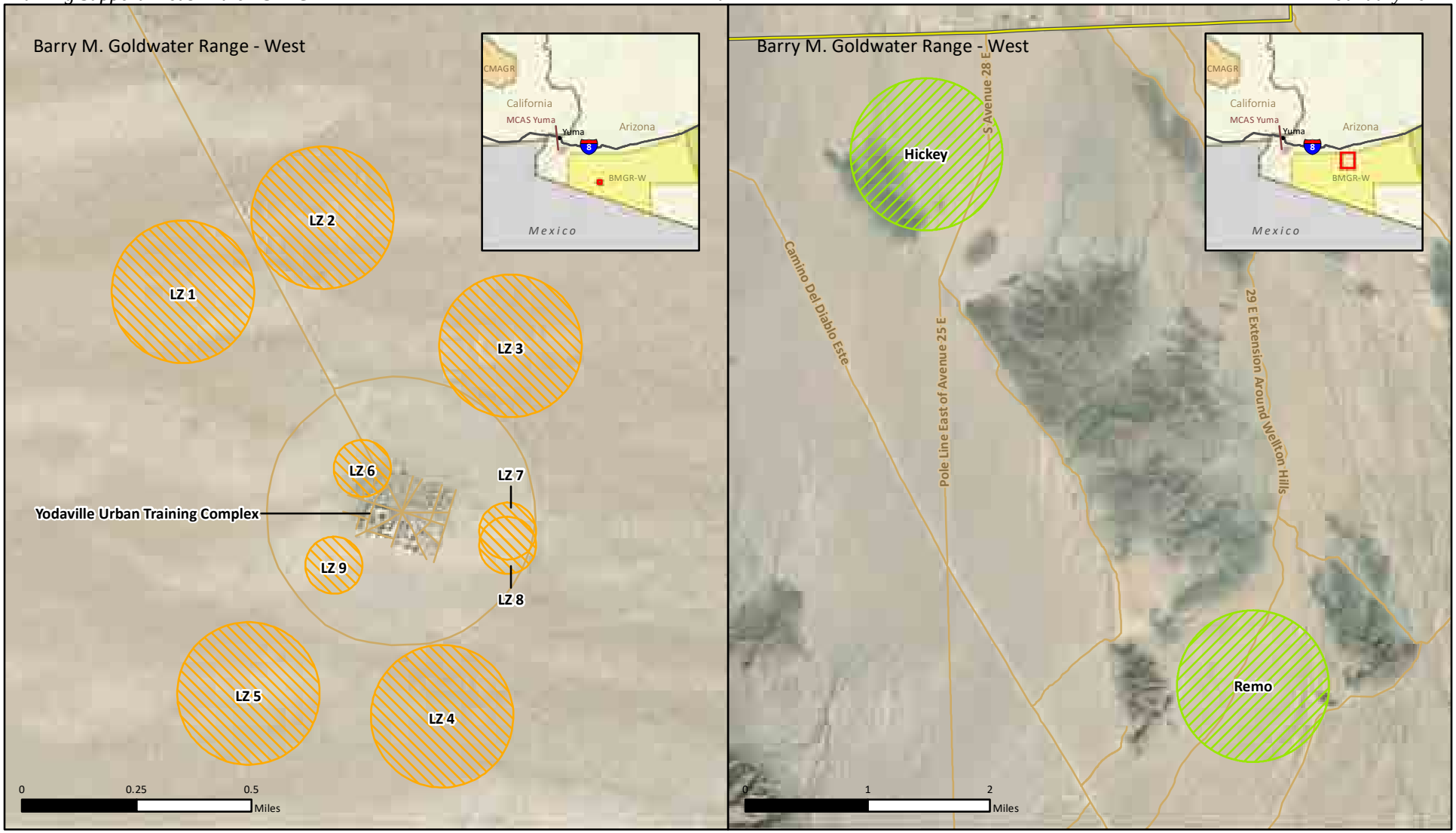


Figure 2-3. Proposed Training Support Areas at the Barry M. Goldwater Range-West

Installation and Range Boundaries

Barry M. Goldwater Range - West

Existing Dirt Road

Proposed Training Support Areas

Drop Zone

Landing Zone

N

Sources: Esri 2018, MCAS Yuma 2020, Navy 2017

- **DZs** established outside of the ground support areas at the BMGR-West would allow for the aerial delivery of small-unit parachute operations (personnel and cargo pallets), including the pick-up of personnel and equipment following operations. Currently the majority of DZs in the BSTRC are located in the approved ground support areas. Additional DZs established outside of the ground support areas would facilitate training in strategic locations or alternative areas based on the Air/Ground Order of Battle. Each DZ would remain in its natural state and no maintenance or improvement would be required. In addition, no new roads would be established for use of the DZs.
- **AFAs** are areas established to allow ground support troops to setup artillery (i.e., large-caliber guns, howitzers, and mortars) for firing into previously established target areas. The establishment of the AFA would not entail any major earthwork beyond on-ground troops digging pits to help absorb the recoil of the artillery. Following training activities, any pits that were dug would be filled and returned to pre-activity contours. AFA Burt 2.0 would require the use of an existing unmaintained dirt access road that stems off of Midway Well Road for access by ground training vehicles and equipment, and the establishment of a combat trail to the AFA (see Figure 2-2b). The access road would be approximately 2.8 miles long. The combat trail would be approximately 0.5 mile long. Both would be unimproved, graded dirt roads that would require initial and occasional grading to maintain the accessibility of the roads and to allow maneuverability of vehicles and equipment. Both the access road and combat trail would receive an initial application of a dust palliative and would receive re-applications as needed.

Under the Proposed Action, no new paved roads or permanent buildings/structures would be established. Operations under the Proposed Action would generally be consistent with on-going operations in the BSTRC. The USMC would not increase the quantity of sorties flown, increase the amount and/or types of ordnance expended, increase artillery training tempo, or alter the existing facilities or airspace within the BSTRC.

Operations within the proposed training support areas would be scheduled and deconflicted with other range users. Once established, the additional training support areas would add to the available locations for MV-22 aircraft operations. Likewise, the addition of an ALZ would add to the overall available training locations for all MAWTS-1/WTI purposes. All proposed training support areas would be utilized in a natural or near-natural setting, except for minor, as needed vegetation trimming, and occasional grading maintenance required to maintain the accessibility of the access road and combat trail to AFA Burt 2.0 and to maintain the expeditionary landing strip at ALZ Bull.

2.3 NO-ACTION ALTERNATIVE

For the purposes of this EA, "no-action" means that the proposed LZs, ALZ, DZs, and AFA within the BSTRC would not be established. Consequently, the potential training challenges for WTI and similar operations at the CMAGR and BMGR-West would persist. This situation would continue to affect the capability of forces to achieve training requirements needed to support current and emerging contingency and wartime requirements. The No-Action Alternative is included as a baseline for comparison to all action alternatives for determining project effects.

The No-Action Alternative is not considered a reasonable alternative because it does not meet the purpose of and need for the Proposed Action. However, as required under CEQ regulations (40 CFR § 1502.14[d]), the No-Action Alternative does provide a description of the baseline conditions against which the impacts of the Proposed Action can be compared.

2.4 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM DETAILED ANALYSIS

For WTI operations, the USMC has considered continued use of established AFAs at the CMAGR. The continued use of established AFAs during WTI operations is not feasible, however, due to aircraft safety limitations and unrealistic ground support artillery training scenarios because of the proximity of existing AFAs to the target areas at the CMAGR. Continued use of existing AFAs during WTI operations would not allow "real world" simulations in the training environment. Therefore, critical Marine Corps and Naval TTPs, Training and Readiness Codes, and Large Force Exercises would not be fully satisfied, which adversely impacts training ability and overall operational readiness.

The USMC also considered the continued use of an existing 4,000-foot "improved" asphalt strip at the CMAGR which provides short airfield training for multiple aircraft types. However, use of the current asphalt airstrip does not satisfy the requirement of training in "unimproved" conditions, nor is it located in a geographic location that presents expeditionary or hasty training opportunities that expose aircrews to maximum-effort landings/takeoffs within a rigorous setting. Training in an ALZ is required for aircrews to satisfy higher-level TTPs and Training and Readiness Codes. Therefore, continued use of the existing 4,000-foot "improved" asphalt strip at the CMAGR would not support the purpose and need of the Proposed Action, and this alternative was not brought forward for detailed analysis.

Finally, the USMC considered an original configuration and location for ALZ Bull which, following field reconnaissance during field surveys, was deemed to have potential environmental and logistical constraints because it would require grading in portions of several ephemeral desert washes. Ephemeral washes carry water only during and immediately after significant rainfall events and would likely cause washouts, requiring a greater level of maintenance grading and potentially altering downslope habitats. Therefore, the location and configuration of ALZ Bull were changed, as presented in this EA, to reduce the potential for impacting ephemeral washes and related maintenance grading, and the original ALZ Bull configuration was not brought forward for analysis.

2.5 CONSERVATION MEASURES

The following conservation measures (CMs) (organized by resource area) have been developed to avoid or minimize the potential environmental consequences of the Proposed Action. These CMs would be implemented as part of the Proposed Action.

Biological Resources CMs in Section 2.5.2 are derived from the applicable terms and conditions from previous consultations with the U.S. Fish and Wildlife Service (USFWS) addressing similar actions and the desert tortoise, including the Biological Opinion (BO) for the Military Use of the CMAGR (1-6-96-F-40) (USFWS 1996) and the Proposed Special Warfare Training Areas 4 and 5 Amended BO for Military Use of the CMAGR (FWS-IMP-15B0239-16F0039; USFWS 2015). The USFWS issued an amendment to the 1996 BO specific to the Proposed Action on 24 January 2022. (Appendix A). The CMs adopted as part of the Proposed Action include those listed in Sections 2.5.1 through 2.5.5 and those in the BO amendment issued for the Proposed Action. Where in conflict, CMs listed in the BO amendment (Appendix A) would supersede those listed for Biological Resources in Section 2.5.2.

2.5.1 Air Quality

AQ-1) Imperial County Air Pollution Control District (ICAPCD) Rule 800 would be followed to minimize potential fugitive dust emissions by implementing measures to reduce particulate matter

emissions (e.g., watering of exposed soils, soil stockpiling, and soil stabilization) during grading (ICAPCD 2012). This includes the preparation of a fugitive dust control plan before grading.

2.5.2 Biological Resources

BR-1) The MCAS Yuma Tortoise Management Representative within the Range Management Department would ensure compliance with protective stipulations by all users. This representative has the authority to halt activities that may be in violation of such provisions. The Tortoise Management Representative also would coordinate with the designated USFWS representative on all matters concerning desert tortoise mitigation and management responsibilities. The Tortoise Management Representative does not have to be a qualified desert tortoise biologist and therefore would receive instructions from a qualified desert tortoise biologist in the handling, data collection, and release procedures for desert tortoise prior to engaging in such activities. MCAS Yuma would submit the name(s) and credentials of the person(s) that would be the Tortoise Management Representative or appointee(s) (see CM BR-5 for additional information) to the USFWS. Only qualified desert tortoise biologists, the Tortoise Management Representative, or appointees ("appointee" is defined as a person having the same qualifications as the Tortoise Management Representative) would handle desert tortoises.

BR-2) All personnel accessing the CMAGR would participate in MCAS Yuma's existing tortoise education program, which has been developed cooperatively with the USFWS. The program would include, at a minimum, the following topics: (1) occurrence of the desert tortoise; (2) sensitivity of the species to human activities; (3) legal protection for desert tortoises; (4) penalties for violations of federal law; (5) general tortoise ecology and activity patterns; (6) reporting requirements; (7) measures to protect tortoises; (8) personal measures that users can take to promote the conservation of desert tortoises; and (9) procedures and a point of contact if a desert tortoise is observed on the site.

BR-3) All personnel accessing the CMAGR would be informed of their responsibility to report any form of take to the Tortoise Management Representative. If a tortoise is found in the proposed training support areas, activities may, if appropriate, be modified to avoid injuring or harming it and MCAS Yuma Tortoise Management Representative shall be contacted immediately.

BR-4) Range Management personnel would be responsible for periodically reminding all personnel of the protective measures for tortoises.

BR-5) Desert 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, MCAS Yuma shall submit their credentials to the USFWS for review and approval at least 30 days before the initiation of any activity within suitable 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/ventura/endangered/species/surveys-protocol.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.

BR-6) MCAS Yuma would prepare and deliver an annual monitoring report to the USFWS on or before 15 January of each year. The report would briefly outline the effectiveness of the desert tortoise mitigation measures and summarize desert tortoise injuries or mortalities. To enhance desert tortoise protection, the report would make recommendations for modifying or refining existing measures.

BR-7) The action area (the region subject to direct and indirect impacts to biological resources from the Proposed Action) would be included in the rotation of areas that are currently surveyed during on-going annual surveys at the CMAGR (as funds are available). Surveys would be conducted using the USFWS-recommended methods by qualified desert tortoise biologists. Surveys would be conducted within existing safety protocols and mission parameters at the designated area(s) within the CMAGR during regularly scheduled range closures in the spring and all data are collected and entered into the MCAS Yuma Geographic Information System database. The results of monitoring would be included in the annual monitoring report prepared by MCAS Yuma and delivered to the USFWS on or before 15 January of each year. Any changes in survey methodology would be reported to the USFWS in an annual monitoring report.

BR-8) In accordance with the existing BO for the CMAGR (1-6-95-F-40; USFWS 1996), the boundaries of ground-disturbing activities would be determined in the field, mapped, and marked with monuments prior to ground-disturbing activities. Ground-disturbing activities would occur outside of and away from surface drainage features, where feasible. All ground-disturbing activities would be within the designated boundaries. Desert tortoise clearance surveys conforming to USFWS recommendations would be followed for the initial siting of all ground-disturbing activities. A qualified desert tortoise biologist or the Tortoise Management Representative would also be on-site during initial ground-disturbing activities.

BR-9) An authorized desert tortoise biologist would be "on-call"/available during ground-disturbing activities to address the situation if a desert tortoise is encountered. The MCAS Yuma Range Management Department would provide the USFWS the name(s) and qualifications of the biologist(s) for review and approval.

BR-10) Any excavations associated with ground-disturbing activities that would be left open in areas that are not being monitored shall 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 shall be inspected for desert tortoises before filling.

BR-11) A tortoise exclusion fence would be installed around each site before grading. A qualified desert tortoise monitor would be present during the initial activity at each grading site. Once a tortoise fence is installed and the clearance surveys are completed, the monitor would no longer need to be present at the site. If a tortoise is found in the action area during grading activities, the tortoise would be allowed to move away on its own free will or would be safely moved by an approved desert tortoise biologist. Following grading, the tortoise exclusion fences would be removed.

BR-12) All personnel conducting grading activities and operational range clearance (e.g., Explosives Ordnance Disposal [EOD] personnel) would monitor "take" as part of their sweeps of activity areas.

Personnel would report to the Tortoise Management Representative any injured or dead tortoises located, as well as habitat damage outside of the designated activity area. Personnel would fill out a form after ground-disturbing/training activities and EOD clearance activities, reporting any take. The Tortoise Management Representative (or appointee) would be present during all ground-disturbing activities and EOD clearance activities and available to respond to individual EOD and range maintenance crews (who would be trained per CMs BR-2 and BR-3) in the event the crews observe tortoise mortality/take, habitat damage, or need to have a tortoise relocated.

BR-13) The project proponent would designate a Field Contact Representative (FCR) once ground clearing is completed and the desert tortoise fences are installed. The FCR would be responsible for overseeing compliance with biological resources CMs, and any other required terms and conditions resulting from consultation between the USMC and USFWS. The FCR would be on-site during all grading activities. The FCR would have a copy of all CMs during grading activities. The FCR may be a crew chief, field supervisor, project manager, or a contracted biologist. The FCR would have the authority to halt grading, operation, or maintenance activities that are in violation of these requirements. A representative from MCAS Yuma Range Management Department would make bi-weekly visits to ensure compliance.

BR-14) Roads would conform to the natural contour of the land as much as possible to minimize grading and would avoid existing perennial plants as much as possible.

BR-15) Vehicles traveling along access roads, or any road within critical habitat, shall not exceed 20 miles per hour. All roads entering critical habitat would be posted with speed limits of 20 miles per hour. To the extent practicable, vehicles would remain on established roads except as required for specific training activities. Vehicles used during specified training activities would stay within the confines of road boundaries until the destination is reached.

BR-16) After ground-disturbing activities are completed, operations would be directed by the 1996 BO (USFWS 1996) and the BO amendment specific to the Proposed Action (Appendix A), with the exception that off-road driving (which is prohibited by the 1996 BO) would be allowed.

BR-17) All personnel operating vehicles within suitable tortoise habitat on the CMAGR would inspect underneath their parked vehicle before moving it. If a desert tortoise is found beneath a vehicle, the Tortoise Management Representative or qualified appointee(s) would be contacted, and the vehicle would not be moved until the Tortoise Management Representative removes it from harm's way or the tortoise leaves on its own accord.

BR-18) No pets would be permitted at any time within the action area. Military working dogs are permitted, but only under the control of their handler.

BR-19) All personnel that enter the action area would be required to remove all food stuffs, trash, or other waste that may attract common ravens (*Corvus corax*; hereafter raven) and other desert tortoise predators, in accordance with existing regulations for the CMAGR. Any temporary trash receptacles would be equipped with latching/locking lids. The Tortoise Management Representative would be responsible for ensuring that trash is removed regularly from the action area and that the trash containers are kept securely closed when not in use. MCAS Yuma would employ the following measures to further discourage raven settlement:

a. Abandoned vehicles found on the CMAGR would be inventoried and steps would be taken to remove them.

b. Public use is restricted and would continue to be restricted in the CMAGR, thus reducing the raven attraction towards people.

c. Cattle grazing and cattle watering troughs are restricted on the range and would remain as such for security and raven prevention.

d. Range signs and fencing would be limited to a minimum to reduce the number of elevated perches.

e. Training operations and personnel would be required to properly dispose of food and trash per Station Order 3710.63.

f. Ground-disturbing activities would have appropriate trash receptacles per Station Order 3710.63.

g. Personnel such as range wardens, range inspectors, and personnel using the training areas would be educated and instructed to report any raven sightings, which would be investigated and documented by MCAS Yuma biologists.

h. Any raven or raven nests discovered on the CMAGR would be evaluated by MCAS Yuma biologists for tortoise predation. In addition, if any raven-damaged tortoise shells are found, the surrounding area would be searched for raven and raven nests. Upon completion of any necessary environmental review, and in accordance with appropriate permitting, any predatory ravens and their nests would be removed using methods similar to those identified in the March 2008 "Reduce Common Raven Predation on the Desert Tortoise" USFWS EA upon completion of any necessary environmental review and in accordance with appropriate permitting.

i. Periodically, all wildlife guzzlers would be inspected by biologists, range inspectors, and range wardens for raven usage. Observations of tortoise carcasses and raven nests near guzzlers would result in further evaluation for removal.

BR-20) The Tortoise Management Representative or appointee(s) would survey all ground support areas for dead or injured tortoises after the completion of each ground operation.

BR-21) Should a dead or injured tortoise be located on-site during or after any military activity, the MCAS Yuma Range Management Department would be notified immediately. The USFWS would be notified by the Tortoise Management Representative via email within 3 working days of the discovery of any tortoise death or injury potentially caused by military activity. Notification would include the date, time, circumstances, and location of any injury or death. Dead tortoises would be buried to avoid attraction of scavengers. Injured tortoises would be taken to a veterinarian approved by the USFWS. Information to be provided to the USFWS would include the date and time of the finding or incident (if known), location of the carcass, a photograph, cause of death (if known), and any other pertinent information.

BR-22) In an effort to control the spread of invasive (non-native) plants, all grading equipment and/or grading vehicles originating outside of the CMAGR, or BMGR-West shall be power-washed before entering roadways on the way to the CMAGR or BMGR-West. While washing wheeled vehicles, the front wheels shall be turned lock-to-lock to allow for exposure of surfaces that may hold soil or plant seeds.

2.5.3 Cultural Resources

CR-1) Should potential subsurface archaeological deposits be detected in the course of grading or operations, all work in the discovery area would cease. The contractor would contact MCAS Yuma Range Management Division and would refrain from working in the discovery area until the MCAS Yuma Cultural Resources Manager provides input regarding the significance of the detected item(s) and instructions.

CR-2) Per MCO 3550.10 and MCAS Yuma Station Order 3710.6J, mandatory cultural awareness/ sensitivity training will continue to be provided to all personnel accessing the BSTRC.

2.5.4 Geological Resources

GR-1) Dirt roads and the ALZ/LZs would receive an initial application of a dust palliative. Post-grading, the roads and ALZ/LZs would receive re-applications of the dust palliative as needed.

2.5.5 Water Resources

WR-1) Before grading, and consistent with maintenance of other training support areas at the BSTRC, a Stormwater Pollution Prevention Plan (SWPPP) would be prepared in accordance with the Construction General Permit. The SWPPP would include best management practices for erosion and sedimentation controls, including techniques to diffuse and slow the velocity of stormwater. In addition, as part of the Grading Plan, an Erosion Control Plan would be prepared to include standard erosion control measures to reduce potential impacts (e.g., soil loss and sedimentation) during grading. A Notice of Intent would be submitted to the Regional Water Quality Control Board. The MCAS Yuma Range Management Department would oversee implementation and enforcement of the SWPPP.

2.6 SUMMARY OF ENVIRONMENTAL CONSEQUENCES

In accordance with NEPA, the USMC analyzed the following resource areas potentially affected by implementation of the Proposed Action and No-Action Alternative: air quality, biological resources, cultural resources, and geological resources. Impacts to other resource areas are anticipated to be negligible or non-existent from implementation of the Proposed Action and the No-Action Alternative, and as such have not been analyzed in detail.

Table 2-2 presents a summary of the potential impacts to each resource area resulting from the implementation of the Proposed Action and the No-Action Alternative.

Table 2-2 Summary of Environmental Consequences

Resource Area	Proposed Action	No-Action Alternative
Resource Areas Eliminated from Detailed Analysis		
Airspace and Air Traffic	No change in airspace. No alteration of the existing configuration of airspaces within the BSTRC. No increase in number of sorties or in the type or amount of ordnance expended. No impact to existing airspace designations and a negligible impact to airspace operations. *Conclusion*: **Negligible Impact.**	No change from existing conditions. *Conclusion*: **No Impact.**
Noise	The airspace and artillery-related training noise from the Proposed Action would be consistent with existing training and not result in a discernable change in noise levels to off-installation receptors at the CMAGR and BMGR-West. There are no sensitive human receptors or residential communities in or adjacent to the project area. *Conclusion*: **Negligible Impact.**	No change from existing conditions. *Conclusion*: **No Impact.**
Visual Resources	No alteration of the existing visual setting of the project area and vicinity. Use of training support areas would be visually consistent with existing training activity. *Conclusion*: **Negligible Impact.**	No change from existing conditions. *Conclusion*: **No Impact.**
Hazardous Materials and Wastes	Potential for an inadvertent release of fuels, lubricants, coolants, or hydraulic fluids from vehicles and equipment. All hazardous materials and waste generated would continue to be managed and handled in accordance with applicable Marine Corps Air Station (MCAS) Yuma Environmental Standard Operating Procedures. *Conclusion*: **Negligible Impact.**	No change from existing conditions. *Conclusion*: **No Impact.**
Utilities and Infrastructure	No increase in utility demand or impact to existing regional utilities. Grading of the combat trail to the AFA would result in an incremental increase in road infrastructure. *Conclusion*: **Negligible Impact.**	No change from existing conditions. *Conclusion*: **No Impact.**
Public Health and Safety	Potential for trespassers to interrupt training activities. Potential to encounter unexploded ordnance. Consistent with current operations. *Conclusion*: **Negligible Impact.**	No change from existing conditions. *Conclusion*: **No Impact.**
Socioeconomics and Environmental Justice	No creation of new jobs. Short-term and negligible increase to the local economy during training support area development. *Conclusion*: **Negligible Impact.** The Proposed Action would be confined to the BSTRC and not adjacent to minority or low-income populations. Children (and all unauthorized people) are not allowed on lands designated for military training. *Conclusion*: **No Disproportionate Impact** to minority or low-income populations or the health and safety of children**.**	No change from existing conditions. *Conclusion*: **No Impact.**

Table 2-2 Summary of Environmental Consequences

Resource Area	Proposed Action	No-Action Alternative
Water Resources	No impacts to surface waters, groundwater, or waters of the U.S. All activities would occur in upland areas. Low potential for erosion to result in indirect impact to water resources. Application of water-permeable dust palliative would not generate additional runoff to adjacent areas. *Conclusion*: **Negligible Impact.**	No change from existing conditions. *Conclusion*: **No Impact.**
Land Use	No change to existing land use designations or incompatible effects to off-installation land uses. *Conclusion*: **No Impact.**	No change from existing conditions. *Conclusion*: **No Impact.**
Recreation	No impact to the public's ability to recreate in existing recreational areas adjacent to the CMAGR. Potential increase in public recreation area closures in BMGR-West during training. *Conclusion*: **Negligible Impact.**	No change from existing conditions. *Conclusion*: **No Impact.**
Ground Transportation	Short-term increase of a few (approximately 30) vehicle trips during initial grading and maintenance. No long-term increase in vehicle trips or impact to the existing regional surface transportation network. *Conclusion*: **Negligible Impact.**	No change from existing conditions. *Conclusion*: **No Impact.**
Resource Areas Analyzed in Detail		
Air Quality	Combined grading and operational emissions would be less than *de minimis* levels for all criteria pollutants. *Conclusion:* **No Significant Impact.**	No change from existing conditions. *Conclusion*: **No Impact.**
Biological Resources	Approximately 57.7 acres of desert scrub/wash vegetation would be permanently impacted by grading at the CMAGR. Vegetation and wildlife would temporarily be impacted during training activities, including landings/takeoffs of MV-22s. Adverse effects to the desert tortoise would be minimized by implementation of CMs (Section 2.5.2). *Conclusion:* **No Significant Impact.**	No change from existing conditions. *Conclusion*: **No Impact.**
Cultural Resources	No impacts to cultural resources (as defined in Chapter 3.4). The Arizona and California State Historic Preservation Offices have concurred with MCAS Yuma's findings of no historic properties affected (Appendix A). *Conclusion:* **No Significant Impact.**	No change from existing conditions. *Conclusion*: **No Impact.**
Geological Resources	Grading would result in alterations to topographic features. Grading and training activities would cause compaction of soils and an increase in erosion potential. *Conclusion*: **No Significant Impact**.	No change from existing conditions. *Conclusion*: **No Impact.**

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CHAPTER 3
AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

3.1 APPROACH TO ANALYSIS

NEPA, CEQ regulations, and Navy and USMC procedures for implementing NEPA specify that an EA should only focus on those environmental resource areas potentially subject to impacts. In addition, the level of analysis should correspond with the anticipated level of impact. A NEPA document should consider, but not analyze in detail, those areas or resources not potentially affected by a Proposed Action. Therefore, a NEPA document should not be encyclopedic; rather, it should be succinct and to the point. Both the description and analysis in an EA should provide sufficient detail and depth to ensure that the lead agency (e.g., USMC) took a critical look at all resources potentially impacted by an action. NEPA also requires a comparative analysis that allows decision-makers and the public to differentiate among the alternatives. Thus, this EA focuses on those resources potentially subject to impacts resulting from the Proposed Action with a consideration of the potential additive (cumulative effects) of other past, present, and reasonably foreseeable actions.

This chapter presents the affected environment and potential environmental consequences for the following resource areas: air quality, biological resources, cultural resources, and geological resources. Conversely, this EA does not include a detailed analysis of the resource areas discussed in Section 3.1.1, *Resources Eliminated from Detailed Analysis* below, as the USMC anticipates that negligible or no impacts to these resource areas would occur from implementation of the alternatives.

3.1.1 Resources Eliminated From Detailed Analysis

3.1.1.1 Airspace and Air Traffic

Airspace that has been designated to support military training activities within the CMAGR includes restricted areas, Military Operations Areas, and military training routes, which are all depicted on aviation aeronautical charts. Restricted areas are established to conduct hazardous flight and ground-based activities such as the air-to-air and air-to-ground aircraft ordnance deliveries, explosive detonations, and infantry weapons uses at the CMAGR. Non-participating military and civilian aircraft cannot enter this airspace while activated for those hazardous activities. Figure 3.1-1 depicts the airspace within the CMAGR.

The CMAGR consists of restricted areas R-2507N, R-2507S, R-2507E, and R-2507W overlaid by the Abel North, Abel South, Abel East, Abel Bravo, and Kane East/West/South Military Operations Areas, as shown on Figure 3.1-1. The restricted area (R-2301W) associated with BMGR-West extends from the ground surface to 80,000 feet above mean sea level and supports operations from nearby military facilities, including MCAS Yuma (Figure 3.1-2).

Air traffic control for the R-2507 and R-2301 airspaces and other Special Use Areas in the project area is managed by MCAS Yuma Combined Center and Radar Approach Control. By acting as a single unit of air traffic control responsibility, MCAS Yuma enhances the safety of a myriad of training activities that take place in and around the area ranges and airspace. MCAS Yuma Station Order 3710.6J (MCAS Yuma 2013) defines the procedures and regulations for Commands using the RTAs managed by MCAS Yuma.

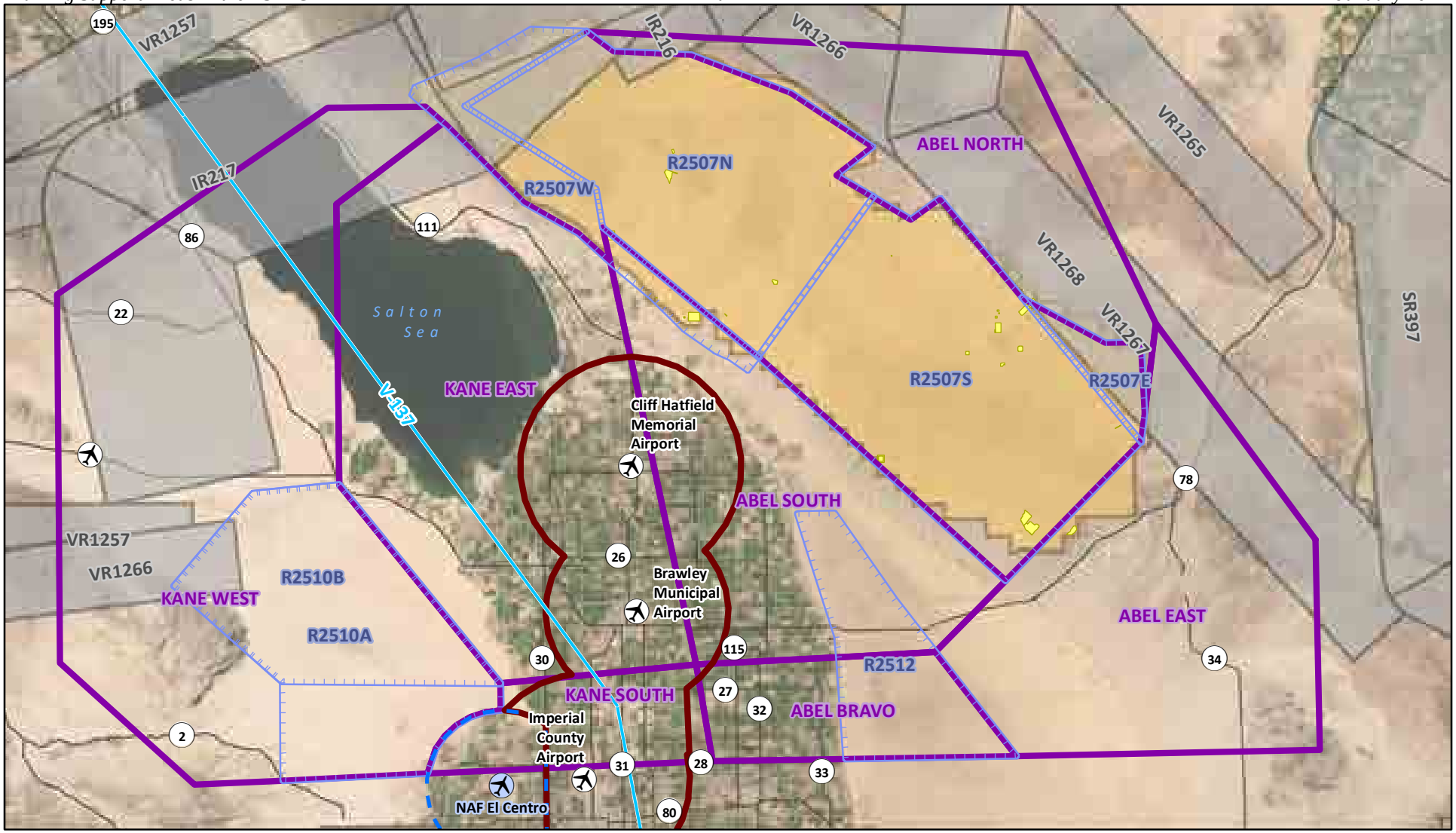


Figure 3.1-1. Existing Airspace and Training Support Areas within the Chocolate Mountain Aerial Gunnery Range

Installation and Range Boundaries
- Chocolate Mountain Aerial Gunnery Range

Existing Training Support Areas
- Landing Zone

Existing Airspace Features
- Civil Airport
- Military Airport
- Victor Route (V-137)
- Class D Airspace
- Class E Airspace
- Military Operating Area
- Military Training Route
- Restricted Airspace
- State Highway

0 5 10 Miles

Sources: Esri 2018, MCAS Yuma 2020, Navy 2017, NGA 2017

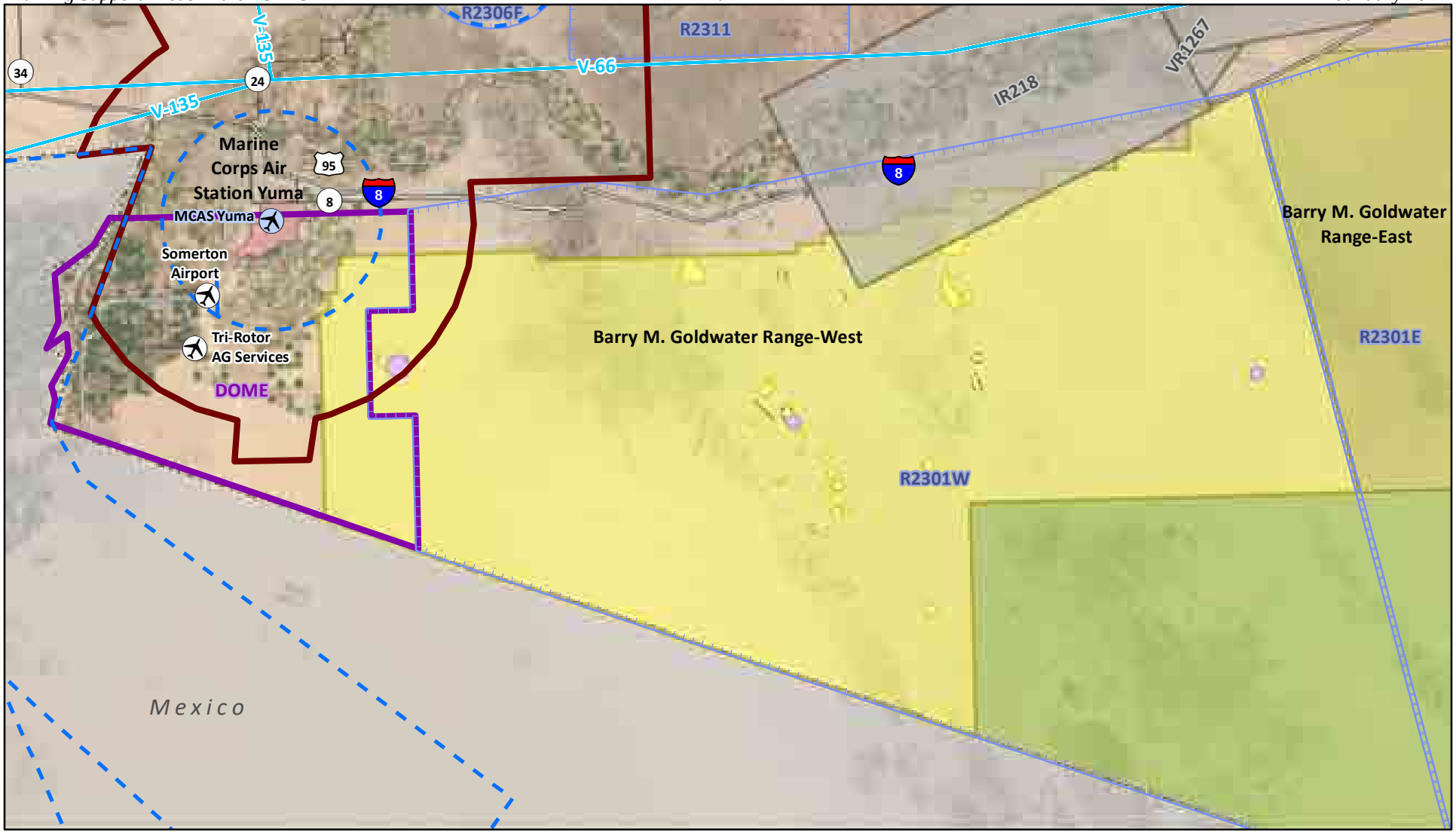
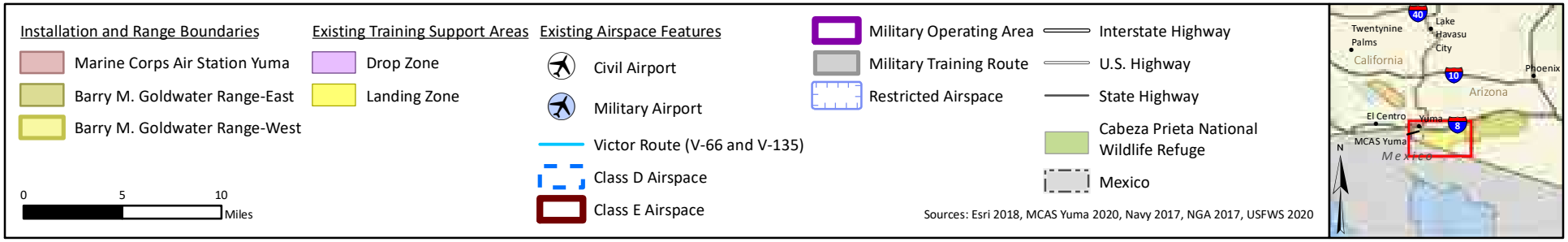


Figure 3.1-2. Existing Airspace and Training Support Areas within the Barry M. Goldwater Range-West



As described in Section 2.2, the Proposed Action would not increase the quantity of sorties flown, increase the amount and/or types of ordnance expended, increase artillery training tempo, or alter the existing facilities or airspace within the BSTRC. Once established, the additional training support areas would add to the available training locations for MV-22 aircraft operations effectively spreading existing activity to a larger number of training support areas within the CMAGR and BMGR-West. Consistent with existing procedures, operations within the designated training support areas would be scheduled and deconflicted with other range users. Therefore, there would be no impact to existing airspace designations and a negligible impact to airspace operations and air traffic. Implementation of the No-Action Alternative would not change existing conditions. Therefore, implementation of the Proposed Action or No-Action Alternative would have a negligible impact to airspace and air traffic. Accordingly, airspace and air traffic is not carried forward for detailed analysis in this EA.

3.1.1.2 Noise

Training activities within the BSTRC generate noise consistent with military activities (e.g., aircraft and artillery noise). Potential noise-sensitive receptors consist of a mix of residential, religious, educational, recreational, and health-related sites. The Salton Sea National Wildlife Refuge and the Salton Sea State Park, both located west of the project area, were also identified as noise-sensitive areas. The contribution to the ambient noise environment from military operations is primarily from high-speed low-flying aircraft and ordnance delivery.

The grading of the proposed training support areas would have no impact to the off-installation noise environment given their location and temporary nature of activity. Under the Proposed Action, the USMC would not increase the quantity of sorties flown, increase the amount and/or types of ordnance expended, increase artillery training tempo, or alter the existing facilities or airspace within the BSTRC. In addition, the types of aircraft involved with the proposed training (e.g., MV-22 and C-130s) do not represent the dominant source of existing noise within the BSTRC. Thus, the airspace-related training noise from the Proposed Action would be consistent with existing training and not result in a discernable change in noise levels to off-installation receptors. In addition, artillery firing from the proposed AFA Burt would be consistent with existing noise sources and levels and no sensitive noise receptors are located in the area. Therefore, there would be a negligible impact to noise. Implementation of the No-Action Alternative would not change existing conditions. Therefore, implementation of the Proposed Action or No-Action Alternative would have a negligible impact to noise. Accordingly, noise is not carried forward for detailed analysis in this EA.

3.1.1.3 Visual Resources

The Proposed Action would not alter the existing visual setting of the project area and vicinity as the setting would continue to support on-going military training. The Proposed Action would not alter the number of existing training exercises within the BSTRC. The proposed training support areas would not have a substantial vertical element (i.e., they would be flat) and would therefore not be visible off-installation. In addition, training activities would be well-within the complex and not easily visible. If observed, the activity would be consistent with existing military training. Therefore, there would be a negligible impact to visual resources. Implementation of the No-Action Alternative would not change existing conditions. Therefore, implementation of the Proposed Action or No-Action Alternative would have a negligible impact to visual resources. Accordingly, visual resources is not carried forward for detailed analysis in this EA.

3.1.1.4 Hazardous Materials and Wastes

Grading of the proposed training support areas would require the use of vehicles and equipment that use and generate hazardous materials and wastes. The temporary employment of vehicles and equipment under the Proposed Action would pose a small potential for an inadvertent release of fuels, lubricants, coolants, or hydraulic fluids. Any spills would be contained and properly disposed of in accordance with established local, federal, and state laws and regulations. Operationally, the Proposed Action would not result in an increase in potential impacts to or from hazardous materials or waste because there would be no increase in ordnance expenditures. All hazardous materials used, and wastes generated would continue to be managed and handled in accordance with applicable MCAS Yuma Environmental Standard Operating Procedures. According to the Safety Data Sheet for the dust palliative, the material is not considered a hazardous waste, does not contain any components that are subject to the U.S. Toxic Substance Control Act, and does not contain 0.1 percent or more of any chemical listed as a carcinogen (Soilworks 2015). Therefore, there would be a negligible impact to hazardous materials and wastes. Implementation of the No-Action Alternative would not change existing conditions. Therefore, implementation of the Proposed Action or No-Action Alternative would have a negligible impact to hazardous materials and wastes. Accordingly, hazardous materials and wastes is not carried forward for detailed analysis in this EA.

3.1.1.5 Utilities and Infrastructure

Under the Proposed Action, no utility infrastructure would be constructed because no additional utility demands would be required. Short-term power needs for the grading of the training support areas would be met by the proposed equipment and vehicles. The training support areas would not require permanent sources of lighting or other elements that would require new permanent power sources (e.g., generators or power lines). The proposed grading of the combat trail to the AFA would result in an incremental increase in road infrastructure. Therefore, there would be no impact to utilities and a negligible impact to infrastructure. Implementation of the No-Action Alternative would not change existing conditions. Therefore, implementation of the Proposed Action or No-Action Alternative would have a negligible impact to utilites and infrastructure. Accordingly, utilites and infrastructure is not carried forward for detailed analysis in this EA.

3.1.1.6 Public Health and Safety

The CMAGR is closed to the public. A series of signs warning unauthorized personnel not to enter the RTA 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 (MCAS Yuma 2017). In addition, MCAS Yuma has conducted public outreach programs to raise awareness of the military training mission at the CMAGR and the associated dangers and 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. In accordance with Station Order 3710.6J 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.

Under the Proposed Action, unauthorized persons would continue to accidentally or knowingly trespass beyond the marked boundaries of the RTAs and potentially be exposed to hazardous military training activities. Per Station Order 3710.6J directives, any live-fire exercises would continue to be terminated until the trespassers are removed from the range.

Public health and safety impacts related to grading/earthwork would primarily be associated with the potential to encounter unexploded ordnance. To minimize the risk of encountering unexploded ordnance during such activities, these areas would be swept for unexploded ordnance by EOD personnel. If during grading/earthwork any potential unexploded ordnance is discovered, work would cease immediately and MCAS Yuma EOD personnel would be contacted. Operations within the designated training support areas would be scheduled and deconflicted with other range users. Applicable MCOs, Station Orders, and Standard Operating Procedures would continue to be implemented under the Proposed Action, reducing or eliminating risks to operator health and safety. Proper range management and periodic sweeps by EOD personnel would ensure that munitions constituents and potentially dangerous foreign objects are not left behind in the proposed training support areas. Therefore, there would be a negligible impact to public health and safety. Implementation of the No-Action Alternative would not change existing conditions. Therefore, implementation of the Proposed Action or No-Action Alternative would have a negligible impact to public health and safety. Accordingly, public health and safety is not carried forward for detailed analysis in this EA.

3.1.1.7 Socioeconomics and Environmental Justice

Implementation of the Proposed Action would not create any new permanent jobs and no permanent or substantive change to existing economic conditions would occur. There would be a short-term and negligible increase to the local economy during training support area development; however, any increase would be indiscernible from existing conditions given the small and short-term nature of the improvements. Therefore, there would be a negligible impact to socioeconomics. Implementation of the No-Action Alternative would not change existing socioeconomic conditions. Therefore, implementation of the Proposed Action or No-Action Alternative would have a negligible impact to socioeconomic conditions. Accordingly, socioeconomics is not carried forward for detailed analysis in this EA.

EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, requires federal agencies to consider human health and environmental conditions in minority and low-income communities. EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks* helps ensure that federal agencies' policies, programs, activities, and standards address environmental health and safety risks to children. The project area is located within military lands restricted to the public. Children are not present and there is no permanent military family housing or civilian housing at or near the project area. Therefore, there would be no impact to minority or low-income populations or children. Implementation of the No-Action Alternative would not change existing conditions. Therefore, implementation of the Proposed Action or No-Action Alternative would not have a disproportionate impact to minority or low-income populations or the health and safety of children. Accordingly, environmental justice is not carried forward for detailed analysis in this EA.

3.1.1.8 Water Resources

Annual precipitation in the project area is low (approximately 3 inches [8 centimeters] per year), while the annual evaporation rate is high (approximately 70 inches [178 centimeters]) (Imperial Irrigation District 2018). Consequently, only a few permanent surface water resources (e.g., Salton Sea, Colorado River, Coachella Canal) occur in the vicinity of the project area. The majority of the interior drainage within the project area flows through ephemeral channels and unnamed washes. There are no intermittent streams or

standing bodies of water in the project area. All activities would occur in upland areas. As discussed in Section 2.4, the USMC proactively avoided siting the training support areas over existing hydrologic features. Thus, implementation of the Proposed Action would avoid direct impacts to water resources.

Before grading, and consistent with maintenance of other training support areas at the BSTRC, a SWPPP would be prepared in accordance with the Construction General Permit. The SWPPP would include best management practices for erosion and sedimentation controls, including techniques to diffuse and slow the velocity of stormwater. In addition, as part of the Grading Plan, an Erosion Control Plan would be prepared to include standard erosion control measures to reduce potential impacts (e.g., soil loss and sedimentation) during grading. A Notice of Intent would be submitted to the Regional Water Quality Control Board. The MCAS Yuma Range Management Department would oversee implementation and enforcement of the SWPPP. The application of water-permeable dust palliative would not generate additional runoff to adjacent areas. Therefore, there would be a negligible indirect impact to water resources. Implementation of the No-Action Alternative would not change existing water resource conditions. Therefore, implementation of the Proposed Action or No-Action Alternative would have a negligible impact to water resources. Accordingly, water resources is not carried forward for detailed analysis in this EA.

3.1.1.9 Land Use

The Proposed Action would occur on and above lands owned by the federal government designated for military training. The Proposed Action would not change this designation. Surrounding land uses, which include open space, natural resource exploration, recreation, utility corridors, and transportation corridors, would not be affected or altered. Implementation of the No-Action Alternative would not change existing land use conditions. Therefore, implementation of the Proposed Action or No-Action Alternative would not impact land use. Accordingly, land use is not carried forward for detailed analysis in this EA.

3.1.1.10 Recreation

Public lands near the BSTRC offer recreational uses such as hiking, camping, bird watching, and hunting. All of the proposed training support areas would be located within the existing BSTRC boundaries, and most of them several miles within the boundaries (see Figure 2-1). The CMAGR is closed to the public. Although approximately 75 percent of the BMGR-West is open for public recreation through a permitting process (U.S. Air Force and USMC 2018), public access is restricted to those portions of the range when and where active military training operations are occurring. The establishment of additional training support areas within the BMGR-West may result in an increase in the number and duration of public closures during training for the specific areas in use. There would be no impact to the public's ability to recreate in existing recreational areas adjacent to the CMAGR. Aircraft and training-related noise would continue to be occasionally audible to persons recreating in the vicinity of the BSTRC; however, the noise types and noise levels would be similar to existing conditions. Thus, any additional impact to off-complex recreation would be negligible. Implementation of the No-Action Alternative would not change existing recreation conditions. Therefore, implementation of the Proposed Action or No-Action Alternative would have a negligible impact to recreation. Accordingly, recreation is not carried forward for detailed analysis in this EA.

3.1.1.11 Ground Transportation

Implementation of the Proposed Action would generate temporary daily vehicle trips to establish ALZ Bull and for grading of the access road and combat trail to AFA Burt 2.0. Periodic vehicle trips would also occur for occasional grading maintenance of the ALZ Bull airstrip and the AFA Burt 2.0 access road and combat trail, and application of dust palliative and vegetation management. Vehicles would predominantly use

government roads to access the sites and the total number of vehicles involved would be low (approximately 30). Because the Proposed Action would not increase the quantity of sorties flown, increase the amount and/or types of ordnance expended, increase artillery training tempo, or alter the existing facilities or airspace within the BSTRC, there would be no potential long-term increase in traffic volumes on roadways near the air installations from which the BSTRC training flights originate. Given the additional vehicle trips would be temporary and few, implementation of Proposed Action would not result in a permanent demand on the regional surface transportation network. Implementation of the No-Action Alternative would not change existing transportation conditions. Therefore, implementation of the Proposed Action or No-Action Alternative would have a negligible impact to ground transportation. Accordingly, ground transportation is not carried forward for detailed analysis in this EA.

3.2 AIR QUALITY

3.2.1 Definition of Resource

Air quality is defined by ambient (outdoor) air concentrations of specific pollutants determined by the U.S. Environmental Protection Agency (USEPA) to be of concern with respect to the health, safety, and welfare of the public. Ambient air quality refers to the amount of pollutants in a specified volume of air (or the atmospheric concentration of a specific compound) that occurs at a particular geographic location. Pollutant concentration is generally expressed in units of parts per million (ppm) or micrograms per cubic meter ($\mu g/m^3$).

Primary pollutants, such as carbon monoxide (CO), sulfur dioxide (SO_2), lead, and some particulates are emitted directly into the atmosphere from emission sources. Secondary pollutants, such as ozone (O_3), nitrogen dioxide (NO_2), and some particulates, are formed through atmospheric chemical reactions that are influenced by meteorology, ultraviolet light, and other atmospheric processes.

Greenhouse gases (GHGs) are gases that trap heat in the atmosphere and their accumulation in earth's atmosphere regulates the temperature of the planet. GHGs can be emitted by natural processes and human activities, and climate change is attributed to anthropogenic sources of GHG emissions. In 2009, the USEPA signed GHG Endangerment Findings under Section 202(a) of the Clean Air Act (CAA), stating that six "key" GHGs are a threat to public health and welfare (carbon dioxide [CO_2], methane [CH_4], nitrous oxide [N_2O], hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride). Since then, the USEPA has created standards and regulations for controlling GHG emissions from passenger vehicles and engines. The CEQ submitted draft guidance entitled Draft NEPA Guidance on Consideration of Greenhouse Gas Emissions (21 June 2019) (CEQ 2019), which was rescinded by EO 13990 in January 2021. This order directs the CEQ to update its final guidance entitled Final Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in NEPA Reviews (81 Federal Register 51866, 5 August 2016). At this time, a threshold of significance has not been established for GHG emissions, but the guidance suggests that agencies should use estimated GHG emissions in NEPA analyses as a proxy for assessing potential effects on climate change.

3.2.2 Affected Environment

3.2.2.1 Federal Requirements

The USEPA established the National Ambient Air Quality Standards (NAAQS) and there are six criteria pollutants of concern: CO, SO_2, NO_2, O_3, total suspended particulate matter less than or equal to 10 (PM_{10}) and 2.5 ($PM_{2.5}$) microns in diameter, and lead. NAAQS are classified as primary or secondary. Primary

standards protect against adverse health effects. Secondary standards protect against welfare effects, such as damage to crops, vegetation, and buildings (USEPA 2021a). The USEPA designates an area as in attainment when it complies with the NAAQS. Areas that violate these ambient air quality standards are designated as nonattainment areas. Areas that have improved air quality from nonattainment to attainment are designated as attainment/maintenance areas.

Under the Proposed Action, the primary activities that would generate air emissions would be establishing and maintaining the expeditionary landing strip at ALZ Bull and occasional grading of the access road and combat trail to AFA Burt 2.0. These activities would occur in the Imperial County portion of the CMAGR, and thus this section focuses on the affected environment for this geographic area. In addition, as needed maintenance trips would occur for the LZs established in BMGR-West located in Yuma County, and thus this section also describes the affected environment for this geographic area. Imperial County is in nonattainment (marginal) of the 8-hour O_3 NAAQS (which includes its precursor pollutants of volatile organic compounds (VOCs) and nitrogen oxides [NO_x]), is in nonattainment (moderate) of $PM_{2.5}$, and is in maintenance (serious) of PM_{10} NAAQS. Yuma County is in nonattainment (marginal) of the 8-hour O_3 NAAQS, and is in nonattainment (moderate) of PM_{10} NAAQS (USEPA 2021b). Although VOCs or NO_x other than NO_2 have no established ambient air quality standards, they are important as precursors to O_3 formation. All other criteria pollutants are in attainment of the NAAQS.

3.2.2.2 State/Local Requirements

The federal CAA and its subsequent amendments delegate the enforcement of the NAAQS to the states and each state is required to develop, adopt, and implement a State Implementation Plan to achieve, maintain, and enforce the federal air quality standards across the state, for areas in nonattainment of the NAAQS.

California

Within California, the California Air Resources Board is responsible for establishing the California Ambient Air Quality Standards (CAAQS), which in general are at least as stringent as the NAAQS, and for enforcing both the federal and state air pollution standards. As described above, portions of the Proposed Action would occur in Imperial County, which is within the jurisdiction of the ICAPCD and located in the Salton Sea Air Basin. The ICAPCD has developed air quality plans that are designed to bring the region into attainment of the national and state ambient air quality standards. Through this attainment planning process, the ICAPCD develops the ICAPCD Rules and Regulations to regulate stationary sources of air pollution in Imperial County, including Regulation VIII, which contains the rule regarding fugitive dust and fine particulate matter (ICAPCD 2021). With respect to the CAAQS, the Salton Sea Air Basin is in nonattainment of the state standards for O_3 and PM_{10} (California Air Resources Board 2021b) and is in attainment of all other CAAQS criteria pollutants.

Arizona

The Arizona Department of Environmental Quality is the state agency responsible for implementing the State Implementation Plan and has adopted the federal NAAQS (Arizona Department of Environmental Quality 2021). Yuma County's attainment status for the NAAQS is presented in the previous section. Table 3.2-1 presents the NAAQS and CAAQS for the criteria pollutants.

Table 3.2-1 National and California Ambient Air Quality Standards

Pollutant	*Averaging Time*	*National*[1,2]		*California*[5]
		Primary[3]	*Secondary*[4]	*Concentration*
O_3	1-hour	—	—	0.09 ppm (180 µg/m³)
	8-hour	0.07 ppm (137 µg/m³)	Same as primary	0.07 ppm (137 µg/m³)
CO	1-hour	35 ppm (40 mg/m³)	—	20 ppm (23 mg/m³)
	8-hour	9 ppm (10 mg/m³)	—	9 ppm (10 mg/m³)
NO_2	1-hour	100 ppb (188 µg/m³)	—	0.18 ppm (339 µg/m³)
	Annual	53 ppb (100 µg/m³)	Same as primary	0.03 ppm (57 µg/m³)
SO_2	1-hour	75 ppb (105 µg/m³)	—	0.25 ppm (655 µg/m³)
	3-hour	—	0.5 ppm (1,300 µg/m³)	—
	24-hour	—	—	0.04 ppm (105 µg/m³)
PM_{10}	24-hour	150 µg/m³	Same as primary	50 µg/m³
	Annual	—	—	20 µg/m³
$PM_{2.5}$	24-hour	35 µg/m³	Same as primary	—
	Annual	12 µg/m³	15 µg/m³	12 µg/m³
Lead	Rolling 3-month period	0.15 µg/m³	Same as primary	—
	30-day average	—	—	1.5 µg/m³

Notes: µg/m³ = micrograms per cubic meter; mg/m³ = milligrams per cubic meter; ppb = parts per billion; ppm = parts per million.

[1] Equivalent units given in parenthesis.

[2] National standards (other than O_3, particulate matter, and those based on annual arithmetic mean) are not to be exceeded more than once a year. The O_3 standard is attained when the fourth highest 8-hour concentration measured at each site in a year, averaged over 3 years, is equal to or less than the standard. For PM_{10}, the 24-hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 µg/m³ is equal to or less than one. For $PM_{2.5}$, the 24-hour standard is attained when 98 percent of the daily concentrations, averaged over 3 years, are equal to or less than the standard.

[3] Primary Standards: The levels of air quality necessary, with an adequate margin of safety, to protect the public health.

[4] Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

[5] California standards for O_3, CO (except 8-hour Lake Tahoe), SO_2 (1 and 24 hour), NO_2, and particulate matter (PM_{10}, $PM_{2.5}$, and visibility reducing particles), are values that are not to be exceeded. All others are not to be equaled or exceeded. CAAQS are listed in the Table of Standards in Section 70200 of Title 17 of the California CFR.

Sources: USEPA 2021a; California Air Resources Board 2021a.

3.2.2.3 General Conformity

Section 176(c) of the CAA, as articulated in the USEPA General Conformity Rule, states that a federal agency cannot issue a permit for or support an activity unless the agency determines that it will conform to the most recent USEPA-approved State Implementation Plan. The USEPA General Conformity Rule applies to federal actions occurring in nonattainment or maintenance areas when the total direct and indirect

emissions of nonattainment pollutants (or their precursors) exceed specified thresholds. The emission thresholds that trigger requirements of the conformity rule are called *de minimis* levels. Table 3.2-2 identifies the federal nonattainment pollutants and the relevant *de minimis* emission thresholds.

Table 3.2-2 Applicable Criteria Pollutant *de minimis* Levels (tons/year)

***VOCs*[1]**	***NO_x*[1]**	***CO*[1]**	***SO_2***	***PM_{10}***	***$PM_{2.5}$***
100	100	NA	NA	100	100

Notes: [1] Imperial County is in nonattainment (marginal) of the 8-hour O_3 NAAQS (which includes its precursor pollutants of VOCs and NO_x), is in nonattainment (moderate) of $PM_{2.5}$ and is in maintenance (serious) of PM_{10} NAAQS. Yuma County is in nonattainment (marginal) of the 8-hour O_3 NAAQS (which includes its precursor pollutants of VOCs and NOx) and is in nonattainment (moderate) of PM_{10} NAAQS.
NA = not applicable because the county is currently in attainment of the NAAQS for these criteria pollutants.
Source: USEPA 2021b.

A conformity applicability analysis is required for each of the nonattainment pollutants or its precursor emissions. Compliance with the conformity rule can be demonstrated in several ways. Compliance is presumed if the net increase in direct and indirect emissions from a federal action would be less than the relevant *de minimis* level. If net emissions exceed the relevant *de minimis* level, a formal CAA Conformity Determination process must be followed.

3.2.2.4 Greenhouse Gases

To estimate global warming potential, which is the heat trapping capacity of a gas, the U.S. quantifies GHG emissions using the 100-year timeframe values established in the Intergovernmental Panel on Climate Change Fourth Assessment Report (Intergovernmental Panel on Climate Change 2007).

3.2.3 Environmental Consequences

The air quality analysis for this EA focuses on the estimated emissions of VOCs, NO_x (both are precursors to the formation of O_3), CO, SO_2, PM_{10}, and $PM_{2.5}$. Air quality impacts from grading activities under the Proposed Action would primarily occur from combustive emissions due to the use of fossil fuel-powered equipment and fugitive dust emissions (PM_{10} and $PM_{2.5}$) from the operation of equipment on exposed soil. The only change in operational emissions would result from establishment of an occasional maintenance activities for ALZ Bull and AFA Burt 2.0, as the number of sorties and types of training activities would not change from existing conditions.

Grading emissions were estimated using the California Emissions Estimator Model, developed by the California Air Pollution Officers Association. The California Emissions Estimator Model is the current comprehensive tool for quantifying air quality impacts from land use projects throughout California. The model includes default data (e.g., emission factors, trip lengths, meteorology, source inventory) that have been provided by the various California air districts to account for local requirements and conditions (California Air Pollution Officers Association 2021). For this analysis, default data were overridden in the model by project-specific data (as provided in Chapter 2), when available.

Assumptions were made regarding the total number of days each piece of equipment would be used and the number of hours per day each type of equipment would be used. Assumptions and model inputs are located within the modeling calculations in Appendix B. Operational emissions from the as needed maintenance and application of dust palliative were estimated based on the representative equipment needed to complete the proposed maintenance activities, as described in Chapter 2.

3.2.3.1 Proposed Action

Grading emissions from the Proposed Action would exclusively occur within the CMAGR from the grading activities to establish ALZ Bull and the access road and combat trail to AFA Burt 2.0. Operational emissions would originate on an irregular basis and would include the occasional grading maintenance of the ALZ Bull airstrip and the AFA Burt 2.0 access road and combat trail. Application of the dust palliative would be done on an as needed basis, as described in Section 2.2. However, for estimating the operational emissions, it was assumed this would occur twice per year and require one truck to apply the dust palliative. In addition, vehicle trips would be required for the as needed vegetation management of the areas identified in Section 2.2.

Table 3.2-3 presents a summary of the annual estimated emissions associated with grading and earthwork activities at the CMAGR under the Proposed Action. Emission calculations are provided in Appendix B. As shown in Table 3.2-3, estimated emissions from grading and earthwork activities would be below *de minimis* thresholds and would not trigger a formal Conformity Determination under the CAA General Conformity Rule. A Record of Non-Applicability for CAA Conformity is provided in Appendix B.

Table 3.2-3 Proposed Action within the CMAGR with Evaluation of Conformity

Emission Source	*Emissions (tons/year)*					
	VOCs	***NO_x***	***CO***	***SO_2***	***PM_{10}***	***$PM_{2.5}$***
Proposed Action – Initial Grading						
Year – 2022	0.15	1.56	1.19	0.003	0.34	0.20
Proposed Action - Operations						
Year – Beginning 2023	0.0014	0.0118	0.0083	0.0000	0.0004	0.0004
Conformity *de minimis* Limits	100	100	NA	NA	100	100
Exceeds Conformity *de minimis* Limits?	No	No	No	No	No	No

Note: NA = not applicable.

Table 3.2-4 presents the annual GHG emissions that would occur from initial grading and operations of the Proposed Action.

Table 3.2-4 Proposed Action Grading and Operational GHG Emissions

Emission Source	*Emissions (metric tons/year)*			
	CO_2	***CH_4***	***N_2O***	***CO_2e***
Proposed Action – Initial Grading				
Year – 2022	223.40	0.07	0.00	225
Proposed Action - Operations				
Year – Beginning 2023	2.90	0.00	0.00	3

The potential effects of GHG emissions are by nature global and may result in cumulative impacts, as individual sources of GHG emissions are not large enough to have an appreciable effect on climate change. As a point of comparison, the GHGs from grading activities under the Proposed Action would represent 0.00005 percent of California's statewide GHG emissions.

During grading activities, proper and routine maintenance of all vehicles and other equipment would be implemented to ensure that emissions are within the design standards of all equipment. ICAPCD Rule 800 would be followed to minimize potential fugitive dust emissions by implementing measures to reduce particulate matter emissions (e.g., watering of exposed soils, soil stockpiling, and soil stabilization) during grading (ICAPCD 2012). This includes the preparation of a fugitive dust control plan before grading. In addition, the application of the dust palliative on an as needed basis for maintenance, as described in Chapter 2, would help reduce the amount of dust generated during the operational phase.

Operational emissions for the BMGR-West generated from the nonscheduled, as needed dust palliative application for LZs and the as deemed necessary vegetation maintenance for LZs, would be less than those identified for the operational emissions for the CMAGR in Table 3.2-3. Maintenance would not be required for any DZs at the BMGR-West and any maintenance for the LZs, prior to training exercises, would be completed on an as needed basis.

Given that emissions from the Proposed Action would be below *de minimis* thresholds, and that windblown dust and sand generated by wind, mining operations, off-road vehicle use, and military training activities regularly occur in desert environments, the amount of dust over baseline levels generated by the Proposed Action would be negligible. Therefore, implementation of the Proposed Action would have no significant impact on air quality.

3.2.3.2 No-Action Alternative

Under the No-Action Alternative, the proposed LZs, ALZ, DZs, and AFA within the BSTRC would not be established, and current training operations within the CMAGR and BMGR-West would persist. Existing conditions would remain as described in Section 3.2.2. Therefore, no impacts to air quality would occur under the No-Action Alternative.

3.3 BIOLOGICAL RESOURCES

3.3.1 Definition of Resource

Biological resources include plant and animal species and the habitats within which they occur. This analysis focuses on species that are important to the function of ecosystems, are of special societal importance, or are protected under federal or state law. These resources are commonly divided into the following categories: *Plant Communities*, *Wildlife*, and *Special Status Species*.

Biological resources are grouped and analyzed in this EA as follows:

- *Plant Communities* include plant associations and dominant constituent species that occur in the action area. Special status plant species are discussed in more detail below.
- *Wildlife* includes the characteristic animal species that occur in the action area. Special consideration is given to bird species protected under the Migratory Bird Treaty Act and EO 13186, *Responsibilities of Federal Agencies to Protect Migratory Birds*. Special status wildlife species are discussed in more detail below.
- *Special Status Species* are defined in this EA as species that are listed, have been proposed for listing, or are candidates for listing as threatened or endangered under the federal Endangered Species Act, the California Endangered Species Act, and other species of concern as recognized by state or federal agencies.

The action area for biological resources includes the proposed training support areas (see Figure 2-1) and immediately adjacent lands that may experience noise, visual, other physical, or indirect impacts.

3.3.2 Affected Environment

Areas owned, controlled, or designated for use by the Department of Defense are excluded from critical habitat designation where an Integrated Natural Resources Management Plan (INRMP) has been developed that, as determined by the Navy, Department of Interior Secretary or Department of Commerce Secretary, provides a benefit to the species subject to critical habitat designation. MCAS Yuma (2017) and BMGR

(2018) have prepared and follow INRMPs for their respective areas. The INRMPs provide an implementable framework for managing natural resources on the land while executing the military mission.

3.3.2.1 Plant Communities

Chocolate Mountain Aerial Gunnery Range

Vegetation at the CMAGR is typical of the Colorado Desert region, which is widespread creosote desert scrub with expansive dry desert washes. There are three basic categories of landforms within the CMAGR: (1) rocky slopes and ridges; (2) large washes; and (3) alluvial terraces with runnels (small channels) and minor washes (MCAS Yuma 2017). Rocky slopes and alluvial terrace landforms are dominated by desert scrub plants such as creosote bush (*Larrea tridentata*), desert ironwood (*Olneya tesota*), brittlebush (*Encelia farinosa*), white bursage (*Ambrosia dumosa*), ocotillo (*Fouquieria splendens*), and Munz's cholla (*Cylindropuntia munzii*) (MCAS Yuma 2017). Washes at the CMAGR are dominated by desert ironwood, and blue paloverde (*Parkinsonia florida*). Large shrubs along the washes include graythorn (*Ziziphus obtusifolia* var. *canescens*), wolfberry (*Lycium* sp.), and desert lavender (*Hyptis emoryi*) (MCAS Yuma 2017).

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The majority of the BMGR-West vegetation is part of the Mojave-Sonoran Semi-Desert Scrub Macrogroup, which covers most of the Mojave and Sonoran deserts in the southwestern U.S. Within this macrogroup, there are six alliances, including creosote, bursage, saltbush, brittlebush, watercourse, and blue paloverde. The creosote and bursage alliances dominate the land area within the BMGR-West (U.S. Air Force and USMC 2018). Common plant species across the BMGR-West include creosote bush, bursages (*Ambrosia* spp.), acacias (*Acacia* spp.), paloverdes, mesquites (*Prosopis* spp.), cacti, and a variety of grasses (U.S. Air Force and USMC 2018).

3.3.2.2 Wildlife

Chocolate Mountain Aerial Gunnery Range

As a consequence of the harsh climatic extremes, limited habitat resources, and regional geographic barriers in the Colorado Desert, the diversity and density of animal species in the CMAGR is typically low relative to other deserts such as the Sonoran and Mojave deserts (MCAS Yuma 2017). Nearly all migratory and resident birds occurring at the CMAGR are protected under the Migratory Bird Treaty Act.

General wildlife species known to occur at the CMAGR include the great basin whiptail lizard (*Aspidoscelis tigris tigris*), zebra-tailed lizard (*Callisaurus draconoides*), desert horned lizard (*Phrynosoma platyrhinos*), common side blotched lizard (*Uta stansburiana*), desert iguana (*Dipsosaurus dorsalis*), sidewinder (*Crotalus cerastes*), verdin (*Auriparus flaviceps*), cactus wren (*Campylorhynchus brunneicapillus*), black-chinned sparrow (*Spizella atrogularis*), common raven (*Corvus corax*), black-tailed gnatcatcher (*Polioptila melanura*), phainopepla (*Phainopepla nitens*), ash-throated flycatcher (*Myiarchus cinerascens*), big brown bat (*Eptesicus fuscus*), kit fox (*Vulpes macrotis*), Merriam's kangaroo rat (*Dipodomys merriami*), black-tailed jackrabbit (*Lepus californicus*), coyote (*Canis latrans*), and mule deer (*Odocoileus hemionus*) (MCAS Yuma 2017).

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Wildlife found at the BMGR-West is typical of that found in the Sonoran Desert ecosystem (U.S. Air Force and USMC 2018). As with the CMAGR, nearly all migratory and resident birds occurring at the BMGR-West are protected under the Migratory Bird Treaty Act.

General wildlife species known to occur at the BMGR-West include zebra-tailed lizard, desert iguana, long-tailed brush lizard (*Urosaurus graciosus*), western whiptail lizard (*Cnemidophorus tigris*), sidewinder, western shovel-nosed snake (*Chionactis occipitalis*), red-tailed hawk (*Buteo jamaicensis*), turkey vulture (*Cathartes aura*), greater roadrunner (*Geococcyx californianus*), burrowing owl (*Athene cunicularia*), loggerhead shrike (*Lanius ludovicianus*), killdeer (*Charadrius vociferus*), black-throated sparrow (*Amphispiza bilineata*), Costa's hummingbird (*Calypte costae*), great-tailed grackle (*Quiscalus mexicanus*), black-tailed jackrabbit, kangaroo rats (*Dipodomys* spp.), round-tailed ground squirrel (*Spermophilus tereticaudus*), coyote, kit fox, and mule deer (U.S. Air Force and USMC 2018).

3.3.2.3 Special Status Species

Chocolate Mountain Aerial Gunnery Range

The only federally listed species known to or likely to occur within the CMAGR portion of the action area is the Mojave desert tortoise (*Gopherus agassizii*) (hereafter, desert tortoise) (see Table 3.3-1). Approximately 40 percent of the CMAGR occurs within designated desert tortoise critical habitat. Approximately 642.1 acres of the 1,410.6-acre CMAGR portion of the action area (or 45.5 percent) occur within critical habitat. While not all the proposed training support areas are located within designated critical habitat, they all contain the physical and biological features of desert tortoise critical habitat as described by USFWS (2019). The endangered southwestern willow flycatcher (*Empidonax traillii extimus*) is known to be a transient visitor to the CMAGR but requires dense riparian habitats that do not occur in the action area.

In support of the Proposed Action, focused desert tortoise surveys were conducted in March 2021 throughout the entirety of the proposed training support areas at the CMAGR (Naval Facilities Engineering Systems Command [NAVFAC] Southwest 2021). The results of focused desert tortoise surveys are incorporated below by reference and are included as an appendix to the Biological Assessment prepared for the Proposed Action (refer to Appendix A).

Table 3.3-1 Special Status Species Potentially Occurring in the CMAGR Action Area

Common Name *Scientific Name*	Federal Status	State Status	Habitat
PLANTS			
Harwood's milk-vetch (*Astragalus insularis* var. *harwoodii*)	None	CRPR 2B.2	Desert dunes, desert wash, desert scrub
Emory's crucifixion-thorn (*Castela emoryi*)	None	CRPR 2B.2	Creosote scrub, bajadas, dry washes
Sand evening-primrose (*Chylismia arenaria*)	None	CRPR 2B.2	Desert scrub
Las Animas colubrina (*Colubrina californica*)	None	CRPR 2B.3	Desert wash, desert scrub
Deep Canyon snapdragon (*Pseudorontium cyathiferum*)	None	CRPR 2B.3	Desert scrub, rocky habitats
Orocopia sage (*Salvia greatae*)	None	CRPR 1B.3	Desert scrub
Desert spike-moss (*Selaginella eremophila*)	None	CRPR 2B.2	Desert scrub, rocky habitats
REPTILES			
Desert tortoise (*Gopherus agassizii*)[1]	T	T	Desert scrub

Table 3.3-1 Special Status Species Potentially Occurring in the CMAGR Action Area

Common Name *Scientific Name*	Federal Status	State Status	Habitat
MAMMALS			
Pallid bat (*Antrozous pallidus*)	None	SSC	Desert wash, desert scrub, riparian woodland
Western mastiff bat (*Eumops perotis californicus*)	None	SSC	Various habitats
Western yellow bat (*Lasiurus xanthinus*)	None	SSC	Desert wash
Pocketed free-tailed bat (*Nyctinomops femorosaccus*)	None	SSC	Riparian scrub, desert scrub
Yuma hispid cotton rat (*Sigmodon hispidus eremicus*)	None	SSC	Various habitats
American badger (*Taxidea taxus*)	None	SSC	Desert dunes, desert wash, desert scrub
BIRDS			
Cooper's hawk (*Accipiter cooperii*)	None	WL	Woodlands, agricultural areas
Golden eagle (*Aquila chrysaetos*)	BCC, BGEPA	FP	Forages in grassy and open shrub habitats, nests on cliffs and large trees
Burrowing owl (*Athene cunicularia*)	BCC	SSC	Desert scrub, grasslands, agricultural areas
Swainson's hawk (*Buteo swainsoni*)	BCC	T	Grasslands, desert scrub, agricultural areas
Vaux's swift (*Chaetura vauxi*)	None	SSC	Forages over many habitats, nests in tree cavities and artificial structures
Merlin (*Falco columbarius*)	None	WL	Grasslands, desert scrub, woodlands, agricultural areas
Prairie falcon (*Falco mexicanus*)	BCC	WL	Desert scrub, grasslands, cliffs
Loggerhead shrike (*Lanius ludovicianus*)[1]	BCC	SSC	Desert wash, desert scrub, riparian woodland
Gila woodpecker (*Melanerpes uropygialis*)[1]	BCC	E	Desert scrub, riparian woodlands, dry desert washes
Crissal thrasher (*Toxostoma crissale*)[1]	None	SSC	Desert scrub and washes
Le Conte's thrasher (*Toxostoma lecontei*)	None	SSC	Desert scrub, mesquite, riparian

Notes: [1] Species observed during desert tortoise surveys conducted for this project (NAVFAC Southwest 2021).

Status: Federal (determined by USFWS): T = Threatened, E = Endangered, BCC = Bird of Conservation Concern, BGEPA = Bald and Golden Eagle Protection Act.
State: T = Threatened, R = Rare, SSC = Species of Special Concern, WL = Watch List, FP = Fully Protected.
California Rare Plant Ranks (CRPR) created by the California Native Plant Society (CNPS):
2B - Plants rare, threatened, or endangered in California, but more common elsewhere
CNPS Threat Ranks
0.2 - Moderately threatened in California (20-80 percent occurrences threatened)
0.3 - Not very threatened in California (<20 percent of occurrences threatened, or no current threats known)

Sources: USMC 2016; MCAS Yuma 2017; California Native Plant Society 2021; California Department of Fish and Wildlife 2021.

The desert tortoise occurs within a variety of desert scrub vegetation types; however, the primary characteristic plant community is creosote bush scrub (USFWS 2011). They occur from sea level to an elevation of 7,300 feet; however, the most favorable habitat occurs at elevations of approximately 1,000 to 3,000 feet. Tortoises dig their own burrows and spend much of their lifetime in these burrows (USFWS 2011).

The greatest threat to the desert tortoise is habitat loss and degradation caused by human activities including urbanization, agricultural development, military training, recreational use, mining, livestock grazing, and a lack of regulatory mechanisms (USFWS 2011). Other known threats to the species include predation by common ravens, canids (e.g., coyotes, kit foxes, and dogs [*Canis familiaris*]), and golden eagles; collection by humans for pets or consumption; fire; collisions with vehicles on paved and unpaved roads; and mortality resulting from disease (e.g., upper respiratory tract disease) (USFWS 2011).

During desert tortoise surveys conducted in March 2021, desert tortoise individuals or sign (shell fragments, bones, scutes, carcasses, drinking depressions, mating rings, scat, burrows, and/or tracks) were observed within all of the proposed training support areas at the CMAGR except the proposed ALZ Bull (NAVFAC Southwest 2021) (see Appendix A). Desert tortoise surveys represent a snapshot in time to document desert tortoise occurrence and/or use of the survey areas. Lack of occurrence or sign within a given area does not preclude individual tortoises from utilizing or occurring in that area in the future.

With regard to desert tortoises on the CMAGR, the incidental take of desert tortoises during military training throughout CMAGR is authorized in the 1996 BO (USFWS 1996). MCAS Yuma initiated consultation with the USFWS under section 7 of the Endangered Species Act.

Other special status species with the potential to occur in the CMAGR action area, including rare plant species and wildlife species recognized as species of special concern by the California Department of Fish and Wildlife, are presented in Table 3.3-1. No populations of rare plant species are known to occur within the proposed training support areas, although individuals may occur. The majority of special status wildlife listed in Table 3.3-1 would potentially occur transiently in the CMAGR action area either during migration, for foraging, or during localized movement.

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The Sonoran pronghorn (*Antilocapra americana sonoriensis*) is the only federally listed species known to occur at the BMGR-West (U.S. Air Force and USMC 2018). However, the proposed training support areas at the BMGR-West are not within the known range of the Sonoran pronghorn, as the species only occupies the eastern portion of the BMGR-West. Special status species that potentially occur in the proposed training support areas at the BMGR-West are listed in Table 3.3-2. The reptiles in Table 3.3-2 have a low likelihood of occurrence in the action area because of lack of habitat. Bat species in Table 3.3-2 may utilize the action area for foraging, but would not roost in the action area due to lack of habitat.

Table 3.3-2 Special Status Species Potentially Occurring in the BMGR-West Action Area

Common Name *Scientific Name*	Federal Status	State Status	Habitat
REPTILES			
Desert rosy boa (*Lichanura trivirgata gracia*)	None	SGCN	Rocky areas in desert ranges, especially canyons with water
Mexican rosy boa (*Lichanura trivirgata trivirgata*)	None	SGCN	Rocky mountains or hillsides in desert ranges
Flat-tailed horned lizard (*Phrynosoma mcallii*)	None	SGCN	Creosote flats, sand dunes, mud hills (known habitat at BMGR-West is outside of the action area)
MAMMALS			
Spotted bat (*Euderma maculatum)*	None	SGCN	Riparian areas, rocky cliffs
Western mastiff bat (*Eumops perotis californicus*)	None	SGCN	Various habitats
California leaf-nosed bat *(Macrotus californicus*)	None	SGCN	Roosts in caves or mines. Forages in desert scrub or desert riparian.

Table 3.3-2 Special Status Species Potentially Occurring in the BMGR-West Action Area

Common Name *Scientific Name*	Federal Status	State Status	Habitat
BIRDS			
Ferruginous hawk (*Buteo regalis*)	None	SGCN	Arid to semiarid regions, grasslands
Peregrine falcon (*Falco peregrinus anatum*)	BCC	SGCN	Isolated cliffs; winter migrant
Le Conte's Thrasher (*Toxostoma lecontei*)	BCC	SGCN	Desert scrub, mesquite, riparian

Notes: **Status**: Federal (determined by USFWS): BCC = Bird of Conservation Concern.
State: SGCN = Species of Greatest Conservation Need (Arizona).
Source: U.S. Air Force and USMC 2018.

3.3.3 Environmental Consequences

3.3.3.1 Proposed Action

Plant Communities

Chocolate Mountain Aerial Gunnery Range

Under the Proposed Action, up to 12.9 acres (ALZ Bull) and 44.8 acres (access road and combat trail for AFA Burt 2.0) of desert scrub/wash vegetation would be permanently impacted by initial grading and routine maintenance grading. In total, 57.7 acres of desert scrub/wash impacts would represent a low level of impact to the roughly 459,000 acres of habitat present at the CMAGR (0.01 percent). In addition, plant communities throughout the action area are sparsely vegetated and very little plant life would be directly impacted by project grading.

Vehicle use and artillery training at AFA Burt 2.0 could result in the crushing, breaking, and removal of plants; a reduction of overall vegetative cover; and the erosion and/or compaction of topsoil. Particulate matter, fugitive dust, and/or sediment generated by vehicle and artillery use can reduce the photosynthetic capacity of affected plants, potentially reducing growth and vigor (Ouren et al. 2007). However, dust can increase net photosynthesis early in the growing season (when water is more available) by increasing leaf temperature (Upekala et al. 2009). Overall, particulate matter generation associated with vehicle use and ordnance deployment is expected to cause plant productivity to decrease in localized areas. However, windblown dust and sand regularly occur in desert environments. As such, based on the localized nature of the impacts, the amount of dust over baseline levels generated by the Proposed Action would be negligible.

Biannual vegetation trimming within MV-22 landing sites at LZs and ALZ Bull would be conducted in accordance with the CMs listed in Section 2.5 and would not involve complete removal of vegetation. The majority of vegetation within the LZs and ALZ Bull would not be impacted by vegetation trimming. Where vegetation is trimmed, no plants would be intentionally uprooted or removed and trimming would be done with hand tools.

MV-22 training at LZs, as well as aircraft landings/takeoffs at ALZ Bull, would result in the temporary disturbance of loose surface debris and soil. MV-22 downdraft and outwash from moving rotors (collectively known as rotorwash) in the vicinity of takeoffs, landings, and near-surface hovering, could impact vegetation and soils. Rotorwash forces are relative to the engine power settings and the aircraft's proximity to the ground. Wind velocities could reach over 100 miles per hour directly below the MV-22 when hovering at 100 feet above ground level (Marine Corps Installations West 2009 as cited in USMC 2013).

Typical effects resulting from MV-22 rotorwash can range from windblown vegetation to broken branches in shrubs and trees (USMC 2013). Dust cloud development from the displacement of top soil and loose vegetation is another common effect from rotorwash. The intensity of these effects is proportional to the amount of time the area is exposed to these high velocity winds and the amount of vegetation that actually occur within a given landing area (USMC 2013).

Effects on vegetation from the use of MV-22s would be minor as (1) they would be localized under the landing sites; (2) pilots would avoid landing sites with vegetation or other vertical obstacles as much as possible; (3) LZs are sparsely vegetated; (4) the USMC anticipates that most MV-22 landing operations, such as insertions/extractions, would take less than 3 minutes; (5) effects associated with MV-22 landings would otherwise be similar to those of legacy rotary-wing aircraft currently operating at the CMAGR; (6) MV-22 aircrews can throttle back to 75 percent of engine power, and maintain a 75-degree angle to the nacelles, while on the ground to substantially reduce rotorwash wind speeds and deconcentrate engine heat exhaust; and (7) exhaust deflectors would automatically be deployed when on the ground.

Despite the aforementioned considerations, ground disturbance associated with training activities would likely reduce the cover and productivity of native plant communities. However, the area of vegetation that would potentially be disturbed under the Proposed Action comprises a small portion of the CMAGR. In addition, training in the proposed support areas would offset training impacts that are currently occurring in other areas of the BSTRC because there would be no overall change in training tempo. Therefore, impacts to plant communities under the Proposed Action would be less than significant.

Barry M. Goldwater Range-West

Under the Proposed Action, impacts to plant communities at the BMGR-West would be minimal. Use of DZs would not entail any grading or ground maintenance. Delivery of small-unit parachute operations (personnel and cargo pallets) to the DZs could cause minor temporary impacts to individual plants, but operations would intentionally be carried out in sparsely vegetated portions of the DZs to avoid vegetation. Use of proposed LZs at the BMGR-West for MV-22 training would have similar impacts as described above for the CMAGR. However, the proposed LZs at the BMGR-West occur in and in the vicinity of the Yodaville Urban Training Complex, where there is an existing high level of training disturbance and surrounding vegetation is sparse (see Figure 2-3). Therefore, impacts to plant communities at the BMGR-West would be less than significant.

Wildlife

Chocolate Mountain Aerial Gunnery Range

Impacts to wildlife associated with grading at ALZ Bull and the access road and combat trail to AFA Burt 2.0 would include temporary and, to a lesser degree, permanent displacement of a small number of birds, reptiles, and small mammals from the approximately 57.7 acres of habitat (see Table 2-1). The majority of wildlife individuals would move away from the grading areas to adjacent similar habitats. Smaller, less mobile species, and those seeking refuge in burrows (e.g., rodents and reptiles) could inadvertently be killed during grading activities; however, long-term, permanent impacts to populations of such species would not result because these species are abundant in surrounding areas and would rapidly repopulate suitable habitat within the affected area. Grading would not present major barriers to dispersal, and once completed, would not prevent normal life behaviors.

Vehicle and aircraft movement and ordnance/artillery use associated with training could result in wildlife injury/mortality and loss of habitat. All proposed training support areas would be infrequently used, and

when not in use, would not present barriers to wildlife movement in areas already characterized by naturally occurring sparse vegetation.

A considerable number of bird species that utilize resources in the action area do so during migration or as passing vagrants, and are not permanent residents. Bird species known to regularly utilize the action area are considered fairly common and widespread. Training activities under the Proposed Action may eliminate visitation by certain bird species or reduce the amount of time they spend in the action area. However, displacement of these species during training exercises would not be considered substantial. Biannual vegetation trimming within MV-22 landing sites at LZs would be conducted in accordance with the CMs listed in Section 2.5, and would not involve complete removal of vegetation, thereby reducing potential impacts to wildlife nesting, roosting, and cover sites.

There could be an increased likelihood of bird-aircraft strikes across a broader geographic area, as use of designated training support areas would entail more dispersed training. However, there would be no change in the types of training that occur at the CMAGR and there would be no increase in the quantity of sorties flown, no increase in the amount and/or types of ordnance expended, no increase in artillery training tempo, and no change to existing facilities or airspace under the Proposed Action. Therefore, there is no expected measurable change in bird-aircraft strikes across the CMAGR.

Use of aircraft, particularly low-level flights and landings/takeoffs can cause noise and visual disturbance to wildlife. Impacts to wildlife from aircraft noise and visual stressors can include: a startle reflex that induces running or flight, increased expenditure of energy, decreased time and energy spent on life functions such as feeding and mating, increased likelihood of predation, and interruption of breeding or nursing behavior (Larkin 1996; Efroymson et al. 2000). Effects related to rotorwash and noise from aircraft would diminish with distance from the source, and exposure to elevated noise levels would generally be localized around landings, takeoffs, and low-level hovering but diminish with distance. As training activities already occur at the CMAGR, there would be no change in training tempo or number of sorties flown, and with implementation of CMs (Section 2.5), impacts to wildlife at the CMAGR under the Proposed Action would be less than significant.

Barry M. Goldwater Range-West

Impacts to wildlife at the BMGR-West under the Proposed Action would be similar in nature to those described above for the CMAGR, but would be less impactful for the following reasons: (1) there would be no grading or ground maintenance; (2) there would be no landing of aircraft in the proposed DZs; and (3) the proposed LZs at the BMGR-West occur in and in the vicinity of the Yodaville Urban Training Complex, where there is a high level of training disturbance and surrounding vegetation is sparse, providing little habitat for wildlife. Therefore, impacts to wildlife at the BMGR-West under the Proposed Action would be less than significant.

Special Status Species

Chocolate Mountain Aerial Gunnery Range

As previously discussed, potential impacts to the desert tortoise, including the species' critical habitat, were fully analyzed in the Biological Assessment that was prepared in support of the Proposed Action (see Appendix A). The USMC has completed consultation with the USFWS under section 7 of the Endangered Species Act (Appendix A). Potential impacts to the desert tortoise from the Proposed Action at the CMAGR would include incidental injury or death due to training activities from military vehicles (during both establishment of the training support areas and operations), MV-22 landings, and ordnance use; loss of habitat from grading and/or training activities; noise and dust impacts from training operations; and

alteration of habitat over time. However, implementation of the CMs listed in Section 2.5, and adherence to CMs provided in the amendment to the 1996 BO for the Proposed Action (Appendix A) would reduce potential impacts to the desert tortoise.

Other special status plant and wildlife species at the CMAGR (Table 3.3-1) may be impacted by the Proposed Action. However, no special status species have populations that are restricted to the CMAGR action area or adjacent lands. There are no known special status plant species populations in the action area. Potential impacts from grading, maintenance, and training activities to individual special status plants and wildlife would be identical to those described above for plant communities and wildlife. Special status wildlife species would be able to transit the proposed training support areas at the CMAGR post-grading/maintenance and normal life behaviors would not be impacted. In addition, training activities at the proposed training support areas would only occur minimally throughout the year and would largely be left unimpacted. Implementation of the CMs listed in Section 2.5 would reduce potential impacts to biological resources at the CMAGR. Therefore, there would be no significant impact to special status species at the CMAGR under the Proposed Action.

Barry M. Goldwater Range-West

No federally listed species and no rare plant species would be impacted under the Proposed Action at the BMGR-West. Other special status wildlife species at the BMGR-West (Table 3.3-2) may be impacted by the Proposed Action. However, no special status species have populations that are restricted to the BMGR-West action area or adjacent lands. Potential impacts from training activities to individual special status wildlife would be identical to those described above for wildlife. Training activities at the proposed training support areas would only occur minimally throughout the year and would largely be left unimpacted. Therefore, there would be no significant impact to special status species at the BMGR-West under the Proposed Action.

3.3.3.2 No-Action Alternative

Under the No-Action Alternative, the proposed LZs, ALZ, DZs, and AFA within the BSTRC would not be established and current training operations within the CMAGR and BMGR-West would persist. Existing conditions would remain as described in Section 3.3.2. Therefore, no impacts to biological resources would occur under the No-Action Alternative.

3.4 CULTURAL RESOURCES

3.4.1 Definition of Resource

Cultural resources is an inclusive label used to encompass any historic properties or resources of traditional knowledge valued by traditional communities (most often associated with Tribal Nations). Cultural resources are finite, nonrenewable resources, whose salient characteristics are easily diminished by physical disturbance; certain types of cultural resources also may be negatively affected by visual, auditory, and atmospheric intrusions.

Historic properties are defined in the federal regulations outlining Section 106 of the National Historic Preservation Act (NHPA), as amended (54 USC 306108 *et seq.*), 36 CFR § 800, as prehistoric and historical sites, buildings, structures, districts, or objects listed or eligible for listing in the National Register of Historic Places (NRHP), as well as artifacts, records, and remains related to such properties. Compliance with Section 106 of the NHPA, which directs federal agencies to consider the effect of a federal undertaking on a historic property, is outlined in the Advisory Council on Historic Preservation's regulations, *Protection*

of Historic Properties (36 CFR § 800). A resource of traditional knowledge can be defined generally as one that is eligible for inclusion in the NRHP because of its association with cultural practices or beliefs of a living community that are rooted in that community's history and are important in maintaining the continuing cultural identity of the community.

To be eligible for the NRHP, a property must possess integrity of location, design, setting, workmanship, feeling, and association, and meet the following criteria for evaluation in at least one area of significance as defined by the *Secretary of the Interior's Standards for Evaluation* (36 CFR § 60):

> (a) associated with events that have made a significant contribution to the broad patterns of American history; or
>
> (b) associated with the lives of persons significant in our past; or
>
> (c) embody the distinctive characteristic of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic value, or that represent a significant or distinguishable entity whose components may lack individual distinction; or
>
> (d) have yielded, or may likely yield, information important in prehistory or history.

In addition to significance, a cultural resource must also retain integrity, which is the ability to convey said significance. The NRHP criteria recognize seven aspects of integrity: location, design, setting, materials, workmanship, feeling, and association. A resource must retain several, if not all of these aspects, to be considered eligible for listing in the NRHP. For archaeological resources, eligibility is generally determined under Criterion D for the ability to provide important information in prehistory and/or history. The assessment of integrity for archaeological properties depends on the data requirements of an applicable research design. This includes the identification of appropriate physical remains in an intact depositional (horizontal or vertical) context. Once a federal agency has determined a cultural resource to be significant, the agency has a responsibility to manage the resource as a historic property.

While there are multiple laws, regulations, and EOs that govern the identification and management of cultural resources at MCAS Yuma, the main regulatory drivers are Section 110 and 106 of the NHPA of 1966 [54 USC 300101 et seq.] and associated regulations [36 CFR § 800]. Section 110 of NHPA requires all federal agencies to identify historic properties on their landholdings while Section 106 of NHPA requires all federal agencies to consider the effects of their undertakings on historic properties and seek to avoid, minimize, or mitigate adverse effects to these properties (36 CFR § 800.1(a)). Section 106 also requires agencies to consult with federally recognized Tribal Nations and other stakeholders with a vested interest in the undertaking. MCAS Yuma coordinates with federally recognized Tribal Nations on a recurring basis.

3.4.2 Affected Environment

The affected environment for cultural resources is based on the establishment of the area of potential effect (APE) of an undertaking, through consultation with the State Historic Preservation Offices. An APE is defined in 36 CFR § 800.16(d) as "the geographic area or areas within which an undertaking may directly or indirectly cause changes in the character or use of historic properties, if any such properties exist." The APE, and therefore the affected environment, for the Proposed Action includes 3,236.3 acres, which is the total acreage to establish five LZs, an ALZ, and an AFA at the CMAGR; and two DZs and nine LZs at the BMGR-West within the BSTRC (see Table 2-1 and Figures 2-2a, 2-2b, and 2-3).

3.4.2.1 Prehistoric and Historical Setting

The CMAGR and the BMGR-West are located within the Sonoran Desert ecoregion. The CMAGR is located in the Colorado Desert, a subregion of the Sonoran Desert. This area has not been well studied, which has resulted in a very limited understanding of the culture history of the area. The same challenges are found when studying the history of the BMGR-West. The BMGR-West is located within the western Papagueria, another a subregion of the Sonoran Desert. This term was first used by Spanish explorers to describe those occupying southwestern Arizona and northern Sonora, Mexico. The people of this region had a diverse material culture matched by shifts in ceramic, architectural, and burial styles. However, because those in this region did not live-in permanent settlements and therefore obtained few possessions, studying the population and its changing culture is challenging.

This cultural context for the BSTRC is drawn from the BMGR and CMAGR Integrated Cultural Resources Management Plans (MCAS Yuma 2019 and MCAS Yuma 2011, respectively). The plans document the procedures and processes through which MCAS Yuma fulfills its commitment to compliance with applicable laws, regulations, and policies, in the spirit of faithful stewardship of cultural resources.

Prehistoric Setting

The earliest, well-documented prehistoric sites in the region are identified as belonging to the San Dieguito complex/tradition that dates to approximately 8000 to 9000 BC. Small, mobile bands of hunters and gatherers with a hunting economy focused on highly ranked resources such as large mammals. Resources assigned to this complex may include cleared circles in desert pavement, rock alignments, and heavily varnished stone tools. Lithic technologies from the period are large projectile points similar to Pinto and Elko points (MCAS Yuma 2017).

Cultural resources from the Early Holocene Period (8000 to 7000 BC) have also been assigned to the San Dieguito complex. The early San Dieguito is defined by cleared circles in desert pavement, rock alignments, and heavily varnished aceramic stone tool assemblages. Similarly, the subsistence patterns in the Early Holocene also seem to be based on small mobile bands exploiting small and large game as well as seasonally available floral resources (MCAS Yuma 2017). The San Dieguito complex has been subdivided into three phases, each with additional and more sophisticated tools. Suggested artifact associations for the San Dieguito I and II phases are bifacial and unifacial scrapers and choppers as well as bilaterally notched pebbles. The San Dieguito II phase is the proposed advent of finely made blades and bifacial points as well as a large assortment of choppers and scrapers. In the San Dieguito III phase, the use of pressure flaking is the primary marker through pressure-flaked blades, leaf-shaped projectile points, plano-convex scrapers, crescentics, and elongated bifacial knives (MCAS Yuma 2017).

A continuance of mobile and limited occupation/transient sites may persist in the early and middle part of the Middle Holocene. Early Late Holocene period sites with rock-lined cache pits, multiple hearths, projectile points, and milling stones suggest a use of strategic food storage and resource caching by mobile groups. The presence of more intensive occupation in the sites examined during this period suggests that a limited number of base camps allowed mobile hunter/gatherers to exploit optimal areas more intensively during this period (MCAS Yuma 2017).

The start of the Late Holocene period (after approximately A.D. 500) (associated with the Patayan period on the lower Colorado River) roughly correlates with the introduction of pottery production (using the paddle-and-anvil technique) and floodplain agriculture on the Colorado River. The emphasis on subsistence practices appears to have been on a broad-spectrum seasonal round timed in accordance with the availability of different resources throughout the region (MCAS Yuma 2017).

The ceramic ware associated with the region is Lower Colorado Buff Ware. It was made from local clays and materials found in the Colorado River from the southern tip of Nevada to the Gulf of California. Lower Colorado Buff Ware often found along trails, and it is thought that certain types marked trails of different time periods (Waters 1982; MCAS Yuma 2017).

A variety of well-developed trail systems throughout the Western Papagueria and the Colorado Desert corroborate the case for long-range travel to specialized resource collection areas and ceremonial locales. Several important prehistoric travel corridors have been noted in or adjacent to the CMAGR (Schaefer and Dalope 2011; MCAS Yuma 2017).

Historical Native American Groups

The CMAGR and BMGR-West are in close proximity to the traditional boundaries of the Yuman (Quechan), Kamia (Diegueño, Tipai, Kumeyaay), and the Cahuilla. The groups were present in their traditional territories from the prehistoric period, through the protohistoric, and into the historical period. Their early occupation of these areas is poorly documented, but a wealth of information from the historical period provides a suggestion of lifeways that may cautiously be used to infer patterns that persisted from the late prehistoric period (MCAS Yuma 2017).

Euro-American History

Though Euro-American expeditions along the Colorado River began earlier, the first expedition to pass near the Yuma area was that of Francisco Garcés and Juan Bautista de Anza in the late 1770s as they attempted to find a route from the Colorado River to the Pacific Ocean. Spanish missionization efforts were likewise concentrated in the Yuman groups along the Colorado River (Schaefer and Dalope 2011; MCAS Yuma 2017).

Spanish-Quechan interactions increased after the visits of Garcés and Anza. In 1780, two Franciscan missions, La Purísima Concepción and San Pedro y San Pablo, with associated lay communities, were established in Quechan territory (Schaefer and Dalope 2011; MCAS Yuma 2017).

Most of the later Euro-American presence in the Chocolate Mountains was transient and fleeting. The Chocolate Mountains were not viewed as an ideal location for agriculture due to the much richer lands to the south and west and the presence of water in these areas. Settlers from the U.S. confronted the Yumans for the first time with the advent of the Gold Rush after 1849. Prospecting and placer mining took place in the Chocolate Mountains, the most productive of these activities being the Mary Lode gold mine on the southwest face of the Chocolate Mountains. With the gold rush strikes along the Colorado River and western Arizona during the late 1850s, Yuma became a transportation hub and then later the location for the territorial prison (Schaefer and Dalope 2011; MCAS Yuma 2017).

Agriculture and tourism provided an economic boom during the early and mid-20th century. Due to its isolated location in southwestern Arizona and ideal flying climate, the federal government acquired 1.1 million acres at what is now BMGR to create a training range for air-to-air and air-to-ground combat (U.S. Air Force and USMC 2018). In June 1941, Luke Field was established, and training began. During World War II, the acreage expanded to 2.1 million acres and was divided into eastern and western components, designated the Gila Bend Gunnery Range and the Yuma Aerial Gunnery and Bombing Range. The Gila Bend Gunnery Range was renamed several times following World War II and in 1986 was redesignated as the Barry M. Goldwater Range (U.S. Air Force and USMC 2018).

MCAS Yuma was originally a municipal flying field (Fly Field), but the facility was taken over by the military during World War II and has been used as an important training base ever since. It was first

established as the Yuma Army Air Base in 1942 for the development of an advanced flying school. The CMAGR was first used as the Desert Training Center in 1942 and has remained in military use since that time. After the war, the base was left inactive until it was reactivated in 1951 as an Air Force Weapons Training Center; it was declared a permanent installation in 1954. The base was transferred to the Department of the Navy in 1959 and was used for USMC and Navy training. The installation's name and status changed to Marine Corps Air Station in 1962 (MCAS Yuma 2017).

3.4.2.2 Cultural Resources Within the Affected Environment

Through a combination of cultural resource studies carried out to comply with Sections 106 and 110 of the NHPA, the entire APE has been subjected to intensive cultural resources pedestrian surveys and the State Historic Preservation Offices have concurred that the APE was adequately delineated per 36 CFR Part 800.4(a)(1). These studies include large-scale survey efforts conducted between 1977 and 2021 (CMAGR: von Werlhof and von Werlhof 1977, Pigniolo et al. 2000, Wahoff et al. 2002, Shalom 2007, Schaefer et al. 2009, Austerman et al. 2010, Knighton-Wisor et al. 2016, Miljour et al. 2019, and Brann et al. 2021; BMGR-West: Doelle 1982, Dosh 2008, ASM Affiliates 2008, James 2013, Hauer et al. 2016, and Brann et al. 2021) and include all the areas of the APE.

Resources of Traditional Knowledge

As part of this EA, MCAS Yuma consulted with federally recognized Tribal Nations who assert ancestral ties to the CMAGR and BMGR-West region to identify resources of traditional knowledge in the APE (Appendix A). The APE does not contain any identified resources of traditional knowledge.

Historical Buildings and Structures

No historical buildings or structures are located in or immediately adjacent to the APE.

Archaeological Resources

Cultural resources surveys previously conducted and including the 2021 survey (Brann et al. 2021) resulted in the identification and recording of six archaeological sites within the boundaries of the APE in both the CMAGR and the BMGR-West. These sites date to the historical period and include trash scatters, mining exploration, habitation, a road, and a military camp.

Of the previously recorded archaeological sites within the APE, two sites (a historical military camp and historical road) were considered unevaluated for listing in the NRHP, and one site (historical mining site) is not eligible for listing in the NRHP with Arizona State Historic Preservation Office concurrence. During the recent survey (Brann et al. 2021), three newly recorded historical sites and one previously recorded historical site that was revisited were recommended not eligible for listing in the NRHP. The Arizona and California State Historic Preservation Offices have both concurred that none of these sites are eligible for listing in the NRHP and that no historic properties would be affected under the Proposed Action (Appendix A).

3.4.3 Environmental Consequences

The regulations implementing Section 106 of the NHPA require that federal agencies consider the effects (impacts) of their undertakings (proposed actions) on historic properties (cultural resources). Impacts on cultural resources are considered significant if a historic property, as defined in 36 CFR 60.4, would be physically damaged or altered, would be isolated from the context considered significant, or would be affected by project elements that would be out of character with the significant property or its setting.

Analysis of potential impacts on cultural resources considers both direct and indirect impacts. Direct impacts may occur by: (1) physically altering, damaging, or destroying all or part of a resource; (2) altering characteristics of the surrounding environment that contribute to resource significance; (3) introducing visual, audible, or atmospheric elements that are out of character with the property or alter its setting; or (4) neglecting the resource to the extent that it deteriorates or is destroyed. Direct impacts can be assessed by identifying the type and location of the Proposed Action and by determining the exact locations of cultural resources that could be affected. Indirect impacts primarily result from the effects that are farther removed from the immediate project area including visual, audible (noise), or atmospheric changes due to the project implementation.

3.4.3.1 Proposed Action

Resources of Traditional Knowledge

No resources of traditional knowledge have been identified within the APE. Government-to-government consultation between the USMC and each federally recognized Tribal Nation associated with the BSTRC was conducted for this action in recognition of their status as sovereign nations, to provide information regarding Tribal Nation concerns per Section 106 of the NHPA, as well as information on resources of traditional knowledge that may be present near the APE (Appendix A). MCAS Yuma received a request from the Quechan Tribal Nation to include cultural sensitivity training as a conservation measure in this EA. Accordingly, as stated in Section 2.5.3, mandatory cultural awareness/sensitivity training will continue to be provided to all personnel accessing the BSTRC.

Historical Buildings and Structures

No historical buildings or structures are located in or immediately adjacent to the APE. Therefore, there would be no impacts to historical buildings or structures.

Archaeological Resources

Based on the results of the previous and recent pedestrian archaeological surveys conducted within the APE, no NRHP eligible/listed archaeological sites are present. Should potential subsurface archaeological deposits be detected in the course of grading or operations, all work in the discovery area would cease. The contractor would contact MCAS Yuma Range Management Division and would refrain from working in the discovery area until the MCAS Yuma Cultural Resources Manager provides input regarding the significance of the detected item(s) and instructions.

Aircraft landings on the unevaluated historical road would not affect the integrity of this feature. Therefore, no avoidance and/or mitigation measures are needed. MCAS Yuma has consulted with the Arizona and California State Historic Preservation Offices regarding concurrence with a finding of no historic properties affected pursuant to 36 CFR800.4(d)(1). The Arizona and California State Historic Preservation Offices have both concurred that no new sites are eligible for listing in the NRHP and that no historic properties would be affected under the Proposed Action (Appendix A). Therefore, the Proposed Action would have no impact on archaeological resources.

3.4.3.2 No-Action Alternative

Under the No-Action Alternative, the proposed LZs, ALZ, DZs, and AFA within the BSTRC would not be established, and current training operations within the CMAGR and BMGR-West would continue. Existing conditions would remain as described in Section 3.4.2. Therefore, no impacts to cultural resources would occur under the No-Action Alternative.

3.5 GEOLOGICAL RESOURCES

3.5.1 Definition of Resource

Geological resources are generally defined as the geology, topography, soils, and geologic hazards of a given area. The geology of an area includes surface and bedrock materials, its orientation and faulting, and may contain valuable geologic resources such as mineral deposits, petroleum reserves, and fossils. Topography is the elevation, slope, aspect, and surface features found within a given area. Long-term geological, seismic, erosional, and depositional processes influence the topographic relief of an area. Soil refers to unconsolidated earthen materials overlaying bedrock or other parent material. Geologic hazards include the seismicity (the relative frequency of earthquakes), and existence or potential for landslides, sinkholes, and liquefaction in a given area. The area considered for geologic resources includes the project area, as described in Section 2.2, and the vicinity surrounding the project area. Existing geological conditions at the CMAGR and BMGR-West are described in the paragraphs below.

3.5.2 Affected Environment

3.5.2.1 CMAGR

The CMAGR is generally bound on the west by the Salton Sea Basin and on the east by the Chuckwalla and Palo Verde mountains. The CMAGR is located 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. This province 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 (MCAS Yuma 2015). The CMAGR is characterized by the rugged Chocolate Mountains, a range that rises abruptly from broad alluvium-filled desert basins. These mountains are largely tilted fault blocks comprised 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 Tertiary (about 3 to 65 million years ago) volcanic and intrusive rocks. Pliocene (about 3 to 5 million years ago) and Pleistocene (about 2 to 3 million years ago) older alluvium occur within the adjacent basins to the east and west (MCAS Yuma 2015).

Late Pliocene, Pleistocene, and Holocene alluvial deposits overlie most of the older formations in the Chocolate Mountains and form dissected piedmont slopes around the CMAGR. These alluvial fan and terrace deposits have been informally designated as older, intermediate, and younger alluvium, based on their stratigraphic relationships (MCAS Yuma 2015). The proposed training support areas at the CMAGR lie on surficial soils overlying on-site alluvium consisting of the Rillito-Gunsight series, which is characterized by very deep, sandy and rocky loams prone to high to extremely high-water erosion and high to very high wind erosion, as shown on Figures 3.5-1 and 3.5-2 (Natural Resources Conservation Service 2011; Navy 2013).

Past and present actions such as ground range reconfigurations and associated training in the CMAGR (MCAS Yuma 2015; USMC 2016) have used a dust abatement palliative during ground-disturbing activities.

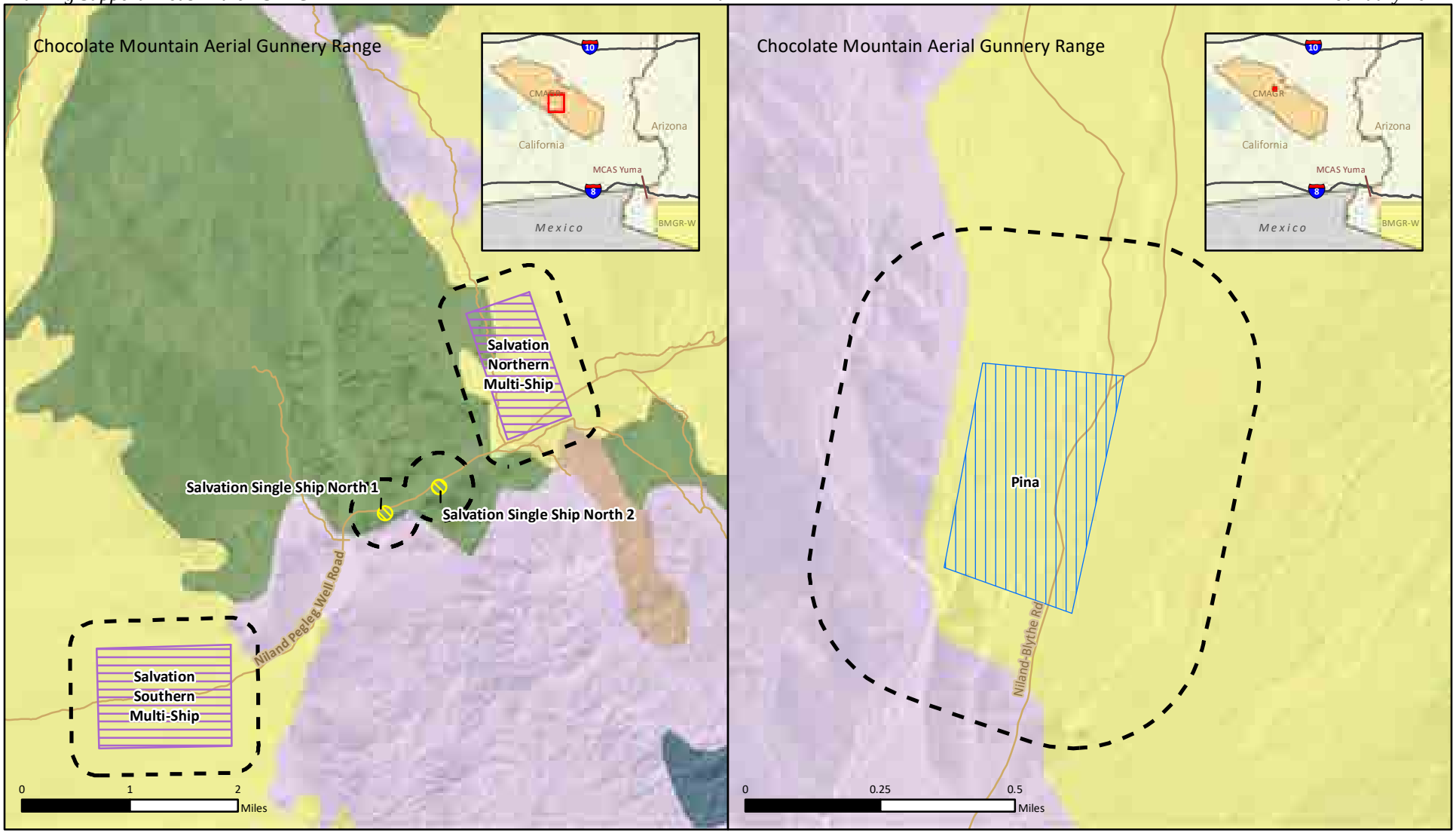

Figure 3.5-1. Geologic Features in the Vicinity of the Proposed Training Support Areas at the Chocolate Mountain Aerial Gunnery Range

Proposed Training Support Areas
- Landing Zone Pina
- Landing Zone Salvation Pass Multi-Ship
- Landing Zone Salvation Pass Single Ship
- 0.25-Mile Buffer
- Existing Dirt Road

Geologic Features (Basement Rock and Surface Deposits)
- Alluvium
- Basalt
- Gneiss
- Mica Schist
- Plutonic Rock (Phaneritic)

Sources: Esri 2018, MCAS Yuma 2020, Navy 2017, USGS 2005

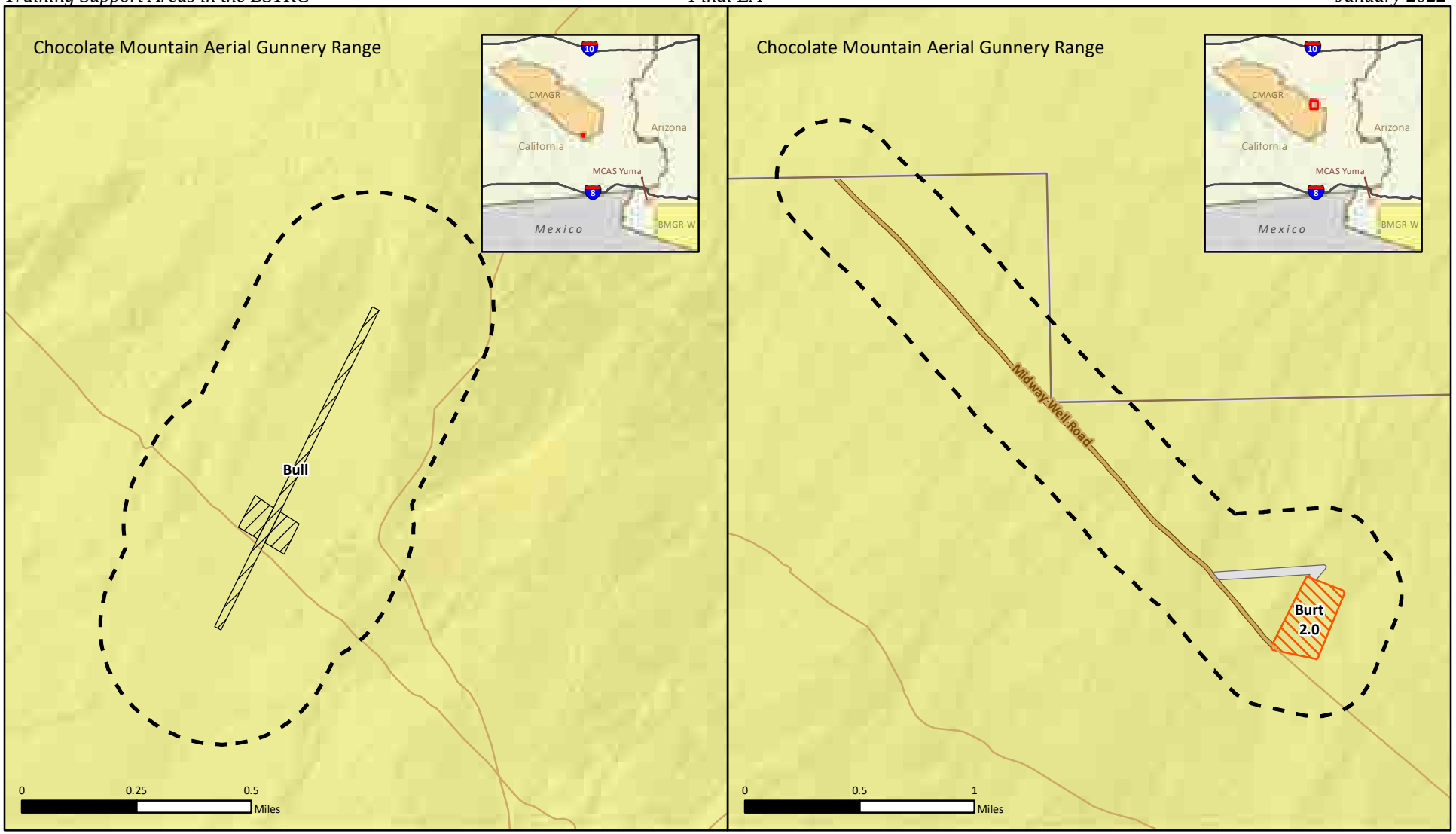

Figure 3.5-2. Geologic Features in the Vicinity of the Proposed Training Support Areas at the Chocolate Mountain Aerial Gunnery Range

Installation and Range Boundaries
- Chocolate Mountain Aerial Gunnery Range

Proposed Training Support Areas
- Artillery Firing Area Burt 2.0
- Access Road
- Combat Trail
- Assault Landing Zone Bull

0.25-Mile Buffer

Existing Dirt Road

Geologic Features (Basement Rock and Surface Deposits)
- Alluvium

N

Sources: Esri 2018, MCAS Yuma 2020, Navy 2017, USGS 2005

3.5.2.2 BMGR-West

Topography within the BMGR-West is dominated by narrow mountain ranges and broad, low-gradient alluvial valleys, including the Gila Mountains, Tinajas Mountains, Mohawk Mountains, and Mohawk Valley (U.S. Army 2017). The mountain ranges are formed from igneous, metamorphic, and sedimentary rock types. The alluvial valleys are deep bedrock basins filled with silt, clay, sand, and gravel deposits. These deposits can be more than 10,000 feet deep. Along many of the mountain bases, sloping masses of alluvial fill material, known as bajadas, extend outward like fans to taper more gradually than the mountains themselves into the generally flat valley floors (BMGR 2018). The proposed training support areas at the BMGR-West lie within alluvial basins that contain sand and loamy sand that tend to dominate the broad alluvial valleys and low-gradient slopes (BMGR 2018, U.S. Army 2017, Arizona Bureau of Mines 1960).

3.5.3 Environmental Consequences

This section presents an analysis of potential impacts to geology and soils that could result from implementation of the Proposed Action as a result of project-related activities (e.g., earth disturbing activities), and evaluates the degree of potential impact in terms of short-term (associated with the grading phase of project implementation) and long-term effects.

3.5.3.1 Proposed Action

LZs and DZs

Under the Proposed Action, all LZs and DZs would largely remain in their natural states and no maintenance or improvements would be required. No new roads or earth-moving activities would be required for establishment or use of the LZs and DZs. LZs would have biannual vegetation maintenance that would be done by hand tools without the need to uproot any vegetation and would not disturb soil stability. Therefore, there would be no impacts to geological resources from the establishment of LZs or DZs at the CMAGR and the BMGR-West.

Training activities that would be conducted in the designated LZs and DZ would generate surface soil disturbance and a potential increase in erosion. However, such impacts would be localized and temporary and training activities in the proposed training support areas would be consistent with on-going training at the BSTRC. In addition, LZs would not be scheduled for dust abatement, but a dust palliative, as described in Section 2.2, could be applied for dust suppression should it be deemed necessary prior to a training exercise. The application of water-permeable dust palliative would not generate additional runoff to adjacent areas that may lead to an increase in erosion. Therefore, operations within the LZs and DZs would have no significant impact on geological resources.

ALZ Bull and AFA Burt 2.0

Establishment of ALZ Bull would require grading/earthwork, to include surficial grading and leveling, to create an expeditionary landing strip. Though surface soils would be disturbed for the creation of the landing strip, the overall impact to topography would be minimal as the topography of the proposed ALZ Bull footprint is relatively flat.

AFA Burt 2.0 would require the use of an existing unmaintained dirt road that stems off of Midway Well Road for access by ground training vehicles and equipment, and the establishment of a combat trail to the AFA (see Figure 2-2b). Both would be unimproved, graded dirt roads that would require initial and occasional grading to maintain the accessibility of the roads and to allow maneuverability of vehicles and equipment. Although surface soils would be disturbed, the overall impact to topography would be minimal as the topography in the vicinity of AFA Burt 2.0 is relatively flat.

Use of AFA Burt 2.0 would not entail any major earthwork beyond on-ground troops digging pits to help absorb the recoil of the artillery and would be temporary, as described in Section 2.2. Following training activities, any pits that were dug would be filled and returned to pre-activity contours.

Training activities that would be conducted at ALZ Bull would generate surface soil disturbance and a potential increase in erosion. However, such impacts would be localized and temporary. To minimize the potential for impacts, following the initial grading, the landing strip for ALZ Bull would receive applications of a dust palliative, as described in Section 2.2, on an as needed basis, to provide erosion control and dust suppression. Therefore, operations within ALZ Bull and AFA Burt 2.0 would have no significant impact on geological resources.

3.5.3.2 No-Action Alternative

Under the No-Action Alternative, the proposed LZs, ALZ, DZs, and AFA within the BSTRC would not be established, and current training operations at the CMAGR and the BMGR-West would persist. Existing conditions would remain as described in Section 3.5.2. Therefore, no impacts to geological resources would occur under the No-Action Alternative.

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CHAPTER 4
OTHER NEPA CONSIDERATIONS

4.1 POSSIBLE CONFLICTS BETWEEN THE PROPOSED ACTION AND THE OBJECTIVES OF FEDERAL, STATE, LOCAL, AND REGIONAL LAND USE PLANS, POLICIES, AND CONTROLS

Implementation of the Proposed Action would comply with all applicable federal, state, and local statutes and regulations (refer to Section 1.6, *Regulatory Setting*), as well as all applicable federal, state, regional, and local policies and programs.

4.2 ENERGY REQUIREMENTS AND CONSERVATION POTENTIAL OF ALTERNATIVES INCLUDING THE PROPOSED ACTION AND ALL MITIGATION MEASURES BEING CONSIDERED

As discussed in Section 2.4, the Proposed Action reflects the culmination of an iterative process that successively reduced impacts to resources without sacrificing operational training needs. The resulting project also reflects features that represent the minimum amount of resources and associated energy to implement the Proposed Action. Furthermore, reducing the level of future maintenance (and thus energy needed) for the Proposed Action was factored into the project design. The resulting training support areas identified under the Proposed Action would have no direct energy requirements. The Proposed Action would comply with the Energy Policy Act of 2005 and the Energy Independence and Security Act of 2007.

4.3 IRREVERSIBLE OR IRRETRIEVABLE COMMITMENT OF NATURAL OR FINITE RESOURCES

Resources that are irreversibly or irretrievably committed to a project are those used on a long-term or permanent basis. This includes the use of nonrenewable resources such as metal and fuel, and other natural or cultural resources. These resources are "irretrievable" when used for one project when another action could have used them for another purpose. Human labor is also an irretrievable resource. Another impact that falls under this category is the unavoidable destruction of natural resources that could limit the range of potential uses of that particular environment.

Under the Proposed Action, grading and maintenance activities would require the use of vehicles that would result in the consumption of additional limited amounts of fuel, oil, and lubricants. Due to the anticipated limited use of these resources, their use would not constitute a significant irreversible or irretrievable commitment of resources.

4.4 RELATIONSHIP BETWEEN LOCAL SHORT-TERM USE OF THE HUMAN ENVIRONMENT AND MAINTENANCE AND ENHANCEMENT OF LONG-TERM NATURAL RESOURCE PRODUCTIVITY

NEPA requires an analysis of the relationship between a project's short-term impacts on the environment and the effects that these impacts may have on the maintenance and enhancement of the long-term

productivity of the affected environment. Impacts that narrow the range of beneficial uses of the environment are of particular concern. This refers to the possibility that choosing one development option reduces future flexibility in pursuing other options, or that designate a parcel of land or other resource to a certain use often eliminates the possibility of other uses at that site.

The Proposed Action would result in short-term effects primarily related to grading and maintenance activities involving the use of vehicles and equipment used for other purposes. The Proposed Action would not result in any impacts that would reduce environmental productivity, permanently narrow the range of beneficial uses of the environment, or pose long-term risks to health, safety, or the welfare of the public.

4.5 MEANS TO MITIGATE AND/OR MONITOR ADVERSE ENVIRONMENTAL IMPACTS _

The CMs presented in Section 2.5 would be implemented as part of the Proposed Action to reduce potential adverse environmental impacts.

CHAPTER 5
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CHAPTER 6
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APPENDIX A
Public, Agency, and Tribal Coordination

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Draft Environmental Assessment
Establishment and Use of Training Support Areas in the
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Chocolate Mountain Aerial Gunnery Range and Barry M. Goldwater Range-West
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If you wish to provide comments on the Draft EA, please submit your written comments no later than August 21, 2021, to: Mr. Jesse Martinez, Senior NEPA Planner/Project Manager, Naval Facilities Engineering Systems Command via email to jesse.w.martinez1@navy.mil.
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Imperial Valley Press

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CACTUS WEST MV-22 DRAFT

Affidavit of Publication

STATE OF AZ } SS
COUNTY OF YUMA }

Lisa Reilly or David Fornof, being duly sworn, says:

That (s)he is Publisher or Director of Operations of the Yuma Sun, a daily newspaper of general circulation, printed and published in Yuma, Yuma County, AZ; that the publication, a copy of which is attached hereto, was in the published said newspaper on the following dates:

08/06/2021 08/07/2021 08/08/2021

That said newspaper was regularly issued and circulated on those dates.
SIGNED:

Publisher or Director of Operations

Subscribed to and sworn to me this 8th day of August 2021.

VIRGEN P PEREZ, Notary, Yuma County, AZ

My commission expires: May 10, 2025

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NOTARY PUBLIC - ARIZONA
YUMA COUNTY
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My Comm. Expires May 10, 2025

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HOW TO REVIEW AND COMMENT ON THE DRAFT EA: Public input is requested on the Draft EA. Hardcopies of the Draft EA are available for review in the El Centro Public Library, Brawley Public Library, and the Yuma Main Library. In addition, the Draft EA is available for electronic viewing via the following website: https://www.mcasyuma.marines.mil/Portals/152/Staff%20and%20Agencies/Range%20Natural%20and%20Cultural%20Resources/Draft%20EA%20Training%20Support%20Areas%20BSTRC%20Aug%202021.pdf?ver=LFRtcUuV5_5G_D6Svbb8Hg%3d%3d

If you wish to provide comments on the Draft EA, please submit your written comments no later than August 21, 2021, to: Mr. Jesse Martinez, Senior NEPA Planner/Project Manager, Naval Facilities Engineering Systems Command via email to jesse.w.martinez1@navy.mil.

Yuma Sun: August 6, 7, 8, 2021 - 37380

Yuma Sun 8/6/21

Public Notice of Availability
Draft Environmental Assessment
Establishment and Use of Training Support Areas in the Bob Stump Training Range Complex
Chocolate Mountain Aerial Gunnery Range and Barry M. Goldwater Range-West
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Yuma Sun: August 6, 7, 8, 2021 - 37380

Yuma Sun 8/8/21

BREVES DEL VALLE IMPERIAL

■ El Juez Poli Flores autorizó asignar un nuevo abogado defensor a Rosita Deborah Torres, acusada junto con Daniel Alexander Munguía por el asesinato en 2019 de Raúl "Bubba" Esparza, de El Centro, debido a que Veronica Henderson, ex socia del abogado, Steven Honse, representó al cómplice en otro caso. El nuevo abogado es Jill Cremeans.

■ El conductor de un vehículo fue sorprendido en un puerto fronterizo de Calexico en presunta posesión de 55 libras de fentanilo, metanfetamina y heroína.

■ Seis inmigrantes fueron rescatados por elementos del Sector El Centro de la Patrulla Fronteriza y personal militar la madrugada de este miércoles 18 de agosto en la región silvestre de Jacumba, ubicada al sur de Ocotillo y al norte de la Laguna Salada, con lo que suman 286 personas salvadas desde el 1 de octubre.

■ Aunque de inicio el Valle Imperial no se vio afectado directamente por las reducciones anunciadas recientemente en el río Colorado para 2022, el Distrito de Riego de Imperial (IID) dijo estar monitoreando las condiciones de sequía y las elevaciones pronosticadas de los embalses mientras el distrito busca proteger el único suministro de agua del Valle Imperial.

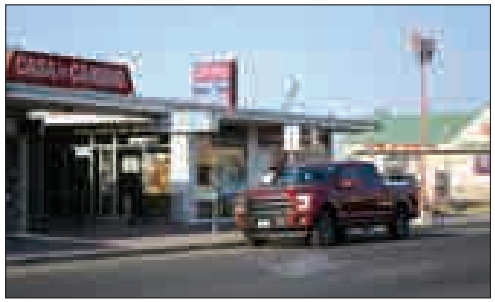
■ A partir de esta semana, el Registro de Votantes del Condado de Imperial dio inicio con el envío por correo de boletas a todos los electores empadronados para las elecciones de revocación de mandato del 14 de septiembre.

■ El Alcalde de Calexico, Javier Moreno, propuso la eliminación de la comisión de policía de esta ciudad, conformada en 1984, debido a la falta de personal asignado a dicho organismo y a la labor de otras agencias que pueden realizar las actividades de dicho organismo.

■ Los senadores estadounidenses Alex Padilla y Dianne Feinstein, ambos demócratas por California, presentaron la iniciativa de Ley de Mejoras a los Proyectos del Mar de Salton, un proyecto que busca aumentar la inversión federal de 10 a 250 millones de dólares en proyectos de mejora ecológica en el Mar de Salton.

Reporta Censo poco aumento de habitantes en Calexico

ARTURO BOJÓRQUEZ
Adelante Valle



EL CENTRO — Mientras el condado de Imperial registró un crecimiento poblacional en la última década, al igual que la mayoría de las ciudades del Valle Imperial, la ciudad de Calexico apenas reportó un aumento de habitantes.

El Censo de los Estados Unidos indica que la población en el condado de Imperial ascendió a 179 mil 702 habitantes lo que representa un alza del 2.96 por ciento comparado con el conteo de 2010.

De acuerdo al Censo, la población del Condado se compone por un 8 por ciento de menores de 5 años, 28.5 por ciento de personas menores de edad, un 13.3 por ciento de adultos mayores de 65 años y un 48.7 por ciento de mujeres.

El 85 por ciento de la población es de origen hispano o latino.

Además, el número de unidades habitacionales ascendió a 58 mil 280, de las cuales el 58.3 por ciento son ocupadas por sus propietarios.

Los residentes del Condado de Imperial pagan hipotecas promedio de mil 458 dólares mensuales.

Según el Censo, el valor promedio de las viviendas habitadas es 195 mil 800 dólares.

En el Condado, el 76.5 por ciento de los hogares habla un idioma distinto al inglés.

Poco más del 87 por ciento de los hogares del Condado cuenta con una computadora, pero el 77.5 por ciento cuenta con internet de banda ancha.

En el aspecto educativo, cerca del 70 por ciento de los habitantes mayores de 25 años cuenta con preparaciones de bachillerato y el 15.2 por ciento tiene nivel de licenciatura o mayor.

El ingreso promedio por hogar se ubicó en 47 mil 622 dólares anuales, mientras que el ingreso promedio por persona es de 18 mil dólares anuales.

Según el Censo, el 22 por ciento de las personas que viven en el condado de Imperial se encuentran en pobreza.

La ciudad más grande del Valle Imperial continúa siendo El Centro, con 44 mil 322 habitantes que representa cerca de 2 mil personas más que en 2010.

La ciudad de Brawley registró un crecimiento poblacional similar, al pasar de 24 mil 953 habitantes en 2010 a 26 mil 416 en 2020.

Por su parte, la ciudad de Imperial registró un crecimiento mayor, al pasar de 14 mil 758 habitantes en 2010 a superar la barrera de las 20 mil personas en este 2020, lo que representa un aumento del 37.30 por ciento.

La ciudad de Calexico pasó de 38 mil 572 habitantes en 2010 a 38 mil 633 en 2020, un aumento de apenas 200 personas.

La ciudad vecina de Mexicali registra el mayor porcentaje de personas de origen hispano con cerca del 98 por ciento.

El Censo agrega que la ciudad de Holtville perdió población en la última década, al bajar de 5 mil 939 habitantes en 2010 a 5 mil 605.

Un fenómeno similar ocurrió en Calipatria, donde la población descendió de 7 mil 705 habitantes en 2010 a 6 mil 515 en 2020, lo que representa una reducción del 15.44 por ciento.

La población de Heber pasó de 4 mil 275 habitantes en 2010 a 6 mil 896 residentes en 2020, lo que representa un incremento de 61.30 por ciento. Este poblado, ubicado entre Calexico y El Centro, y que es una zona desincorporada del Condado de Imperial, supera a Calipatria, Holtville y Westmorland en habitantes.

Lanza SBA portal de internet para condonación de préstamos a negocios

REDACCION
Adelante Valle

WASHINGTON — La Administración de Pequeñas Empresas (SBA en inglés) ha lanzado un portal optimizado para permitir a los prestatarios que accedieron a préstamos de hasta 150 mil dólares del Programa de Protección de Cheques de Pago (PPP), a través de prestamistas participantes solicitar la condonación directamente a través de la SBA.

"El nuevo portal de aplicaciones optimizado de la SBA simplificará el perdón para millones de nuestras empresas más pequeñas, incluidos muchos propietarios únicos, que utilizaron fondos de los préstamos del Programa de Protección de Cheques de Pago para sobrevivir a la pandemia", afirmó la titular de la SBA, Isabel Casillas Guzmán.

De acuerdo a la funcionaria, la gran mayoría de las empresas que esperan la condonación tienen préstamos de menos de 150 mil dólares.

Estos empresarios, afirmó, están ocupados administrando sus negocios y se enfrentan a un proceso de perdón demasiado complicado.

"Necesitamos entregar el perdón de manera más eficiente para que puedan volver a animar nuestras calles principales, sostener nuestros vecindarios e impulsar la economía de nuestra nación".

"La SBA está haciendo que el proceso de perdón sea más eficiente para las pequeñas empresas para que puedan recuperarse más completamente, retomar el rumbo y crecer", dijo el director de Distrito de la SBA, Rubén García.

"El segmento más grande de préstamos del Programa de Protección de Cheques de Pago en espera de condonación en el área del Valle Imperial es de 150 mil dólares o menos.

"Las pequeñas empresas y las organizaciones sin fines de lucro con un préstamo PPP a través de un prestamista que opte por este portal podrán solicitar la condonación a través de este método más sencillo", detalló García.

Según el funcionario, con el nuevo portal de solicitud simplificado, las empresas del Condado de Imperial, e incluso las empresas unipersonales que tomaron prestados fondos del PPP, verán estos fondos condenados.

"Era hora de que hiciéramos el proceso más eficiente para que las empresas puedan volver a sostener a nuestras comunidades", expresó García.

Según la SBA, este nuevo cambio ayudará a acelerar el alivio de más de 6.5 millones de pequeñas empresas, incluidas las del Condado de Imperial.

La nueva plataforma perdón comenzará a aceptar solicitudes de los prestatarios a partir del 4 de agosto.

Además de la plataforma tecnológica, la SBA está organizando un equipo de servicio al cliente de APP para responder preguntas y ayudar directamente a los prestatarios con sus solicitudes de condonación.

Endeavour Bank, un prestamista en San Diego, fue uno de los primeros prestamistas en el área en registrarse en el nuevo portal para acelerar su proceso de condonación.

"El nuevo portal de condonación de préstamos PPP de la SBA es eficiente y representa una excelente herramienta para ahorrar tiempo para ayudar en el proceso de condonación de PPP que los dueños de negocios sin duda aplaudirán. Alentamos a otros prestamistas a que también se inscriban en el portal de la SBA", dijo Dan Yates, director ejecutivo de Endeavor Bank.

"Esta iniciativa permitirá a los prestatarios de APP dejar atrás sus preocupaciones de lograr el perdón total y enfocarse en operar y hacer crecer sus negocios nuevamente", sostuvoPatrick Kelley, Administrador Asociado de la Oficina de Capital Access de la SBA.

Más de 600 bancos han optado por la condonación directa.

Contacto

Los prestatarios que necesiten ayuda o tengan preguntas deben llamar al (877) 552-2692, de lunes a viernes, de 8 de la mañana a 8 de la noche, hora del este

Ingreso

www.directforgiveness.sba.gov

Tienen cientos de residentes propiedades en registro estatal

VINCENT OSUNA
Imperial Valley Press

CALEXICO — Cientos de residentes del condado de Imperial tienen propiedades que pueden reclamar a la Oficina del Contralor estatal.

El contralor estatal protege la propiedad perdida y olvidada entregada al estado, como cuentas bancarias, cheques sin cobrar y beneficios de seguros, hasta que pueda ser reclamada por el propietario legítimo.

Los interesados pueden buscar por nombre y dirección. Los registros se dividen por rango de precios.

Como se menciona en el sitio de internet, la Ley de Propiedad No Reclamada del estado requiere que los bancos, compañías de seguros, corporaciones y ciertas otras entidades (denominadas titulares) informen y presenten la propiedad de sus clientes a la Oficina del Contralor estatal cuando no haya habido actividad durante un período.

Esta ley requiere que estos titulares informen anualmente y entreguen la propiedad a la Oficina del Contralor estatal después de que no haya habido actividad en la cuenta durante un tiempo, generalmente tres años.

La contraloría protege esta propiedad perdida u olvidada mientras sea necesario para entregarla a los propietarios legítimos. No hay fecha límite para reclamarlo una vez que se transfiere a la Oficina del Contralor estatal.

Traducción/Adelante Valle

PARA EL SALTON SEA

Eligen a líder de grupo de estudio de importación de agua

REDACCION
Adelante Valle

SACRAMENTO — Rominder Suri, profesor y presidente del Departamento de Ingeniería Civil y Ambiental de la Universidad de Temple, se desempeñará como presidente del Panel de Revisión Independiente que evaluará las estrategias de importación de agua a largo plazo para la restauración del Mar de Salton.

La Agencias de Recursos Hídricos de California informó que el liderazgo de Suri desde su mandato académico, así como su Centro de Tecnología del Agua y Ambiental (WET) financiado por la Fundación Nacional de Ciencias, le brindan una amplia experiencia en el trabajo con grupos de interés y en la facilitación de procesos de colaboración.

"Su trabajo con el Centro Egipcio de Excelencia para el Agua financiado por USAID lo ha colocado en escenarios internacionales donde se requiere diplomacia, así como experiencia técnica", agregó la agencia.

Suri ha publicado artículos sobre procesos de tratamiento de agua.

También ha estudiado técnicas de tratamiento tradicionales y novedosas.

Su trabajo se ha traducido en la construcción de instalaciones de tratamiento en Brasil e Irlanda.

Los impactos en la calidad del agua serán una consideración importante en la evaluación de los conceptos de importación de agua de mar para la restauración a largo plazo del Mar Salton.

Como presidente del panel de revisión independiente, sus funciones incluirán la selección de los nominados del panel, liderar la redacción de informes, establecer las agendas y administrar todas las reuniones, y supervisar todos los votos y deliberaciones del panel.

Los conceptos de importación de agua serán revisados por los expertos del panel.

Los miembros del panel celebrarán su primera reunión este otoño.

En ese momento, los miembros del público pueden compartir opiniones e información sobre las opciones de importación de agua de mar.

Suri asistirá a las reuniones comunitarias del 31 de agosto y el 2 de septiembre para brindar información adicional sobre el estudio de factibilidad de importación de agua.

Adelante Valle

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PUBLICIDAD

760-335-4645
760-337-3433
760-337-3401
760-337-3453
760-335-4649
760-337-3438

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Adelante Valle es una publicacion de Imperial Valley Company, 205 N. 8th St., El Centro, CA 92243.

Aviso Público de Disponibilidad
Borrador de Evaluación Ambiental
El proyecto propuesto de Cactus West MV-22
Landing Zones, Assault Landing Zones, y Drop Zones
Chocolate Mountain Aerial Gunnery Range y Barry M. Goldwater Range-West
Los condados de Imperial y Riverside, California, y el condado de Yuma, Arizona

La Infantería de Marina de los Estados Unidos (USMC por sus siglas en inglés) ha preparado un borrador de Evaluación Ambiental (EA por sus siglas en inglés) para estudiar los posibles impactos ambientales asociados con el establecimiento y la utilización de zonas de aterrizaje, una zona de aterrizaje de asalto, zonas de caída, y una zona de tiro de artillería en los dos rangos tácticos dentro del Bob Stump Training Range Complex (BSTRC por sus siglas en inglés), incluyendo el Chocolate Mountain Aerial Gunnery Range en California y el Barry M. Goldwater Range-West en Arizona.

ACCIÓN PROPUESTA: El propósito de la acción propuesta es expandir las capacidades de entrenamiento de misión crítica dentro del BSTRC para los aviadores de la Infantería de Marina y del Departamento Naval, y cañoneros de artillería del Marine Air-Ground Task Force. La Acción Propuesta es necesaria para proporcionar a la aeronave MV-22 una flexibilidad similar a las normas y los procedimientos de aeronaves de ala rotatoria anticuadas actuales, y proporcionar un entorno de entrenamiento de disparo de artillería más seguro y realista. La Acción Propuesta también es necesaria para lograr procedimientos críticos de entrenamiento táctico de la Infantería de Marina y el Departamento Naval, códigos de entrenamiento y preparación, y ejercicios de gran fuerza. La implementación de la Acción Propuesta facilitaría el mantenimiento de la Infantería de Marina y otras fuerzas en un estado óptimo de preparación para apoyar las contingencias actuales y emergentes y los requisitos durante tiempos de guerra. El USMC no aumentaría la cantidad de vuelos realizados, no aumentaría la cantidad y/o los tipos de artillería gastados, no aumentaría el ritmo de entrenamiento de la artillería, ni alteraría las instalaciones actuales o el espacio aéreo dentro del BSTRC como parte de esta Acción Propuesta.

CÓMO REVISAR Y COMENTAR SOBRE EL BORRADOR DE EA: Se solicitan comentarios del público sobre el borrador de EA. Copias impresas del borrador de EA están disponibles para revisión en la Biblioteca Pública de El Centro, la Biblioteca Pública de Brawley, y la Biblioteca Principal de Yuma. Adicionalmente, el borrador de EA está disponible en el siguiente sitio web: https://www.mcasyuma.marines.mil/Portals/152/Staff%20and%20Agencies/Range%20Natural%20and%20Cultural%20Resources/Draft%20EA_Cactus%20West%20MV-22_July%202021.pdf?ver=S5utZufW9l7JbNcpYDFHCA%3d%3d. Si desea ofrecer comentarios sobre el borrador de EA, envíe sus comentarios por escrito a más tardar el 2 de agosto de 2021 a: Mr. Jesse Martinez, Senior NEPA Planner/Project Manager, Naval Facilities Engineering Systems Command por correo electrónico a jesse.w.martinez1@navy.mil.

11486345

UNITED STATES MARINE CORPS
MARINE CORPS AIR STATION YUMA
BOX 99100
YUMA, ARIZONA 85369-9100

5090
YRMD/KJ
July 27, 2021

Ms. Erin Davis
Archaeological Compliance Specialist
State Historic Preservation Office
1100 W. Washington St.
Phoenix, Arizona 85007

Dear Ms. Davis:

Under Section 106 of the National Historic Preservation Act of 1966, as amended, and its implementing regulations, 36 CFR 800, Marine Corps Air Station (MCAS) Yuma is initializing consultation for a proposed MV-22 facilities project on the Barry M. Goldwater Range West (BMGRW) in southwestern Arizona and the Chocolate Mountain Aerial Gunnery Range (CMAGR) in southeastern California. The proposed project would include nine new Landing Zones (LZs) and two new Drop Zones (DZs) on the BMGRW. Although the enclosed survey report also details the results of the CMAGR portion of the survey in California, we are including and consulting on only those portions on the BMGRW in Arizona.

Naval Facilities Engineering Systems Command, on behalf of MCAS Yuma, contracted Cardno GS, Inc. (Cardno) to conduct an intensive archaeological survey within the Area of Potential Effect (APE) associated with the LZs and DZs. The survey resulted in the recording of three new sites and 65 isolated occurrences (IOs). Cardno relocated one previously recorded site, for which they updated the site form. Prior to the survey, a literature review and records search was conducted for the APE and surrounding one-mile radius. The search revealed that previous archaeological surveys resulted in no historic properties recorded within the APE. None of the newly recorded sites and none of the IOs are eligible for listing in the National Register of Historic Places (NRHP).

Site Number	**Site Description**	**NRHP Determination**
AZ X:8:142(ASM)	Historical Mining Site	Not Eligible
AZ X:8:178 (ASM)	Historical Trash Scatter	Not Eligible
AZ X:8:179 (ASM)	Historical Can and Trash Scatter	Not Eligible
AZ X:8:180 (ASM)	Historical Mining Exploration and Habitation	Not Eligible

MCAS Yuma has made a finding of No Historic Properties Affected for the proposed MV-22 facilities project. A similar letter was emailed on June 17, 2021, to the tribes with whom we typically consult and a matrix of our tribal consultation efforts is enclosed for your records. In addition, MCAS Yuma has prepared a draft Environmental Assessment that will be available for

addition, MCAS Yuma has prepared a draft Environmental Assessment that will be available for public review and comment in August, and we will notify your office of any substantive comments that we receive. We appreciate your input and thank you for your interest in our cultural resources program. If you have any comments or questions concerning consultation of this project, please contact Karla James, MCAS Yuma Archaeologist, at (928) 269-2288 or karla.james@usmc.mil.

Sincerely,

WILLIAM R. SELLARS
By direction of the
Commanding Officer

Enclosures: 1. Archaeological Survey of 2,004 Acres for the Proposed Cactus West MV-22 Landing Zones, Drop Zones, Assault Landing Zone, and Artillery Firing Area on the Barry M. Goldwater Range-West, Yuma County, Arizona and on the Chocolate Mountain Aerial Gunnery Range, Imperial County, California
2. Consultation Matrix

The Arizona State Historic Preservation Office concurs with MCAS Yuma's determinations of eligibility and finding of No Historic Properties Affected for the portion of the project within Arizona.

Erin Davis
Arizona State Historic Preservation Office
August 19, 2021

UNITED STATES MARINE CORPS
MARINE CORPS AIR STATION YUMA
BOX 99100
YUMA, ARIZONA 85369-9100

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Naval Facilities Engineering Systems Command, on behalf of MCAS Yuma, contracted Cardno GS, Inc. (Cardno) to conduct an intensive archaeological survey within the Area of Potential Effect (APE) associated with the LZs and DZs. The survey resulted in the recording of three new sites and 65 isolated occurrences (IOs). Cardno relocated one previously recorded site, for which they updated the site form. Prior to the survey, a literature review and records search was conducted for the APE and surrounding one-mile radius. The search revealed that previous archaeological surveys resulted in no historic properties recorded within the APE. None of the newly recorded sites and none of the IOs are eligible for listing in the National Register of Historic Places (NRHP).

Site Number	**Site Description**	**NRHP Determination**
AZ X:8:142(ASM)	Historical Mining Site	Not Eligible
AZ X:8:178 (ASM)	Historical Trash Scatter	Not Eligible
AZ X:8:179 (ASM)	Historical Can and Trash Scatter	Not Eligible
AZ X:8:180 (ASM)	Historical Mining Exploration and Habitation	Not Eligible

MCAS Yuma has made a finding of No Historic Properties Affected for the proposed MV-22 facilities project. A similar letter was emailed on June 17, 2021, to the tribes with whom we typically consult and a matrix of our tribal consultation efforts is enclosed for your records. In addition, MCAS Yuma has prepared a draft Environmental Assessment that will be available for

addition, MCAS Yuma has prepared a draft Environmental Assessment that will be available for public review and comment in August, and we will notify your office of any substantive comments that we receive. We appreciate your input and thank you for your interest in our cultural resources program. If you have any comments or questions concerning consultation of this project, please contact Karla James, MCAS Yuma Archaeologist, at (928) 269-2288 or karla.james@usmc.mil.

Sincerely,

WILLIAM R. SELLARS
By direction of the
Commanding Officer

Enclosures: 1. Archaeological Survey of 2,004 Acres for the Proposed Cactus West MV-22 Landing Zones, Drop Zones, Assault Landing Zone, and Artillery Firing Area on the Barry M. Goldwater Range-West, Yuma County, Arizona and on the Chocolate Mountain Aerial Gunnery Range, Imperial County, California
2. Consultation Matrix

James CIV Karla K

From: James CIV Karla K
Sent: Wednesday, July 28, 2021 7:46 AM
To: Erin Davis
Subject: RE: [Non-DoD Source] Re: Initial Project Submittal - MV22

Good Morning Erin,

I realized that I did not explain the reason the letter to the Tribes says there are 4 new sites and the SHPO letter says there are 3 new sites. Based on comments from the ASM during concurrent agency review, Cardno realized that their sites with field numbers Cardno 3 and Cardno 4 should be combined into one site because they are less than 100 meters apart. Thus, AZ X:8:180(ASM) consists of Cardno 3 and Cardno 4. Please let me know if you have any questions or need additional information. Thank you. Karla

Karla James, M.A.
Archaeologist/CRM
MCAS Yuma
Range Management
PO Box 99134
Yuma, AZ 85369
(928) 269-2288

From: jroth@azstateparks.gov <jroth@azstateparks.gov> **On Behalf Of** AZSHPO - AZPARKS
Sent: Tuesday, July 27, 2021 9:38 AM
To: James CIV Karla K <karla.james@usmc.mil>
Subject: [Non-DoD Source] Re: Initial Project Submittal - MV22

Your Project (and additional files) Have Been Received...Thank You.

Arizona State Historic Preservation Office

On Tue, Jul 27, 2021 at 9:09 AM James CIV Karla K <karla.james@usmc.mil> wrote:

> Good Morning,
>
> Attached for SHPO review and concurrence is MCAS Yuma's letter and consultation matrix for our MV22 Project. Due to the size of the report, it is being sent along with all enclosures via DoD SAFE. You will be receiving an email shortly with download instructions and a password.
>
> Please let me know if you have any questions.

V/r Karla

Karla James, M.A.

Archaeologist/CRM

MCAS Yuma

Range Management

PO Box 99134

Yuma, AZ 85369

(928) 269-2288

UNITED STATES MARINE CORPS
MARINE CORPS AIR STATION YUMA
BOX 99100
YUMA, ARIZONA 85369-9100

5090
YRMD/KJ
July 27, 2021

Ms. Julianne Polanco
SHPO
Historic Preservation Office
1725 23rd St., Ste. 100
Sacramento, California 95816

Dear Ms. Polanco:

Under Section 106 of the National Historic Preservation Act of 1966, as amended, and its implementing regulations, 36 CFR 800, Marine Corps Air Station (MCAS) Yuma is initializing consultation for a proposed MV-22 facilities project on the Chocolate Mountain Aerial Gunnery Range (CMAGR) in southeastern California and the Barry M. Goldwater Range West (BMGRW) in southwestern Arizona. The proposed project would include three LZs, one Assault Landing Zone (ALZ), and one Artillery Firing Area (AFA) on the CMAGR. Although the enclosed survey report also details the results of the BMGRW portions of the survey in Arizona, we are including and consulting on only those portions on the CMAGR in California.

Naval Facilities Engineering Systems Command, on behalf of MCAS Yuma, Cardno GS, Inc. (Cardno) to conduct an intensive archaeological survey within the Area of Potential Effect (APE) associated with the LZs, the ALZ, and the AFA. The survey resulted in the recording of no new sites and 12 isolated occurrences (IOs). Prior to the survey, a literature review and records search was conducted for the APE and surrounding one-mile radius. The search revealed that previous archaeological surveys resulted in two historical-period sites recorded within the APE (P-13-017027 and CA-IMP-10184). P-13-017027 is a road that has been previously determined not eligible and CA-IMP-10184 is a military site that will not be impacted by the proposed project. None of the newly recorded sites and none of the IOs are eligible for listing in the National Register of Historic Places (NRHP).

MCAS Yuma has made a finding of No Historic Properties Affected for the proposed MV-22 facilities project. A similar letter was emailed on June 17, 2021, to the tribes with whom we typically consult and a matrix of our tribal consultation efforts is enclosed for your records. In addition, MCAS Yuma has prepared a draft Environmental Assessment that will be available for public review and comment in August, and we will notify your office of any substantive comments that we receive. We appreciate your input and thank you for your interest in our cultural resources program. If you have any comments or questions concerning consultation of this project, please contact Karla James, MCAS Yuma Archaeologist, at (928) 269-2288 or karla.james@usmc.mil.

Sincerely,

WILLIAM R. SELLARS
By direction of the
Commanding Officer

Enclosures: 1. Archaeological Survey of 2,004 Acres for the Proposed Cactus West MV-22 Landing Zones, Drop Zones, Assault Landing Zone, and Artillery Firing Area on the Barry M. Goldwater Range-West, Yuma County, Arizona and on the Chocolate Mountain Aerial Gunnery Range, Imperial County, California
2. Consultation Matrix

James CIV Karla K

From: James CIV Karla K
Sent: Wednesday, July 28, 2021 11:20 AM
To: OHP, CALSHPO@Parks (CALSHPO.OHP@parks.ca.gov)
Cc: English CIV Randy J; Sellars CIV William R
Subject: RE: Initial Project Submittal - MV22

Importance: High

Good Morning,

I am writing to update you on an eligibility determination that we neglected to make and inform you of in our letter relayed to you with the below email.

On page 5-42 of the report that we sent via our secure FTP, Cardno recommends CA-IMP-10184 as not eligible for listing in the NRHP. In our letter to you, we stated that the site would not be impacted by the proposed project. While this is still true, in light of the recommendation from Cardno, we respectfully request your concurrence with our determination of Not Eligible for listing on the NRHP for CA-IMP-10184.

I apologize for this oversight and any confusion it may cause. Please let me know if you need any further documentation from us.

Thank you. Karla

Karla James, M.A.
Archaeologist/CRM
MCAS Yuma
Range Management
PO Box 99134
Yuma, AZ 85369
(928) 269-2288

From: James CIV Karla K
Sent: Tuesday, July 27, 2021 9:18 AM
To: OHP, CALSHPO@Parks (CALSHPO.OHP@parks.ca.gov) <CALSHPO.OHP@parks.ca.gov>
Subject: Initial Project Submittal - MV22

Good Morning,

Attached for SHPO review and concurrence is MCAS Yuma's letter and consultation matrix for our MV22 Project. Due to the size of the report, it is being sent along with all enclosures via DoD SAFE. You will be receiving an email shortly with download instructions and a password.

Please let me know if you have any questions.

V/r Karla

Karla James, M.A.
Archaeologist/CRM

MCAS Yuma
Range Management
PO Box 99134
Yuma, AZ 85369
(928) 269-2288

State of California • Natural Resources Agency Gavin Newsom, *Governor*

DEPARTMENT OF PARKS AND RECREATION Armando Quintero, *Director*
OFFICE OF HISTORIC PRESERVATION

Julianne Polanco, State Historic Preservation Officer
1725 23rd Street, Suite 100, Sacramento, CA 95816-7100
Telephone: (916) 445-7000 FAX: (916) 445-7053
calshpo.ohp@parks.ca.gov www.ohp.parks.ca.gov

August 24, 2021

Reply In Reference To: USMC_2021_0727_001

VIA ELECTRONIC MAIL

Mr. William R. Sellars
Marine Corps Air Station Yuma
P. O. Box 99100
Yuma, AZ 85369-9100

RE: Section 106 Consultation for Proposed MV-22 Facilities Project, Marine Corps Air Station Yuma, (USMC 5090, YRMD/KJ of July 27, 2021 and emails of July 28, 2021 and August 11 and 19, 2021)

Dear Mr. Sellars:

The United States Marine Corps (USMC) is initiating consultation regarding their effort to comply with Section 106 of the National Historic Preservation Act of 1966 (54 U.S.C. 306108), as amended, and its implementing regulation found at 36 CFR Part 800.

The USMC proposes to establish MV-22 facilities on the Chocolate Mountain Aerial Gunnery Range, which will include three Landing Zones, one Assault Landing Zone, and one Artillery Firing Area. The proposed undertaking has been described adequately in your submission. The area of potential effect (APE) consists of five separate areas ranging in size from 8.8 to 79.5 acres for a collective total of 178.34 acres.

As documentation for its finding of effect, the USMC has provided an archaeological survey report prepared by Steven Brann, Isla Nelson, and Katie Briscoe (Cardno GS. Inc.) and dated July 26, 2021. A records search of both the USMC cultural resources records and the South Coastal Information Center, San Diego State University, revealed that 12 previous surveys had occurred within portions of the APE between 1977 and 2019. Those surveys identified that a historical military camp (CA-IMP-10184) and a portion of the Niland-Blythe Road (CA-IMP-10383) are located within the APE. Based on the current survey report, the USMC has determined that CA-SDI-10184 is not eligible for listing on the National Register of Historic Places (NRHP) and has requested the SHPO to concur with that determination.

A pedestrian survey of the APE was conducted between March 1 – 23. 2021 by personnel from Cardno GS Inc. and a Native American tribal monitor. No new cultural

resources sites were identified, but eight isolated occurrences (IO) were identified. The IO were historical and included an Army Corps of Engineers survey marker, a possible sealed well head, and trash scatters that were probably associated with the road.

On June 17, 2021, the USMC consulted with 15 tribal governments or groups in regard to the proposed undertaking. As of today, the USMC has received the following response – Jill McCormick, Tribal Historic Preservation Officer, Quechan Tribe requested that cultural awareness/sensitivity training be provided to personnel involved in the implementation of the proposed undertaking. The USMC has agreed to that request.

Based on the records review, the previous surveys, and the tribal consultations, the USMC has determined that a finding of No Historic Properties Affected is appropriate for this proposed undertaking and has requested the SHPO's concurrence with that finding, its determination of eligibility, and its identification of the APE.

The SHPO has reviewed the documentation provided and offers the following comments:

- The SHPO has no objections to identification and delineation of the APE, pursuant to 36 CFR Parts 800.4(a)(1) and 800.16(d);
- If the USMC receives any additional information and/or comments from a Tribe regarding the proposed undertaking, the SHPO requests the USMC to provide that information to us;
- The SHPO concurs that CA-IMP-10184 is not eligible for listing on the NRHP, and
- The SHPO does not object to your finding of No Historic Properties Affected and agrees that it is appropriate for this proposed undertaking, as described above.

Be advised that under certain circumstances, such as an unanticipated discovery or a change in project description, the USMC may have additional future responsibilities for this undertaking under 36 CFR Part 800. Should you encounter cultural artifacts during ground disturbing activities, please halt all work until a qualified archaeologist can be consulted on the nature and significance of such artifacts.

If you have any questions or concerns, please contact Tristan Tozer at (916) 445-7027 or via e-mail at Tristan.Tozer@parks.ca.gov.

Sincerely,

Julianne Polanco
State Historic Preservation Officer

James CIV Karla K

From: Quechan Historic Preservation Officer <historicpreservation@quechantribe.com>
Sent: Monday, August 16, 2021 1:40 PM
To: James CIV Karla K
Subject: RE: [Non-DoD Source] RE: MV22 EA Link

Thank you Karla.

From: James CIV Karla K [mailto:karla.james@usmc.mil]
Sent: Monday, August 16, 2021 1:18 PM
To: Quechan Historic Preservation Officer
Subject: RE: [Non-DoD Source] RE: MV22 EA Link

Hi Jill,

I appreciate your response. Cultural awareness training is already included in mandatory (per Marine Corps Order 3550.10 and Station Order 3710.6J) training for all military and support elements utilizing the MCASY-administered ranges and will continue to be included in said training. As a mitigation measure in the MV-22 EA, we will reiterate the inclusion of cultural awareness/sensitivity training in our mandatory training implementing MCO 3550.10 and StaO 3710.6J.

Thank you. Karla

From: Quechan Historic Preservation Officer <historicpreservation@quechantribe.com>
Sent: Friday, August 13, 2021 2:10 PM
To: James CIV Karla K <karla.james@usmc.mil>
Subject: RE: [Non-DoD Source] RE: MV22 EA Link

Hello Karla,
Thank you for follow up on the EA comments. At this point, we would like to request that cultural sensitivity training be added as a part of the conservation measures.

Jill

From: James CIV Karla K [mailto:karla.james@usmc.mil]
Sent: Friday, August 13, 2021 12:53 PM
To: Quechan Historic Preservation Officer
Subject: RE: [Non-DoD Source] RE: MV22 EA Link

Hi Jill,

With today being the last day for review and comment, I just wanted to follow up with you to see if you had any comments on the EA.

Thanks. Karla

From: Quechan Historic Preservation Officer <historicpreservation@quechantribe.com>
Sent: Monday, August 9, 2021 12:42 PM

To: James CIV Karla K <karla.james@usmc.mil>
Subject: RE: [Non-DoD Source] RE: MV22 EA Link

Thank you for the information.

From: James CIV Karla K [mailto:karla.james@usmc.mil]
Sent: Monday, August 09, 2021 9:50 AM
To: Quechan Historic Preservation Officer
Subject: RE: [Non-DoD Source] RE: MV22 EA Link

Good Morning Jill,

Since we are continuing to consult with every Tribal Nation that has expressed any interest in or concerns with the project, MCAS Yuma did not consider that another consultation letter would be necessary. The review and comment period for the EA is 7 days, ending on August 13. Please let me know if you have any questions or need additional information.

Thanks. Karla

From: Quechan Historic Preservation Officer <historicpreservation@quechantribe.com>
Sent: Monday, August 9, 2021 7:47 AM
To: James CIV Karla K <karla.james@usmc.mil>
Subject: [Non-DoD Source] RE: MV22 EA Link

Good morning Karla,
Will MCAS Yuma be sending out a consultation letter for the Draft EA? Also, what is the length of the review period for the Draft EA?

Jill

From: James CIV Karla K [mailto:karla.james@usmc.mil]
Sent: Friday, August 06, 2021 10:28 AM
To: Jill McCormick (historicpreservation@quechantribe.com)
Cc: English CIV Randy J; Erin Davis
Subject: MV22 EA Link

Good Morning Jill,

As promised, here is the link to the MCAS Yuma MV22 Environmental Assessment:
https://www.mcasyuma.marines.mil/Portals/152/Staff%20and%20Agencies/Range%20Natural%20and%20Cultural%20Resources/Draft%20EA%20Training%20Support%20Areas%20BSTRC%20Aug%202021.pdf?ver=LFRtcUuV5_5G_D6Svbb8Hg%3d%3d

A hard copy will be available at the Yuma Main Library starting tomorrow.

Please let me know if you have any additional questions or comments.

V/r
Karla

UNITED STATES MARINE CORPS
MARINE CORPS AIR STATION YUMA
BOX 99100
YUMA, ARIZONA 85369-9100

5090
YRMD/KJ
June 16, 2021

Mr. Jeff L. Grubbe
Chairman
Agua Caliente Band of Cahuilla Indians
5401 Dinah Shore Drive
Palm Springs, California 92264

Dear Chairman Grubbe:

Under Section 106 of the National Historic Preservation Act of 1966, as amended, and its implementing regulations, 36 CFR 800, Marine Corps Air Station (MCAS) Yuma is initializing government-to-government consultation for a proposed MV-22 facilities project on the Barry M. Goldwater Range West (BMGRW) in southwestern Arizona and the Chocolate Mountain Aerial Gunnery Range (CMAGR) in southeastern California. The proposed project would consist of nine new Landing Zones (LZs) and two new Drop Zones (DZs) on the BMGRW and three LZs, one Assault Landing Zone (ALZ), and one Artillery Firing Area (AFA) on the CMAGR.

MCAS Yuma contracted Cardno GS, Inc. (Cardno) to conduct an intensive archaeological survey within the Area of Potential Effects (APE) associated with the LZs, DZs, ALZ, and AFA. The survey resulted in the recording of 4 new sites and 77 isolated occurrences (IOs). Cardno relocated 3 previously recorded sites, 1 for which they updated the site form. Prior to the survey, a literature review and records search was conducted for the APE and surrounding one-mile radius within the BMGRW and the CMAGR boundaries. The search revealed that previous archaeological surveys resulted in no historic properties recorded within the APE. None of the newly recorded sites and none of the IOs are eligible for listing in the National Register of Historic Places (NRHP).

Field Number	Site Description	Location	NRHP Determination
Cardno 1	Historical Trash Scatter	BMGRW	Not Eligible
Cardno 2	Historical Can and Trash Scatter	BMGRW	Not Eligible
Cardno 3	Historical Mining Exploration	BMGRW	Not Eligible
Cardno 4	Historical Habitation	BMGRW	Not Eligible

MCAS Yuma has made a finding of No Historic Properties Affected for the proposed MV-22 facilities project. We appreciate your input and thank you for your interest in our cultural resources program. If you have any comments concerning properties of traditional, religious, and cultural significance in the vicinity of the proposed project or questions regarding consultation on this project, please contact Karla James, MCAS Yuma Archaeologist, at (928) 269-2288 or karla.james@usmc.mil.

Sincerely,

WILLIAM R. SELLARS
By direction of the
Commanding Officer

Enclosure: Archaeological Survey of 2,004 Acres for the Proposed Cactus West MV-22 Landing Zones, Drop Zones, Assault Landing Zone, and Artillery Firing Area on the Barry M. Goldwater Range-West, Yuma County, Arizona and on the Chocolate Mountain Aerial Gunnery Range, Imperial County, California

Copy to: Ms. Patricia Garcia-Tuck, with enclosure(s)

UNITED STATES MARINE CORPS
MARINE CORPS AIR STATION YUMA
BOX 99100
YUMA, ARIZONA 85369-9100

5090
YRMD/KJ
June 16, 2021

Mr. Robert Miguel
Chairman
Ak-Chin Indian Community
42507 West Peters and Nall Road
Maricopa, Arizona 85138

Dear Chairman Miguel:

Under Section 106 of the National Historic Preservation Act of 1966, as amended, and its implementing regulations, 36 CFR 800, Marine Corps Air Station (MCAS) Yuma is initializing government-to-government consultation for a proposed MV-22 facilities project on the Barry M. Goldwater Range West (BMGRW) in southwestern Arizona and the Chocolate Mountain Aerial Gunnery Range (CMAGR) in southeastern California. The proposed project would consist of nine new Landing Zones (LZs) and two new Drop Zones (DZs) on the BMGRW and three LZs, one Assault Landing Zone (ALZ), and one Artillery Firing Area (AFA) on the CMAGR.

MCAS Yuma contracted Cardno GS, Inc. (Cardno) to conduct an intensive archaeological survey within the Area of Potential Effects (APE) associated with the LZs, DZs, ALZ, and AFA. The survey resulted in the recording of 4 new sites and 77 isolated occurrences (IOs). Cardno relocated 3 previously recorded sites, 1 for which they updated the site form. Prior to the survey, a literature review and records search was conducted for the APE and surrounding one-mile radius within the BMGRW and the CMAGR boundaries. The search revealed that previous archaeological surveys resulted in no historic properties recorded within the APE. None of the newly recorded sites and none of the IOs are eligible for listing in the National Register of Historic Places (NRHP).

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MCAS Yuma has made a finding of No Historic Properties Affected for the proposed MV-22 facilities project. We appreciate your input and thank you for your interest in our cultural resources program. If you have any comments concerning properties of traditional, religious, and cultural significance in the vicinity of the proposed project or questions regarding consultation on this project, please contact Karla James, MCAS Yuma Archaeologist, at (928) 269-2288 or karla.james@usmc.mil.

Sincerely,

WILLIAM R. SELLARS
By direction of the
Commanding Officer

Enclosure: Archaeological Survey of 2,004 Acres for the Proposed Cactus West MV-22 Landing Zones, Drop Zones, Assault Landing Zone, and Artillery Firing Area on the Barry M. Goldwater Range-West, Yuma County, Arizona and on the Chocolate Mountain Aerial Gunnery Range, Imperial County, California

Copy to: Ms. Carmen Narcia, with enclosure(s)

UNITED STATES MARINE CORPS
MARINE CORPS AIR STATION YUMA
BOX 99100
YUMA, ARIZONA 85369-9100

5090
YRMD/KJ
June 16, 2021

Ms. Sherry Cordova
Chairwoman
Cocopah Indian Tribe
14515 South Veterans Drive
Somerton, Arizona 85350

Dear Chairwoman Cordova:

Under Section 106 of the National Historic Preservation Act of 1966, as amended, and its implementing regulations, 36 CFR 800, Marine Corps Air Station (MCAS) Yuma is initializing government-to-government consultation for a proposed MV-22 facilities project on the Barry M. Goldwater Range West (BMGRW) in southwestern Arizona and the Chocolate Mountain Aerial Gunnery Range (CMAGR) in southeastern California. The proposed project would consist of nine new Landing Zones (LZs) and two new Drop Zones (DZs) on the BMGRW and three LZs, one Assault Landing Zone (ALZ), and one Artillery Firing Area (AFA) on the CMAGR.

MCAS Yuma contracted Cardno GS, Inc. (Cardno) to conduct an intensive archaeological survey within the Area of Potential Effects (APE) associated with the LZs, DZs, ALZ, and AFA. The survey resulted in the recording of 4 new sites and 77 isolated occurrences (IOs). Cardno relocated 3 previously recorded sites, 1 for which they updated the site form. Prior to the survey, a literature review and records search was conducted for the APE and surrounding one-mile radius within the BMGRW and the CMAGR boundaries. The search revealed that previous archaeological surveys resulted in no historic properties recorded within the APE. None of the newly recorded sites and none of the IOs are eligible for listing in the National Register of Historic Places (NRHP).

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MCAS Yuma has made a finding of No Historic Properties Affected for the proposed MV-22 facilities project. We appreciate your input and thank you for your interest in our cultural resources program. If you have any comments concerning properties of traditional, religious, and cultural significance in the vicinity of the proposed project or questions regarding consultation on this project, please contact Karla James, MCAS Yuma Archaeologist, at (928) 269-2288 or karla.james@usmc.mil.

Sincerely,

WILLIAM R. SELLARS
By direction of the
Commanding Officer

Enclosure: Archaeological Survey of 2,004 Acres for the Proposed Cactus West MV-22 Landing Zones, Drop Zones, Assault Landing Zone, and Artillery Firing Area on the Barry M. Goldwater Range-West, Yuma County, Arizona and on the Chocolate Mountain Aerial Gunnery Range, Imperial County, California

Copy to: Mr. Justin Brundin, with enclosure(s)

UNITED STATES MARINE CORPS
MARINE CORPS AIR STATION YUMA
BOX 99100
YUMA, ARIZONA 85369-9100

5090
YRMD/KJ
June 16, 2021

Mr. Bryan Etsitty
Acting Director, THPO
Colorado River Indian Tribes
26600 Mohave Rd.
Parker, Arizona 85344

Dear Mr. Etsitty:

Under Section 106 of the National Historic Preservation Act of 1966, as amended, and its implementing regulations, 36 CFR 800, Marine Corps Air Station (MCAS) Yuma is initializing government-to-government consultation for a proposed MV-22 facilities project on the Barry M. Goldwater Range West (BMGRW) in southwestern Arizona and the Chocolate Mountain Aerial Gunnery Range (CMAGR) in southeastern California. The proposed project would consist of nine new Landing Zones (LZs) and two new Drop Zones (DZs) on the BMGRW and three LZs, one Assault Landing Zone (ALZ), and one Artillery Firing Area (AFA) on the CMAGR.

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Sincerely,

WILLIAM R. SELLARS
By direction of the
Commanding Officer

Enclosure: Archaeological Survey of 2,004 Acres for the Proposed Cactus West MV-22 Landing Zones, Drop Zones, Assault Landing Zone, and Artillery Firing Area on the Barry M. Goldwater Range-West, Yuma County, Arizona and on the Chocolate Mountain Aerial Gunnery Range, Imperial County, California

UNITED STATES MARINE CORPS
MARINE CORPS AIR STATION YUMA
BOX 99100
YUMA, ARIZONA 85369-9100

5090
YRMD/KJ
June 16, 2021

Mr. Timothy Williams
Chairman
Fort Mojave Indian Tribe
500 Merriman Avenue
Needles, California 92363

Dear Chairman Williams:

Under Section 106 of the National Historic Preservation Act of 1966, as amended, and its implementing regulations, 36 CFR 800, Marine Corps Air Station (MCAS) Yuma is initializing government-to-government consultation for a proposed MV-22 facilities project on the Barry M. Goldwater Range West (BMGRW) in southwestern Arizona and the Chocolate Mountain Aerial Gunnery Range (CMAGR) in southeastern California. The proposed project would consist of nine new Landing Zones (LZs) and two new Drop Zones (DZs) on the BMGRW and three LZs, one Assault Landing Zone (ALZ), and one Artillery Firing Area (AFA) on the CMAGR.

MCAS Yuma contracted Cardno GS, Inc. (Cardno) to conduct an intensive archaeological survey within the Area of Potential Effects (APE) associated with the LZs, DZs, ALZ, and AFA. The survey resulted in the recording of 4 new sites and 77 isolated occurrences (IOs). Cardno relocated 3 previously recorded sites, 1 for which they updated the site form. Prior to the survey, a literature review and records search was conducted for the APE and surrounding one-mile radius within the BMGRW and the CMAGR boundaries. The search revealed that previous archaeological surveys resulted in no historic properties recorded within the APE. None of the newly recorded sites and none of the IOs are eligible for listing in the National Register of Historic Places (NRHP).

Field Number	Site Description	Location	NRHP Determination
Cardno 1	Historical Trash Scatter	BMGRW	Not Eligible
Cardno 2	Historical Can and Trash Scatter	BMGRW	Not Eligible
Cardno 3	Historical Mining Exploration	BMGRW	Not Eligible
Cardno 4	Historical Habitation	BMGRW	Not Eligible

MCAS Yuma has made a finding of No Historic Properties Affected for the proposed MV-22 facilities project. We appreciate your input and thank you for your interest in our cultural resources program. If you have any comments concerning properties of traditional, religious, and cultural significance in the vicinity of the proposed project or questions regarding consultation on this project, please contact Karla James, MCAS Yuma Archaeologist, at (928) 269-2288 or karla.james@usmc.mil.

Sincerely,

WILLIAM R. SELLARS
By direction of the
Commanding Officer

Enclosure: Archaeological Survey of 2,004 Acres for the Proposed Cactus West MV-22 Landing Zones, Drop Zones, Assault Landing Zone, and Artillery Firing Area on the Barry M. Goldwater Range-West, Yuma County, Arizona and on the Chocolate Mountain Aerial Gunnery Range, Imperial County, California

Copy to: Ms. Linda Otero, with enclosure(s)

UNITED STATES MARINE CORPS
MARINE CORPS AIR STATION YUMA
BOX 99100
YUMA, ARIZONA 85369-9100

5090
YRMD/KJ
June 16, 2021

Mr. Jordan Joaquin
President
Fort Yuma Quechan Tribe
P.O. Box 1899
Yuma, Arizona 85366

Dear President Joaquin:

Under Section 106 of the National Historic Preservation Act of 1966, as amended, and its implementing regulations, 36 CFR 800, Marine Corps Air Station (MCAS) Yuma is initializing government-to-government consultation for a proposed MV-22 facilities project on the Barry M. Goldwater Range West (BMGRW) in southwestern Arizona and the Chocolate Mountain Aerial Gunnery Range (CMAGR) in southeastern California. The proposed project would consist of nine new Landing Zones (LZs) and two new Drop Zones (DZs) on the BMGRW and three LZs, one Assault Landing Zone (ALZ), and one Artillery Firing Area (AFA) on the CMAGR.

MCAS Yuma contracted Cardno GS, Inc. (Cardno) to conduct an intensive archaeological survey within the Area of Potential Effects (APE) associated with the LZs, DZs, ALZ, and AFA. The survey resulted in the recording of 4 new sites and 77 isolated occurrences (IOs). Cardno relocated 3 previously recorded sites, 1 for which they updated the site form. Prior to the survey, a literature review and records search was conducted for the APE and surrounding one-mile radius within the BMGRW and the CMAGR boundaries. The search revealed that previous archaeological surveys resulted in no historic properties recorded within the APE. None of the newly recorded sites and none of the IOs are eligible for listing in the National Register of Historic Places (NRHP).

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Sincerely,

WILLIAM R. SELLARS
By direction of the
Commanding Officer

Enclosure: Archaeological Survey of 2,004 Acres for the Proposed Cactus West MV-22 Landing Zones, Drop Zones, Assault Landing Zone, and Artillery Firing Area on the Barry M. Goldwater Range-West, Yuma County, Arizona and on the Chocolate Mountain Aerial Gunnery Range, Imperial County, California

Copy to: Mr. Manfred Scott and Ms. Jill McCormick, with enclosure(s)

UNITED STATES MARINE CORPS
MARINE CORPS AIR STATION YUMA
BOX 99100
YUMA, ARIZONA 85369-9100

5090
YRMD/KJ
June 16, 2021

Mr. Stephen Lewis
Governor
Gila River Indian Community
P.O. Box 97
Sacaton, Arizona 85147

Dear Governor Lewis:

Under Section 106 of the National Historic Preservation Act of 1966, as amended, and its implementing regulations, 36 CFR 800, Marine Corps Air Station (MCAS) Yuma is initializing government-to-government consultation for a proposed MV-22 facilities project on the Barry M. Goldwater Range West (BMGRW) in southwestern Arizona and the Chocolate Mountain Aerial Gunnery Range (CMAGR) in southeastern California. The proposed project would consist of nine new Landing Zones (LZs) and two new Drop Zones (DZs) on the BMGRW and three LZs, one Assault Landing Zone (ALZ), and one Artillery Firing Area (AFA) on the CMAGR.

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Sincerely,

WILLIAM R. SELLARS
By direction of the
Commanding Officer

Enclosure: Archaeological Survey of 2,004 Acres for the Proposed Cactus West MV-22 Landing Zones, Drop Zones, Assault Landing Zone, and Artillery Firing Area on the Barry M. Goldwater Range-West, Yuma County, Arizona and on the Chocolate Mountain Aerial Gunnery Range, Imperial County, California

Copy to: GRIC-THPO, with enclosure(s)

UNITED STATES MARINE CORPS
MARINE CORPS AIR STATION YUMA
BOX 99100
YUMA, ARIZONA 85369-9100

5090
YRMD/KJ
June 16, 2021

Ms. Christina C. Andrews
Chairwoman
Hia-Ced Hemajkam
10710 E. Pathside Dr.
Tucson, Arizona 85748

Dear Ms. Andrews:

Under Section 106 of the National Historic Preservation Act of 1966, as amended, and its implementing regulations, 36 CFR 800, Marine Corps Air Station (MCAS) Yuma is initializing government-to-government consultation for a proposed MV-22 facilities project on the Barry M. Goldwater Range West (BMGRW) in southwestern Arizona and the Chocolate Mountain Aerial Gunnery Range (CMAGR) in southeastern California. The proposed project would consist of nine new Landing Zones (LZs) and two new Drop Zones (DZs) on the BMGRW and three LZs, one Assault Landing Zone (ALZ), and one Artillery Firing Area (AFA) on the CMAGR.

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Cardno 3	Historical Mining Exploration	BMGRW	Not Eligible
Cardno 4	Historical Habitation	BMGRW	Not Eligible

MCAS Yuma has made a finding of No Historic Properties Affected for the proposed MV-22 facilities project. We appreciate your input and thank you for your interest in our cultural resources program. If you have any comments concerning properties of traditional, religious, and cultural significance in the vicinity of the proposed project or questions regarding consultation on this project, please contact Karla James, MCAS Yuma Archaeologist, at (928) 269-2288 or karla.james@usmc.mil.

Sincerely,

WILLIAM R. SELLARS
By direction of the
Commanding Officer

Enclosure: Archaeological Survey of 2,004 Acres for the Proposed Cactus West MV-22 Landing Zones, Drop Zones, Assault Landing Zone, and Artillery Firing Area on the Barry M. Goldwater Range-West, Yuma County, Arizona and on the Chocolate Mountain Aerial Gunnery Range, Imperial County, California

UNITED STATES MARINE CORPS
MARINE CORPS AIR STATION YUMA
BOX 99100
YUMA, ARIZONA 85369-9100

5090
YRMD/KJ
June 16, 2021

Mr. Timothy Nuvangyaoma
Chairman
Hopi Tribe
P.O. Box 123
Kykotsmovi, Arizona 86039

Dear Chairman Nuvangyaoma:

Under Section 106 of the National Historic Preservation Act of 1966, as amended, and its implementing regulations, 36 CFR 800, Marine Corps Air Station (MCAS) Yuma is initializing government-to-government consultation for a proposed MV-22 facilities project on the Barry M. Goldwater Range West (BMGRW) in southwestern Arizona and the Chocolate Mountain Aerial Gunnery Range (CMAGR) in southeastern California. The proposed project would consist of nine new Landing Zones (LZs) and two new Drop Zones (DZs) on the BMGRW and three LZs, one Assault Landing Zone (ALZ), and one Artillery Firing Area (AFA) on the CMAGR.

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Cardno 3	Historical Mining Exploration	BMGRW	Not Eligible
Cardno 4	Historical Habitation	BMGRW	Not Eligible

MCAS Yuma has made a finding of No Historic Properties Affected for the proposed MV-22 facilities project. We appreciate your input and thank you for your interest in our cultural resources program. If you have any comments concerning properties of traditional, religious, and cultural significance in the vicinity of the proposed project or questions regarding consultation on this project, please contact Karla James, MCAS Yuma Archaeologist, at (928) 269-2288 or karla.james@usmc.mil.

Sincerely,

WILLIAM R. SELLARS
By direction of the
Commanding Officer

Enclosure: Archaeological Survey of 2,004 Acres for the Proposed Cactus West MV-22 Landing Zones, Drop Zones, Assault Landing Zone, and Artillery Firing Area on the Barry M. Goldwater Range-West, Yuma County, Arizona and on the Chocolate Mountain Aerial Gunnery Range, Imperial County, California

Copy to: Mr. Stewart Koyiyumptewa, with enclosure(s)

UNITED STATES MARINE CORPS
MARINE CORPS AIR STATION YUMA
BOX 99100
YUMA, ARIZONA 85369-9100

5090
YRMD/KJ
June 16, 2021

Mr. Val R. Panteah
Governor
Pueblo of Zuni
P.O. Box 339
Zuni, New Mexico 87327

Dear Governor Panteah:

Under Section 106 of the National Historic Preservation Act of 1966, as amended, and its implementing regulations, 36 CFR 800, Marine Corps Air Station (MCAS) Yuma is initializing government-to-government consultation for a proposed MV-22 facilities project on the Barry M. Goldwater Range West (BMGRW) in southwestern Arizona and the Chocolate Mountain Aerial Gunnery Range (CMAGR) in southeastern California. The proposed project would consist of nine new Landing Zones (LZs) and two new Drop Zones (DZs) on the BMGRW and three LZs, one Assault Landing Zone (ALZ), and one Artillery Firing Area (AFA) on the CMAGR.

MCAS Yuma contracted Cardno GS, Inc. (Cardno) to conduct an intensive archaeological survey within the Area of Potential Effects (APE) associated with the LZs, DZs, ALZ, and AFA. The survey resulted in the recording of 4 new sites and 77 isolated occurrences (IOs). Cardno relocated 3 previously recorded sites, 1 for which they updated the site form. Prior to the survey, a literature review and records search was conducted for the APE and surrounding one-mile radius within the BMGRW and the CMAGR boundaries. The search revealed that previous archaeological surveys resulted in no historic properties recorded within the APE. None of the newly recorded sites and none of the IOs are eligible for listing in the National Register of Historic Places (NRHP).

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Cardno 3	Historical Mining Exploration	BMGRW	Not Eligible
Cardno 4	Historical Habitation	BMGRW	Not Eligible

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Sincerely,

WILLIAM R. SELLARS
By direction of the
Commanding Officer

Enclosure: Archaeological Survey of 2,004 Acres for the Proposed Cactus West MV-22 Landing Zones, Drop Zones, Assault Landing Zone, and Artillery Firing Area on the Barry M. Goldwater Range-West, Yuma County, Arizona and on the Chocolate Mountain Aerial Gunnery Range, Imperial County, California

Copy to: Mr. Kurt Dongoske, with enclosure(s)

UNITED STATES MARINE CORPS
MARINE CORPS AIR STATION YUMA
BOX 99100
YUMA, ARIZONA 85369-9100

5090
YRMD/KJ
June 16, 2021

Mr. Martin Harvier
President
Salt River Pima-Maricopa Indian Community
10005 East Osborn Road
Scottsdale, Arizona 85256

Dear President Harvier:

Under Section 106 of the National Historic Preservation Act of 1966, as amended, and its implementing regulations, 36 CFR 800, Marine Corps Air Station (MCAS) Yuma is initializing government-to-government consultation for a proposed MV-22 facilities project on the Barry M. Goldwater Range West (BMGRW) in southwestern Arizona and the Chocolate Mountain Aerial Gunnery Range (CMAGR) in southeastern California. The proposed project would consist of nine new Landing Zones (LZs) and two new Drop Zones (DZs) on the BMGRW and three LZs, one Assault Landing Zone (ALZ), and one Artillery Firing Area (AFA) on the CMAGR.

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Cardno 3	Historical Mining Exploration	BMGRW	Not Eligible
Cardno 4	Historical Habitation	BMGRW	Not Eligible

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Sincerely,

WILLIAM R. SELLARS
By direction of the
Commanding Officer

Enclosure: Archaeological Survey of 2,004 Acres for the Proposed Cactus West MV-22 Landing Zones, Drop Zones, Assault Landing Zone, and Artillery Firing Area on the Barry M. Goldwater Range-West, Yuma County, Arizona and on the Chocolate Mountain Aerial Gunnery Range, Imperial County, California

Copy to: Ms. Angela Garcia-Lewis, with enclosure(s)

UNITED STATES MARINE CORPS
MARINE CORPS AIR STATION YUMA
BOX 99100
YUMA, ARIZONA 85369-9100

5090
YRMD/KJ
June 16, 2021

Mr. Peter Steere
Mr. Jefford Francisco
Tohono O'Odham Nation
P.O. Box 837
Sells, Arizona 85634

Dear Mssrs. Steere and Francisco:

Under Section 106 of the National Historic Preservation Act of 1966, as amended, and its implementing regulations, 36 CFR 800, Marine Corps Air Station (MCAS) Yuma is initializing government-to-government consultation for a proposed MV-22 facilities project on the Barry M. Goldwater Range West (BMGRW) in southwestern Arizona and the Chocolate Mountain Aerial Gunnery Range (CMAGR) in southeastern California. The proposed project would consist of nine new Landing Zones (LZs) and two new Drop Zones (DZs) on the BMGRW and three LZs, one Assault Landing Zone (ALZ), and one Artillery Firing Area (AFA) on the CMAGR.

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Sincerely,

WILLIAM R. SELLARS
By direction of the
Commanding Officer

Enclosure: Archaeological Survey of 2,004 Acres for the Proposed Cactus West MV-22 Landing Zones, Drop Zones, Assault Landing Zone, and Artillery Firing Area on the Barry M. Goldwater Range-West, Yuma County, Arizona and on the Chocolate Mountain Aerial Gunnery Range, Imperial County, California

UNITED STATES MARINE CORPS
MARINE CORPS AIR STATION YUMA
BOX 99100
YUMA, ARIZONA 85369-9100

5090
YRMD/KJ
June 16, 2021

Mr. Thomas Tortez
Chairman
Torres-Martinez Desert Cahuilla Indians
P.O. Box 1160
Thermal, California 92274

Dear Chairman Tortez:

Under Section 106 of the National Historic Preservation Act of 1966, as amended, and its implementing regulations, 36 CFR 800, Marine Corps Air Station (MCAS) Yuma is initializing government-to-government consultation for a proposed MV-22 facilities project on the Barry M. Goldwater Range West (BMGRW) in southwestern Arizona and the Chocolate Mountain Aerial Gunnery Range (CMAGR) in southeastern California. The proposed project would consist of nine new Landing Zones (LZs) and two new Drop Zones (DZs) on the BMGRW and three LZs, one Assault Landing Zone (ALZ), and one Artillery Firing Area (AFA) on the CMAGR.

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Sincerely,

WILLIAM R. SELLARS
By direction of the
Commanding Officer

Enclosure: Archaeological Survey of 2,004 Acres for the Proposed Cactus West MV-22 Landing Zones, Drop Zones, Assault Landing Zone, and Artillery Firing Area on the Barry M. Goldwater Range-West, Yuma County, Arizona and on the Chocolate Mountain Aerial Gunnery Range, Imperial County, California

Copy to: Mr. Michael Mirelez, with enclosure(s)

UNITED STATES MARINE CORPS
MARINE CORPS AIR STATION YUMA
BOX 99100
YUMA, ARIZONA 85369-9100

5090
YRMD/KJ
June 16, 2021

Mr. Chris Coder
Tribal Archaeologist
Yavapai-Apache Nation
2400 W. Datsi St.
Camp Verde, Arizona 86322

Dear Mr. Coder:

Under Section 106 of the National Historic Preservation Act of 1966, as amended, and its implementing regulations, 36 CFR 800, Marine Corps Air Station (MCAS) Yuma is initializing government-to-government consultation for a proposed MV-22 facilities project on the Barry M. Goldwater Range West (BMGRW) in southwestern Arizona and the Chocolate Mountain Aerial Gunnery Range (CMAGR) in southeastern California. The proposed project would consist of nine new Landing Zones (LZs) and two new Drop Zones (DZs) on the BMGRW and three LZs, one Assault Landing Zone (ALZ), and one Artillery Firing Area (AFA) on the CMAGR.

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Sincerely,

WILLIAM R. SELLARS
By direction of the
Commanding Officer

Enclosure: Archaeological Survey of 2,004 Acres for the Proposed Cactus West MV-22 Landing Zones, Drop Zones, Assault Landing Zone, and Artillery Firing Area on the Barry M. Goldwater Range-West, Yuma County, Arizona and on the Chocolate Mountain Aerial Gunnery Range, Imperial County, California

UNITED STATES MARINE CORPS
MARINE CORPS AIR STATION YUMA
BOX 99100
YUMA, ARIZONA 85369-9100

5090
YRMD/KJ
June 16, 2021

Mr. Robert Ogo
President
Yavapai-Prescott Indian Tribe
530 East Merritt Street
Prescott, Arizona 86301

Dear President Ogo:

Under Section 106 of the National Historic Preservation Act of 1966, as amended, and its implementing regulations, 36 CFR 800, Marine Corps Air Station (MCAS) Yuma is initializing government-to-government consultation for a proposed MV-22 facilities project on the Barry M. Goldwater Range West (BMGRW) in southwestern Arizona and the Chocolate Mountain Aerial Gunnery Range (CMAGR) in southeastern California. The proposed project would consist of nine new Landing Zones (LZs) and two new Drop Zones (DZs) on the BMGRW and three LZs, one Assault Landing Zone (ALZ), and one Artillery Firing Area (AFA) on the CMAGR.

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Sincerely,

WILLIAM R. SELLARS
By direction of the
Commanding Officer

Enclosure: Archaeological Survey of 2,004 Acres for the Proposed Cactus West MV-22 Landing Zones, Drop Zones, Assault Landing Zone, and Artillery Firing Area on the Barry M. Goldwater Range-West, Yuma County, Arizona and on the Chocolate Mountain Aerial Gunnery Range, Imperial County, California

Copy to: Ms. Linda Ogo, with enclosure(s)

From: Law CIV Robert P
To: Jenness McBride
Cc: James, Vincent P
Subject: CMAGR MV-22 Formal Consultation
Date: Wednesday, June 23, 2021 12:47:00 PM
Attachments: MV-22 USFWS Consultation Letter_BL_signed.pdf
Final BA MV-22 LZ"s_BL.pdf
Final MV-22 Desert Tortoise Survey Report_BL.pdf

Ms. McBride

MCASY request to initiate formal consultation with USFWS on the attached project. Attachments include a request letter, final BA, and DT survey report. I have been working with Mr. James, and he is familiar with the project. I look forward to working with USFWS on this consultation. If you have any questions or concerns please let me know.

Thanks,

Bobby Law
Biologist/Natural Resources Section
Range Management Dept/MCAS
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FINAL
BIOLOGICAL ASSESSMENT
FOR CACTUS WEST MV-22 LANDING ZONES, ASSAULT LANDING ZONES, AND DROP ZONES MARINE CORPS AIR STATION, YUMA

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Naval Facilities Engineering Systems Command Southwest
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JUNE 2021

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ACRONYMS AND ABBREVIATIONS

Acronym	Definition
AFA	artillery firing area
ALZ	assault landing zone
BA	Biological Assessment
BMGR-West	Barry M. Goldwater Range-West
BO	biological opinion
BSTRC	Bob Stump Training Range Complex
C.F.R.	Code of Federal Regulations
CMAGR	Chocolate Mountain Aerial Gunnery Range
DZ	drop zone
EOD	Explosives Ordnance Disposal
ESA	Endangered Species Act
FCR	Field Contact Representative
km	kilometer
LZ	landing zone
MAW	Marine Aircraft Wing
MAWTS-1	Marine Aviation Weapons and Tactics Squadron One
MCASY	Marine Corps Air Station Yuma
MCL	mean carapace length
mm	millimeter(s)
DON	Department of the Navy
StaO	Station Order
TTP	Tactical Training Procedure
U.S.	United States
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
USMC	United States Marine Corps
VegCAMP	Vegetation Classification and Mapping Program
WTI	Weapons and Tactics Instructor

EXECUTIVE SUMMARY

The United States Marine Corps (USMC) has prepared this Biological Assessment (BA) in accordance with Section 7(a)(2) of the Endangered Species Act and as required by 50 Code of Federal Regulations 402.14(c) to facilitate consultation between the USMC and the U.S. Fish and Wildlife Service (USFWS) regarding potential effects to Mojave desert tortoise (*Gopherus agassizii*) from the Proposed Action.

Under the Proposed Action, the USMC proposes to establish and use landing zones (LZs), an assault landing zone (ALZ), drop zones (DZs), and an artillery firing area (AFA) at the two tactical ranges within the Bob Stump Training Range Complex (BSTRC): the Chocolate Mountain Aerial Gunnery Range (CMAGR), California and the Barry M. Goldwater Range-West, Arizona. The USMC does not propose to increase the quantity of sorties flown, increase the amount and/or types of ordnance expended, increase artillery training tempo, or alter the existing facilities or airspace within the BSTRC under the Proposed Action. This BA only analyzes the portion of the Proposed Action that occurs on the CMAGR, for which new DZs are not proposed. The Proposed Action does not include any new construction or permanent landscape alteration but includes the establishment of seven proposed training support areas: five LZs, one ALZ, and one AFA. This requires grading, blading, vegetation trimming for aircraft safety purposes, and the application of a liquid copolymer dust palliative, which may be applied to the LZs for dust suppression to provide a safe landing environment.

In support of this BA, focused desert tortoise surveys were conducted in March 2021 within the seven proposed training support areas at the CMAGR, totaling 1,410.6 acres. Live desert tortoise, their sign (i.e., scat, carcasses, eggshell fragments, etc.), or potential burrows were found in the majority of the proposed training support areas and, therefore, all areas within the Proposed Action are considered occupied by desert tortoise. All proposed training support areas are located within the Colorado Desert Recovery Unit of the desert tortoise, and several on the east side of the Chocolate Mountains are located within federally designated critical habitat for the desert tortoise.

To avoid, minimize, and compensate for potential consequences of the Proposed Action, multiple measures detailed in previous biological opinions (BOs) (1-6-95-F-40 [USFWS 1996]; FWS-IMP-15B0239-16F-0039 [USFWS 2015]); and the *Integrated Natural Resources Management Plan for the Chocolate Mountains Aerial Gunnery Range, California* (MCASY 2017) would be implemented.

In summary, this BA concludes the Proposed Action may affect and is likely to adversely affect the desert tortoise and desert tortoise critical habitat (see Table ES-1).

Table ES-1. Summary of Findings for the Desert Tortoise and Desert Tortoise Critical Habitat

Species or Habitat	Effects Determination
Desert Tortoise	May affect and is likely to adversely affect.
Desert Tortoise Critical Habitat	May affect and is likely to adversely affect.

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CHAPTER 1
INTRODUCTION

This Biological Assessment (BA) provides the information necessary to support consultation between the United States Marine Corps (USMC) and the U.S. Fish and Wildlife Service (USFWS), as required by 50 Code of Federal Regulations (C.F.R.) 402.14(c) and Section 7 of the federal Endangered Species Act (ESA) of 1973, as amended. The USMC proposes to establish and use landing zones (LZs), an assault landing zone (ALZ), drop zones (DZs), and an artillery firing area (AFA) at the two tactical ranges within the Bob Stump Training Range Complex (BSTRC): the Chocolate Mountain Aerial Gunnery Range (CMAGR) and the Barry M. Goldwater Range-West (BMGR-West). Expansion of training support areas in the BSTRC is essential to accomplishing critical Marine Corps and Naval Tactical Training Procedures (TTPs), Training and Readiness Codes, and Large Force Exercises.

Marine Corps Air Station Yuma (MCASY) manages the BSTRC, which consists of Department of Defense-controlled airspace and Department of the Navy (DON)/USMC-controlled training ranges, including the CMAGR in southeastern California and the BMGR-West in southwestern Arizona. The CMAGR, lying on a southeast-northwest axis, is located in north-central Imperial County and south-central Riverside County, California (Figure 1). The CMAGR is generally bound on the west by the Salton Sea Basin and on the east by the Chuckwalla and Palo Verde mountains.

For the purposes of this BA, only those portions of the Proposed Action that would occur within the CMAGR are analyzed. The DZs, which are proposed only on the BMGR-West, are not located within the range of the desert tortoise and are not discussed within this BA. Within the CMAGR, the Proposed Action includes the establishment and use of seven proposed training support areas (five LZs, one ALZ, and one AFA), which comprise the Proposed Action discussed herein.

1.1 PURPOSE AND NEED

The purpose of the Proposed Action is to expand mission-critical training capabilities within the CMAGR for Marine Corps and Naval aviators and Marine Air-Ground Task Force artillery cannoneers (ground troops who fire artillery). The Proposed Action is needed to provide MV-22 aircraft similar flexibility to existing legacy rotary-wing aircraft, and to provide a safer and more realistic artillery firing training environment within the CMAGR. The Proposed Action is also needed to accomplish critical Marine Corps and Naval TTPs, Training and Readiness Codes, and Large Force Exercises. More specifically, the Proposed Action would address ongoing training challenges at the CMAGR, which include the following:

- Tilt-rotor aircraft (i.e., the MV-22) lack the same training flexibility as legacy rotary-wing aircraft at the CMAGR. Tilt-rotor aircraft landings outside of designated areas at the CMAGR are strictly prohibited, unlike rotary-wing aircraft, which can land in a variety of locations (MCASY 2013). However, it is critical that MV-22 aircraft have similar flexibility to legacy rotary-wing assault support aircraft in order to conduct air-to-ground embark of troops in LZs during training evolutions in support of Assault Support Tactics and Training and Readiness Certifications.

- ALZs are designated LZs that allow for landing and takeoff of fixed-wing, rotary-wing, and tilt-rotor aircraft in geographic locations that contain expeditionary or hasty landing fields that expose aircrews to maximum-effort takeoffs/landings within a rigorous setting. The Assault Support training community has critical and emergent requirements to train on unimproved surfaces for combat readiness and for expeditionary operations. Currently, there are no ALZs within the CMAGR.

- AFAs are on-ground areas established to support ground combat artillery (i.e., large-caliber guns, howitzers, and mortars) firing activities. Currently, the primary AFA at the CMAGR used during Weapons and Tactics Instructor (WTI) courses is too close to the target impact areas, which does not allow for a realistic artillery employment scenario. In addition, the proximity to the impact area limits the targets that are able to be engaged safely when traversing the gun-target line with rotary-wing aircraft due to the maximum ordnance of the round. A new AFA at the CMAGR, established farther from the target impact areas, would extend the artillery range and associated training envelope, which would subsequently increase the separation from the aircraft and the flight path of the round when crossing the gun-target line.

1.2 PROJECT BACKGROUND

The CMAGR is the premier national live-fire training range essential for developing and maintaining the readiness of Marine Corps and DON aviators. The range is also vital for training select Marine Corps and DON land combat forces. The CMAGR currently supports training by units of the DON, U.S. Air Force, U.S. Army, U.S. Reserve Components, and U.S. National Guard; however, the Marine Corps, and in particular, the 3rd Marine Aircraft Wing (MAW) is the primary user of the CMAGR. Local command for military operation and administration of the CMAGR, which is approximately 459,000 acres in size, has been delegated by the Secretary of the DON to the Commanding Officer, MCASY, Arizona (DON 2013).

Ground combat training also occurs at the CMAGR. The use of the range for ground warfare training dates from 1966 and is oriented towards individual fighting skills and unit tactics. Ground warfare, to include the use of artillery, typically involves battalion-sized or smaller units. The USMC routinely deploys small units, up to battalion in size, to MCASY for ground training; twice annually, the USMC sends an infantry battalion to MCASY to support the WTI Course. The CMAGR also has an extensive network of ground ranges for training in small arms, artillery, and explosives.

1.3 LISTED SPECIES POTENTIALLY AFFECTED

This BA provides the best available scientific data for the federally threatened Mojave desert tortoise (*Gopherus agassizii*; hereafter desert tortoise), which is the only federally listed species known to occur at the CMAGR (MCASY 2017). Additionally, 642.1 acres of federally designated critical habitat for the desert tortoise within the Chuckwalla Critical Habitat Unit occur within the Proposed Action Area.

Cardno 2021; US Census 2010; Sources: Esri, USGS, NOAA

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Final Desert Tortoise Biological Assessment in Support of MV-22 Landing Zones, Assault Landing Zones, and Drop Zones, MCASY

FIGURE 1 OVERVIEW MAP

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CHAPTER 2
PROPOSED ACTION

2.1 DESCRIPTION OF THE PROPOSED ACTION

Under the Proposed Action, the USMC would establish seven proposed training support areas at the CMAGR: five LZs, one ALZ, and one AFA. Establishment of these areas would not require any paving, permanent structures, or new utilities; however, grading, blading, and soil contouring would be required to establish and maintain several of the proposed training support areas. Table 1 details the proposed training support areas at the CMAGR, and they are depicted on Figure 2. The proposed training support areas, specific to the Proposed Action, include:

- LZs are areas that would allow for landing and takeoff of MV-22 aircraft in realistic combat scenarios in the Range and Training Areas consistent with Legacy Rotary-Wing Aircraft Policy and Procedures. Marine Corps Assault Support Tactics require the ability and flexibility to land aircraft while conducting evolutions within a single objective area. MV-22 aircraft require the ability to tactically ingress and egress. LZs established for use by MV-22 aircraft would largely remain in their natural states and no new roads would be established for use of the LZs. However, to reduce the threats to aircraft and aircrews posed by large, woody vegetation, minor trimming of woody vegetation may occur biannually within the immediate vicinity of MV-22 landing sites within the LZs. Because aircrews would intentionally land in areas devoid or nearly devoid of vegetation, it is expected that the need for biannual vegetation trimming would be minimal. No plants would be intentionally uprooted or removed and trimming would be done with hand tools. In addition, LZs would not be scheduled for dust abatement. However, if deemed necessary prior to training operations due to high potential for unsafe dust conditions for aircrews, an eco-safe, biodegradable, liquid copolymer dust palliative (e.g., brand name “Envirotac II”) may be applied to the LZs for dust suppression.

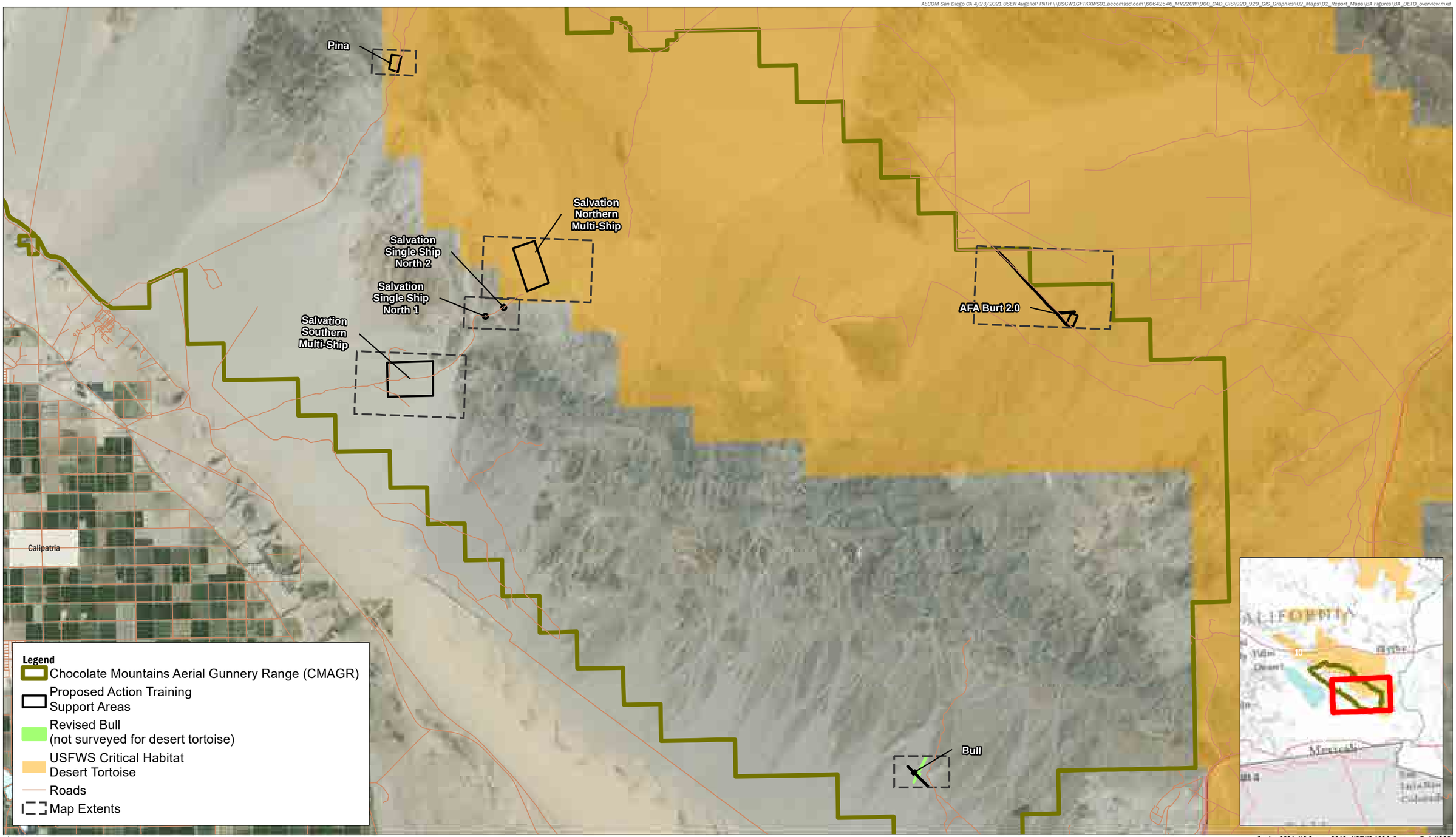
- ALZs facilitate the landing and takeoff of fixed-wing, rotary-wing, and tilt-rotor aircraft in geographic locations that contain expeditionary or hasty landing fields that expose aircrews to maximum-effort takeoffs/landings within a rigorous setting. The Assault Support training community has critical and emergent requirements to train on unimproved surfaces for combat readiness and for expeditionary operations. Although ALZs do not require the establishment of support facilities or structures, occasional maintenance grading would be required to maintain the expeditionary landing strip within the ALZ. In addition, following initial grading, the landing strip would receive an application of an eco-safe, biodegradable, liquid copolymer dust palliative (as previously discussed for LZs). The landing strip would receive reapplications of the dust palliative as needed. The dust palliative is used to provide erosion control and dust suppression. No new roads would be established for use of the ALZ.

- AFAs are areas established to allow ground support troops to set up artillery (i.e., large-caliber guns, howitzers, and mortars) for firing into previously established target areas. The establishment of the AFA would not entail any major earthwork beyond on-ground troops digging pits to help absorb the recoil of the artillery. Following training activities, any pits that were dug would be filled and returned to pre-activity contours. AFA Burt 2.0 would require the use of the existing Midway Well Road for access by ground training vehicles and equipment, and

the establishment of a new combat road/trail to the AFA. The new combat road/trail would be an unimproved graded dirt road. Both roads would require occasional grading to maintain the accessibility of the roads and to allow maneuverability of vehicles and equipment.

Table 1. Proposed Action Training Support Areas

Training Support Area Type	Training Support Area Name	Acres
Landing Zone	Pina	68.3
	Salvation Northern Multi-Ship	487.0
	Salvation Southern Multi-Ship	738.0
	Salvation Single Ship North 1	8.8
	Salvation Single Ship North 2	8.8
Assault Landing Zone	Bull	12.9
Artillery Firing Area	AFA Burt 2.0	42.0
	Access Road (via existing Midway Well Road)	33.4
	New Combat Road/Trail	11.4
	Total	**1,410.6**



Cardno 2021; US Census 2010; USFWS 1994; Sources: Esri, USGS,

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Final Desert Tortoise Biological Assessment in Support of MV-22 Landing Zones, Assault Landing Zones, and Drop Zones, MCASY

FIGURE 2 PROPOSED ACTION TRAINING SUPPORT AREAS

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Under the Proposed Action, no new paved roads or permanent buildings/structures would be established; however, initial and occasional maintenance grading would occur for the creation and continued use of the ALZ and the access roads to AFA Burt 2.0. Operations under the Proposed Action would generally be consistent with ongoing operations in the CMAGR. The USMC would not increase the quantity of sorties flown, increase the amount and/or types of ordnance expended, increase artillery training tempo, or alter the existing facilities or airspace within the CMAGR.

Operations within the new training support areas would be scheduled and deconflicted with other range users. Once established, the additional training support areas would add to the available locations for MV-22 aircraft operations. Likewise, the addition of an ALZ would add to the overall available training locations for all MAWTS-1/WTI purposes. All proposed training support areas would be utilized in a natural or near-natural setting, except for minor, as-needed vegetation trimming and occasional grading maintenance required to maintain the accessibility of the access roads to AFA Burt 2.0 and to maintain the expeditionary landing strip at ALZ Bull.

2.2 MEASURES PROPOSED TO AVOID, MINIMIZE, AND COMPENSATE FOR EFFECTS TO LISTED SPECIES AND/OR CRITICAL HABITAT

The Proposed Action would be conducted in accordance with the conservation measures presented below. The following measures are proposed to avoid, minimize, and compensate for potential effects to desert tortoise within the Proposed Action Area. These measures are based upon review of potential Proposed Action effects and the incorporation of applicable terms and conditions from previous consultations with the USFWS addressing similar actions and the desert tortoise, including the Biological Opinion (BO) for the Military Use of the CMAGR, California (1-6-96-F-40) (USFWS 1996), and the Proposed Special Warfare Training Areas 4 and 5 Amended BO for Military Use of the CMAGR (FWS-IMP-15B0239-16F0039; USFWS 2015). These measures have been reviewed to ensure compliance with the *Integrated Natural Resources Management Plan for the Chocolate Mountains Aerial Gunnery Range, California* (MCASY 2017; hereafter 2017 CMAGR INRMP). The measures outlined in this BA are intended to reduce the potential for death or injury to individual tortoises, reduce or minimize negative effects on tortoise habitat, and monitor population trends.

Many of the measures below are specific to construction activities. While the Proposed Action would not construct any physical structures, ground-disturbing activities would occur through grading/blading an access road and new combat road/trail to AFA Burt 2.0 and during creation of ALZ Bull. Therefore, many of the below measures have been slightly modified to replace the term "construction" with "ground-disturbing activities," which are specific to the Proposed Action. The measures that would be incorporated into the Proposed Action include:

1) The MCASY Tortoise Management Representative within the Range Management Department would ensure compliance with protective stipulations by all users. This representative has the authority to halt activities that may be in violation of such provisions. The Tortoise Management Representative also would coordinate with the designated USFWS representative on all matters concerning desert tortoise mitigation and management responsibilities. The Tortoise Management Representative does not have to be a qualified desert tortoise biologist and therefore would receive instructions from a qualified desert tortoise biologist in the handling, data collection, and release procedures for desert tortoise prior to engaging in such

activities. MCASY would submit the name(s) and credentials of the person(s) that would be the Tortoise Management Representative or appointee(s) (see Measure 5 for additional information). Only qualified desert tortoise biologists, the Tortoise Management Representative, or appointees ("appointee" is defined as a person having the same qualifications as the Tortoise Management Representative) would handle desert tortoises.

2) All personnel accessing the CMAGR would participate in MCASY's existing tortoise education program, which has been developed cooperatively with the USFWS. The program would include, at a minimum, the following topics: (1) occurrence of the desert tortoise; (2) sensitivity of the species to human activities; (3) legal protection for desert tortoises; (4) penalties for violations of federal law; (5) general tortoise ecology and activity patterns; (6) reporting requirements; (7) measures to protect tortoises; (8) personal measures that users can take to promote the conservation of desert tortoises; and (9) procedures and a point of contact if a desert tortoise is observed on the site.

3) All personnel accessing the CMAGR would be informed of their responsibility to report any form of take to the Tortoise Management Representative. If a tortoise is found in the proposed training support areas, activities may, if appropriate, be modified to avoid injuring or harming it and MCASY Tortoise Management Representative shall be contacted immediately.

4) Range Management personnel would be responsible for periodically reminding all personnel of the protective measures for tortoises.

5) Desert 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, MCASY 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/ventura/endangered/species/surveys-protocol.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.

6) An annual monitoring report would be prepared and delivered to the USFWS on or before 15 January of each year. The report would briefly outline the effectiveness of the desert tortoise mitigation measures and summarize desert tortoise injuries or mortalities. To enhance desert tortoise protection, the report would make recommendations for modifying or refining existing measures.

7) The Proposed Action Area would be included in the rotation of areas that are currently surveyed during ongoing annual surveys at the CMAGR (as funds are available). Surveys are conducted using the USFWS-recommended methods by qualified desert tortoise biologists. Surveys are conducted within existing safety protocols and mission parameters at the designated area(s) within the CMAGR during regularly scheduled range closures in the spring and all data are collected and entered into the MCASY Geographic Information System database. The results of monitoring are included in the annual monitoring report prepared by MCASY and delivered to the USFWS on or before 15 January of each year. Any changes in survey methodology would be reported to the USFWS in an annual monitoring report.

8) In accordance with the existing BO for the CMAGR (1-6-95-F-40; USFWS 1996), the boundaries of ground-disturbing activities would be determined in the field, mapped, and marked with monuments prior to ground-disturbing activities. Ground-disturbing activities would be placed outside of and away from surface drainages, where feasible. All ground-disturbing activities would be within the designated boundaries. Clearance surveys conforming to USFWS recommendations would be followed for the initial siting of all ground-disturbing activities. A qualified desert tortoise biologist or the Tortoise Management Representative would also be on-site during initial ground-disturbing activities.

9) An authorized desert tortoise biologist would be "on-call"/available during ground-disturbing activities to address the situation if a desert tortoise is encountered. The MCASY Range Management Department would provide the USFWS the name(s) and qualifications of the biologist(s) for review and approval.

10) Any excavations associated with ground-disturbing activities that would be left open in areas that are not being monitored shall 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 shall be inspected for desert tortoises before filling.

11) All personnel conducting service road construction, construction/training activities, and operational range clearance (e.g., Explosives Ordnance Disposal [EOD] personnel) would monitor "take" as part of their sweeps of activity areas. Personnel would report to the Tortoise Management Representative any injured or dead tortoises located, as well as habitat damage outside of the designated activity area. Personnel would fill out a form after ground-disturbing/training activities and EOD clearance activities, reporting any take. The Tortoise Management Representative (or appointee) would be present during all ground-disturbing activities and EOD clearance activities and available to respond to individual EOD and range maintenance crews (who would be trained per Measures 2 and 3) in the event the crews observe tortoise mortality/take, habitat damage, or need to have a tortoise relocated.

12) The project proponent would designate a Field Contact Representative (FCR) once ground clearing is completed and the desert tortoise fences are installed. The FCR would be responsible for overseeing compliance with biological resources conservation measures, and any other required terms and conditions resulting from consultation between the USMC and USFWS. The FCR would be on-site during all construction activities. The FCR would have a copy of all avoidance and minimization measures during construction activities. The FCR may be a crew chief, field supervisor, project manager, or a contracted biologist. The FCR would have the authority to halt construction, operation, or maintenance activities that are in violation

of these requirements. A representative from MCASY Range Management Department would make bi-weekly visits to ensure compliance.

13) Roads would conform to the natural contour of the land as much as possible to minimize grading, and would avoid existing perennial plants as much as possible.

14) Vehicles traveling along access roads, or any road within critical habitat, shall not exceed 20 miles (32 kilometers [km]) per hour. All roads entering critical habitat would be posted with speed limits of 20 miles (32 km) per hour. To the extent practicable, vehicles would remain on established roads except as required for specific training activities. To reduce potential effects, vehicles used during specified training activities would stay within the confines of road boundaries until the destination is reached.

15) After ground-disturbing activities are completed, operations would be directed by the 1996 BO (USFWS 1996), and/or the anticipated amendment to the 1996 BO, or new and subsequent BOs tiered to the original, including the BO that would be issued as a result of this BA, with the exception that off-road driving (which is prohibited by the 1996 BO) would be allowed.

16) All personnel operating vehicles within tortoise habitat on the CMAGR would inspect underneath their parked vehicle before moving it. If a desert tortoise is found beneath a vehicle, the Tortoise Management Representative or qualified appointee(s) would be contacted and the vehicle would not be moved until the Tortoise Management Representative removes it from harm's way or the tortoise leaves on its own accord.

17) No pets would be permitted at any time within the Proposed Action Area. Military working dogs are permitted, but only under the control of their handler.

18) All ground personnel that enter the Proposed Action Area would be required to remove all food stuffs, trash, or other waste that may attract common ravens (*Corvus corax*; hereafter raven) and other desert tortoise predators, in accordance with existing regulations for the CMAGR. Any temporary trash receptacles would be equipped with latching/locking lids. The Tortoise Management Representative would be responsible for ensuring that trash is removed regularly from the Proposed Action Area and that the trash containers are kept securely closed when not in use. MCASY would employ the following measures to further discourage raven settlement:

    a. Abandoned vehicles found on the CMAGR would be inventoried and steps would be taken to remove them.

    b. Public use is restricted and would continue to be restricted in the CMAGR, thus reducing the raven attraction towards people.

    c. Cattle grazing and cattle watering troughs are restricted on the range and would remain as such for security and raven prevention.

    d. Range signs and fencing would be limited to a minimum to reduce the number of elevated perches.

    e. Training operations and personnel would be required to properly dispose of food and trash per Station Order (StaO) 3710.63.

    f. Ground-disturbing activities would have appropriate trash receptacles per StaO 3710.63.

g. Personnel such as range wardens, range inspectors, and troops using the training areas would be educated and instructed to report any raven sightings, which would be investigated and documented by MCASY biologists.

h. Any raven or raven nests discovered on the CMAGR would be evaluated by MCASY biologists for tortoise predation. In addition, when any raven-damaged tortoise shells are found, the surrounding area would be searched for raven and raven nests. Upon completion of any necessary environmental review, and in accordance with appropriate permitting, any predatory ravens and their nests would be removed using methods similar to those identified in the March 2008 "Reduce Common Raven Predation on the Desert Tortoise" USFWS Environmental Assessment upon completion of any necessary environmental review and in accordance with appropriate permitting.

i. Periodically, all wildlife guzzlers would be inspected by biologists, range inspectors, and range wardens for raven usage. Observations of tortoise carcasses and raven nests near guzzlers would result in further evaluation for removal.

19) The Tortoise Management Representative or appointee(s) would survey all ground support areas for dead or injured tortoises after the completion of each ground operation.

20) Should a dead or injured tortoise be located on-site during or after any military activity, the MCASY Range Management Department would be notified immediately. The USFWS would be notified by the Tortoise Management Representative via email within three working days of the discovery of any tortoise death or injury caused by military activity. Notification would include the date, time, circumstances, and location of any injury or death. Dead animals would be buried to avoid attraction of scavengers. Injured animals would be taken to a veterinarian approved by the USFWS. Information to be provided to the USFWS would include the date and time of the finding or incident (if known), location of the carcass, a photograph, cause of death (if known), and any other pertinent information.

21) In an effort to control the spread of invasive (non-native) weeds, all construction-type equipment and/or construction-type vehicles originating outside of the CMAGR shall be power-washed before entering roadways on the way to the CMAGR. While washing wheeled vehicles, the front wheels shall be turned lock-to-lock to allow for exposure of surfaces that may hold soil or weed seeds.

CHAPTER 3
EXISTING CONDITIONS, INCLUDING FEDERALLY LISTED SPECIES, AND DESCRIPTION OF THE SPECIFIC AREA AFFECTED BY THE ACTION

3.1 DESCRIPTION OF THE PROPOSED ACTION AREA

The Proposed Action Area includes the footprints of the seven proposed training support areas detailed previously in Chapter 2.1, which total 1,410.6 acres. As previously detailed, the USMC does not propose to increase the quantity of sorties flown, increase the amount and/or types of ordnance expended, increase artillery training tempo, or alter the existing facilities or airspace within the CMAGR under the Proposed Action. Rather, the Proposed Action is specific to the creation/establishment and use of the proposed training support areas.

3.1.1 Site Description

The Proposed Action Area is located within the southwestern portion of the Colorado Desert Recovery Unit for the desert tortoise and is north and east of the eastern edge of the Salton Sea. The Proposed Action Area is classified as having a low to high potential for the desert tortoise based on the U.S. Geological Survey (USGS) desert tortoise habitat potential model (Nussear et al. 2009). Habitat along the gradually west-sloped side of the Chocolate Mountains is predicted to be lower quality for the desert tortoise compared with higher quality habitat near the base of, within, and east of the Chocolate Mountains. Multiple surveys over the past several decades confirm this is the case as detailed in the 2017 CMAGR INRMP (MCASY 2017).

Regionally, the Proposed Action Area is situated within the Colorado Desert on sloped, open terrain dominated by desert scrub vegetation interspersed with small ephemeral drainages and washes. Federally designated critical habitat for the desert tortoise within the Chuckwalla Critical Habitat Unit is located on the east side of the CMAGR and overlaps with portions of the Proposed Action that occur to the east of the Chocolate Mountains. The Chuckwalla Critical Habitat Unit encompasses 1,020,600 acres, of which 187,842 acres occur in the CMAGR. Approximately 40 percent of the CMAGR occurs within designated desert tortoise critical habitat. Approximately 642.1 acres of the 1,410.6-acre Proposed Action Area (or 45.5 percent) occur within critical habitat. While not all of the proposed training support areas are located within designated critical habitat, they all contain the physical and biological features of desert tortoise critical habitat as described in *Preparing for Any Action That May Occur within the Range of the Mojave Desert Tortoise* (*Gopherus agassizii*) (USFWS 2019). These include:

- sufficient space to support viable populations within each of the 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 growth of these species;
- suitable substrates for burrowing, nesting, and overwintering;
- burrows, caliche caves, and other shelter sites;

- sufficient vegetation for shelter from temperature extremes and predators; and
- habitat protected from disturbance and human-caused mortality.

The Proposed Action Area contains three main natural communities based on the mapping (VegCAMP et al. 2013) in the 2017 CMAGR INRMP (MCASY 2017). The Proposed Action Area on the west side of the Chocolate Mountains is predominantly Madrean Warm Semi-Desert Wash Woodland/Scrub interspersed with Lower Bajada and Fan Mojavean-Sonoran Desert Scrub. The Proposed Action Area within and on the east side of the Chocolate Mountains includes sections of North American Warm Desert Bedrock Cliff and Outcrop along with Lower Bajada and Fan Mojavean-Sonoran Desert Scrub.

3.1.2 Desert Tortoise

The desert tortoise is the only federally listed species known to occur on the CMAGR, and the Proposed Action Area occurs within habitat known to be occupied by desert tortoise (MCASY 2017). Focused desert tortoise surveys were conducted in March 2021 to determine the presence/absence of desert tortoise within the Proposed Action Area. Details of those surveys are provided in Appendix A and summarized below.

Desert Tortoise Surveys

Methodology

Desert tortoise surveys were conducted in accordance with the most recent guidance from the USFWS detailed in *Preparing for Any Action That May Occur within the Range of the Mojave Desert Tortoise* (*Gopherus agassizii*) (USFWS 2019). The surveys employed 100-percent visual coverage of the seven proposed training support areas ("survey areas" within the desert tortoise survey report in Appendix A). Range access constraints on the CMAGR prevented surveys from occurring during the protocol survey window (April through May and September through October) and desert tortoise surveys were instead conducted in early to mid-March 2021. While surveys were conducted earlier than the USFWS 2019 protocol states, temperatures are generally warmer earlier in the season near the southern extent of the species range, including the CMAGR. Furthermore, because surveys used 100-percent coverage and desert tortoises are known to be active and above ground in March on the CMAGR (based on the *2020 Line Distance Sampling for Desert Tortoises at Chocolate Mountains Aerial Gunnery Range*; Vernadero Group 2020), survey timing was determined as appropriate. Finally, email dialogue with Natural Resources Staff at MCASY confirmed that the March timeframe was appropriate for detecting desert tortoises on the CMAGR, as confirmed by the USFWS.

Focused 100-percent coverage desert tortoise surveys were conducted by biologists slowly walking 10-meter-wide spaced transects searching for all desert tortoise sign. All desert tortoise sign detected (shell fragments, bones, scutes, carcasses, drinking depressions, mating rings, scat, burrows, tracks, and live individuals) were recorded. A hand-held mirror or light was used to examine any potential desert tortoise burrows for occupancy. All surveys were conducted during daylight hours with no minimum temperature restrictions. However, surveys were not conducted if temperatures exceeded 35 degrees Centigrade (95 degrees Fahrenheit) in the shade when measured approximately 5 centimeters from the soil surface above the ground.

Data collected followed the guidelines in the most recent survey protocol (USFWS 2019). All desert tortoise sign had its location recorded via geographic positioning system. Data recorded included the survey date, names of all surveyors, start and end times, weather conditions, and any evidence that indicated desert tortoises were present (e.g., scat, burrows, carcasses, courtship rings, drinking depressions, etc., in addition to live tortoises). The USFWS Field Manual (USFWS 2009) was used to categorize the condition of all potential burrows detected. For every live desert tortoise found, the mean carapace length (MCL) was estimated, along with the tortoise gender, whether it had a transmitter, its general health (if its face was visible), and any additional distinguishing marks. All observed desert tortoise sign regardless of where it was detected within the proposed training support areas was recorded.

Results

Across all proposed training support areas, fresh/recent desert tortoise sign was relatively scarce but highly localized in the few areas where it was detected. Two adult desert tortoises were detected in the northwestern corner of Salvation Northern Multi-Ship training support area (Figure 3), with an additional adult tortoise detected outside that training support area on the west side. No desert tortoises (or recent sign) were detected within the two small Salvation Single Ship North 1 and 2 training support areas (Figure 4). Three adult desert tortoises were detected in the southern half of Salvation Southern Multi-Ship training support area (Figure 5). Three adult desert tortoises were detected within AFA Burt 2.0 training support area and associated new combat road/trail, with a fourth desert tortoise detected outside of, but walking towards a desert tortoise located within the new combat road/trail (Figure 6). No desert tortoises were detected at the Bull or Pina training support areas (Figures 7 and 8, respectively). Table 2 provides a breakdown of the number of live adult desert tortoises detected per training support area (desert tortoises observed outside of training support areas are not counted in Table 2), along with the number of burrows (and their classifications), carcasses, scat, and eggshell fragments. Regarding the number of carcasses detected, both intact whole carcasses in addition to shell fragments and scattered carcass remains are included together.

All desert tortoise sign detected (and detailed in Table 2) is displayed on training support area-specific Figures 3 through 8. Generally, there was more desert tortoise sign, including live adult desert tortoises on the north and east sides of the Chocolate Mountains, which is in line with the USGS habitat mapping and the USFWS critical habitat designation.

Finally, the USMC considered an original configuration and location for ALZ Bull which, following field reconnaissance during field surveys, was deemed to have potential environmental and logistical constraints because it would require grading in portions of several ephemeral desert washes. Therefore, the location and configuration of ALZ Bull was changed (rotated towards the north to reduce the potential for affecting ephemeral washes), as presented in this BA as Revised Bull (on Figure 7), which was not surveyed for desert tortoise. The original ALZ Bull was surveyed, but because the footprint of ALZ Bull was revised after the completion of desert tortoise surveys, focused desert tortoise surveys were not conducted throughout the entirety of Revised Bull.

Table 2. Desert Tortoise Training Support Area Survey Results

Desert Tortoise Sign by Survey Location		Salvation Northern Multi-Ship	Salvation Single Ship North 1 and 2	Salvation Southern Multi-Ship	AFA Burt 2.0, Access Road, and New Combat Road/Trail	Bull	Pina	Total
Live Desert Tortoise	Adult (≥180 millimeters [mm] MCL)	2[1]	0	3	3[1]	0	0	**8**
	Subadult/Juvenile (<180 mm MCL)	0	0	0	0	0	0	**0**
Burrows	Class 1	0	0	2	1	0	0	**3**
	Class 2	1	0	3	0	0	0	**4**
	Class 3	1	0	0	0	0	0	**1**
	Class 4	12	1	10	0	0	6	**29**
	Class 5	12	1	3	2	0	7	**25**
Carcasses	Intact carcasses and scattered shell/bone fragments	9 adult (four female, one male, and four of unknown sex) and 1 subadult	1	5 adult (one female, one male, and three of unknown sex)	1	0	0	**17**
Scat		0	0	5	1	0	0	**6**
Eggshell Fragments		1	0	0	0	0	0	**1**

Notes:

[1] One adult desert tortoise was found just outside of the survey area and, therefore, is not included here.

[2] The following burrow class definitions were adopted from the USFWS Field Manual (USFWS 2009) and are defined as:

a. currently active, with desert tortoise or recent desert tortoise sign

b. good condition, definitely desert tortoise; no evidence of recent use

c. deteriorated condition; this includes collapsed burrows; definitely desert tortoise

d. good condition; possibly desert tortoise

e. deteriorated condition; this includes collapsed burrows; possibly desert tortoise

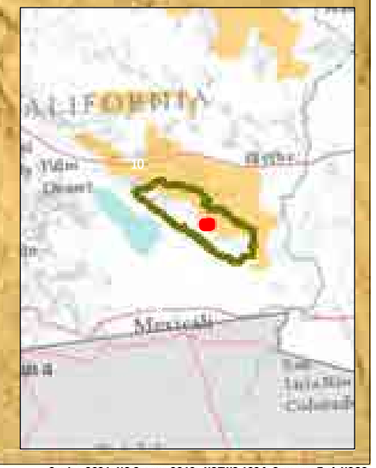
Legend

- Chocolate Mountains Aerial Gunnery Range (CMAGR)
- Proposed Action Training Support Areas
- USFWS Critical Habitat Desert Tortoise
- Roads

2021 Desert Tortoise Survey Results

Burrow

- Class 2
- Class 3
- Class 4
- Class 5
- Carcass, ≥180 mm MCL, Female
- Carcass, ≥180 mm MCL, Male
- Carcass, ≥180 mm MCL, Unknown Sex
- Carcass, <180 mm MCL, Unknown Sex
- Individual(s), ≥180 mm MCL, Female
- Individual(s), ≥180 mm MCL, Male
- Individual(s), ≥180 mm MCL, Unknown Sex
- Eggshell fragment



German Diggins Wash

Pegleg Well Rd

Niland

N

0 1,000

Feet

Cardno 2021; US Census 2010; USFWS 1994; Sources: Esri, USGS,

AECOM

Final Desert Tortoise Biological Assessment in Support of MV-22 Landing Zones, Assault Landing Zones, and Drop Zones, MCASY

FIGURE 3
SALVATION NORTHERN MULTI-SHIP TRAINING SUPPORT AREA

Salvation Single Ship North 2

Salvation Single Ship North 1

Niland Pegleg Well Rd

Legend

- Chocolate Mountains Aerial Gunnery Range (CMAGR)
- Proposed Action Training Support Areas
- USFWS Critical Habitat Desert Tortoise
- Roads

2021 Desert Tortoise Survey Results

Burrow

- Class 4
- Class 5
- Desert Tortoise Shell Fragment

N

0 500

Feet

Cardno 2021; US Census 2010; USFWS 1994; Sources: Esri, USGS,

AECOM

Final Desert Tortoise Biological Assessment in Support of MV-22 Landing Zones, Assault Landing Zones, and Drop Zones, MCASY

FIGURE 4
SALVATION SINGLE SHIP NORTH 1 AND 2 TRAINING SUPPORT AREA

Niland Pegleg Well Rd

Legend

- Chocolate Mountains Aerial Gunnery Range (CMAGR)
- Proposed Action Training Support Areas
- Roads

2021 Desert Tortoise Survey Results

Burrow

- Class 1
- Class 2
- Class 4
- Class 5
- Carcass, ≥180 mm MCL, Female
- Carcass, ≥180 mm MCL, Male
- Carcass, ≥180 mm MCL, Unknown Sex
- Individual(s), ≥180 mm MCL, Female
- Individual(s), ≥180 mm MCL, Male
- Scat

N

0 1,000

Feet

Cardno 2021; US Census 2010; USFWS 1994; Sources: Esri, USGS,

AECOM

Final Desert Tortoise Biological Assessment in Support of MV-22 Landing Zones, Assault Landing Zones, and Drop Zones, MCASY

FIGURE 5
SALVATION SOUTHERN MULTI-SHIP TRAINING SUPPORT AREA

Dietz Rd

Jake Wash

Bruce Wash

AFA Burt 2.0
Access Road

AFA Burt 2.0
New Combat Road/Trail

AFA Burt 2.0

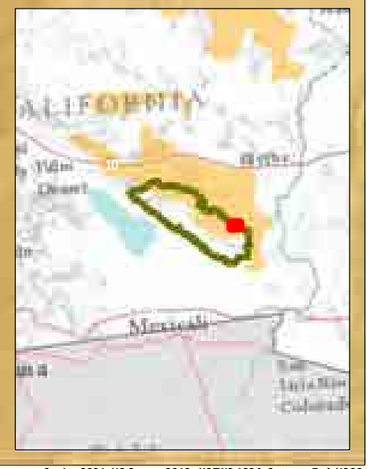
Legend

- Chocolate Mountains Aerial Gunnery Range (CMAGR)
- Proposed Action Training Support Areas
- USFWS Critical Habitat Desert Tortoise
- Roads

2021 Desert Tortoise Survey Results

Burrow

- Class 1
- Class 5
- Carcass, ≥180 mm MCL, Male
- Carcass, ≥180 mm MCL, Unknown Sex
- Individual(s), ≥180 mm MCL, Female
- Individual(s), ≥180 mm MCL, Male
- Scat



N

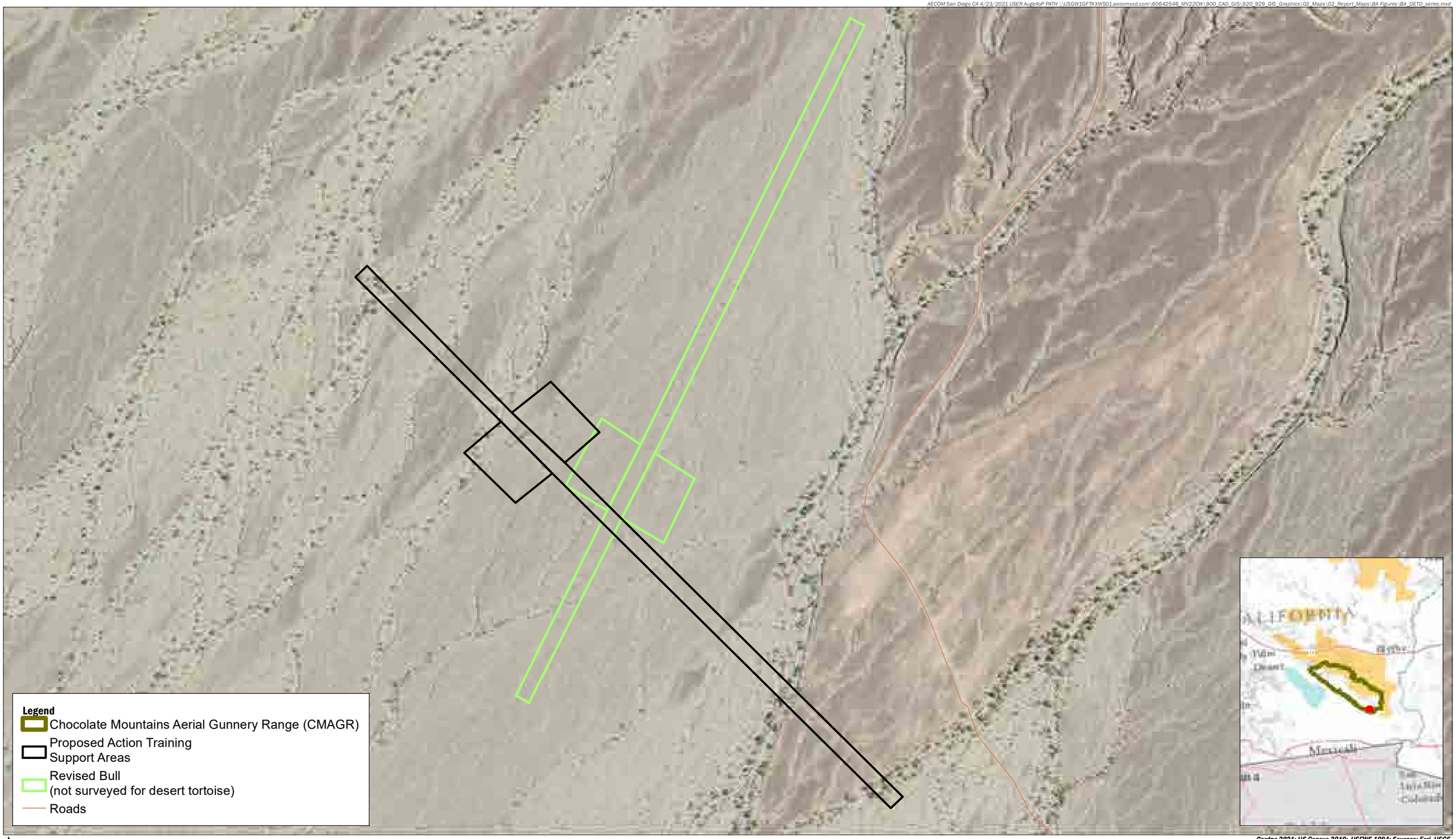
0 1,250
Feet

Cardno 2021; US Census 2010; USFWS 1994; Sources: Esri, USGS,

AECOM

Final Desert Tortoise Biological Assessment in Support of MV-22 Landing Zones, Assault Landing Zones, and Drop Zones, MCASY

FIGURE 6
AFA BURT 2.0 TRAINING SUPPORT AREA

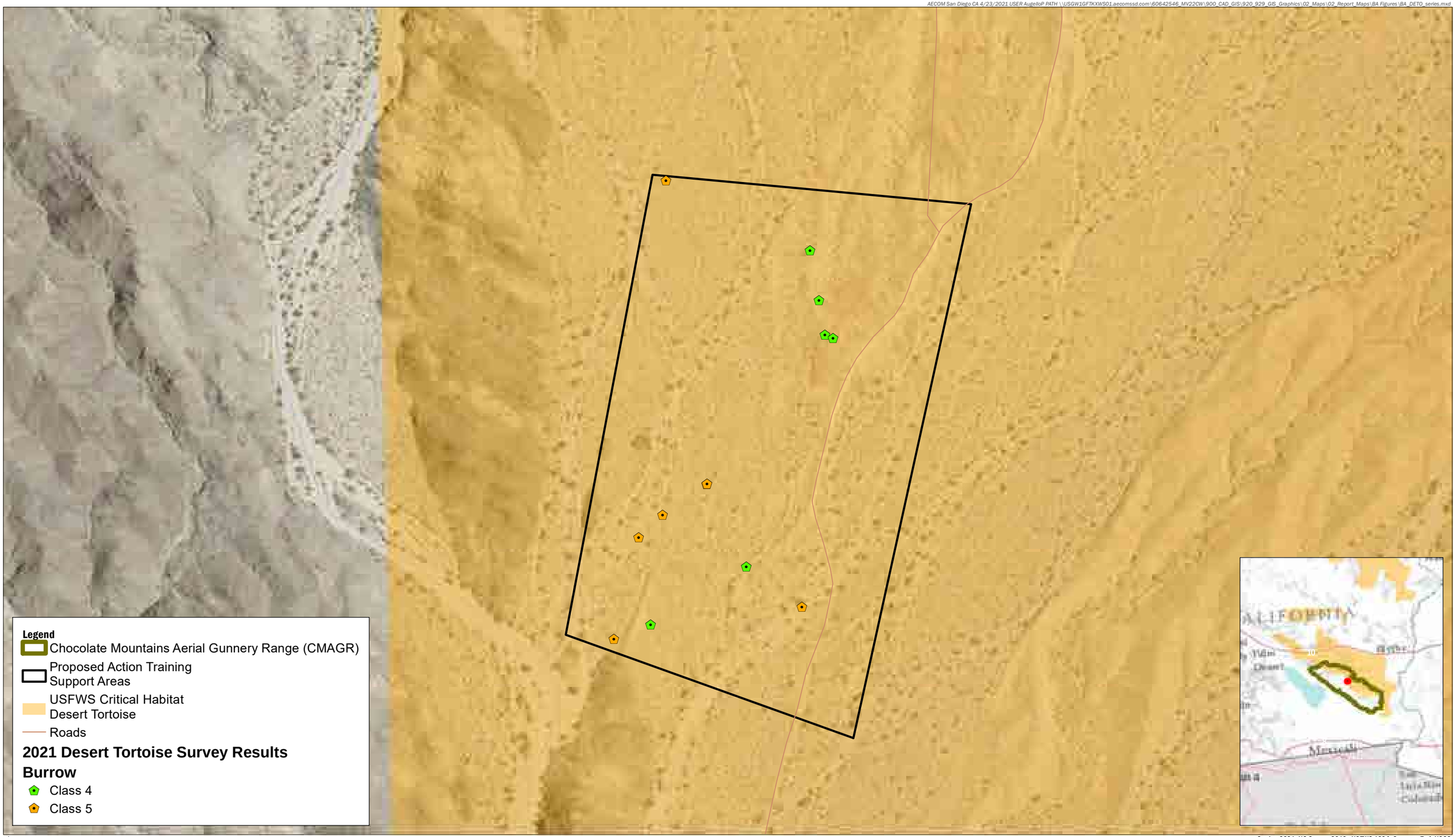


Cardno 2021; US Census 2010; USFWS 1994; Sources: Esri, USGS,

AECOM

Final Desert Tortoise Biological Assessment in Support of MV-22 Landing Zones, Assault Landing Zones, and Drop Zones, MCASY

FIGURE 7
BULL TRAINING SUPPORT AREA



Cardno 2021; US Census 2010; USFWS 1994; Sources: Esri, USGS,

AECOM

Final Desert Tortoise Biological Assessment in Support of MV-22 Landing Zones, Assault Landing Zones, and Drop Zones, MCASY

FIGURE 8
PINA TRAINING SUPPORT AREA

CHAPTER 4
ANALYSIS OF EFFECTS AND DESCRIPTION OF THE MANNER IN WHICH THE ACTION MAY AFFECT LISTED SPECIES

Per updated regulations (on August 27, 2019; USFWS 2019) regarding revisions to portions of the regulations to clarify, interpret, and implement Section 7 of the ESA, this BA uses the term "consequences" to refer to the various effects of the Proposed Action. Per the revised regulations: "*Effects of the action*" are all consequences to listed species or critical habitat that are caused by the proposed action, including the consequences of other activities that are caused by the proposed action. A consequence is caused by the proposed action if it would not occur but for the proposed action and it is reasonably certain to occur. Effects of the action may occur later in time and may include consequences occurring outside the immediate area involved in the action. (50 C.F.R. Section 402.17).

This section analyzes potential consequences that may occur to desert tortoise and desert tortoise critical habitat. While potential consequences would be very similar for both desert tortoise and critical habitat, those consequences that are more specific to desert tortoise (i.e., noise, injury and/or mortality) are discussed first under the desert tortoise section, and habitat-based consequences are discussed under the critical habitat section.

4.1 DESCRIPTION OF PROPOSED ACTION CONSEQUENCES

Implementation of the Proposed Action is anticipated to result in a variety of consequences (also known as effects) that may be direct, indirect, permanent, and/or temporary. Direct effects are the immediate result of Proposed Action activities (e.g., direct mortality of desert tortoise or removal of vegetation and habitat by grading for access roads). Direct effects may be either temporary (reversible) or permanent (irreversible).

Indirect effects are caused by or result from Proposed Action activities but occur later in time or are spatially removed from the activities (e.g., shifts in vegetation composition or increased predation risk over time). Indirect effects are diffuse, resource specific, and less amenable to quantification or mapping than direct effects, but still need to be considered. Indirect effects typically extend beyond the immediate project footprint(s).

The term "permanent effects" is used to define effects that would result in the irreversible removal of biological resources that cause affected areas to no longer function as habitat for desert tortoise. Permanent effects may occur from grading/blading: the access road to AFA Burt 2.0, the new combat road/trail at AFA Burt 2.0, and from ALZ Bull. Furthermore, the potential for injury and/or mortality to desert tortoise through direct strikes from MV-22s or military vehicles/equipment or by crushing them in burrows would be considered a permanent effect.

The term "temporary effects" is used to discuss effects that may temporarily render habitat unusable/undesirable to desert tortoise but are considered reversible, such as minor soil-disturbing activities that do not permanently remove biological resources for desert tortoise. Temporary effects may include vegetation trimming to allow safe landing areas for MV-22s; noise; dust; vibration; and potential

for wildland fire from MV-22s, military vehicles, artillery recoil pits, and ordnance expenditure from use of the AFA.

4.1.1 Desert Tortoise

Across the various training support areas, desert tortoise and their burrows were found in different locations that may be affected by the Proposed Action. These are briefly described below as they pertain to specific effects from the Proposed Action. The locations of desert tortoise and their burrows that were documented during March 20201 surveys are depicted on Figures 3 through 8.

At the Pina training support area, no active, recent, or definitive desert tortoise burrows (Class 1, 2, or 3 burrows) were detected. Only Class 4 and 5 burrows, which are possibly desert tortoise, were found. Therefore, use of the LZ at Pina is unlikely to result in direct crushing of burrows that support desert tortoise.

At the Salvation Northern Multi-Ship training support area, live desert tortoise and all active/recent desert tortoise burrows were located in the far-western portion of the site where small steeply eroded hills are located. The hills are not ideal locations for landing MV-22s due to their steep nature, and desert tortoise and their burrows are protected by the rocky landscape. No desert tortoise or active/recent burrows (Class 1, 2, or 3) were found in the flat areas that comprise the majority of the Salvation Northern Multi-Ship training support area.

At the Salvation Single-Ship North 1 and 2 training support areas, no desert tortoise or active/recent burrows were found, as they are located in an incised canyon wash with deep sand that does not support burrows.

At the Salvation Southern Multi-Ship training support area, three desert tortoise and several burrows were found in the southern half of the site. These burrows were located in semi-open sparsely vegetated areas in slightly elevated portions within a broad wash. These burrows have the potential to be crushed by MV-22s and military vehicles/equipment if activities are conducted near the southern half of the site.

Several desert tortoises and their burrows were found within AFA Burt 2.0 and its associated access roads. These desert tortoise and their burrows have a potential to be crushed or disturbed by road grading/blading and by training activities, including the placement of artillery.

The ALZ Bull training support area (the originally proposed location) had no desert tortoise or sign detected. However, the location of Revised Bull was not fully surveyed for desert tortoise; therefore, it is unknown if any active/recent desert tortoise burrows are present within Revised Bull.

Direct Effects

Permanent

Direct, permanent effects to desert tortoises may include the potential for incidental injury or death due to training activities from military vehicles (during both establishment of the training support areas and operations), MV-22 landings, and ordnance expenditure from use of the AFA. Training activities could cause injury or mortality to desert tortoises by vehicle and MV-22 tires striking desert tortoises while they

are aboveground or by crushing burrows with desert tortoise inside. During use of LZs and the ALZ, MV-22 pilots would generally choose open locations to land that have low-growing vegetation and are not in hilly/rocky terrain. Desert tortoise tend to construct burrows in locations with strong soil structural integrity such as in rocky areas or at the base of perennial vegetation. While there is a potential for burrows with desert tortoise potentially inside to be crushed or collapsed by MV-22 use of LZs and the ALZ, most burrows detected during spring 2021 surveys were in specific locations that are not suitable for landing aircraft.

Desert tortoises in training support areas could be crushed or buried as a result of road and ALZ grading/blading, digging recoil pits at AFA Burt 2.0, and other ground-disturbing activities. Measures identified in Chapter 2.2, however, would minimize the potential to directly harm desert tortoises by requiring pre-construction clearance surveys at all proposed ground-disturbing areas before commencing activities. Any desert tortoises found within ground-disturbing areas would be relocated outside of the area by a USFWS-authorized biologist.

Furthermore, all vehicles would be restricted to a speed limit of 20 miles per hour or less on access roads within desert tortoise critical habitat and would stay within the confines of road boundaries until reaching designated ranges, to reduce potential effects to desert tortoises. Speed limits would be clearly marked and all personnel would be made aware of these speed limits. Also, all parked vehicles would be inspected immediately before being moved. If a desert tortoise is found under a vehicle, the vehicle would not be moved until the desert tortoise leaves on its own accord or is safely relocated by the Tortoise Management Representative or qualified appointee. The need to handle a tortoise in this circumstance would constitute a "take" by harassment, but the effect is expected to be a temporary stress to the desert tortoise that is unlikely to result in mortality.

In summary, with the implementation of all proposed measures (see Chapter 2.2), there is low potential for desert tortoise injury and mortality. Incidental take could also occur by way of animal handling if translocation of tortoises becomes necessary during ground-disturbing activities or use of the training support areas, as such handling can induce stress as indicated by the voiding of the bladder (USMC 2011). Since desert tortoises store much of their water in their bladders, this can lead to an increase in the potential for dehydration (Jørgensen 1998). However, desert tortoises at other military installations (e.g., 29 Palms Combat Center) have been moved out of harm's way on numerous occasions. Generally, these tortoises were moved only short distances and showed no adverse effect (Henen 2010, as cited in USMC 2011).

An additional potential permanent direct effect to desert tortoise is the grading/blading of habitat within the Proposed Action Area. Table 3 provides a breakdown of detailed acreages, including critical habitat, that would be permanently and temporarily affected under the Proposed Action.

Table 3. Proposed Training Support Area Acreages of Permanent and Temporary Effects

Training Support Area Type	Training Support Area Name	Permanent Effects (acres)	Temporary Effects (acres)	Acreage within Desert Tortoise Critical Habitat (acres)
Landing Zone	Pina	-	68.3	68.3
	Salvation Northern Multi-Ship	-	487.0	487.0
	Salvation Southern Multi-Ship	-	738.0	-
	Salvation Single Ship North 1	-	8.8	-
	Salvation Single Ship North 2	-	8.8	-
Assault Landing Zone	Bull	12.9	-	-
Artillery Firing Area	AFA Burt 2.0	-	42.0	42.0
	Access Road (via existing Midway Well Road)	33.4	-	33.4*
	New Combat Road/Trail	11.4	-	11.4*
Total		**57.7**	**1,352.9**	**642.1**

Note: *These acreages within desert tortoise critical habitat are considered permanent effects from grading/blading of access road and new combat road/trail.

Based on acreages in Table 3, 12.9 acres of desert tortoise habitat would be permanently affected by grading/blading of ALZ Bull. The original location of ALZ Bull had no desert tortoise sign detected during March 2021 surveys; the Revised Bull location was not fully surveyed but, consistent with the original location that was surveyed, is expected to have a low potential for desert tortoise. Furthermore, vehicle and aircraft use could result in the crushing, breaking, and removal of plants; a reduction of overall vegetative cover; and the erosion and/or compaction of topsoil. Surface disturbance and reduced plant cover associated with military training activities may also facilitate detection of hatchling and juvenile desert tortoises by predators such as ravens and coyotes. Additional habitat would be permanently affected at AFA Burt 2.0, but because the habitat is designated as desert tortoise critical habitat, it is discussed in the critical habitat section below.

Temporary

Several temporary, direct effects may occur to desert tortoise, primarily from MV-22 use of the LZs and ALZ, and to a lesser extent artillery firing from AFA Burt 2.0, which include noise and dust. Noises that are nearby, loud, sudden, and combined with a visual stimulus produce the most intense reactions in animals (Bowles et al. 1999). While the noise emanating from MV-22 and other military equipment may disturb desert tortoise, there is little potential for noise or visual stimuli to effect tortoises for the vast majority of the year for the following reasons: (1) only 5 percent of a desert tortoise's life is spent aboveground (Nagy and Medica 1986), (2) tortoises do not appear heavily affected by noise (Bowles et al. 1999), (3) the Proposed Action activities would not be continuous as they would occur sporadically throughout the year (especially during WTI that generally occurs biannually), and (4) disturbance would cease upon training event completion. These effects are also unlikely to cause mortality, and tortoises temporarily affected would be able to resume normal behaviors and to utilize areas from which they have been deterred by the activity. As such, any effect that noise associated with the proposed training activities might have on desert tortoises is expected to be minimal and would not cause stress or behavioral reactions that would rise to the level of take under the ESA.

Desert tortoises would be exposed to increased amounts of particulate matter, fugitive dust, and/or sediment generated by vehicles and aircraft. MV-22 training would result in the temporary disturbance of loose surface debris and soil caused by downdraft and outwash from moving rotors (collectively known as rotorwash) in the vicinity of take-offs, landings, and near-surface hovering, potentially resulting in a temporary direct effect to vegetation and soils. Rotorwash forces are relative to the engine power settings and the aircraft's proximity to the ground. Wind velocities could reach 90 knots (103.6 miles per hour) directly below the MV-22 when hovering at 100 feet (30.48 meters) above ground level (Marine Corps Installation West 2009 as cited in USMC 2013). As recorded from direct field observations (USMC 2013), typical effects resulting from MV-22 rotorwash range from windblown vegetation to broken branches in shrubs and trees. In extreme cases, soil can be scoured to the extent that small shrubs are uprooted or nearly uprooted. Dust cloud development from the displacement of topsoil and loose vegetation is another common effect from rotorwash. The intensity of these effects would be proportional to the amount of time the area is exposed to these high velocity winds and the amount of vegetation (or tortoises) that actually occur within a given landing area. However only 5 percent of a desert tortoise's life is spent aboveground (Nagy and Medica 1986), and desert tortoises are naturally exposed to dust and sand, both above- and belowground. By comparison, the airborne sand and dust from training events would affect relatively small areas for brief periods, during which a tortoise in the vicinity would probably retract into its shell.

Another temporary direct effect to desert tortoise (and desert tortoise habitat) would be excessive heat from MV-22s during landings and take-offs. As described in USMC 2013, heat radiating from MV-22 engines while landing, departing, or idling can cause vegetation to wilt or become desiccated, toasted, or charred. Under normal operations, however, with engine exhaust deflectors operating, the exhaust of the MV-22 should not heat the ground to a temperature high enough to support combustion of plant-based materials such as dry grasses (USMC and U.S. Forest Service 2013). This is because exhaust deflectors activate as soon as there is weight on the main landing gear wheels, thereby ensuring that the aircraft operates with the exhaust deflectors on at all times when on the ground and reducing the potential for wildfire ignition to low (Marine Corps Air Ground Combat Center 2010).

Although effects on desert tortoise habitat from the use of MV-22s would be direct, they are anticipated to be temporary as (1) they would be localized under the landing site; (2) pilots would avoid landing sites with vegetation or other vertical obstacles as much as possible; (3) the USMC anticipates that most MV-22 landing operations, such as insertions/extractions, would take a few minutes; (4) MV-22 aircrews can throttle back engine power while on the ground to substantially reduce rotorwash wind speeds and deconcentrate engine heat exhaust; and (5) exhaust deflectors would automatically be deployed when on the ground. As such, the use of MV-22s is not expected to appreciably degrade desert tortoise habitat within the Proposed Action.

Indirect Effects

Indirect effects may be both permanent and/or temporary and some effects may start out as temporary and become permanent. As such, they are presented herein together. Indirect effects to desert tortoises and their habitat may include an increase in predation, an increase in dust on vegetation that desert tortoise consume, and a potential for increased spread of weedy species. An increase in desert tortoise predation may result if tortoise predators (e.g., common ravens and canids [coyotes and desert kit foxes]) are attracted to the proposed training support areas, which has a potential to increase predation on desert

tortoises, especially juveniles. With the implementation of the measures in Chapter 2.2, the attraction of potential predators to the proposed training areas would be reduced by the control and management of trash associated with training activities and military personnel.

There is a potential for increased dust from Proposed Action activities to cover desert tortoise food sources and indirectly affect the species. Particulate matter, fugitive dust, and/or sediment generated by vehicle and aircraft use can reduce the photosynthetic capacity of affected plants, potentially reducing growth and vigor (Sharifi et al. 1997; Ouren et al. 2007). However, dust can increase net photosynthesis early in the growing season (when water is more available) by increasing leaf temperature (Upekala et al. 2009). Overall, particulate matter generation associated with vehicle and aircraft use is expected to cause plant productivity to decrease in localized areas. However, as described above, windblown dust and sand regularly occur in desert environments. As such, based on the localized nature of the effects, the amount of dust over baseline levels generated by the Proposed Action would be negligible. Furthermore, the use of dust suppressants, included as part of the Proposed Action, would reduce the potential for dust to accumulate on vegetation and make it less palatable for desert tortoise.

Finally, ground disturbance associated with Proposed Action activities could increase the likelihood of non-native plant dispersal and establishment by increasing the amount of disturbed habitat for such species to occur in, which could reduce forage cover available directly by outcompeting native vegetation or indirectly by increasing the risk of fire. These effects would be reduced by the implementation of measures in Chapter 2.2 such as washing equipment brought onto the CMAGR from outside areas.

Summary of Effects to Desert Tortoise

The Proposed Action has a potential to cause direct and indirect effects that are both permanent and temporary to desert tortoise and their habitat. Establishment and use of the training support areas have the potential to cause injury and/or mortality to desert tortoise, result in the permanent and temporary loss of habitat, and result in habitat degradation through increased dust, potential to spread invasive weeds, and increased wildfire frequency. While the measures proposed in Chapter 2.2 have proven to reduce effects to desert tortoise and their habitat since the implementation of the 1996 BO and subsequent BOs, there remains a low potential for desert tortoise take from the Proposed Action. While it is difficult to quantify a level of take that may occur from the Proposed Action due to varying desert tortoise densities across the different training support areas, several desert tortoises and their burrows were detected within the proposed training support areas (namely Salvation Northern and Southern Multi-Ship sites, and AFA Burt 2.0). If desert tortoise are moved out of harm's way prior to use of these training support areas, the potential for direct injury and/or mortality is low. While the Proposed Action is not necessarily covered by an existing BO, the activities are similar to those covered by the 1996 BO (USFWS 1996) and would have no greater effect on desert tortoise than those activities already covered by the 1996 BO. The 1996 BO exempted take in the form of injury and mortality of 11 desert tortoises and capture/harassment of 112 desert tortoises annually across the CMAGR. No take has been reported in recent years (USFWS 2015) under the 1996 BO and thus the additional potential for take from the Proposed Action is not likely to adversely affect the desert tortoise.

4.1.2 Desert Tortoise Critical Habitat

Table 4 presents the breakdown of the permanent and temporary acreage of effects to desert tortoise critical habitat. In general, the permanent effects from grading/blading in the access road and new combat

road/trail are much smaller than the temporary effects to critical habitat from establishment and use of the LZs and ALZ.

Table 4. Proposed Training Support Areas under the Proposed Action within Critical Habitat

Training Support Area Type	Training Support Area Name	Permanent Effects (acres)	Temporary Effects (acres)
Landing Zone	Pina	-	68.3
	Salvation Northern Multi-Ship	-	487.0
Artillery Firing Area	AFA Burt 2.0	-	42.0
	Access Road (via existing Midway Well Road)	33.4	-
	New Combat Road/Trail	11.4	-
	Total	**44.8**	**597.3**

Direct

Permanent

Up to 44.8 acres of occupied desert tortoise critical habitat would be permanently affected from grading/blading of an access road from Midway Well Road to AFA Burt 2.0 along with a new combat road/trail that connects from the access road to the AFA. The access road and new combat road/trail would be maintained as dirt roads free of vegetation (by periodic grading/blading) and not support foraging or burrowing habitat for desert tortoise. The access roads would have a relatively narrow width (15 to 30 feet wide), would not be paved or bermed, and would generally follow a narrow existing dirt road that leads southeast from Midway Well Road to AFA Burt 2.0. Since the roads would not be bermed, desert tortoise would be able to walk across the roads without hindrance. Based on surveys in spring 2021, one desert tortoise burrow with a female desert tortoise was found within the footprint of the proposed new combat road/trail. The desert tortoise and burrow would be avoided during grading/blading of the new combat road/trail and the burrow would not need to be moved or relocated. As part of sighting in the new combat road/trail, in accordance with measures in Chapter 2.2 (measures 8 and 9), the boundaries of road grading would be determined in the field, mapped, and marked prior to ground-disturbing activities. Desert tortoise clearance surveys conforming to USFWS recommendations would be followed for the initial siting of road grading, and a qualified desert tortoise biologist or the Tortoise Management Representative would also be on-site during grading activities. An authorized desert tortoise biologist would be "on-call"/available if a desert tortoise is encountered. A qualified desert tortoise biologist or the Tortoise Management Representative would survey and stake the road grading locations to avoid direct effects to desert tortoise burrows.

Permanent effects to 44.8 acres of critical habitat represents a small fraction (0.004 percent) of the 1,020,600 acres of habitat within the Chuckwalla Critical Habitat Unit. Permanent effects to this small portion of critical habitat would not negatively affect the function of the surrounding critical habitat or affect desert tortoise movement in the area as desert tortoise would be able to easily cross the access road and new combat road/trail. The access road and new combat road/trail are not anticipated to negatively affect the primary constituent elements of the adjacent critical habitat.

Temporary

Under the Proposed Action, there would be periodic temporary effects to 597.3 acres of occupied desert tortoise critical habitat during military training activities, especially WTI, which occurs biannually. Effects may include vegetation trimming (mainly the upper portion of tall woody vegetation that is not used by desert tortoise); vegetation trampling (through use of LZs and ALZ by MV-22s and military vehicles); increased dust; potential for minor, localized erosion (through rotor downwash); and other types of soil disturbance. Periodic, temporary disturbance to 597.3 acres of critical habitat represents a small fraction (0.06 percent) of the 1,020,600 acres of habitat within the Chuckwalla Critical Habitat Unit.

These effects would be temporary due to the occasional use of the LZs and ALZ mainly by the biannual WTI training. To minimize the effect of dust and provide a safe aircraft landing environment, an eco-safe, biodegradable, liquid copolymer dust palliative (e.g., brand name "Envirotac II") may be applied to the LZs for dust suppression.

Indirect

Indirect effects to desert tortoise critical habitat may include decreased photosynthetic capacity due to increased dust, potential for wildfire to damage and destroy vegetation (both within and outside of proposed training support areas), potential to spread invasive weed species, and others. An increase in dust is unlikely to negatively affect vegetation due to natural windy/dusty conditions that occur within the Colorado Desert (especially within the Imperial Valley and surrounding areas). Desert vegetation is adapted to windy and dusty conditions and areas that require dust abatement for safety purposes would have a dust palliative applied, which would also reduce dust on adjacent vegetation. The potential for wildfires to damage and destroy vegetation is low since the exhaust of the MV-22 should not heat the ground to a temperature high enough to support combustion of plant-based materials such as dry grasses (USMC and U.S. Forest Service 2013). This is because exhaust deflectors activate as soon as there is weight on the main landing gear wheels, thereby ensuring that the aircraft operates with the exhaust deflectors on at all times when on the ground and reducing the potential for wildfire ignition to low (Marine Corps Air Ground Combat Center 2010). As detailed in Chapter 2.2 (Measure 22), in an effort to control the spread of invasive weeds, especially those originating from outside of the CMAGR, all construction-type equipment and/or construction-type vehicles originating outside of the CMAGR would be power-washed before entering roadways on the way to the CMAGR. This would apply to vehicles that originate from outside of the CMAGR that are brought in to conduct AFA Burt 2.0 access road grading. If the vehicles originate within the CMAGR, then no additional measures to reduce the spread of weeds that already exist on the CMAGR are required.

Summary of Effects to Critical Habitat

The use of MV-22s at the CMAGR was previously analyzed in the 2015 BO (USFWS 2015) in which MV-22s were authorized to land anywhere that legacy rotary-wing aircraft could operate. The Proposed Action would involve the landing of MV-22s and the establishment of a new combat road/trail to AFA Burt 2.0 within desert tortoise critical habitat. The permanent effect of up to 44.8 acres and temporary disturbance of up to 597.3 acres of desert tortoise critical habitat would be consistent with current use of the CMAGR. Effects to this small portion of critical habitat would not negatively affect the function of the surrounding critical habitat, affect desert tortoise movement in the area, or negatively affect the

primary constituent elements of the adjacent critical habitat. Moreover, all effects would be limited to 642.1 acres, or 0.06 percent, of the 1,020,600-acre Chuckwalla Critical Habitat Unit.

4.1.3 Cumulative Effects

The area considered in this cumulative effects analysis is the entire CMAGR. Implementation of the Proposed Action and other projects within the CMAGR have the potential to result in the cumulative loss of biological resources in the form of vegetation, habitat, and species. The Proposed Action would result in the permanent loss and temporary disturbance to vegetation communities and cover types that are occupied by desert tortoise. All federal activities within the CMAGR potentially affecting desert tortoise are subject to ESA Section 7 consultation and require the issuance of (or consistency with) a BO by the USFWS with reasonable and prudent measures, terms, conditions, and conservation recommendations. Under the ESA, these future federal activities are not considered in this cumulative effects analysis.

Cumulative effects to be considered under the ESA are those effects of future nonfederal (state, local agency, or private) activities on federally listed species that are reasonably certain to occur within the area affected by the Proposed Action. Since no non-federal activities are proposed within the Proposed Action Area, no cumulative effects are anticipated.

CHAPTER 5
CONCLUSION

Based on the analysis of effects presented in Chapter 4, Table 5 presents the USMC's effects determinations for ESA-listed species and critical habitat from implementation of the Proposed Action within the Proposed Action Area.

Table 5. Effects Determination

Species or Habitat	Effects Determination
Desert Tortoise	May affect and is likely to adversely affect.
Desert Tortoise Critical Habitat	May affect and is likely to adversely affect.

The 1996 BO provides for an annual incidental take allowance of 11 tortoises injured/killed, and 112 tortoises harassed per year across the CMAGR. No take has been reported/identified in recent years at the CMAGR and there is no evidence that annual take has ever exceeded the 1996 BO allowance. The potential incidental take associated with the Proposed Action is not likely to increase the potential take within the CMAGR to a level that exceeds the take limits established in the 1996 BO. The implementation of the proposed measures (Chapter 2.2) would greatly reduce the potential to injure or harass desert tortoises. Therefore, the Proposed Action may affect and is likely to adversely affect the desert tortoise and desert tortoise critical habitat.

CHAPTER 6
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APPENDIX A

DESERT TORTOISE SURVEY REPORT

FINAL DESERT TORTOISE SURVEY REPORT

In Support of

Environmental Assessment for Cactus West MV-22 Landing Zones, Assault Landing Zones, and Drop Zones
Marine Corps Air Station Yuma, Arizona

Prepared for:

Department of the Navy
Naval Facilities Engineering Command Southwest
937 North Harbor Drive
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Prepared Under: Contract Number: N62470-16-D-9002
Task Order: N6247320F5437

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APRIL 2021

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ACRONYMS AND ABBREVIATIONS

AFA	Artillery Firing Area
ALZ	Assault Landing Zone
BMGR-West	Barry M. Goldwater Range-West
BSTRC	Bob Stump Training Range Complex
CMAGR	Chocolate Mountain Aerial Gunnery Range
DZ	Drop Zone
GPS	global positioning system
LZ	Landing Zone
MCAS	Marine Corps Air Station
MCL	mean carapace length
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
USMC	U.S. Marine Corps

1.0 INTRODUCTION

This survey report details the methods and results of focused desert tortoise (*Gopherus agassizii*) surveys conducted in March 2021 for Marine Corps Air Station (MCAS) Yuma, Arizona, on lands located in the Chocolate Mountain Aerial Gunnery Range (CMAGR) in eastern Riverside and Imperial Counties, California (Figure 1). The U.S. Marine Corps (USMC) is in the process of preparing an Environmental Assessment to establish and use new landing zones (LZs), assault landing zones (ALZs), drop zones (DZs), and an artillery firing area (AFA) at the two tactical ranges within the Bob Stump Training Range Complex (BSTRC): the CMAGR (located in California) and the Barry M. Goldwater Range-West (BMGR-West; located in Arizona), as part of the proposed action for the environmental assessment. The USMC does not propose to increase the quantity of sorties flown, increase the amount and/or types of ordnance expended, increase artillery training tempo, or alter the existing facilities or airspace within the BSTRC for the project. Desert tortoise surveys were not conducted at BMGR-West. Desert tortoise surveys were conducted across seven different survey areas within the CMAGR that include the following proposed training components: one LZ, four ALZs, one unimproved ALZ, and one AFA (hereafter referred to as the project).

1.1 Purpose of the Survey Report

This survey report describes the focused desert tortoise surveys conducted in compliance with the U.S. Fish and Wildlife Service (USFWS) guidance outlined in the document titled *Preparing for Any Action That May Occur within the Range of the Mojave Desert Tortoise (Gopherus agassizii)* (USFWS 2019). The pre-project surveys were conducted to support environmental documentation for Endangered Species Act section 7 consultation with the USFWS. Pre-project surveys were conducted to estimate the number of desert tortoises to be potentially impacted by the project and the results of the surveys are detailed herein.

1.2 Project Background

The CMAGR is a USMC Range located east of the Salton Sea in the southeastern corner of California in Riverside and Imperial Counties (Figure 1). The CMAGR is approximately 459,000 acres and includes several sensitive biological resources, which are managed in compliance with the Sikes Act of 1960 by the *Integrated Natural Resources Management Plan for the Chocolate Mountains Aerial Gunnery Range, California* (hereafter, 2017 CMAGR INRMP; MCAS Yuma 2017).

The CMAGR is one of the most intensively used ranges in the Yuma Training Range Complex, providing extensive land space and airspace areas for military aviation training. During World War II, General George S. Patton, Jr., established the Desert Training Center for training in desert

survival and warfare. The Desert Training Center encompassed 18,000 square miles in southeastern California, western Arizona, and southern Nevada. The Center was later renamed as the California-Arizona Maneuver Area and included Camp Young and 10 divisional camps. The Chocolate Mountains, in addition to its association with desert training, became the site for Camp Dunlap, a Marine Training Center, which later became the CMAGR. Since World War II, CMAGR land and airspace have served as a bombing range. The cantonment for Camp Billy Machen was constructed in the western CMAGR in 1966 and serves as a training camp for the Navy SEALs (MCAS Yuma 2011).

To date, the CMAGR is used as a training range for predominantly air-based defenses, including fixed-wing aircraft and helicopters. The range is used for live-fire training and a range of ground support areas, target complexes, individual target sites, and other training facilities. The CMAGR supports training activities for the USMC and Department of the Navy, including air tactics; close air support missions; laser system operations; and air-to ground bombing, rocket, and strafing exercises. The Desert Training Facility within the CMAGR is primarily used for SEAL platoon pre-deployment training and other requirements including air and ground maneuvers, indirect weapons, and demolition firing (MCAS Yuma 2011).

Specific to the project, aircraft that are used in training at the CMAGR originate from squadrons based at MCAS Yuma and MCAS Miramar and include the MV-22. Various air combat training activities occur regularly at the CMAGR including the use of MV-22s, which are currently being expanded. The project would provide necessary training support areas for use of MV-22s in several locations throughout the CMAGR.

1.3 Survey Area Description

The project is located within the southwestern portion of the Colorado Desert Recovery Unit for the desert tortoise and is north and east of the eastern edge of the Salton Sea. The survey areas are classified as having a low to high potential for the desert tortoise based on the U.S. Geological Survey (USGS) desert tortoise habitat potential model (Nussear et al. 2009). Habitat along the gradually west-sloped side of the Chocolate Mountains is predicted to be lower quality for the desert tortoise compared with higher quality habitat near the base of, within, and east of the Chocolate Mountains.

Regionally, the project is situated within the Colorado Desert on sloped, open terrain dominated by desert scrub vegetation interspersed with small drainages and washes. Federally designated critical habitat for the desert tortoise within the Chuckwalla Critical Habitat Unit is located on the east side of the CMAGR and overlaps with portions of the project. Table 1 details the seven desert

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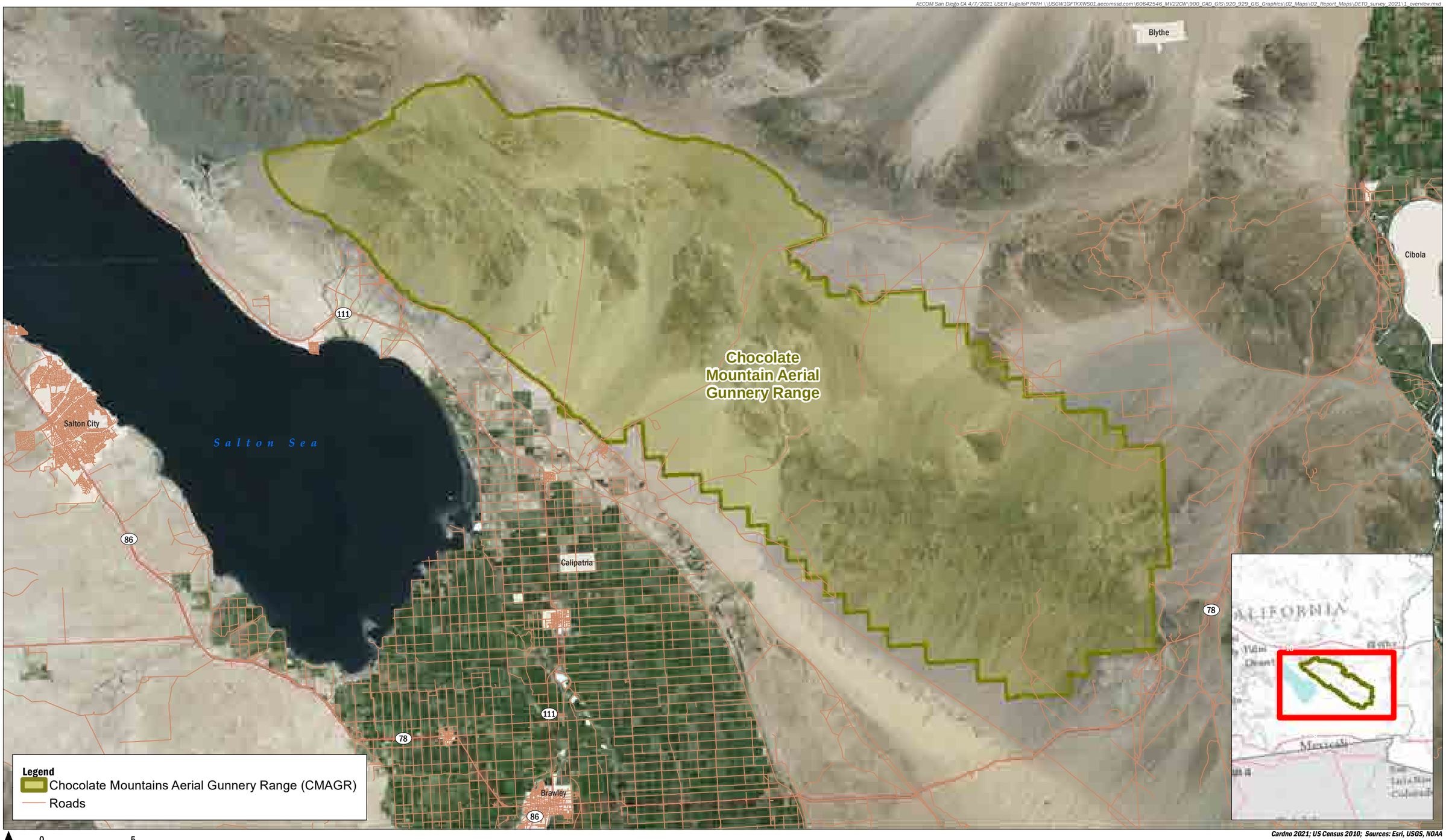

Cardno 2021; US Census 2010; Sources: Esri, USGS, NOAA

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Desert Tortoise Survey Report in Support of MV-22 Landing Zones, Assault Landing Zones, and Drop Zones, MCASY

FIGURE 1 OVERVIEW MAP

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tortoise survey areas, totaling 1,410.6 acres, as well as which survey areas are within the Chuckwalla Critical Habitat Unit. The seven survey areas, along with USFWS desert tortoise critical habitat, are shown on Figure 2.

Table 1 Desert Tortoise Survey Areas

Survey Area	Training Support Area Type	Acreage	Within Chuckwalla Critical Habitat Unit
PA 1 (AFA Burt 2.0 and access roads)	AFA	86.8	Yes
PA 2 (ALZ Bull)	Unimproved ALZ	12.9	No
Pina	LZ	68.3	Yes
Salvation Pass West (Multi-Ship South)	ALZ	738	No
Salvation Pass East (Multi-Ship North)	ALZ	487	Yes
Salvation Pass (Single Ship North 1 and 2)[1]	ALZ	17.6	No
Total		**1,410.6**	

[1] Includes two small separate survey areas.

All seven desert tortoise survey areas include the physical and biological features of desert tortoise critical habitat as described in USFWS 2019. These include:

- sufficient space to support viable populations within each of the 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 growth of these species;
- suitable substrates for burrowing, nesting, and overwintering;
- burrows, caliche caves, and other shelter sites;
- sufficient vegetation for shelter from temperature extremes and predators; and habitat protected from disturbance and human-caused mortality.

The survey areas contain three main natural communities based on the mapping (VegCAMP et al. 2013) in the 2017 CMAGR INRMP (MCAS Yuma 2017). The west side of the Chocolate Mountains is predominantly Madrean Warm Semi-Desert Wash Woodland/Scrub interspersed with Lower Bajada and Fan Mojavean-Sonoran Desert Scrub. Both within and on the east side of the Chocolate Mountains, the survey areas include sections of North American Warm Desert Bedrock Cliff and Outcrop along with Lower Bajada and Fan Mojavean-Sonoran Desert Scrub.

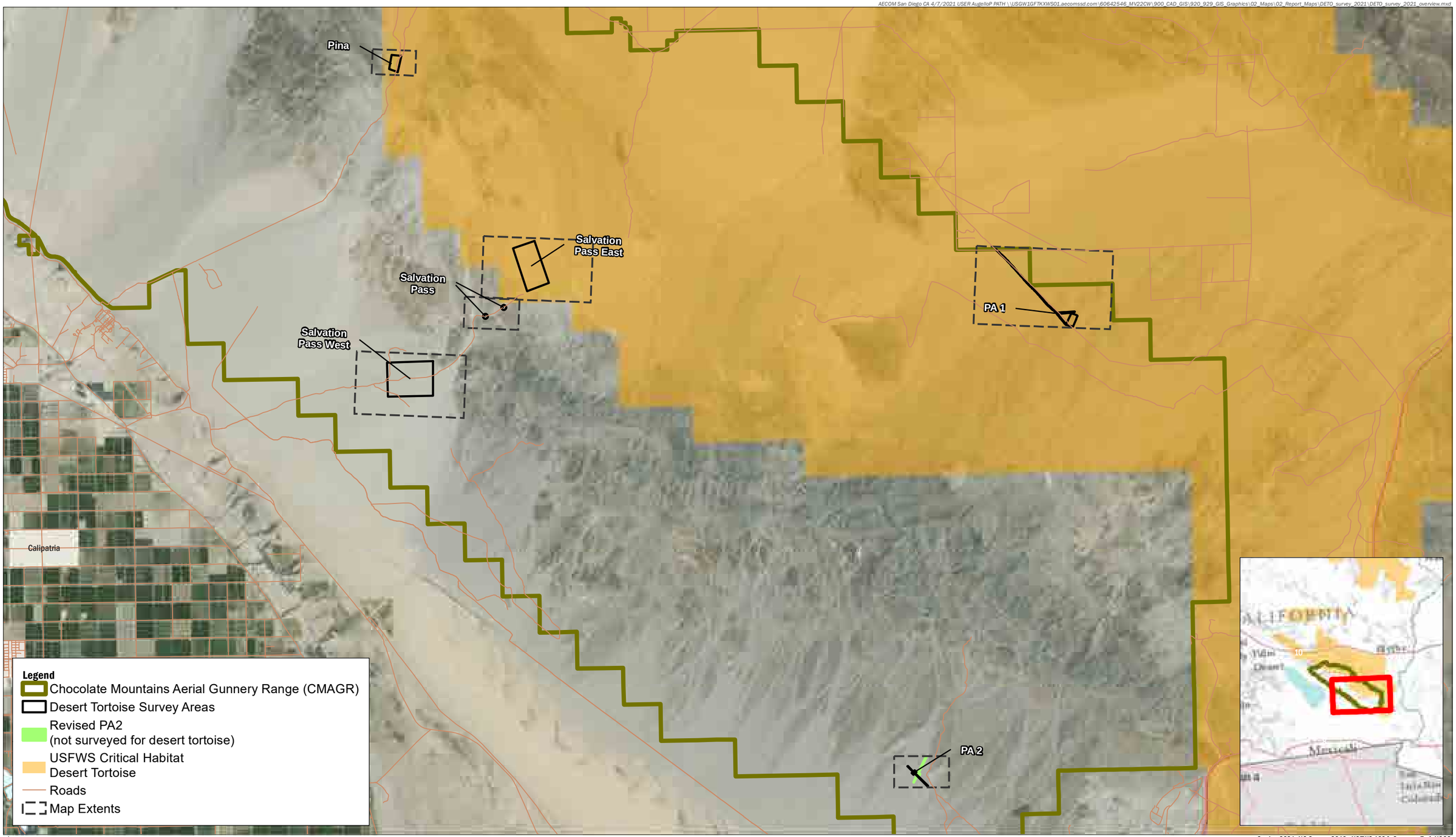
2.0 DESERT TORTOISE

2.1 Survey Methods

Desert tortoise surveys were conducted in accordance with the most recent guidance from the USFWS detailed in *Preparing for Any Action That May Occur within the Range of the Mojave Desert Tortoise* (*Gopherus agassizii*) (USFWS 2019). The purpose of the surveys is to support project-specific Endangered Species Act consultation with the USFWS and, as such, the surveys employed 100 percent coverage of the seven survey areas (detailed in Table 1 and displayed on Figure 2).

Per the protocol, desert tortoises are generally most active April through May and September through October when air temperatures are below 35°Centigrade (95°Fahenheit; Walde et al. 2003). Air temperature is measured approximately 5 centimeters from the soil surface in an area of full sun, but in the shade of the observer. Given range access constraints on the CMAGR, desert tortoise surveys were conducted in early to mid-March 2021. While surveys were conducted earlier than the USFWS 2019 protocol states, temperatures are generally warmer earlier in the season near the southern extent of the species range including the CMAGR. Furthermore, because surveys used 100 percent coverage and were not probabilistic in nature, and desert tortoises are known to be active and above ground in March on the CMAGR (based on the *2020 Line Distance Sampling for Desert Tortoises at Chocolate Mountains Aerial Gunnery Range*; Vernadero Group 2020) survey timing was determined as appropriate. Finally, email dialogue with Natural Resources Staff at MCAS Yuma confirmed that the March timeframe was appropriate for detecting desert tortoises on the CMAGR, as confirmed by the USFWS.

Focused 100 percent coverage desert tortoise surveys were conducted by AECOM biologists at all seven survey areas. Surveys consisted of biologists slowly walking 10-meter-wide spaced transects searching for all desert tortoise sign. Surveyors walked an average of 2 to 12 miles of transects per day per biologist depending upon the location of the survey areas and amount of survey area left to be covered. A team of approximately three to six biologists (including two biologists previously designated as Authorized Biologists by the USFWS) conducted the surveys. All desert tortoise sign (shell fragments, bones, scutes, carcasses, drinking depressions, mating rings, scat, burrows, tracks, and live individuals) were recorded. A hand-held mirror or light was used to examine any potential desert tortoise burrows for occupancy. All surveys were conducted during daylight hours with no minimum temperature restrictions. However, surveys were not conducted if temperatures exceeded 35°Centigrade (95°Fahenheit) in the shade when measured approximately 5 centimeters from the soil surface above the ground.



Cardno 2021; US Census 2010; USFWS 1994; Sources: Esri, USGS,

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Desert Tortoise Survey Report in Support of MV-22 Landing Zones, Assault Landing Zones, and Drop Zones, MCASY

FIGURE 2 DESERT TORTOISE SURVEY AREAS

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Data collected followed the guidelines in the most recent survey protocol (USFWS 2019). Data was collected electronically and uploaded to a secured server every evening. Data was recorded on digital tablets or similar devices that operated custom-designed desert tortoise forms using the software data collection platform known as Fulcrum. All desert tortoise sign had its location recorded via geographic positioning system (GPS). Data recorded included the survey date, names of all surveyors, start and end times, weather conditions, and any evidence that indicated desert tortoises were present (e.g., scat, burrows, carcasses, courtship rings, drinking depressions, etc. in addition to live tortoises). Additional information such as incidentally detected wildlife species was also recorded. The USFWS Field Manual (USFWS 2009) was used to categorize the condition of all potential burrows detected. For every live desert tortoise found, the mean carapace length (MCL) was estimated, along with the tortoise gender, if it had a transmitter, its general health (if its face was visible), and any additional distinguishing marks. All observed desert tortoise sign regardless of where it was detected within the survey areas was recorded. All wildlife species incidentally detected during desert tortoise surveys were also recorded.

2.2 Survey Results

Desert tortoise surveys dates, personnel, survey location, start/end times, and weather conditions are detailed in Table 2.

Table 2 Survey Dates, Personnel, and Weather Summary

Date	Survey Personnel	Survey Location	Start/ End	Time	Weather Summary	Temp. (°F)	Average Wind Speed (mph)
03/01/2021	Andrew Fisher, Angelique Herman, Ayoola Folarin, Bonnie Hendricks, John Parent, Emma Fraser	Salvation Pass East (Multi-Ship North)	Start	10:33 AM	Sunny and cool	71	3
			End	4:45 PM	Clear, cool	67	3
03/02/2021	Andrew Fisher, Angelique Herman, Ayoola Folarin, Bonnie Hendricks, John Parent, Emma Fraser	Salvation Pass East (Multi-Ship North)	Start	9:34 AM	Sunny, light breeze	68	4
			End	3:49 PM	Sunny, cool	74	0
03/03/2021	Andrew Fisher, Angelique Herman, Ayoola Folarin, Bonnie Hendricks, John Parent, Emma Fraser	Salvation Pass East (Multi-Ship North)	Start	8:08 AM	Sunny, light breeze	64	6
			End	3:26 PM	Breezy and light rain	58	6
03/04/2021	Andrew Fisher, Angelique Herman, Ayoola Folarin, Bonnie Hendricks, John Parent, Emma Fraser	Salvation Pass East (Multi-Ship North) and Salvation Pass (Single Ship North 1 and 2)	Start	7:38 AM	Sunny, cool	55	0
			End	2:00 PM	Sunny, light breeze	73	3

Table 2 Survey Dates, Personnel, and Weather Summary

Date	Survey Personnel	Survey Location	Start/ End	Time	Weather Summary	Temp. (°F)	Average Wind Speed (mph)
03/05/2021	Andrew Fisher, Angelique Herman, Ayoola Folarin, Bonnie Hendricks, John Parent, Emma Fraser	Salvation Pass West (Multi-Ship South)	Start	7:11 AM	Sunny, light breeze	62	2
			End	2:56 PM	Sunny, warm	81	2
03/06/2021	Andrew Fisher, Angelique Herman, Ayoola Folarin, Bonnie Hendricks, John Parent, Emma Fraser	Salvation Pass West (Multi-Ship South)	Start	7:10 AM	Sunny, cool	63	2
			End	3:19 PM	Sunny, light breeze	86	5
03/07/2021	Andrew Fisher, Angelique Herman, Ayoola Folarin, Bonnie Hendricks, John Parent, Emma Fraser	Salvation Pass West (Multi-Ship South)	Start	7:06 AM	Sunny, partially cloudy and breezy	64	3
			End	2:47 PM	Sunny	86	2
03/08/2021	Andrew Fisher, Angelique Herman, Ayoola Folarin, Bonnie Hendricks, John Parent, Emma Fraser	Salvation Pass West (Multi-Ship South)	Start	7:15 AM	Sunny	61	1
			End	2:05 PM	Sunny	77	4.5
03/09/2021	Andrew Fisher, Angelique Herman, Ayoola Folarin, Bonnie Hendricks, John Parent, Emma Fraser	PA 1 (AFA Burt 2.0 and access roads	Start	7:33 AM	Sunny	60	2
			End	12:09 PM	Sunny, breezy	69	14.5
03/10/2021	Andrew Fisher, Angelique Herman, Ayoola Folarin, Bonnie Hendricks, John Parent, Emma Fraser	PA 2 (ALZ Bull)	Start	8:23 AM	Sunny	58	3.4
			End	9:56 AM	Sunny	62	3
03/16/2021	Emma Fraser, Ayoola Folarin, Frances Glaser	Pina (AFA 8)	Start	9:09 AM	Sunny	51	1
			End	2:54 PM	Sunny	69	2.5
03/17/2021	Emma Fraser, Ayoola Folarin, Frances Glaser	Pina (AFA 8)	Start	8:43 AM	Sunny	60	0
			End	10:21 AM	Sunny	67	0

Surveys were generally conducted on sunny days with mild springtime temperatures. Most survey areas contained little evidence of fresh annual vegetation growth. The previous winter was dry and based on rainfall data from the Western Regional Climate Center for the Mecca Fire Station (which was the closest reporting station with rainfall data for 2020 and 2021; WRCC 2021), the area received 0.26 inch (7 millimeters) of rainfall between October 2020 and March 2021.

Across all survey areas, desert tortoise sign was relatively scarce but highly localized in the few areas where it was detected. Two adult desert tortoises were detected in the northwestern corner of Salvation Pass East, with an additional adult tortoise detected outside the survey area. No desert tortoises were detected within the two small survey areas of Salvation Pass and three adult desert tortoises were detected along the southern border of Salvation Pass West. Three adult desert tortoises were detected within PA 1, with a fourth desert tortoise detected outside the survey area and walking towards a desert tortoise located within PA 1. No desert tortoises were detected at PA 2 or Pina. Table 3 provides a breakdown of the number of live adult desert tortoises detected per survey area (desert tortoises observed outside of survey areas are not counted in Table 3), along with the number of burrows (and their classifications), carcasses, scat, and eggshell fragments. In regards to the number of carcasses detected per survey area, both intact whole carcasses in addition to shell fragments and scattered carcass remains are included together.

Table 3 Desert Tortoise Survey Results

Desert Tortoise Sign by Survey Location		Salvation Pass East	Salvation Pass	Salvation Pass West	PA 1	PA 2	Pina	Total
Live Desert Tortoise	Adult (≥180 mm MCL)	2[1]	0	3	3[1]	0	0	**8**
	Subadult/Juvenile (<180 mm MCL)	0	0	0	0	0	0	**0**
Burrows	Class 1	0	0	2	1	0	0	**3**
	Class 2	1	0	3	0	0	0	**4**
	Class 3	1	0	0	0	0	0	**1**
	Class 4	12	1	10	0	0	6	**29**
	Class 5	12	1	3	2	0	7	**25**
Carcasses	Intact carcasses and scattered shell/bone fragments	9 adult (four female, one male, and four of unknown sex) and 1 subadult	1	5 adult (one female, one male, and three of unknown sex)	1	0	0	**17**
Scat		0	0	5	1	0	0	**6**
Eggshell Fragments		1	0	0	0	0	0	**1**

Notes:

[1] One adult desert tortoise was found just outside of the survey area and, therefore, is not included here.

[2] The following burrow class definitions were adopted from the USFWS Field Manual (USFWS 2009) and are defined as:

1. currently active, with desert tortoise or recent desert tortoise sign
2. good condition, definitely desert tortoise; no evidence of recent use
3. deteriorated condition; this includes collapsed burrows; definitely desert tortoise (please describe)
4. good condition; possibly desert tortoise (please describe)
5. deteriorated condition; this includes collapsed burrows; possibly desert tortoise (please describe)

All desert tortoise sign detected (and detailed in Table 3) was mapped by GPS and is displayed on survey area-specific Figures 3 through 8. There were several overarching general trends in terms of where desert tortoise sign was located based on the survey area. Generally, there was more

desert tortoise sign, including live adult desert tortoises on the north and east sides of the Chocolate Mountains, which is in line with the USGS habitat mapping and the USFWS critical habitat designation.

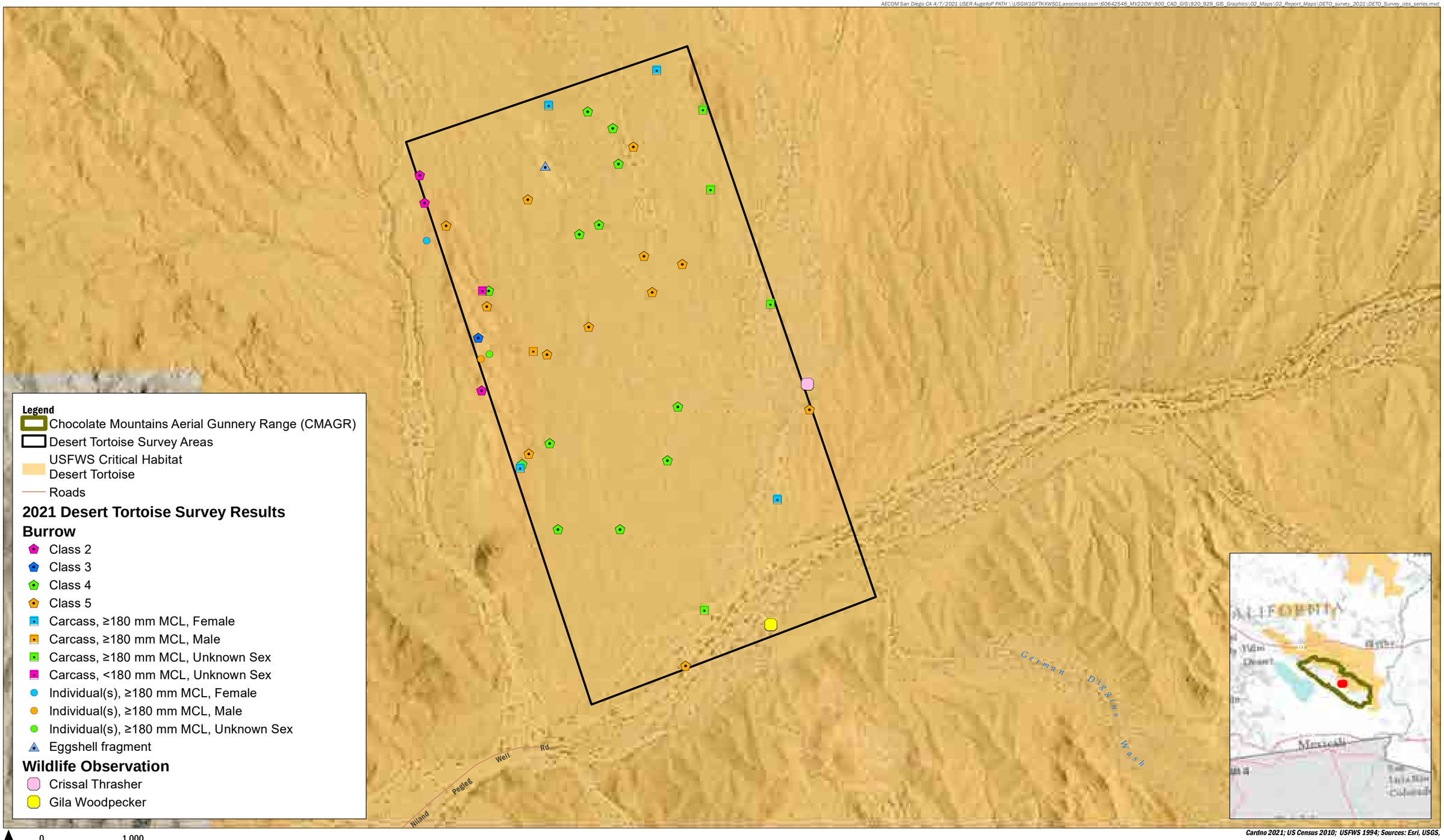
While biologists conducted desert tortoise surveys, they incidentally recorded all wildlife species detected based on direct observations (or heard), scat, tracks, and other sign. A complete list of all wildlife species detected is provided in Appendix A. Representative photographs of the survey areas and desert tortoises are provided in Appendix B. The following section briefly describes the results of surveys within each specific survey area in the order surveyed.

Salvation Pass East: This survey area contains a small, very steep and rocky outcrop in the northwestern corner (Photograph 1) where two live desert tortoises (one adult male and one presumed female) were found (Photograph 2). Several Class 1 burrows and scat were also found along the rocky steep slopes. One adult female tortoise was found to the west outside of the survey area. One partial eggshell fragment was found at the bottom of the rocky outcrop with no nearby burrows. The only sign of subadult/juvenile desert tortoise presence was a partially chewed carcass of a small desert tortoise that had been stashed between pencil cholla in association with a large woodrat midden (Photograph 3). Several old carcasses were scattered around the survey area, mainly on the northern edge in association with washes.

Salvation Pass: The two small survey areas within Salvation Pass did not have any recent desert tortoise sign in them, and the sandy substrate likely precludes desert tortoises from using the area for burrowing (Photograph 4).

Salvation Pass West: This large survey area had a small amount of desert tortoise sign on the northern boundary (one Class 1 burrow with tracks in it, but no desert tortoise observed), and three live adult desert tortoises in the southern half of the survey area (Photographs 5 and 6). Several Class 1 burrows were also detected in the southern half of the survey area within a semi-stabilized portion of the wide wash that traverses the survey area from the Chocolate Mountains southwest towards the Salton Sea and Imperial Valley.

PA 1: Along the main access road, very little desert tortoise sign was found. However, within the AFA and the new combat road/trail, three adult live tortoises (two adult females and one male) were detected (Photographs 7 and 8). One additional adult male was detected just outside of the new combat road/trail walking towards a female in a burrow within the new combat road/trail. No scat was detected, and the only burrows detected were occupied or in the immediate vicinity of a desert tortoise. The area has several small drainages (between patches of desert pavement) with abundant annuals where desert tortoises were feeding.



Cardno 2021; US Census 2010; USFWS 1994; Sources: Esri, USGS,

FIGURE 3
SALVATION PASS EAST SURVEY AREA

AECOM San Diego CA 4/7/2021 USER AugelloP PATH \\USGW1GFTKXWS01.aecomssd.com\60642546_MV22CW\900_CAD_GIS\920_929_GIS_Graphics\02_Maps\02_Report_Maps\DETO_survey_2021\DETO_Survey_obs_series.mxd

Niland Pegleg Well Rd

Legend

- Chocolate Mountains Aerial Gunnery Range (CMAGR)
- Desert Tortoise Survey Areas
- USFWS Critical Habitat Desert Tortoise
- Roads

2021 Desert Tortoise Survey Results

Burrow

- Class 4
- Class 5
- Desert Tortoise Shell Fragment

N

0 500

Feet

Cardno 2021; US Census 2010; USFWS 1994; Sources: Esri, USGS,

AECOM

Desert Tortoise Survey Report in Support of MV-22 Landing Zones, Assault Landing Zones, and Drop Zones, MCASY

FIGURE 4
SALVATION PASS SURVEY AREA

Niland Pegleg Well Rd

Legend

- Chocolate Mountains Aerial Gunnery Range (CMAGR)
- Desert Tortoise Survey Areas
- Roads

2021 Desert Tortoise Survey Results

Burrow

- Class 1
- Class 2
- Class 4
- Class 5
- Carcass, ≥180 mm MCL, Female
- Carcass, ≥180 mm MCL, Male
- Carcass, ≥180 mm MCL, Unknown Sex
- Individual(s), ≥180 mm MCL, Female
- Individual(s), ≥180 mm MCL, Male
- Scat

N

0 1,000

Feet

Cardno 2021; US Census 2010; USFWS 1994; Sources: Esri, USGS,

AECOM

Desert Tortoise Survey Report in Support of MV-22 Landing Zones, Assault Landing Zones, and Drop Zones, MCASY

FIGURE 5
SALVATION PASS WEST SURVEY AREA

AECOM San Diego CA 4/7/2021 USER AugelloP PATH \\USGW1GFTKXWS01.aecomssd.com\60642546_MV22CW\900_CAD_GIS\920_929_GIS_Graphics\02_Maps\02_Report_Maps\DET0_survey_2021\DET0_Survey_obs_series.mxd

Dietz Rd

Jake Wash

Wash

Brue

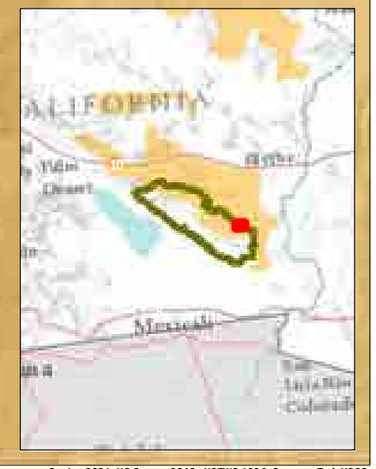
Legend

- Chocolate Mountains Aerial Gunnery Range (CMAGR)
- Desert Tortoise Survey Areas
- USFWS Critical Habitat Desert Tortoise
- Roads

2021 Desert Tortoise Survey Results

Burrow

- Class 1
- Class 5
- Carcass, ≥180 mm MCL, Male
- Carcass, ≥180 mm MCL, Unknown Sex
- Individual(s), ≥180 mm MCL, Female
- Individual(s), ≥180 mm MCL, Male
- Scat



N

0 1,250

Feet

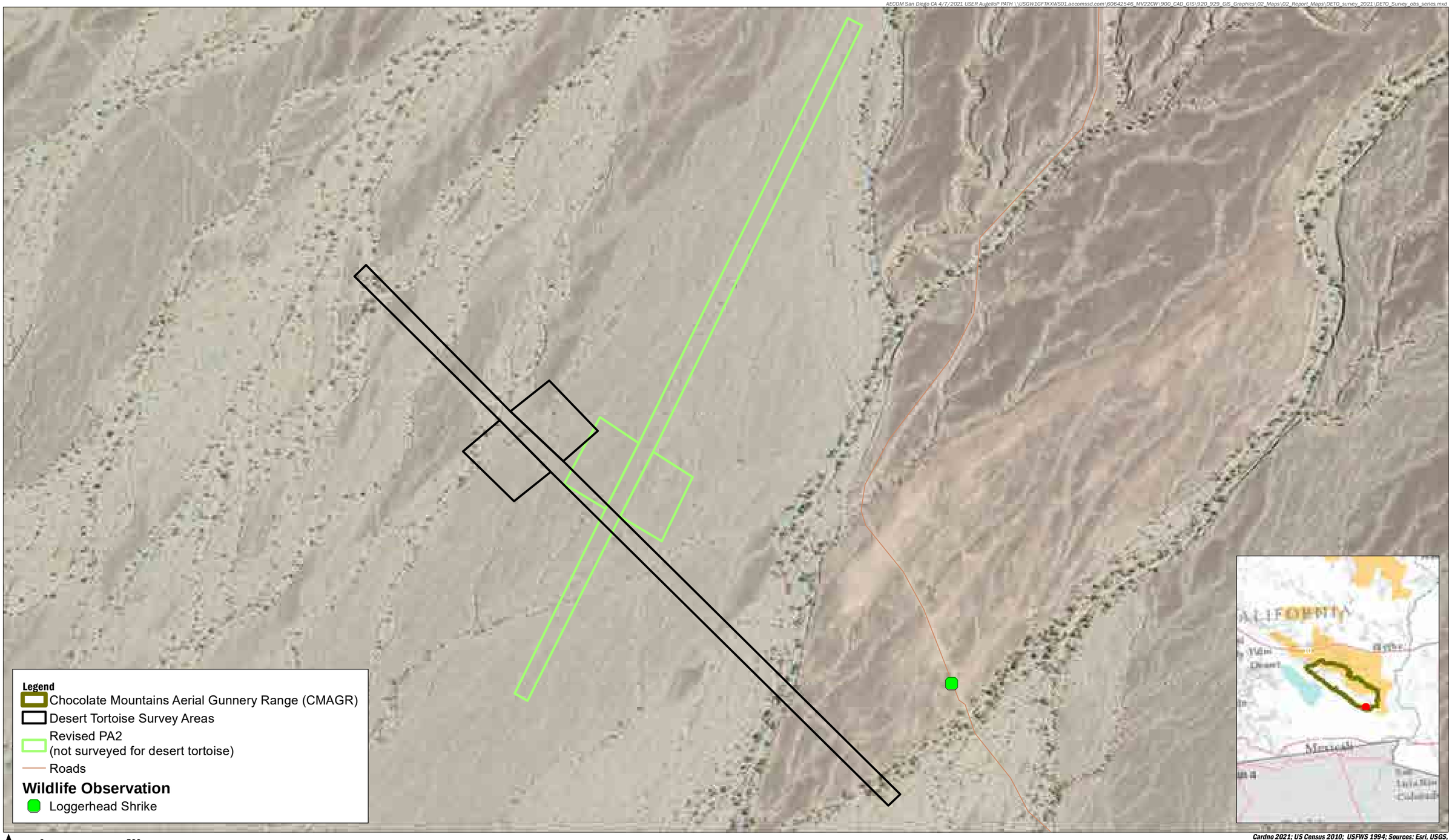
Cardno 2021; US Census 2010; USFWS 1994; Sources: Esri, USGS,

AECOM

Desert Tortoise Survey Report in Support of MV-22 Landing Zones, Assault Landing Zones, and Drop Zones, MCASY

FIGURE 6
PA1 SURVEY AREA

AECOM San Diego CA 4/7/2021 USER AugelloP PATH \\USGW1GFTKXWS01.aecomssd.com\60642546_MV22CW\900_CAD_GIS\920_929_GIS_Graphics\02_Maps\02_Report_Maps\DETO_survey_2021\DETO_Survey_obs_series.mxd

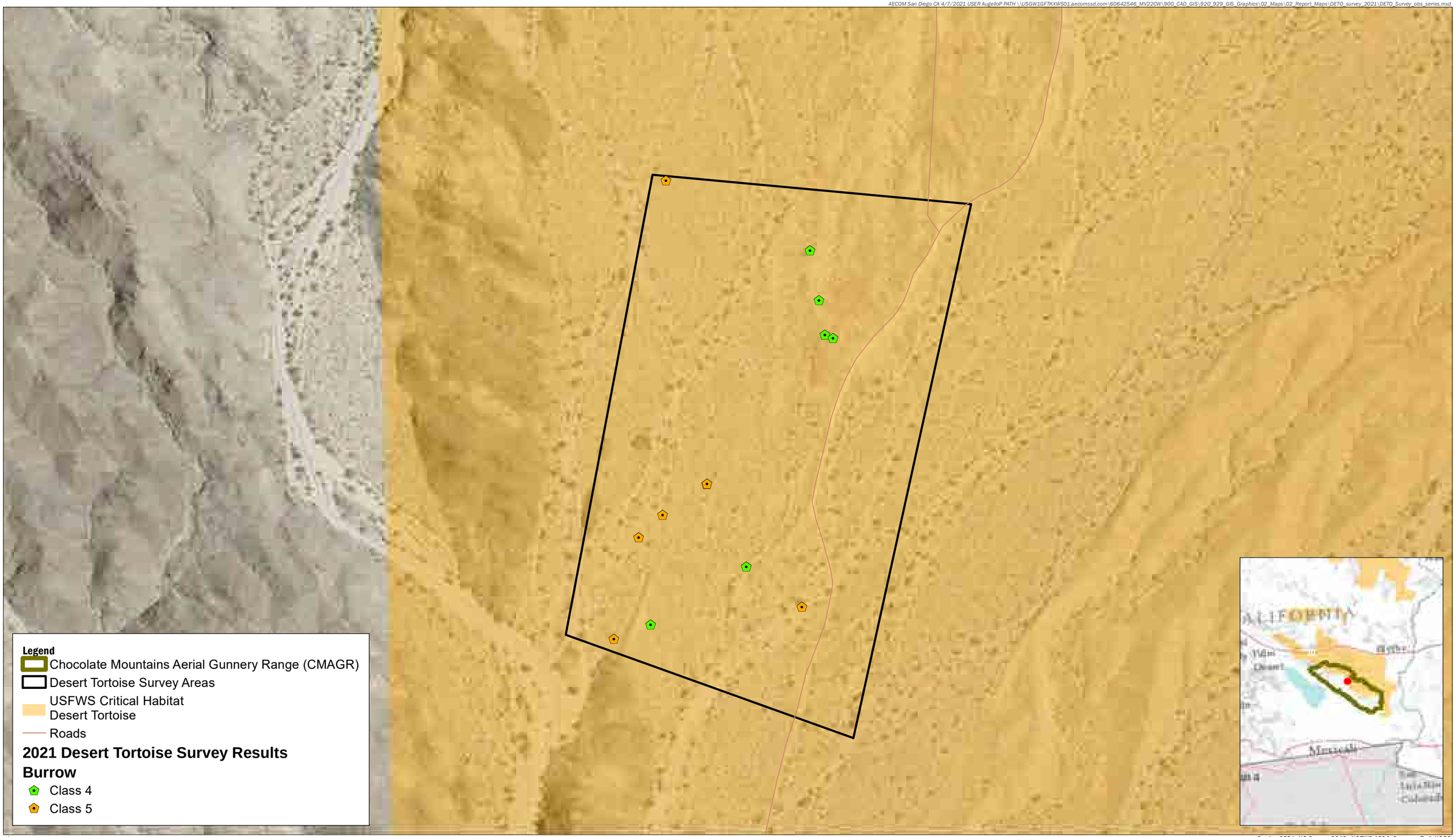


Cardno 2021; US Census 2010; USFWS 1994; Sources: Esri, USGS,

AECOM

Desert Tortoise Survey Report in Support of MV-22 Landing Zones, Assault Landing Zones, and Drop Zones, MCASY

FIGURE 7
PA2 SURVEY AREA



Cardno 2021; US Census 2010; USFWS 1994; Sources: Esri, USGS,

AECOM

Desert Tortoise Survey Report in Support of MV-22 Landing Zones, Assault Landing Zones, and Drop Zones, MCASY

FIGURE 8
PINA SURVEY AREA

PA 2: No sign of desert tortoise occupancy was detected during the surveys. During surveys at PA 2, AECOM biologists noticed that the survey area traversed several large washes that contained tall desert wash woodland vegetation (Photograph 9). PA 2 is oriented perpendicular to washes that have the potential to cause significant scour during high rain events and erode the ALZ. Therefore, AECOM biologists suggested an alternative location perpendicular to the PA 2 survey area that would be less likely to experience periodic scour from rain events. This alternative location is shown on Figure 7 as Revised PA 2 and overlaps a portion of the original PA 2. Although the original PA 2 was surveyed for desert tortoises, for the purposes of the USFWS consultation, survey results will be extrapolated to the alternative and Revised PA 2.

Pina: No sign of desert tortoise occupancy was detected during the surveys despite the habitat appearing suitable (Photograph 10). No live adult desert tortoise, no definitive desert tortoise burrows (Class 1 or 2), and no scat were detected. Several burrows more characteristic of desert kit fox were observed and recorded, but none had diagnostic traits of desert tortoise burrows.

3.0 DISCUSSION

All seven of the desert tortoise survey areas are suitable and most of the survey areas should be considered occupied by the desert tortoise. The desert tortoise surveys represent a snap-shot in time to document desert tortoise use of the survey areas following a dry winter. Very little new annual growth was detected within the survey areas and very little scat was detected. Surveys were conducted early in the spring season, and many of desert tortoises were detected in proximity to a burrow.

The USFWS 2019 protocol was reviewed to determine if using Table 2 would be appropriate for estimating the number of desert tortoises within the survey area and project. Based on the seven separate survey areas (some of which are spread far apart and on opposite sides of the Chocolate Mountains), it was determined that combining them to generate one survey area and generate an estimate for the number of desert tortoises within that area would be inaccurate. All survey areas apart from Salvation Pass West (738 acres) meet the criteria for Small Project Surveys (to be used for areas less than 500 acres) as outlined in USFWS 2019. Based on the protocol for Small Project Surveys, the action areas of small projects are less likely to include the entire home ranges of desert tortoises; therefore, desert tortoises that regularly use the area may be offsite during the surveys. Hence, the USFWS does not recommend using the Table 2 spreadsheets to provide a point estimate and confidence interval for larger tortoises or estimated number of small desert tortoises. Therefore, this survey report does not include the calculations provided by the spreadsheet in Table 2 of USFWS 2019.

The following text describes the habitat-specific conditions based on survey results to understand desert tortoise occupancy within the survey areas.

Salvation Pass East: Desert tortoises were located in topographically elevated areas near the northwestern edge of the survey area. No active desert tortoise burrows or recent sign of desert tortoise occupancy was found in the middle of the survey area. The presence of stable rocky soils capable of holding a burrow appeared restricted primarily to the periphery of the survey area. While many desert kit fox, coyote, and small mammal burrows were detected throughout the survey area, none contained the classic half-moon shape characteristic of desert tortoise burrows. Live desert tortoises were only detected in the hills around the periphery of the survey area, and several carcasses were detected in washes within the survey area. Finally, while no desert tortoise scat or burrows were detected within the central portion of the survey area.

The area does not appear regularly affected by any human activities and, while several old bomb craters were detected (along with widely dispersed shrapnel), no recent sign of human disturbance that would preclude use of the area by desert tortoises was observed.

Salvation Pass: The two small survey areas within Salvation Pass are predominantly deep sandy soils that are unlikely to support desert tortoise burrows. No kit fox or other fossorial mammal burrows were detected within the survey areas and the substrate is likely not suitable. Periodic rain events that cause strong surface flow through this incised section of Salvation Pass likely reduce the potential that burrows remain intact. Furthermore, very little annual vegetative growth was observed. Both survey areas are located directly within the vehicle travel route through Salvation Pass, and vehicle movement through Salvation Pass likely restrict annual vegetation growth.

Salvation Pass West: This survey area is relatively flat with a strong northeast to southwest slope with many small washes draining the Chocolate Mountains (to the east) and directing water flow towards the Salton Sea to the southwest. Compared with the east side of the Chocolate Mountains, the soil was much rockier with fewer annuals. The surface soil appeared influenced by periodic flood and scour events where large rock and debris scrape the surface free of annual growth. The only locations where desert tortoises and burrows were located was along the southern edge of the survey area in stabilized areas that were slightly elevated above the level where surface flow might occur. A dirt road that leads to Salvation Pass bisects the middle of this survey area and no desert tortoise sign was detected near the road.

PA 1: This survey area is primarily desert pavement interspersed with small drainages that contain abundant annuals. The soils were more stabilized than other survey areas and capable of supporting burrows. The habitat was composed of less large rock and had large open areas between veins of desert woodland. One female desert tortoise and burrow were located in the middle of the survey area and a large mature male tortoise was located a short distance away in a small gap in the desert pavement feeding on fresh annual growth. An additional female tortoise was found emerging from a burrow and a male tortoise (found outside the survey area) was observed walking towards the

female. Hence, PA 1 appears to contain a relatively high density of desert tortoises compared to the other survey areas.

PA 2: This survey area is primarily desert wash and lacks stable soils in which desert tortoises can construct burrows. PA 2 contains small sections of desert pavement interspersed with step-incised washes with large rocks and sandy substrate that is not ideal for desert tortoise occupancy. While desert tortoises may forage and transit through the area, they are likely to select locations that are outside washes with more stable substrate for burrowing. While the Revised PA 2 was not surveyed for desert tortoises in March 2021, due to its overlap and adjacency to the original PA 2, it is likely similar to the original PA 2 and to contain a low density of desert tortoises.

Pina: Despite the survey area being located on the east side of the Chocolate Mountains near the northern part of the CMAGR where desert tortoise densities are generally higher, no desert tortoise or recent evidence was detected during surveys. The survey area has small topographical undulations that have potential to support desert tortoise burrows, but none were detected. The survey area is likely used periodically by desert tortoises, but overall, the vegetation seemed drier (many tall, dense cacti were scattered throughout the survey area) with a low abundance of annuals.

4.0 REFERENCES CITED

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Appendix A

Wildlife Species Detected during Desert Tortoise Surveys

APPENDIX A
Wildlife Species Detected during Desert Tortoise Surveys

Common Name	Scientific Name	Order	Family
Birds			
Red-tailed Hawk	*Buteo jamaicensis*	Accipitriformes	Accipitridae
Turkey Vulture	*Cathartes aura*	Accipitriformes	Cathartidae
Greater Roadrunner	*Geococcyx californianus*	Cuculiformes	Cuculidae
Gambel's Quail	*Callipepla gambelii*	Galliformes	Odontophoridae
Common Raven	*Corvus corax*	Passeriformes	Corvidae
Black-throated Sparrow	*Amphispiza bilineata*	Passeriformes	Emberizidae
Sage Sparrow	*Artemisiospiza belli/nevadensis*	Passeriformes	Emberizidae
Brewer's Sparrow	*Spizella breweri*	Passeriformes	Emberizidae
White-crowned Sparrow	*Zonotrichia leucophrys*	Passeriformes	Emberizidae
House Finch	*Haemorhous mexicanus*	Passeriformes	Fringillidae
Barn Swallow	*Hirundo rustica*	Passeriformes	Hirundinidae
Tree Swallow	*Tachycineta bicolor*	Passeriformes	Hirundinidae
Loggerhead Shrike[1]	*Lanius ludovicianus*	Passeriformes	Laniidae
Sage Thrasher	*Oreoscoptes montanus*	Passeriformes	Mimidae
Crissal Thrasher[1]	*Toxostoma crissale*	Passeriformes	Mimidae
Yellow-rumped Warbler	*Setophaga coronate*	Passeriformes	Parulidae
Black-tailed Gnatcatcher	*Polioptila melanura*	Passeriformes	Polioptilidae
Phainopepla	*Phainopepla nitens*	Passeriformes	Ptilogonatidae
Verdin	*Auriparus flaviceps*	Passeriformes	Remizidae
Cactus Wren	*Campylorhynchus brunneicapillus*	Passeriformes	Troglodytidae
Say's Phoebe	*Sayornis saya*	Passeriformes	Tyrannidae
Gila Woodpecker[2]	*Melanerpes uropygialis*	Piciformes	Picidae
Ladder-backed Woodpecker	*Picoides scalaris*	Piciformes	Picidae
Butterflies and Moths			
Desert (Felders) Orangetip	*Anthocharis cethura*	Lepidoptera	Pieridae
Reptiles and Amphibians			
Western Patch-nosed Snake	*Salvadora hexalepis*	Squamata	Colubridae
Long-nosed Leopard Lizard	*Gambelia wislizenii*	Squamata	Crotaphytidae
Desert Iguana	*Dipsosaurus dorsalis*	Squamata	Iguanidae
Zebratail Lizard	*Callisaurus draconoides*	Squamata	Phrynosomatidae
Desert Horned Lizard	*Phrynosoma platyrhinos*	Squamata	Phrynosomatidae
Western Side-blotched Lizard	*Uta stansburiana elegans*	Squamata	Phrynosomatidae

Common Name	Scientific Name	Order	Family
Great Basin Whiptail	*Aspidoscelis tigris*	Squamata	Teiidae
Sidewinder	*Crotalus cerastes*	Squamata	Viperidae
Terrestrial Mammals			
Mule Deer	*Odocoileus hemionus*	Artiodactyla	Cervidae
Coyote	*Canis latrans*	Carnivora	Canidae
Desert Kit Fox	*Vulpes macrotis arsipus*	Carnivora	Canidae
Bobcat	*Lynx rufus*	Carnivora	Felidae
Black-tailed Jackrabbit (Desert ssp.)	*Lepus californicus deserticola*	Lagomorpha	Leporidae
Desert Cottontail	*Sylvilagus audubonii*	Lagomorpha	Leporidae
Botta's Pocket Gopher	*Thomomys bottae*	Rodentia	Geomyidae
Desert Woodrat	*Neotoma bryanti*	Rodentia	Muridae
White-tailed Antelope Squirrel	*Ammospermophilus leucurus*	Rodentia	Sciuridae
Turtles and Tortoises			
Desert Tortoise[3]	*Gopherus agassizii*	Testudines	Testudinidae

[1] California Department of Fish and Wildlife Species of Special Concern
[2] State Threatened Species
[3] Federally Threatened Species

Appendix B

Representative Survey Area and Desert Tortoise Photographs

APPENDIX B
Representative Survey Area and Desert Tortoise Photographs

Photograph 1: Salvation Pass East survey area viewed from the western edge looking east across the survey area.

Photograph 2: Adult male desert tortoise located along western edge of Salvation Pass East survey area in hilly rock outcrop.

Photograph 3: Juvenile desert tortoise carcasses detected within woodrat midden on western edge of Salvation Pass East survey area.

Photograph 4: View north towards center of Salvation Pass. Both survey areas within Salvation Pass contain a large sandy wash with multiple vehicle tracks.

Photograph 5: View north of Salvation Pass West survey area.

Photograph 6: View of adult female desert tortoise emerging from burrow at the base of pencil cholla near the southern edge of Salvation Pass West survey area.

Photograph 7: View west of new access road/trail at PA 1 with adult female desert tortoise in burrow.

Photograph 8: Large adult male desert tortoise in small wash within PA 1 feeding on annual vegetative growth.

Photograph 9: View north through desert washes of the original PA 2 survey area.

Photograph 10: View north of Pina survey area.

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United States Department of the Interior
U.S. FISH AND WILDLIFE SERVICE
Ecological Services
Palm Springs Fish and Wildlife Office
777 East Tahquitz Canyon Way, Suite 208
Palm Springs, California 92262

In Reply Refer to:
FWS-ERIV/IMP-15B0239-21TA1320

August 09, 2021
Sent by Email

William Sellars, Range Management Director
United States Marine Corps
Marine Corps Air Station Yuma
Box 99134
Yuma, Arizona 85369-9100

Subject: Request for Initiation of Formal Section 7 Consultation on the Proposed MV 22 Landing Zones, Assault Landing Zones, and Artillery Firing Areas on the Chocolate Mountain Aerial Gunnery Range, Riverside and Imperial Counties, California

Dear William Sellars:

This letter acknowledges that we received on August 3, 2021, the additional information requested on July 27, 2021 regarding the proposed project, pursuant to section 7 of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq*.). The United States Marine Corps (USMC) proposes to establish and use seven training support areas that include landing zones, assault landing zones, and an artillery firing area (Project) in the Chocolate Mountains Aerial Gunnery Range (Range), Riverside and Imperial Counties, California. USMC determined that the proposed project is likely to adversely affect the federally threatened Mojave desert tortoise (*Gopherus agassizii*) and its critical habitat.

Based on the information provided in the biological assessment (DON 2021), subsequent communications with USMC staff, and the proposed conservation measures for the Project, we have determined that you have provided sufficient information to initiate consultation pursuant to section 7(a)(2) of the Act.

Section 7 of the Act allows the Service up to 90 calendar days to conclude formal consultation with your agency and an additional 45 calendar days to prepare our biological opinion (unless we mutually agree to an extension). Therefore, we expect to provide you with our biological opinion on or before December 16, 2021. During the consultation process, we will continue to work with your agency to identify conservation measures to avoid and minimize impacts to desert tortoise and its habitat.

As a reminder, section 7(d) of the Act requires that after initiation of formal consultation, the Federal action agency may not make any irreversible or irretrievable commitment of resources that limits future options (50 CFR § 402.09). This practice ensures agency actions do not preclude the formulation or implementation of reasonable and prudent alternatives that avoid

jeopardizing the continued existence of endangered or threatened species or destroying or modifying their critical habitats.

If you have any questions about this consultation or the consultation process in general, please contact Vincent James[1] of my staff at 760-322-2070, extension 415.

Sincerely,

JENNESS MCBRIDE

Digitally signed by JENNESS MCBRIDE
Date: 2021.08.09 11:04:17 -07'00'

For Rollie White
Assistant Field Supervisor

LITERATURE CITED

[DON] Department of Navy. 2021. Final Biological Assessment for Cactus West MV-22 Landing Zones, Assault Landing Zones, and Drop Zones, Marine Corps Air Station, Yuma AZ.

[1] vincent_james@fws.gov

United States Department of the Interior
U.S. FISH AND WILDLIFE SERVICE
Ecological Services
Carlsbad Fish and Wildlife Office
2177 Salk Avenue, Suite 250
Carlsbad, California 92008

In Reply Refer to:
FWS-IMP/ERIV-15B0239-21F1321

January 24, 2022
Sent Electronically

William Sellars, Range Management Director
United States Marine Corps
Marine Corps Air Station Yuma
Box 99134
Yuma, Arizona 85369-9100

Subject: Proposed MV-22 Landing Zones, Assault Landing Zones, and Artillery Firing Areas – Amendment to Biological Opinion 1-6-95-F-40 for Military Use of the Chocolate Mountain Aerial Gunnery Range, Imperial and Riverside Counties, California

Dear Mr. Sellars:

This document transmits the U.S. Fish and Wildlife Service's (Service) amendment to the programmatic 1996 Biological Opinion for Military Use of the Chocolate Mountain Aerial Gunnery Range (Service 1996; File No. 1-6-95-F-40). The Service received your electronic request for formal consultation on June 23, 2021, and project clarifications on August 3, 2021, via electronic mail, at which time formal consultation was initiated. This amendment adds the establishment of seven proposed training support areas (Project), which includes five landing zones, one assault landing zone, and one artillery firing area to the proposed action described in the programmatic consultation (Service 1996). This amendment will analyze the effects of the proposed training support areas on the federally threatened desert tortoise [Mojave population DPS (*Gopherus agassizii*); desert tortoise] and its designated critical habitat in accordance with section 7 of the Endangered Species Act of 1973 (Act), as amended (16 U.S.C. 1531 *et seq.*).

The Project is located in the Chocolate Mountains Aerial Gunnery Range (CMAGR) in Imperial and Riverside Counties, California. Aerial bombing within portions of the range was addressed under the programmatic biological opinion. However, all new proposed training support areas must be reviewed to determine if the scope and magnitude of impacts comport with that which was contemplated under the programmatic biological opinion. We have determined that, from a procedural and biological perspective, the description of the proposed action and the level of impacts to the desert tortoise and its habitat are consistent with the intent of the original programmatic consultation. Therefore, we are amending the 1996 biological opinion to include the proposed establishment of the seven training support areas.

This amendment is based on information provided in the following documents and communications that follow: (1) *Final Biological Assessment for Cactus West MV-22 Landing Zones, Assault Landing Zones, and Drop Zones* dated June 2021 [Marine Corps Air Station

Yuma (MCASY) 2021], (2) programmatic Biological Opinion for the Military Use of the CMAGR (Service 1996); (3) various communications between the MCASY and the Service; and (4) various reports and publications, as cited. A record of this consultation is available upon request.

CONSULTATION HISTORY

Between June 2021 and August 2021, staff from the Palm Springs Fish and Wildlife Office worked with MCASY to clarify the Project description and avoidance and minimization measures. The Service coordinated with MCASY through electronic correspondence after reviewing the biological assessment. On December 3, 2021, our office requested a 30-day extension of the consultation period to analyze the effects of the proposed action, which was approved by MCASY the same day.

BIOLOGICAL OPINION

DESCRIPTION OF THE PROPOSED ACTION

MCASY proposes to establish, use, and maintain seven new training support areas within the CMAGR. These training support areas include five landing zones, one assault landing zone, and one artillery firing area. The purpose of establishing these training support areas is to expand mission-critical training capabilities within the CMAGR for the Marine Corps and Naval aviators and marine Air-Ground Task Force artillery cannoneers. These training support areas would be located within the CMAGR in Imperial and Riverside Counties, California (see Figure 1 from MCASY 2021). Table 1 summarizes the proposed training support areas and Figure 2 (MCASY 2021) depicts the locations within the CMAGR.

Overall, MCASY does not propose to increase the quantity of sorties (i.e., attacks) flown, the amount or types of ordnance expended, increase artillery training frequency, or alter the existing facilities or airspace within the CMAGR. The seven training support areas would be added to the existing and available locations for CMAGR operations and training activities that would occur throughout the calendar year. The existing locations were analyzed in the 1996 biological opinion and will not be discussed further. Biannually, MCASY would inspect the training support areas (range sweeps) to ensure that a training support area is prepared for training activities. These range sweeps would occur prior to the biannual Weapons and Tactics Instructor Course (WTI). MCASY proposes to use these training support areas every year approximately 120 days depending on training needs. The operations and maintenance of these training support areas would be consistent with the ongoing training activities that occurs throughout the entire CMAGR.

Below, we provide specific information for the proposed training support areas regarding the establishment, preparation, and operations and maintenance of the proposed training support areas.

Figure 1: Chocolate Mountains Aerial Gunnery Range

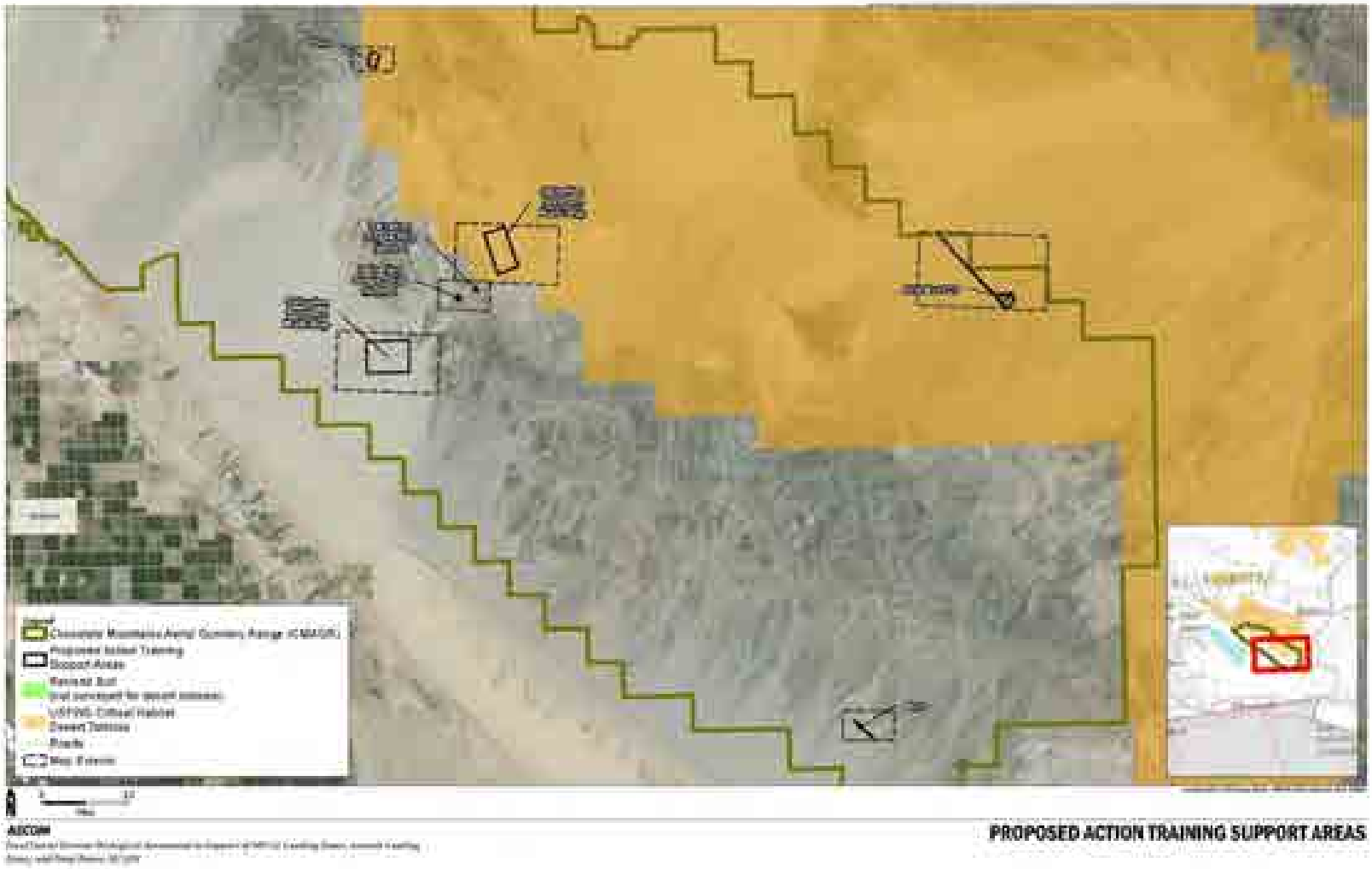

Figure 2: Proposed Training Support Areas

Establishment of Training Support Areas

Establishing each training support area would include identifying boundaries and specifying the types of training activities that would occur in each area. The boundaries will not be physically marked and are shown in Figure 2. These training support areas would be, to the maximum extent practicable, maintained in a natural state to simulate realistic combat scenarios.

Landing Zones

The proposed action includes establishing five training support areas that would be used specifically for landing and takeoffs of MV-22 aircrafts to simulate realistic combat scenarios. The five training support areas would total approximately 1,310.9 acres established specifically for these training activities (Figure 2). However, establishing each landing zone would not result in disturbance of 1,310.9 acres, rather disturbance would be localized to the extent of the MV-22 aircrafts landing and take offs. MCASY personnel would identify specific landing zones within the boundaries of each training support area and provide GPS coordinates to the pilots. If necessary, ground-personnel would access this training support area through existing access roads for preparation, operations, and maintenance activities described below.

Table 1. Proposed Training Support Areas

Training Support Area Type	Training Support Area and Associated Features	Acres
Landing Zone	Pina	68.3
	Salvation Northern Multi-Ship	487.0
	Salvation Southern Multi-Ship	738.0
	Salvation Single Ship North 1	8.8
	Salvation Single Ship North 2	8.8
Assault Landing Zone	Bull	12.9
Artillery Firing Area	AFA Burt 2.0	42.0
	Existing Access Road (Midway Well Road)	33.4
	New Combat Road	11.4
Total		**1,410.6**

Assault Landing Zone

The proposed action includes establishing an assault landing zone for landings and takeoffs of fixed-wing, rotary-wing, and tilt-rotor aircrafts on unimproved surfaces for combat readiness and for expeditionary operations. This training support area would be approximately 12.9 acres. In addition, MCASY will improve existing access roads, create and maintain a landing strip for these training activities. Ground access to these areas would be through the existing access road. In accordance with the 1996 biological opinion, boundaries of ground-disturbing activities will be determined in the field, mapped, and marked with monuments prior to ground-disturbing activities.

Artillery Firing Area

The remaining training support area would be established as an artillery firing area to allow ground-support troops to set up artillery (i.e., large-caliber guns, howitzers, and mortars) to fire into previously established and authorized impact areas. These previously authorized areas were analyzed in the 1996 biological opinion and will not be discussed further. The artillery firing area (Burt 2.0) would be approximately 42.0 acres. Access to Burt 2.0 would be through an existing access road (Midway Well Road, 33.4 acres) and would be maintained as necessary. This existing access road would connect to a proposed new combat road. The proposed new combat road would be about 0.5 miles and disturb 11.4 acres with the purpose of providing ground-support troop access to Burt 2.0. The boundaries of road grading activities would be determined in the field, mapped, and marked prior to ground-disturbing activities.

Preparation of Training Support Areas

Prior to ground-disturbing activities, MCASY will ensure that desert tortoise clearance surveys are conducted and that all locations of live desert tortoises and sign will be recorded and reported to the responsible personnel to avoid and minimize effects to the species. Preparation activities in each training support area would occur biannually prior to WTI, which occurs in March through April and September through October. Prior to WTI, MCASY would conduct range sweeps of the training support areas, which would evaluate the condition of the training support area and determine the scope and type of preparation activities needed for each area. All preparation activities are intended to address and remove hazards to personnel and equipment during training activities.

Landing Zones

Preparation activities would include identifying and inspecting landing and takeoff areas, trimming vegetation, and implementing dust suppression activities. Pilots would identify and ground troops would inspect the landing and takeoff areas to determine if vegetation management is necessary to remove potential hazards. If vegetation trimming is necessary, then ground personnel would use existing access roads and/or hike to the identified landing area, which would occur in February and last through March and then again in August through September. During the landing and takeoff area inspection, personnel would determine if a dust palliative is necessary to reduce soil erosion or to suppress dust. However, these landing and takeoff areas would be maintained as natural as possible to simulate realistic combat scenarios.

Assault Landing Zone

Preparation activities would include maintaining existing access roads, creating and maintaining a landing strip for aircraft, and implementing dust suppression activities as determined by the range sweeps. After the biannual range sweeps, personnel would grade existing access roads and remove vegetation from the roadway, if necessary. Initially, MCASY would create the proposed landing strip by grading the identified location within the assault landing zone (see Figure 2). Prior to training activities occurring within this area, personnel would determine the maintenance

needs of the proposed landing strip (i.e., additional grading and dust suppression). To remove dust hazards to personnel and equipment from the area, vehicles would spray a mixture of water and dust palliative on the graded landing strip, as necessary. However, the intent of this assault landing zone would be to simulate realistic combat scenarios, therefore preparation activities would be conducted in such a way that the training support area would remain as natural as possible.

Artillery Firing Area

Preparation activities would include maintaining the existing access road (Midway Well Road), creating and maintaining a new combat road, and implementing ground disturbing activities to prepare the artillery firing area for training activities. Prior to training activities in this area, MCASY would conduct range sweeps to determine the maintenance needs of Midway Well Road. If necessary, personnel would grade and remove vegetation from the roadway. In addition, MCASY would create the proposed combat road to grant access to the established artillery firing area. Personnel would then maintain this new combat road as evaluated by the biannual range sweeps. Prior to training activities, ground-support troops would dig pits to absorb recoil from firing artillery. After training activities, troops would ensure that the condition of the firing area is returned to its previous state (evaluated by range sweeps to identify hazards; see Preparation of Training Support Areas).

Operations and Maintenance of Training Support Areas

MCASY would schedule and coordinate operations of the training support areas with other users of the CMAGR. Specifically, the landing zones and assault landing zone would be added to the existing and available locations for MV-22 aircraft operations. These operations would assist Marine Aircraft Wing and Marine Aviation Weapons and Tactics Squadron One (MAWTS-1) training needs, respectively.

Operations and training activities would occur throughout the calendar year. Specifically, MCASY proposes to use these training support areas annually approximately 120 days, with 60 days during WTI (March through April and September through October) and the remaining 60 days would be throughout the year depending on training needs. Prior to operations and training activities, personnel would conduct biannual range sweeps to evaluate the type and scope of preparation activities necessary to remove hazards for the safety of personnel and equipment. Operations would be consistent with the ongoing and existing operations on CMAGR as analyzed by the 1996 biological opinion.

Maintenance would ensure that these training support areas remain in a natural or near-natural condition to simulate realistic combat scenarios. Maintenance activities may include vegetation trimming, dust suppression, grading associated features, and restoration of ground-disturbing activities. These activities would be minor and as-needed. Vegetation trimming would occur in the five landing zones biannually, as determined during range sweeps to remove potential hazards to personnel and equipment. Dust palliatives would be used in the five landing zones and the assault landing zone, as determined by range sweeps, and only necessary for safety

considerations and dust suppression activities. Grading activities would occur in the assault landing zone and artillery firing area biannually to maintain access roads and the landing strip at the assault landing zone. In addition, ground-support troops would restore and recontour areas disturbed by training activities in the artillery firing area biannually.

Conservation Measures

MCASY will implement the following conservation measures (CM) intended to avoid and minimize effects to desert tortoise and its designated critical habitat. In addition, MCASY will implement the conservation measures described in the Biological Opinion for the Military Use of the CMAGR, California (1-6-F-40) (Service 1996). These measures will be consistent with the Integrated Natural Resources Management Plan for the Chocolate Mountains Aerial Gunnery Range, California (INRMP, MCASY 2017).

CM 1. **Tortoise Management Representative**. The MCASY Tortoise Management Representative will ensure compliance with protective stipulations by all users of the training support areas. This representative will use their authority to halt activities that may be in violation of such provisions. The Tortoise Management Representative will also coordinate with the designated Service representative on all matters concerning desert tortoise conservation, mitigation, and management responsibilities. Additionally, if the Tortoise Management Representative is not available, an appointee may perform all of the specified responsibilities as a Tortoise Management Representative (an appointee is defined as a person having the same qualifications as the Tortoise Management Representative). The Tortoise Management Representative does not have to be a qualified desert tortoise biologist or an authorized biologist and therefore shall receive instruction from an authorized biologist in handling, data collection, and release procedures for desert tortoises prior to engaging in such activities, which is consistent with the 1996 biological opinion. MCASY will also submit the name(s) and credentials of the person(s) that will be the Tortoise Management Representative to the Service. Only Service approved authorized biologists, or the trained Tortoise Management Representative will handle desert tortoises. In addition, the Tortoise Management Representative will be responsible for reporting requirements described below.

CM 2. **Authorized Biologist.** An authorized biologist is a biologist that the Service has approved to implement conservation measures, handle desert tortoises, and perform additional duties involving desert tortoises. MCASY will follow the process to approve authorized biologists described in the Service's Desert Tortoise Field Manual (2009). As part of this process, MCASY will provide the Service the name(s) and qualifications of the biologist(s) for review and approval. Authorized biologists must have sufficient training and experience to resolve any issue that may arise regarding the specific approved activity on which they are working. For example, if the approved activity involves the handling of desert tortoises, at least one authorized biologist must have sufficient training and experience to move a desert tortoise safely according to the Service's guidance provided in the Desert Tortoise Field Manual (Service 2009) or most recent guidance. If MCASY determines that an authorized biologist is not

performing their duties in a satisfactory manner, they will notify the Service at the earliest possible time. In addition, an authorized biologist will be made available during ground-disturbing activities to advise personnel if a desert tortoise is encountered. A qualified desert tortoise biologist (determined by MCASY staff), authorized biologist, or the Tortoise Management Representative will also be present during initial ground-disturbing activities.

CM 3. **Desert Tortoise Clearance Surveys.** In accordance with the existing programmatic biological opinion (Service 1996), the boundaries of ground-disturbing activities will be determined in the field, mapped, and marked with monuments prior to ground-disturbing activities. Ground-disturbing activities will be placed outside of and away from surface drainages (desert washes), where feasible. All ground-disturbing activities will be within the designated boundaries of each training support area. An authorized biologist will conduct clearance surveys according to the Service's guidance provided in the Desert Tortoise Field Manual (Service 2009) or most recent guidance for the initial siting of all ground-disturbing activities in each training support area.

CM 4. **Desert Tortoise Handling Procedures.** MCASY will ensure implementation of the following:

a. Only authorized biologists approved by the Service or trained Tortoise Management Representatives shall handle desert tortoises, except in circumstances in which the life of the desert tortoise is in immediate danger. For authorized biologists not already approved, MCASY shall submit their credentials to the Service for review and approval at least 30 days before the initiation of any Project activity within desert tortoise habitat.

b. Desert tortoises shall be moved only by an authorized biologist or trained Tortoise Management Representative 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 excavation of desert tortoise burrows and handling of desert tortoise eggs are to be conducted by an authorized biologist in accordance with the Service's guidance provided in the Desert Tortoise Field Manual (Service 2009) or most recent guidance.

d. If an emergency exists, and a desert tortoise must be moved out of immediate danger, the animal may be moved to an adjacent shaded area out of direct sunlight. Desert tortoises shall only be moved the minimum distance to ensure their safety. MCASY Tortoise Management Representatives, authorized biologists, and staff shall be notified immediately.

CM 5. **Tortoise Education Program.** All personnel accessing the CMAGR will participate in MCASY's existing desert tortoise education program, which has been developed cooperatively with the Service. The program will include, at a minimum, the following topics: 1) occurrence of the desert tortoise; 2) sensitivity of the species to human activities; 3) legal protection for desert tortoises; 4) penalties for violations of federal law; 5) general desert tortoise ecology and activity patterns; 6) reporting requirements; 7) measures to protect desert tortoises; 8) personal measures that personnel can take to promote the conservation of desert tortoises; and 9) procedures and a point of contact if a desert tortoise is observed on, to, or from the training support area.

CM 6. **Personnel Responsibilities.** MCASY will inform all personnel accessing the CMAGR of their responsibility to avoid injuring or harming desert tortoises found in the proposed training areas and report any form of take immediately to the Tortoise Management Representative or authorized biologist. In addition, MCASY will periodically remind all personnel of the protective measures for desert tortoises.

In addition, all personnel will monitor for live, injured, or dead desert tortoises within the training support areas and disturbance in desert tortoise habitat outside of the designated training support area boundary when conducting access road construction, construction and training activities, and operational range clearance (e.g., Explosives Ordnance Disposal [EOD] personnel). Personnel will report findings to the Tortoise Management Representative or authorized biologist. Additionally, personnel will fill out a form after ground- disturbing and/or training activities and EOD clearance activities, reporting any take. The Tortoise Management Representative will be available during all ground-disturbing activities and EOD clearance activities and available to respond to individual EOD and range maintenance crews in the event the crews observe a tortoise injury or mortality, habitat damage, or the need to move a desert tortoise.

CM 7. **Excavations.** MCASY will ensure that any excavations associated with ground-disturbing activities that would be left open in areas that are not being monitored shall either be fenced temporarily to exclude desert tortoises, covered at the close of each workday, or provided with ramps so desert tortoises can escape. All excavations shall be inspected for desert tortoises before filling.

CM 8. **Access Roads.** All personnel will use existing access roads during training activities. All roads will conform to the natural contour of the land as much as possible to minimize grading and will avoid existing perennial plants as much as possible.

CM 9. **Speed Limits.** Vehicles traveling along access roads, or any road within desert tortoise habitat, shall not exceed 25 miles per hour and 20 miles per hour in critical habitat. All roads entering desert tortoise habitat will be posted with speed limits of 25 miles per hour and 20 miles per hour for critical habitat. To the extent practicable,

vehicles will remain on established roads and within the confines of the road boundaries until the destination is reached except as required for specific training activities. All road-killed wildlife species will be buried to prevent attraction of common ravens (*Corvus corax*, raven) and other desert tortoise predators.

CM 10. **Vehicle Inspections.** All personnel operating vehicles within desert tortoise habitat on the CMAGR will inspect underneath their parked vehicle before moving it. If a desert tortoise is found beneath a vehicle, the trained Tortoise Management Representative or authorized biologist will be contacted, and the vehicle will not be moved until the trained Tortoise Management Representative or authorized biologist moves the animal from harm's way or the animal leaves on its own accord.

CM 11. **Pet Prohibitions.** No pets will be permitted at any time within the action area, except for military working dogs under direct control of their handler.

CM 12. **Waste Management.** All ground personnel that enter the CMAGR will be required to remove all food stuffs, trash, or other waste that may attract common ravens and other desert tortoise predators, in accordance with existing regulations for the CMAGR. Any temporary trash receptacles will be equipped with latching/locking lids. The Tortoise Management Representative will be responsible for ensuring that trash is removed regularly from the training support areas and that the trash containers are kept securely closed when not in use.

CM 13. **Raven Management.** The common raven is a threat to the desert tortoise. Common ravens are "human commensals" and thrive in highly disturbed habitats including agriculture, suburban, and urban areas. Their reproductive success in California deserts is enhanced by proximity to human developments. Additionally, water subsidies are thought to be an important factor contributing to raven population increases in desert ecosystems. Subsidized water sources include cattle watering troughs, wildlife guzzlers, irrigation canals, reservoirs, sewage treatment areas, and irrigated agricultural areas. A lack of adequate nesting and roosting substrates, food sources, water subsidies, human activity, agriculture, and the general remote location, has likely kept raven densities on CMAGR low. In an effort to discourage raven establishment, MCASY will employ the following raven management measures:

a. Abandoned vehicles found on the CMAGR will be inventoried and they will be removed.

b. Public use is restricted and will continue to be restricted in the CMAGR, thus reducing raven attractants.

c. Cattle grazing and cattle watering troughs are restricted on the CMAGR and will remain as such for security and raven prevention.

d. CMAGR signs and fencing will be limited to a minimum to reduce the number of elevated perches.

e. Training operations and personnel will be required to properly dispose of food and trash per Station Order 3710.63.

f. Ground-disturbing activities will have appropriate trash receptacles per MCASY Station Order 3710.63.

g. Personnel using the training support areas will be educated and instructed to report any raven sightings, which will be investigated and documented by MCASY biologists.

h. Any ravens or raven nests discovered on the CMAGR will be immediately evaluated by MCASY biologists for desert tortoise predation. In addition, when any raven-damaged desert tortoise shells are found, the surrounding area will be searched for ravens and raven nests. Any predatory ravens and their nests will be removed using methods similar to those identified in the Service's environmental assessment, Reduce Common Raven Predation on the Desert Tortoise (Service 2008), with appropriate permitting and coordination.

i. All wildlife guzzlers will be inspected quarterly by CMAGR biologists, range inspectors, and range wardens for raven usage. Observations of desert tortoise carcasses and raven nests near wildlife guzzlers will result in an evaluation for removal.

CM 14. **Post-Operation Surveys.** The Tortoise Management Representative or authorized biologist will survey all support training areas for dead or injured tortoises after the completion of each ground operation or training activity.

CM 15. **Notification of Desert Tortoise Injury or Mortality.** Should a dead or injured desert tortoise be located on-site during or after any military activity, the MCASY CMAGR Management Department will be notified immediately. The Service will be notified by the Tortoise Management Representative via email within three working days of the discovery of any tortoise death or injury caused by military activity. Information in the notification will include the date, time, circumstances, photographs, cause of death (if known), location of any injury or death, and any other pertinent information. Dead desert tortoises will be left in situ. Injured desert tortoises will be taken to a veterinarian approved by the Service.

CM 16. **Invasive Plant Species Control.** MCASY will ensure that all construction-type equipment and/or construction-type vehicles originating outside of the CMAGR shall be power-washed before entering roadways on the way to the CMAGR to control the spread of invasive (non-native) weeds. While washing wheeled vehicles, the front

wheels shall be turned lock-to-lock to allow for exposure of surfaces that may hold soil or weed seeds. In addition, any invasive weeds detected during desert tortoise surveys in the training support areas will be reported to MCASY CMAGR Department to be evaluated for potential invasive management efforts.

CM 17. **Operations under Existing Biological Opinion.** After establishment of the training support areas, operations of these areas will be directed in accordance with this biological opinion together with the original biological opinion issued to CMAGR (Service 1996). However, driving will be allowed on the new access road (new combat road) developed for the artillery firing area, which was not included in the original biological opinion.

CM 18. **Annual Desert Tortoise Surveys.** The action area will be included in the rotation of areas that are currently surveyed during ongoing annual surveys at the CMAGR. Surveys are conducted using the Service-recommended methods by qualified desert tortoise biologists or an authorized biologist and are used to inform the desert tortoise population baseline on the CMAGR. Surveys are conducted within existing safety protocols and mission parameters at the designated area(s) within the CMAGR during regularly scheduled range closures in the spring and all data are collected and entered into the MCASY Geographic Information System (GIS) database. MCASY will include the results of monitoring and any changes in survey methodology in the annual monitoring report submitted to the Service.

CM 19. **Annual Monitoring Report.** MCASY will prepare and submit an annual monitoring report to the Service on or before January 15 of each year. The report will briefly outline the effectiveness of the desert tortoise conservation measures and summarize desert tortoise observations, handlings, injuries, and/or mortalities. The annual monitoring report will also include recommendations to enhance desert tortoise protection and modify existing conservation measures to avoid and minimize effects to desert tortoises.

Action Area

Regulations implementing the Act (50 CFR § 402.02) describe the action area as all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action.

The action area is located within the CMAGR in Imperial and Riverside Counties, California. CMAGR 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 a section of the Chuckwalla Bench. CMAGR extends south to Highway 78 near Glamis, California.

Specifically, the action area includes the locations of the seven training support areas and associated features. These training support areas include: (1) five landing zones (1,310.9 acres),

(2) one assault landing zone (12.9 acres), and (3) one artillery firing area (42.0 acres) including an existing access road (Midway Well Road, 33.4 acres) and a newly proposed combat road (11.4 acres). The action area would total approximately 1,410.6 acres.

ANALYTICAL FRAMEWORK FOR THE SECTION 7(A)(2) DETERMINATIONS

Jeopardy Determination

Section 7(a)(2) of the Act requires that Federal agencies ensure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of listed species. "Jeopardize the continued existence of" means to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species (50 CFR § 402.02).

The jeopardy analysis in this biological opinion relies on four components: (1) the Status of the Species, which describes the range-wide condition of the species, the factors responsible for that condition, and its survival and recovery needs; (2) the Environmental Baseline, which analyzes the condition of the species in the action area, the factors responsible for that condition, and the relationship of the action area to the survival and recovery of the species; (3) the Effects of the Action, which are all consequences to listed species caused by the proposed action that are reasonably certain to occur; and (4) the Cumulative Effects, which evaluate the effects of future, non-Federal activities in the action area on the species.

For the section 7(a)(2) determination regarding jeopardizing the continued existence of the species, the Service begins by evaluating the effects of the proposed Federal action and the cumulative effects. The Service then examines those effects against the current status of the species to determine if implementation of the proposed action is likely to reduce appreciably the likelihood of both the survival and recovery of the species in the wild.

Adverse Modification Determination

Section 7(a)(2) of the Act requires that Federal agencies ensure that any action they authorize, fund, or carry out is not likely to destroy or to adversely modify designated critical habitat. "Destruction or adverse modification" of critical habitat means a direct or indirect alteration that appreciably diminishes the value of critical habitat as a whole for the conservation of a listed species (50 CFR § 402.02).

In accordance with policy and regulation, the adverse modification analysis in this biological opinion relies on four components: (1) the status of critical habitat, which describes the condition of all designated critical habitat in terms of its physical and biological features, the factors responsible for that condition, and the intended recovery function of the critical habitat overall; (2) the environmental baseline, which analyzes the condition of the designated critical habitat in the action area, the factors responsible for that condition, and the recovery role of the critical habitat in the action area; (3) the effects of the action, which analyze all consequences to critical

habitat caused by the proposed action that are reasonably certain to occur and their influence on the recovery role of the affected designated critical habitat units; and (4) cumulative effects, which evaluate the effects of future non-Federal activities in the action area on the physical and biological features of critical habitat and how that will influence the recovery role of affected critical habitat units.

For purposes of the adverse modification determination, the effects of the proposed Federal action on the designated critical habitat are evaluated in the context of the condition of all designated critical habitat, taking into account any cumulative effects, to determine if the consequences of the proposed action are likely to appreciably reduce the value of critical habitat as a whole for the conservation of the species.

STATUS OF THE SPECIES AND ITS CRITICAL HABITAT

Desert Tortoise

Listing History

The Service listed the Mojave population of desert tortoise (all desert tortoises north and west of the Colorado River in Arizona, Utah, Nevada, and California) as threatened on April 2, 1990 [55 Federal Register (FR) 12178].

Recovery Plan

The Service developed a recovery plan (Service 1994) for desert tortoise to identify reasonable actions that are believed to be required to recover and protect the species. As stated in the revised recovery plan (Service 2011), the 1994 recovery plan described a strategy for recovering the desert tortoise, which included the identification of six recovery units, recommendations for a system of Desert Wildlife Management Areas within the recovery units, and development and implementation of specific recovery actions. A key factor in the recovery plan is to maintain high survivorship of adult desert tortoises, and because the list of threats to the species remains mostly unchanged, the requisite management or recovery actions also remain appropriate. The Service recognized that the most significant challenge in the implementation of the 1994 recovery plan was the coordination, description, documentation, and evaluation of implementation of actions. As a result, the Service revised the recovery plan (2011) to build upon the foundation laid by the 1994 recovery plan by emphasizing partnerships to direct and maintain focus on implementing recovery actions and a system to track implementation and effectiveness of recovery actions. The Service (2011) also identified the need for "conservation areas" to protect existing desert tortoise populations and habitat. Please refer to Box 2 and Figure 2 in the recovery plan (Service 2011), which describe and depict these areas in a generalized manner.

The revised recovery plan lists three objectives and associated criteria to achieve delisting. The first objective is to maintain self-sustaining populations of desert tortoises within each recovery unit into the future. The criterion is that the rates of population change for desert tortoises are increasing over at least 25 years (i.e., a single generation), as measured by extensive, range-wide monitoring across conservation areas within each recovery unit and by direct monitoring and

estimation of vital rates (recruitment, survival) from demographic study areas within each recovery unit.

The second objective addresses the distribution of desert tortoises. The goal is to maintain well-distributed populations of desert tortoises throughout each recovery unit; the criterion is that the distribution of desert tortoises throughout each conservation area increase over at least 25 years.

The final objective is to ensure that habitat within each recovery unit is protected and managed to support long-term viability of desert tortoise populations. The criterion is that the quantity of desert tortoise habitat within each conservation area be maintained with no net loss until population viability is ensured.

The revised recovery plan (Service 2011) also recommends connecting blocks of desert tortoise habitat, such as critical habitat units and other important areas, to maintain gene flow between populations. Linkages defined using least-cost path analysis (Averill-Murray *et al*. 2013) illustrate a minimum connection of habitat for desert tortoises between blocks of habitat and represent priority areas for conservation of population connectivity.

Threats

The threats described in the listing rule and both recovery plans (Service 1994, 2011) continue to affect the species. The most apparent threats to the desert tortoise are those that result in mortality and permanent habitat loss across large areas, such as urbanization and large-scale renewable energy projects and those that fragment and degrade habitats, such as proliferation of roads and highways, off-highway vehicle activity, wildfire, and habitat invasion by non-native invasive plant species.

We remain unable to precisely quantify how particular threats affect desert tortoise populations relative to other threats. The assessment of the original recovery plan emphasized the need for a better understanding of the implications of multiple, simultaneous threats facing desert tortoise populations and of the relative contribution of multiple threats on demographic factors (i.e., birth rate, survivorship, fecundity, and death rate; Tracy *et al*. 2004).

For example, we have long known that the construction of a transmission line can result in the death of desert tortoises and loss of habitat. We have also known that common ravens, known predators of desert tortoises, use transmission line pylons for nesting, roosting, and perching and that the access routes associated with transmission lines provide a vector for the introduction and spread of invasive weeds and facilitate increased human access into an area. Increased human access can accelerate illegal collection and release of desert tortoises and their deliberate maiming and killing, as well as facilitate the spread of other threats associated with human presence, such as vehicle use, garbage and dumping, and invasive plants (Service 2011). Changes in the abundance of native plants, because of invasive weeds, can compromise the physiological health of desert tortoises, making them more vulnerable to drought, disease, and predation.

Five-Year Review

Section 4(c)(2) of the Endangered Species Act requires the Service to conduct a status review of each listed species once every 5 years. The purpose of a 5-year review is to evaluate whether the species' status has changed since listing (or since the most recent 5-year review); these reviews, at the time of their completion, provide the most up-to-date information on the range-wide status of the species. For this reason, we are incorporating the 5-year review of the status of the desert tortoise (Service 2010) by reference to provide most of the information needed for this section of the biological opinion. The following paragraphs provide a summary of the relevant information in the 5-year review.

In the 5-year review, the Service discusses the status of the desert tortoise as a single distinct population segment and provides information on the Federal Register notices that resulted in its listing and the designation of critical habitat. The Service also describes the desert tortoise's ecology, life history, spatial distribution, abundance, habitats, and the threats that led to its listing (i.e., the five-factor analysis required by section 4(a)(1) of the Endangered Species Act). In the 5-year review, the Service concluded by recommending that the status of the desert tortoise as a threatened species be maintained.

With regard to the status of the desert tortoise as a distinct population segment, the Service concluded in the 5-year review that the recovery units recognized in the original and revised recovery plans (Service 1994 and 2011, respectively) do not qualify as distinct population segments under the Service's distinct population segment policy (61 FR 4722; February 7, 1996). We reached this conclusion because individuals of the listed taxon occupy habitat that is relatively continuously distributed, exhibit genetic differentiation that is consistent with isolation-by-distance in a continuous-distribution model of gene flow, and likely vary in behavioral and physiological characteristics across the area they occupy as a result of the transitional nature of, or environmental gradations between, the described subdivisions of the Mojave and Colorado deserts.

The Service summarizes information in the 5-year review with regard to the desert tortoise's ecology and life history. Of key importance to assessing threats to the species and to developing and implementing a strategy for recovery is that desert tortoises are long lived, require up to 20 years to reach sexual maturity, and have low reproductive rates during a long period of reproductive potential. The number of eggs that a female desert tortoise can produce in a season is dependent on a variety of factors including environment, habitat, availability of forage and drinking water, and physiological condition. Predation seems to play an important role in clutch failure. Predation and environmental factors also affect the survival of hatchlings. The Service notes in the 5-year review that the combination of the desert tortoise's late breeding age and a low reproductive rate challenges our ability to recover the species.

The 5-year review also notes that desert tortoises increase their reproduction in high rainfall years; more rain provides desert tortoises with more high quality food (i.e., plants that are higher in water and protein), which, in turn, allows them to lay more eggs. Conversely, the physiological stress associated with foraging on food plants with insufficient water and nitrogen

may leave desert tortoises vulnerable to disease, and the reproductive rate of diseased desert tortoises is likely lower than that of healthy animals. Young desert tortoises also rely upon high-quality, low-fiber plants (e.g., native annual plants) with nutrient levels not found in the invasive weeds that have increased in abundance across its range (Oftedal *et al*. 2002; Tracy *et al*. 2004). Compromised nutrition of young desert tortoises likely represents an effective reduction in reproduction by reducing the number of animals that reaches adulthood. Consequently, although we do not have quantitative data that show a direct relationship, the abundance of weedy species within the range of the desert tortoise has the potential to affect the reproduction of desert tortoises and recruitment into the adult population in a negative manner.

"Adult" desert tortoise connotes reproductive maturity. Desert tortoises may become reproductive at various sizes. We have used the term "adult" in this biological opinion to indicate reproductive status. In range-wide monitoring and for pre-project surveys, the Service uses 180 millimeters as its cut-off length for counting desert tortoises, because the best available information indicates that surveyors do not see desert tortoises that are smaller than 180 millimeters with the same frequency that they see the large animals (Service 2019a).

The vast majority of threats to the desert tortoise or its habitat are associated with human land uses. Using captive neonate and yearling desert tortoises, Drake *et al*. (2016) found that individuals "eating native forbs had better body condition and immune functions, grew more, and had higher survival rates (>95%) than (desert) tortoises consuming any other diet"; health and body condition declined in individuals fed only grasses (native or non-native). Current information indicates that invasive species likely affect a large portion of the desert tortoise's range. Furthermore, high densities of weedy species increase the likelihood of wildfires; wildfires, in turn, destroy native species and further the spread of invasive weeds.

Drake *et al*. (2015) "compared movement patterns, home-range size, behavior, microhabitat use, reproduction, and survival for adult desert tortoises located in, and adjacent to, burned habitat" in Nevada. They noted that the fires killed many desert tortoises but found that, in the first 5 years post-fire, individuals moved deeper into burned habitat on a seasonal basis and foraged more frequently in burned areas (corresponding with greater production of annual plants and herbaceous perennials in these areas). Production of annual plants upon which desert tortoises feed was 10 times greater in burned versus unburned areas but was dominated by non-native species (e.g., red brome [*Bromus rubens*]) that frequently have lower digestibility than native vegetation. During years six and seven, the movements of desert tortoises into burned areas contracted with a decline in the live cover of a perennial forage plant that rapidly colonizes burned areas. Drake *et al*. (2015) did not find any differences in health or survivorship for desert tortoises occupying either habitat (burned or unburned) during this study or in reproduction during the seventh year after the fire.

Since the completion of the 5-year review, the Service has issued several biological opinions that affect large areas of desert tortoise habitat because of numerous proposals to develop renewable energy within its range. These biological opinions concluded that proposed solar developments were not likely to jeopardize the continued existence of the desert tortoise primarily because they were located outside of critical habitat and areas of critical environmental concern designated by

the Bureau of Land Management (Bureau) that contain most of the land base required for the recovery of the species. The proposed actions also included numerous measures intended to protect desert tortoise during the construction of the projects, such as translocation of affected individuals. In aggregate, these projects would result in an overall loss of approximately 73,644 acres of habitat of the desert tortoise. We also predicted that the project areas supported up to 19,896 desert tortoises; we concluded that most of these individuals were small desert tortoises, that most large desert tortoises would likely be translocated from project sites, and that most mortalities would be small desert tortoises (less than 180 millimeters) that were not detected during clearance surveys. To date, 664 desert tortoises have been observed during construction of solar projects (see Appendix A); most of these individuals were translocated from work areas, although some desert tortoises have been killed. The mitigation required by the Bureau and California Energy Commission (the agencies permitting some of these facilities) resulted in the acquisition of private land and funding for the implementation of various actions that are intended to promote the recovery of the desert tortoise. These mitigation measures are consistent with recommendations in the recovery plans for the desert tortoise; many of the measures have been derived directly from the recovery plans and the Service supports their implementation. We expect that, based on the best available scientific information, they will result in conservation benefits to the desert tortoise; however, it is difficult to assess how desert tortoise populations will respond because of the long generation time of the species.

In August 2016, the Service (2016) issued a biological opinion to the Bureau for a land use plan amendment under the Desert Renewable Energy Conservation Plan. The land use plan amendment addressed all aspects of the Bureau's management of the California Desert Conservation Area; however, the Service and Bureau agreed that only those aspects related to the construction, operation, maintenance, and decommissioning of renewable energy facilities were likely to adversely affect the desert tortoise. The land use plan amendment resulted in the designation of approximately 388,000 acres of development focus areas where the Bureau would apply a streamlined review process to applications for projects that generate renewable energy; the Bureau estimated that approximately 11,290 acres of modeled desert tortoise habitat within the development focus areas would eventually be developed for renewable energy. The Bureau also adopted numerous conservation and management actions as part of the land use plan amendment to further reduce the adverse effects of renewable energy development on the desert tortoise.

The land use plan amendment also increased the amount of land that the Bureau manages for conservation in California (e.g., areas of critical environmental concern, California Desert National Conservation Lands, etc.) from 6,118,135 to 8,689,669 acres (Bureau 2015); not all of the areas subject to increased protection are within desert tortoise habitat. The Bureau will also manage lands outside of development focus areas according to numerous conservation and management actions; these conservation and management actions are more protective of desert tortoises than direction contained in the previous land use plan. The Service (2016) concluded that the land use plan amendment was not likely to jeopardize the continued existence of the desert tortoise and would benefit its recovery.

In addition to the biological opinions issued for solar development within the range of the desert tortoise, the Service (2012) also issued a biological opinion to the Department of the Army (Army) for the use of additional training lands at Fort Irwin. As part of this proposed action, the Army translocated approximately 650 adult desert tortoises from 18,197 acres of the southern area of Fort Irwin, which had been off-limits to training, to lands south of the base that are managed by the Bureau and the Army. The Army would also use an additional 48,629 acres that lie east of the former boundaries of Fort Irwin; much of this parcel is either too mountainous or too rocky and low in elevation to support numerous desert tortoises. As part of the proposed action, the Army also acquired approximately 100,000 acres of non-federal land within the Superior-Cronese Critical Habitat Unit for management and conservation of desert tortoises. It also purchased the property of three cattle allotments; the Bureau subsequently re-allotted the forage on those allotments to wildlife. The Army also funded several other activities aimed at conserving desert tortoises in the Western Mojave Recovery Unit.

The Service also issued a biological opinion to the Department of the Navy (Navy) that considered the effects of the expansion of the Marine Corps Air Ground Combat Center at Twentynine Palms (Service 2017). We concluded that the Navy's proposed action, the use of approximately 167,982 acres of public and private land for training, was not likely to jeopardize the continued existence of the desert tortoise. Most of the expansion area lies within the Johnson Valley Off-highway Vehicle Recreation Area. As part of this proposed action, the Navy translocated 998 adult desert tortoises from the expansion area to four recipient sites to the north and east of the expansion area (Henen 2019, *in litt*.). The Lucerne-Ord and Siberia sites are entirely within Bureau-managed lands, and the Rodman-Sunshine Peak North and Cleghorn sites overlap Bureau-managed lands and lands managed by the Navy. The Lucerne-Ord site lies within the Ord-Rodman Area of Critical Environmental Concern. The Navy translocated desert tortoises from the Johnson Valley Off-highway Vehicle Recreation Area into populations that were below the Service's established minimum viable density, to attempt to augment these populations and make them more viable in the long-term.

The Service also issued a biological opinion to the Navy that considered the effects of the expansion of the Naval Air Weapons Station at China Lake (Service 2019b). We concluded that the Navy's proposed action, the use of approximately 2,777 acres of the 26,509-acre Cuddeback Range expansion area, was not likely to jeopardize the continued existence of the desert tortoise. The Cuddeback Range lies within the Superior-Cronese Critical Habitat Unit. However, all of the disturbance would occur in a previously disturbed area that the U.S. Air Force historically used as a target zone. The Navy will include the entire Cuddeback Range in its Integrated Natural Resource Management Plan and construct a perimeter fence around the range to prevent trespass by the public. These actions will provide conservation benefits for plants, fish, and wildlife within the area, including the desert tortoise. Because the Navy will not disturb most of the area, it did not translocate any desert tortoises as part of this action.

The incremental effect of the larger actions (i.e., solar development, the expansions of Fort Irwin and the Marine Corps Air Ground Combat Center) on the desert tortoise is unlikely to be positive, despite the numerous conservation measures that have been (or will be) implemented as part of the actions. The acquisition of private lands as mitigation for most of these actions

increases the level of protection afforded these lands; however, these acquisitions do not create new habitat and federal, state, and privately managed lands remain subject to most of the threats and stresses we discussed previously in this section. Land managers have been implementing measures to manage these threats and we expect, based on the best available scientific information, that such measures provide conservation benefits to the desert tortoise. We have been unable, to date, to determine whether desert tortoise populations have benefited from the measures. This is partly because of the low reproductive capacity of the desert tortoise. Therefore, the conversion of habitat into areas that are unsuitable for this species continues the trend of constricting the desert tortoise into a smaller portion of its range.

As the Service notes in the 5-year review (Service 2010), "(t)he threats identified in the original listing rule continue to affect the (desert tortoise) today, with invasive species, wildfire, and renewable energy development coming to the forefront as important factors in habitat loss and conversion. The vast majority of threats to the desert tortoise or its habitat are associated with human land uses."

Climate change is likely to affect the prospects for the long-term conservation of the desert tortoise. For example, predictions for climate change within the range of the desert tortoise suggest more frequent and/or prolonged droughts with an increase of the annual mean temperature by 3.5 to 4.0 degrees Celsius. The greatest increases will likely occur in summer (June-July-August mean increase of as much as 5 degrees Celsius [Christensen *et al*. 2007]). Precipitation will likely decrease by 5 to 15 percent annually in the region; with winter precipitation decreasing by up to 20 percent and summer precipitation increasing by up to 5 percent. Because germination of the desert tortoise's food plants is highly dependent on cool-season rains, increasing temperatures and decreasing winter precipitation could reduce the forage base. Although drought occurs routinely in the Mojave Desert, extended periods of drought have the potential to affect desert tortoises and their habitats through physiological effects to individuals (i.e., stress) and limited forage availability. To place the consequences of long-term drought in perspective, Longshore *et al*. (2003) demonstrated that even short-term drought could result in elevated levels of mortality of desert tortoises. Therefore, long-term drought is likely to have even greater effects, particularly given that the current fragmented nature of desert tortoise habitat (e.g., urban and agricultural development, highways, freeways, military training areas, etc.) will make recolonization of extirpated areas difficult, if not impossible.

Core Criteria for the Jeopardy Determination

When determining whether a proposed action is likely to jeopardize the continued existence of a species, we are required to consider whether the action would "reasonably be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species" (50 CFR 402.02). We have used the best available information to summarize the status of the desert tortoise with respect to its reproduction, numbers, and distribution.

Reproduction

In the 5-year review, the Service notes that desert tortoises increase their reproduction in high rainfall years; more rain provides desert tortoises with more high-quality food (i.e., plants that are higher in water and protein), which, in turn, allows them to lay more eggs. Conversely, the physiological stress associated with foraging on food plants with insufficient water and nitrogen may leave desert tortoises vulnerable to disease (Oftedal *et al*. 2002), and the reproductive rate of diseased desert tortoises is likely lower than that of healthy animals. Young desert tortoises also rely upon high-quality, low-fiber plants (e.g., native annual plants) with nutrient levels not found in the invasive weeds that have increased in abundance across its range (Oftedal *et al*. 2002; Tracy *et al*. 2004). Compromised nutrition of young desert tortoises likely represents an effective reduction in reproduction by reducing the number of animals that reaches adulthood; see previous information from Drake *et al*. (2016). Consequently, although we do not have quantitative data that show a direct relationship, the abundance of weedy species within the range of the desert tortoise has the potential to affect the reproduction of desert tortoises and recruitment into the adult population in a negative manner.

Various human activities have introduced numerous species of non-native invasive plants into the California desert. Routes that humans use to travel through the desert (paved and unpaved roads, railroads, motorcycle trails, etc.) serve as pathways for new species to enter habitat of the desert tortoise and for species that currently occur there to spread. Other disturbances of the desert substrate also provide invasive plant species with entry points into the desert. The abundance and distribution of invasive weeds may compromise, at least to some degree in localized areas across its range, the reproductive capacity of the desert tortoise; the continued increase in human access across the desert likely continues to facilitate the spread of weeds and further affect the reproductive capacity of the species.

Numbers

In the 5-year review, the Service discusses various means by which researchers have attempted to determine the abundance of desert tortoises and the strengths and weaknesses of those methods. Due to differences in area covered and especially to the non-representative nature of earlier study sites, data gathered by the Service's current range-wide monitoring program cannot be reliably compared to information gathered through other means at this time.

Data from small-scale study plots (e.g., one square mile) established as early as 1976 and surveyed primarily through the mid-1990s indicate that localized population declines occurred at many sites across the desert tortoise's range, especially in the western Mojave Desert. Spatial analyses of more widespread surveys also found evidence of relatively high mortality in some parts of the range (Tracy *et al*. 2004). Although we cannot extrapolate population densities from the local study plots to provide an estimate of the number of desert tortoises on a range-wide basis, historical densities in some parts of the desert exceeded 38 per square kilometer; Tracy *et al*. 2004). The Service (2010) concluded that "appreciable declines at the local level in many areas, which coupled with other survey results, suggest that declines may have occurred more broadly."

The range-wide monitoring that the Service initiated in 2001 is the first comprehensive attempt to determine the densities of desert tortoises in conservation areas across their range. Allison and McLuckie (2018) used annual density estimates obtained from this monitoring effort to evaluate range-wide trends in the density of desert tortoises over time. All references to the density of desert tortoises within each monitoring area are averages. Some local areas within each monitoring area support higher densities and some lower; desert tortoises do not occur in uniform densities across large areas. This analysis indicates that densities in the Northeastern Mojave Recovery Unit have increased since 2004, with the increase apparently resulting from increased survival of adults and sub-adults moving into the adult size class. The analysis also indicates that the populations in the other four recovery units are declining; Table 2 depicts the estimated abundance of desert tortoises within the recovery units and the change in abundance. Surveys did not include the steepest slopes in these desert tortoise conservation areas; however, the model developed by Nussear *et al*. (2009) generally rates steep slopes as less likely to support desert tortoises.

Table 2. Change in desert tortoise abundance in recovery units (Allison and McLuckie 2018)*.

Recovery Unit	Modeled Habitat (km^2)	2004 Abundance	2014 Abundance	Change in Abundance
Western Mojave	23,139	131,540	64,871	-66,668
Colorado Desert	18,024	103,675	66,097	-37,578
Northeastern Mojave	10,664	12,610	46,701	+34,091
Eastern Mojave	16,061	75,342	24,664	-50,679
Upper Virgin River	613	13,226	10,010	-3,216
Total	68,501	336,393	212,343	-124,050

* Allison and McLuckie (2018) used modeled habitat within the entire range of the desert tortoise for this estimate. In other discussions in this biological opinion, we used information only in the area of monitored habitat within desert tortoise conservation areas to estimate the number of desert tortoises in the recovery unit.

To further assess the status of the desert tortoise, the Desert Tortoise Recovery Office (Service 2015a) used multi-year trends from the best-fitting model describing log-transformed density of adult animals per square kilometer. In 2014, 3 of the 5 recovery units supported densities below 3.9 adult animals per square kilometer [Western Mojave (2.8), Eastern Mojave (1.5), and Colorado Desert (3.7); see Table 10 in Service 2015b], which is the minimum density recommended to avoid extinction in the 1994 recovery plan. The Northeastern Mojave Recovery Unit supported 4.4 adult desert tortoises per square kilometer and the Upper Virgin River Recovery Unit, which is by far the smallest recovery unit, supported 15.3 adults per square kilometer.

Allison and McLuckie (2018) considered the declines of adult desert tortoises in the Western Mojave and Eastern Mojave recovery units and concluded that these “steep declines” in density

are sustainable only if reproduction and the growth and survival of juveniles improved greatly. Allison and McLuckie used 180 millimeters as the separation point between large and small desert tortoises. However, they note, "the proportion of juveniles has not increased anywhere since 2007, and in these two recovery units the proportion of juveniles in 2014 has declined to 91% and 77% of their representation in 2004, respectively." In short, as of 2014, small desert tortoises were not moving into the large cohort at a rate that was sufficient to reverse declines.

Distribution

The Service (2010) concluded in its 5-year review that the distribution of the desert tortoise has not changed substantially since the publication of the original recovery plan in 1994 in terms of the overall extent of its range. Prior to 1994, urban and agricultural development, military training, and off-road vehicle use extirpated desert tortoises from large areas within their distributional limits. For example, the cities of Barstow, Lancaster, Las Vegas, and St. George, agricultural areas south of Edwards Air Force Base, the National Training Center at Fort Irwin, and portions of off-road recreation areas managed by the Bureau are located within the range of the desert tortoise. Unauthorized off-highway vehicle use in areas such as east of California City has also affected the distribution of the desert tortoise.

Urban development around Las Vegas has likely been the largest contributor to habitat loss throughout the range since 1994. Desert tortoises have essentially been removed from the 18,197-acre southern expansion area at Fort Irwin (Service 2012). The development of large solar facilities has also reduced the amount of habitat available to desert tortoises. No solar facilities have been developed within areas of critical environmental concern that the Bureau has designated for the desert tortoise in California, although such projects have occurred in areas that the Service considers important linkages between conservation areas (e.g., Silver State South Project in Nevada).

In recognition of the absence of specific and recent information on the location of habitable areas within the Mojave Desert, especially at the outer edges, Nussear *et al*. (2009) developed a quantitative, spatial habitat model for the desert tortoise north and west of the Colorado River. The model incorporates environmental variables such as precipitation, geology, vegetation, and slope and uses occurrence data of desert tortoises from sources spanning more than 80 years, including data from the 2001 to 2008 range-wide monitoring surveys. The model predicts the relative potential for desert tortoises to be present in any given location, given the combination of habitat variables at that location in relation to areas of known occupancy throughout the range. Calculations of the amount of desert tortoise habitat in the 5-year review (Service 2010) and in this biological opinion use a threshold of 0.5 or greater predicted value for potential desert tortoise habitat. The model does not account for anthropogenic effects to habitat and represents the potential for occupancy by desert tortoises absent these effects.

Table 3 depicts acreages of habitat (as modeled by Nussear *et al*. 2009, using only areas with a probability of occupancy by desert tortoises greater than 0.5 as potential habitat) within the recovery units of the desert tortoise and of impervious surfaces as of 2006 (Fry *et al*. 2011); calculations are by Darst (2014). Impervious surfaces include paved and developed areas and

other disturbed areas that have zero probability of supporting desert tortoises. All units are in acres.

Table 3. Modeled habitat of the desert tortoise; all units are in acres.

Recovery Unit	Modeled Habitat	Impervious Surfaces (percentage)	Remaining Modeled Habitat
Western Mojave	7,585,312	1,989,843 (26)	5,595,469
Colorado Desert	4,950,225	510,862 (10)	4,439,363
Northeastern Mojave	3,012,293	386,182 (13)	2,626,111
Eastern Mojave	4,763,123	825,274 (17)	3,937,849
Upper Virgin River	231,460	84,404 (36)	147,056
Total	20,542,413	3,796,565 (18)	16,745,848

Since 2010, we again conclude that the species' distribution has not changed substantially in terms of the overall extent of its range. However, solar facilities, military activities, and other developments have removed desert tortoises from several thousand acres within their range.

Status of Designated Critical Habitat of the Desert Tortoise

The Service designated critical habitat for the desert tortoise in portions of California, Nevada, Arizona, and Utah in a final rule published February 8, 1994 (59 FR 5820). The Service designates critical habitat to identify the key biological and physical needs of the species and key areas for recovery and to focus conservation actions on those areas. Within the geographical area occupied by the species at the time of listing, critical habitat is composed of specific geographic areas that contain the biological and physical features essential to the species' conservation and that may require special management considerations or protection. These features include space, food, water, nutrition, cover, shelter, reproductive sites, and special habitats. The specific physical and biological features of critical habitat of the desert tortoise are: 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 growth of these species; suitable substrates for burrowing, nesting, and overwintering; burrows, caliche caves, and other shelter sites; sufficient vegetation for shelter from temperature extremes and predators; and habitat protected from disturbance and human-caused mortality.

Critical habitat of the desert tortoise would not be able to fulfill its intended recovery function without each of the physical and biological features being functional. For example, critical habitat would not function properly if a sufficient amount of forage species were present but human-caused mortality was excessive. A second example is that critical habitat could not fulfill its intended function for recovery if an area with sufficient space to support viable populations and to provide for movement, dispersal, and gene flow did not support adequate forage species.

The final rule for designation of critical habitat did not explicitly ascribe specific conservation roles or functions to the various critical habitat units. Rather, it refers to the strategy of

establishing recovery units and "desert wildlife management areas" recommended by the recovery plan for the desert tortoise, which had been published as a draft at the time of the designation of critical habitat, to capture the "biotic and abiotic variability found in desert tortoise habitat" (59 FR 5823). Specifically, we designated the critical habitat units to follow the direction provided by the draft recovery plan for the establishment of desert wildlife management areas. The critical habitat units in aggregate are intended to protect the variability that occurs across the large range of the desert tortoise; the loss of any specific unit may compromise the ability of critical habitat as a whole to serve its intended function for recovery.

Since the designation of critical habitat, Congress increased the size of Joshua Tree National Park and created the Mojave National Preserve. A portion of the expanded boundary of Joshua Tree National Park lies within critical habitat of the desert tortoise; portions of other critical habitat units lie within the boundaries of the Mojave National Preserve.

Congress also increased the size of the Johnson Valley Off-highway Vehicle Recreation Area through the passage of the Dingell Act in 2019. This act included 3,471 acres of the Ord-Rodman Critical Habitat Unit in the Johnson Valley Off-highway Vehicle Recreation Area, which represents approximately 1.37 percent of the 253,200-acre critical habitat unit.

Within each critical habitat unit, both natural and anthropogenic factors affect the function of the physical and biological features of critical habitat. As an example of a natural factor, in some specific areas within the boundaries of critical habitat, such as within and adjacent to dry lakes, some of the physical and biological features are naturally absent because the substrate is extremely silty; desert tortoises do not normally reside in such areas. Comparing the acreage of desert tortoise habitat as depicted by Nussear *et al.*'s (2009) model to the gross acreage of the critical habitat units demonstrates quantitatively that the entire area within the boundaries of critical habitat likely does not support the physical and biological features. In Table 4, the acreage for modeled habitat is for the area in which the probability that desert tortoises are present is greater than 0.5. We used the 0.5 probability here, rather than the 0.6 value we used to define conservation areas, to depict the broader area that most desert tortoises likely occupy, instead of the slightly more restricted area we consider important for conservation. The acreages of modeled habitat do not include loss of habitat due to human-caused impacts. The difference between gross acreage and modeled habitat is 653,214 acres; that is, approximately 10 percent of the gross acreage of the designated critical habitat is unlikely to support the features of habitat that are conducive to the presence of desert tortoises.

Table 4. Acreage of gross and modeled habitat within critical habitat units for the desert tortoise. The acreage for the Ord-Rodman Critical Habitat Unit has not been adjusted in response to the Dingell Act. All units are in acres.

Critical Habitat Unit	Gross Acreage	Modeled Habitat
Superior-Cronese	766,900	724,967
Fremont-Kramer	518,000	501,095
Ord-Rodman	253,200	184,155
Pinto Mountain	171,700	144,056

Critical Habitat Unit	Gross Acreage	Modeled Habitat
Piute-Eldorado	970,600	930,008
Ivanpah Valley	632,400	510,711
Chuckwalla	1,020,600	809,319
Chemehuevi	937,400	914,505
Gold Butte-Pakoon	488,300	418,189
Mormon Mesa	427,900	407,041
Beaver Dam Slope	204,600	202,499
Upper Virgin River	54,600	46,441
Total	6,446,200	5,792,986

Human activities can have obvious or more subtle effects on the physical and biological features of critical habitat. The grading of an area and subsequent construction of a building removes physical and biological features; this action has an obvious effect on critical habitat. The revised recovery plan identifies human activities such as urbanization and the proliferation of roads and highways as threats to the desert tortoise and its habitat; these threats are examples of activities that have a clear effect on the physical and biological features of critical habitat.

Condition of the Physical and Biological Features of Critical Habitat

The revised recovery plan (Service 2011) discusses the importance of understanding the combined and synergistic effects of human activities on habitat of the desert tortoise. For example, surface disturbance causes increased rates of erosion and generation of dust. Increased erosion alters additional habitat outside of the area directly affected by altering the nature of the substrate, removing shrubs, and possibly destroying burrows and other shelter sites. Increased dust affects photosynthesis in the plants that provide cover and forage to desert tortoises. Disturbed substrates and increased atmospheric nitrogen enhance the likelihood that invasive weeds will out-compete native species; the proliferation of weedy species increases the risk of large-scale fires, which further move habitat conditions away from those that are favorable to desert tortoises.

The following paragraphs generally describe how the threats described in the revised recovery plan affect the physical and biological features of critical habitat of the desert tortoise.

Sufficient space to support viable populations within each of the six recovery units and to provide for movement, dispersal, and gene flow

Urban and agricultural development, concentrated use by off-road vehicles, and other activities such as development of transmission lines and pipelines completely remove habitat. Although we are aware of local areas within the boundaries of critical habitat that have been heavily disturbed, we do not know of any areas that have been disturbed to the intensity and extent that compromise the function of this physical and biological feature. To date, the largest single loss of critical habitat is the use of 18,197 acres of additional training land in the southern portion of Fort Irwin in the Superior-Cronese Critical Habitat Unit. The congressional transfer of 3,471 acres of the Ord-Rodman Critical Habitat Unit to the Johnson Valley Off-highway Vehicle

Recreation Area may reduce the space available to support viable populations within the Western Mojave Recovery Unit and to provide for movement, dispersal, and gene flow. The extent to which recreationists use the transferred area will determine the extent of the effect on this and the other physical and biological features.

The widening of existing freeways likely caused the second largest loss of critical habitat. Despite these losses of critical habitat, which occur in a linear manner, the critical habitat units continue to provide sufficient space to support viable populations within each of the six recovery units.

In some cases, major roads likely disrupt the movement, dispersal, and gene flow of desert tortoises. State Route 58 and Highway 395 in the Fremont-Kramer Critical Habitat Unit, Fort Irwin Road in the Superior-Cronese Critical Habitat Unit, and Interstate 10 in the Chuckwalla Critical Habitat Unit are examples of large and heavily travelled roads that likely disrupt movement, dispersal, and gene flow. Roads that have been fenced and provided with underpasses may alleviate this fragmentation to some degree; however, such facilities have not been in place for sufficient time to determine whether they will eliminate fragmentation.

The threats of invasive plant species described in the revised recovery plan generally do not result in the removal of this physical and biological feature because they do not convert habitat into impervious surfaces, as would urban development.

Sufficient quality and quantity of forage species and the proper soil conditions to provide for the growth of these species

This physical and biological feature addresses the ability of critical habitat to provide adequate nutrition to desert tortoises. As described in the revised recovery plan and 5-year review, grazing, historical fire, invasive plants, altered hydrology, drought, wildfire potential, fugitive dust, and climate change/temperature extremes contribute to the stress of "nutritional compromise." Paved and unpaved roads through critical habitat of the desert tortoise provide avenues by which invasive native species disperse; these legal routes also provide the means by which unauthorized use occurs over large areas of critical habitat. Nitrogen deposition from atmospheric pollution likely occurs throughout all the critical habitat units and exacerbates the effects of the disturbance of substrates. Because paved and unpaved roads are so widespread through critical habitat, this threat has adversely affected the value of critical habitat for conservation of the desert tortoise throughout its range, to some degree.

Suitable substrates for burrowing, nesting, and overwintering

Surface disturbance, motor vehicles traveling off route, use of off-highway vehicle management areas, off-highway vehicle events, unpaved roads, grazing, historical fire, wildfire potential, altered hydrology, and climate change leading to shifts in habitat composition and location, storms, and flooding can alter substrates to the extent that they are no longer suitable for burrowing, nesting, and overwintering. Erosion caused by these activities can alter washes to the extent that desert tortoise burrows placed along the edge of a wash, which is a preferred location

for burrows, could be destroyed. We expect that the area within critical habitat that is affected by off-road vehicle use to the extent that substrates are no longer suitable is relatively small in relation to the area that desert tortoises have available for burrowing, nesting, and overwintering; consequently, off-road vehicle use has not had a substantial effect on this physical and biological feature.

Most livestock allotments have been eliminated from within the boundaries of critical habitat. Of those that remain, livestock would compact substrates to the extent that they would become unsuitable for burrowing, nesting, and overwintering only in areas of concentrated use, such as around watering areas and corrals. Because livestock grazing occurs over a relatively small portion of critical habitat and the substrates in most areas within livestock allotments would not be substantially affected, suitable substrates for burrowing, nesting, and overwintering remain throughout most of the critical habitat units.

Burrows, caliche caves, and other shelter sites

Human-caused effects to burrows, caliche caves, and other shelter sites likely occur at a similar rate as effects to substrates for burrowing, nesting, and overwintering for the same general reasons. Consequently, sufficient burrows, caliche caves, and other shelter sites remain in the critical habitat units.

Sufficient vegetation for shelter from temperature extremes and predators

In general, sufficient vegetation for shelter from temperature extremes and predators remains throughout critical habitat. In areas where large fires have occurred in critical habitat, many of the shrubs that provide shelter from temperature extremes and predators have been destroyed; in such areas, cover sites may be a limiting factor. The proliferation of invasive plants poses a threat to shrub cover throughout critical habitat as the potential for larger and more frequent wildfires increases.

In 2005, wildfires in Nevada, Utah, and Arizona burned extensive areas of critical habitat (Service 2010). Although different agencies report slightly different acreages, Table 5 provides an indication of the scale of the fires. Fires in 2020 also occurred in critical habitat of the desert tortoise; Table 6 includes the approximate acreages of those fires (Luciani 2021, *in litt*).

Table 5. Summary of total burned area within desert tortoise critical habitat for 2005.

Critical Habitat Unit	Total Area Burned (acres)	Percent of the Critical Habitat Unit Burned
Beaver Dam Slope	53,528	26
Gold-Butte Pakoon	65,339	13
Mormon Mesa	12,952	3
Upper Virgin River	10,557	19

Table 6. Summary of total burned area within desert tortoise critical habitat for 2020.

Critical Habitat Unit	Total Area Burned (acres)	Percent of the Critical Habitat Unit Burned
Beaver Dam Slope	51	0.02
Gold-Butte Pakoon	23,684	5
Mormon Mesa	12	<0.01
Upper Virgin River	9,029	17
Ivanpah Valley	42,142	7
Piute-Eldorado	0.1	<0.01

The revised recovery plan notes that the fires caused statistically significant losses of perennial plant cover, although patches of unburned shrubs remained. The percentages of burned habitat do not mean that the fire removed all habitat value for desert tortoises. Drake *et al*. (2015) noted that the production of annual plants was 10 times greater in burned areas compared to unburned areas; however, non-native plants, such as red brome (*Bromus madritensis* ssp. *rubens*), dominated the burned areas. Desert tortoises continued to use the dead branches of shrubs, such as creosote (*Larrea tridentata*) and burro bush (*Ambrosia dumosa*). Their use of burrows was similar in burned and unburned areas (Drake *et al*. 2015). We cannot quantify precisely the extent to which these fires disrupted the value of the critical habitat, given the patchiness with which the physical and biological features of critical habitat are distributed across the critical habitat units and the varying intensity of the wildfires. Drake *et al*. (2015) demonstrate that the physical and biological features within burned areas retain at least some of their value for the conservation of desert tortoises but conclude "burned habitat may take years to recover sufficiently to fully support (desert) tortoise populations."

Habitat protected from disturbance and human-caused mortality

In general, the Federal agencies that manage lands within the boundaries of critical habitat have adopted land management plans that include implementation of some or all of the recommendations contained in the original recovery plan for the desert tortoise (see pages 70 to 72 of Service 2010). The Bureau's land use plan amendment for the Desert Renewable Energy Conservation Plan (2015) increased the amount of land under protective status and adopted conservation and management actions that furthered the Bureau's goals for these areas. Areas of critical environmental concern and California Desert National Conservation Lands are the units by which the Bureau manages its lands; for the most part, these management units overlap critical habitat of the desert tortoise.

To at least some degree, the adoption of these plans has resulted in the implementation of management actions that are likely to reduce the disturbance and human-caused mortality of desert tortoises. For example, these plans resulted in the designation of open routes of travel and the closure (and, in some cases, physical closure) of unauthorized routes. Numerous livestock allotments have been relinquished by the permittees and cattle no longer graze these allotments. Because of actions on the part of various agencies, many miles of highways and other paved roads have been fenced to prevent desert tortoises from wandering into traffic and being killed.

The Service and other agencies of the Desert Managers Group in California are implementing a plan to remove common ravens that prey on desert tortoises and to undertake other actions that would reduce subsidies (i.e., food, water, sites for nesting, roosting, and perching, etc.) that facilitate raven abundance in the California Desert (Service 2008).

Despite the implementation of these actions, disturbance and human-caused mortality continue to occur in many areas of critical habitat to the extent that they adversely affect the value of critical habitat for the conservation of the desert tortoise, to some degree. For example, many highways and other paved roads in California remain unfenced. Hughson and Darby (2013) noted that as many as 10 desert tortoises are reported killed annually on paved roads within Mojave National Preserve. Because scavengers quickly remove carcasses from roads, we expect that vehicle use kills more desert tortoises than are reported.

Unauthorized off-road vehicle use continues to disturb habitat and result in loss of vegetation within the boundaries of critical habitat; although we have not documented the death of desert tortoises as a direct result of this activity, it likely occurs. Additionally, the habitat disturbance caused by this unauthorized activity exacerbates the spread of invasive plants, which displace native plants that are important forage for the desert tortoise, thereby increasing the physiological stress faced by desert tortoises.

Finally, in California, the Bureau will not allow the development of renewable energy facilities on public lands within the boundaries of areas of critical environmental concern and California Desert National Conservation Lands. Counties have not specifically restricted the development of renewable energy facilities on private lands within the boundaries of areas of critical environmental concern. However, the checkerboard pattern of land ownership would likely necessitate that the Bureau consider issuance of a right-of-way for such a facility, which likely decreases the potential for such proposals in the future.

Summary of the Status of Critical Habitat of the Desert Tortoise

As noted in the 5-year review and revised recovery plan for the desert tortoise (Service 2010, 2011), critical habitat of the desert tortoise is subject to landscape-level impacts in addition to the site-specific effects of individual human activities. Land managers have undertaken actions to improve the status of critical habitat. For example, as part of its efforts to offset the effects of the use of additional training maneuver lands at Fort Irwin (Service 2004), the Department of the Army acquired the private interests in the Harper Lake and Cronese Lakes allotments, which are located within critical habitat in the Western Mojave Recovery Unit; as a result, cattle have been removed from these allotments. The retirement of allotments assists in the recovery of the species by eliminating disturbance to the physical and biological features of critical habitat by cattle and range improvements.

Although human activities have affected the remaining physical and biological features to some degree, these impacts have not, to date, appreciably diminished the value of the critical habitat units for the conservation of the desert tortoise. We have reached this conclusion primarily

because the effects are localized and thus do not affect the value of large areas of critical habitat for the conservation of the desert tortoise.

ENVIRONMENTAL BASELINE

The regulations implementing the Act (50 CFR § 402.02) define the environmental baseline as the condition of the listed species or its designated critical habitat in the action area, without the consequences to the listed species or designated critical habitat caused by the proposed action. The environmental baseline includes the past and present impacts of all Federal, State, or private actions and other human activities in the action area, the anticipated impacts of all proposed Federal projects in the action area that have already undergone formal or early section 7 consultation, and the impact of State or private actions which are contemporaneous with the consultation in process. The consequences to listed species or designated critical habitat from ongoing agency activities or existing agency facilities that are not within the agency's discretion to modify are part of the environmental baseline (50 CFR § 402.02).

Previous consultations in the Action Area

Prior to this proposed action, the Service issued the Biological Opinion for the Military use of the CMAGR (Service 1996), which this consultation amends. The Service concluded that the proposed action was not likely to jeopardize the continued existence of desert tortoise or result in the destruction or adverse modification of its designated critical habitat. Additionally, the Service amended the 1996 biological opinion to include activities for the Target Complex Invader (Service 2015c) and SWATs 4 and 5 (Service 2015d), which did not change the Service's opinion on whether the action was likely to jeopardize the continued existence of desert tortoise or result in destruction or adverse modification of critical habitat. No take has been reported under these previous consultations to date.

Status of the Species in the Action Area

The Project's biological assessment (MCASY 2021) states that desert tortoises are known to occur throughout the action area. Desert tortoise surveys were conducted in accordance with the most recent guidance from the Service (Service 2019a) in March 2021 to determine the presence or absence of desert tortoises within the action area. For more specific details on the methodology of desert tortoise surveys, please see the biological assessment (MCASY 2021). Below, we summarize the results described in the biological assessment, specifically for habitat quality, numbers of animals, distribution of desert tortoises, and information regarding reproduction.

The action area is within the southwestern portion of the Colorado Desert Recovery Unit for desert tortoise. The surveyed areas have low to high potential for desert tortoise based on the U.S. Geological Survey (USGS) desert tortoise habitat potential model (Nussear *et al*. 2009). The survey areas were divided into seven distinct areas based on the seven training support areas: 1) five landing zones, 2) one assault landing zone (Bull), and 3) one artillery firing area (Burt 2.0). All seven training support areas were surveyed which totaled approximately 1,410.6

acres and are considered relatively undisturbed desert tortoise habitat. However, MCASY changed the location and configuration (rotated towards the north to reduce the potential for affecting ephemeral desert washes, see Figure 3) of the Bull training support area because of potential environmental and logistical constraints. The original Bull training support area was surveyed but because the configuration was revised after the completion of desert tortoise surveys, surveys were not conducted throughout the entire revised Bull training support area. In addition, designated critical habitat for desert tortoise overlaps portions of the action area, which we describe in more detail below. Overall, the action area contains desert tortoise habitat that is relatively undisturbed.

Table 7 summarizes the results of the desert tortoise surveys, which includes live desert tortoises, desert tortoise sign, and its distribution throughout the action area. Eight live desert tortoises were found in three of the seven training support areas. Desert tortoise sign was found throughout the action area, including 62 burrows in six of the training support areas, 17 carcasses in five of the training support areas, six scat in two of the training support areas, and one eggshell fragment in one of the training support areas. There were no signs of small desert tortoises or juveniles, or signs of reproduction with the exception of the one eggshell fragment.

Table 7. Results of the 2021 desert tortoise surveys within the CMAGR proposed action area.

Desert Tortoise Sign by Survey Location	Salvation Northern Multi-Ship	Salvation Single Ship North 1 and 2	Salvation Southern Multi-Ship	AFA Burt 2.0, Access Road, and New Combat Road	Bull[1]	Pina	Total
Live Desert Tortoise	2	0	3	3	0	0	8
Burrows	26	2	18	3	0	13	62
Carcasses	10	1	5	1	0	0	17
Scat	0	0	5	1	0	0	6
Eggshell Fragments	1	0	0	0	0	0	1

[1] The configuration of the Bull training support area was revised after the completion of desert tortoise surveys; therefore, surveys were not conducted throughout the entire revised Bull training support area in 2021.

Figure 3: Bull Training Support Area

Based on the size and disjunct location of each training support area, MCASY determined that combining these areas to generate one survey area and estimate for number of desert tortoise would be inaccurate. All survey areas, except for one of the landing zones meet the criteria for small project surveys (Service 2019a). These small project areas are less likely to include the entire home range of desert tortoises; therefore, desert tortoises that regularly use the area may be offsite during the surveys. Therefore, estimates and confidence intervals for adult desert tortoises or estimated number of small desert tortoises were not provided.

The action area likely supports juvenile desert tortoises (less than or equal to 180 millimeters) and eggs. Estimating densities of juvenile desert tortoises is difficult because of low detection probabilities due to their small size and cryptic nature. However, based on a 4-year study of their population ecology, Turner *et al*. (1987) determined that juveniles accounted for 19 to 81 percent of the overall population. Using this range and the observed number of 8 large desert tortoises in the action area, we estimate that these areas may support between 1 to 6 juveniles. We recognize that this estimate is derived from survey data and a limited number of studies and that population levels are constantly changing. We also recognize that because the number of large desert tortoises in the action area is based on observations found during surveys, the estimate of the number of juveniles may be inaccurate; however, these estimates provide the best available data to establish a baseline for our analysis.

In addition, we expect the action area to support desert tortoise eggs. Estimating the number of desert tortoise eggs is extremely difficult given that the eggs are buried beneath the soil surface. To estimate the number of eggs that could be present in the action area, we used the mean clutch size of 5.38 eggs per clutch (Turner *et al*. 1986 in Service 1994) and a mean number of clutches of 1.6 per female per year (Turner *et al*. 1984). Assuming a 1:1 sex ratio (Turner *et al*. 1984, Turner *et al*. 1987), up to 4 of the observed 8 desert tortoises within the action area may be reproductive females that together could produce approximately 35 eggs per year (4 reproductive females x 5.38 eggs per clutch x 1.6 clutches per female per year). Applying these assumptions (i.e., the sex ratio, mean clutch size, and mean number of clutches per female per year are comparable to those observed by Turner *et al*. [1984]) to estimate the number of eggs in the action area has an unknown but high level of uncertainty. Therefore, while we cannot calculate the precise estimate for the number of eggs that may be impacted by the proposed action, we use this estimate, which constitutes the best available information, for the analysis contained in this biological opinion.

Status of Critical Habitat of the Species in the Action Area

The Project's biological assessment states a portion of the proposed action occurs within the Chuckwalla Critical Habitat Unit. The Chuckwalla Critical Habitat Unit has 1,020,600 acres and CMAGR occurs on 187,842 acres of critical habitat. Approximately 642.1 acres (0.06 percent of the Chuckwalla Critical Habitat Unit) of the 1,410.6-acre proposed action area would occur in critical habitat. Specifically, 44.8 acres of critical habitat would be permanently lost due to the grading of the existing access road and new combat road created for Burt 2.0. The remaining 597.3 acres of critical habitat would be temporarily disturbed as evaluated by the biannual range sweeps for preparation and maintenance needs of the landing zones and assault landing zone in critical habitat. While the action area supports physical and biological features of critical habitat, temporary and permanent effects would be confined to three training support areas (two landing

zones, Bull, and Burt 2.0). Although various activities associated with military use, such as off-road vehicle use, occur in this area, the proposed action is not expected to appreciably diminish the physical and biological features necessary to support the conservation function of the critical habitat unit overall.

EFFECTS OF THE ACTION

Regulations implementing the Act (50 CFR § 402.02) define the effects of the action as all consequences to listed species or critical habitat that are caused by the proposed action, including the consequences of other activities that are caused by the proposed action. A consequence is caused by the proposed action if it would not occur but for the proposed action and it is reasonably certain to occur. Effects of the action may occur later in time and may include consequences occurring outside the immediate area involved in the action (50 CFR § 402.17).

The regulations for section 7(a)(2) note that "a conclusion of reasonably certain to occur must be based on clear and substantial information, using the best scientific and commercial data available" [50 CFR § 402.17(a)]. When considering whether activities caused by the proposed action (but not part of the proposed action) or activities reviewed under cumulative effects are reasonably certain to occur, we consider factors such as (1) past experiences with activities that have resulted from actions that are similar in scope, nature, and magnitude to the proposed action; (2) existing plans for the activity; and (3) any remaining economic, administrative, and legal requirements necessary for the activity to go forward.

The proposed action may affect desert tortoises in several ways. We will examine the designation, preparation, operations and maintenance of the training support areas and the effects that these activities may have on desert tortoises. Desert tortoises may be captured, handled, and moved from harm's way; they may also be injured or killed by aircrafts, heavy equipment, and vehicles. The proposed action may also result in the temporary and permanent loss and degradation of habitat. In addition, the Project may increase subsidies to common ravens, predator abundance, and potential to prey on desert tortoises. Non-native plants species may also increase, along with the potential risk for wildfires. However, MCASY will implement conservation measures identified in the Description of the Proposed Action section, which have been considered when analyzing the activities below. Although we cannot predict the number of individuals that would be killed or injured because of multiple variables involved, including weather conditions and activity patterns of desert tortoises at the time of training exercises, we expect this number to be small (see the Environmental Baseline section above for the number of desert tortoises found in the action area).

Throughout this analysis we may differentiate between the different size classes of desert tortoises as large (midline carapace length greater than 180 millimeters) and small (midline carapace length less than or equal to 180 millimeters) individuals. We may also refer to large desert tortoises as "adult" desert tortoises because it connotes reproductive maturity. However, desert tortoises may become reproductive at various sizes. The Service based its 2010 survey protocol on the methodology used in range-wide sampling but erred in citing 160 millimeters as the size below which surveyors' ability to detect desert tortoises decreases. In range-wide

sampling, the Service uses 180 millimeters as its cut-off length for counting desert tortoises, at least in part because the Styrofoam models used for training are 180 millimeters in length. The Service changed the survey protocol to use 180 millimeters in the revised version (Service 2019a). We have used the term "adult" to indicate reproductive status and those animals larger than 180 millimeters to conform to the Service's protocols for range-wide sampling and pre-project surveys.

Below, we will analyze how these various aspects of the proposed action may affect desert tortoises. In the Conclusion section, we will integrate this general analysis with the best available information on reproduction, number, and distribution of desert tortoises in the action area, to determine whether the proposed action is likely to jeopardize the continued existence of the species.

Establishment of Training Support Areas

Establishing training support areas would be a loss of desert tortoise habitat; specifically, approximately 12.9 acres of desert tortoise habitat (assault landing zone) and 44.8 acres of critical habitat (artillery firing area) would be permanently lost (57.7 acres). In addition, the Project would temporarily degrade 755.6 acres of desert tortoise habitat and 597.3 acres of critical habitat (1,352.9 acres). The temporary degradation and permanent loss of desert tortoise habitat is described in more detail in the Preparation of Training Support Areas and Loss and Degradation of Habitat section. However, disturbance would be temporary and localized within the landing zone areas and artillery firing area (1,310.9 and 42.0 acres, respectively). This disturbance would be limited to the extent of the MV-22 aircraft landing and takeoffs and setting up for artillery expenditure. We cannot predict the exact amount of temporary disturbance that would occur within the landing zone areas and artillery firing area.

We expect that establishing training support areas is not likely to have a measurable effect on the distribution of desert tortoises because the training support areas would be maintained in a natural state to simulate realistic combat scenarios. Over time, desert tortoises would continue to use training support areas to forage, burrow, nest, and traverse. We also expect that training activities would be localized within the established boundaries. We cannot quantify the amount of localized disturbance because we do not know the exact locations within the training support areas where training activities would occur. We anticipate that the implemented conservation measures would avoid and minimize the effects of establishing these training support areas. Therefore, the loss and degradation of habitat resulting from establishing training support areas would not result in long-term impacts to resident desert tortoises.

Preparation of Training Support Areas

Preparing the training support areas may affect desert tortoises by capturing and moving individuals, injuring or killing desert tortoises, and degrading and removing desert tortoise habitat. These preparation activities would occur prior to WTI and training activities so that hazards to personnel and equipment are removed. Prior to ground-disturbing preparation and training activities, MCASY will conduct desert tortoise clearance surveys to identify desert

tortoises and sign (CM 3), so that localized training activities can avoid areas with desert tortoises. Below we will analyze the effects of the different preparation activities on desert tortoises.

Vegetation Trimming and Other Ground-disturbing Activities

Minimal vegetation trimming (mainly the upper portion of tall mature woody vegetation that is not used by desert tortoises) may occur in the landing zones and assault landing zone as determined by the biannual range sweep surveys to ensure that the area is ready for personnel use and training activities. Aircrews would intentionally land in areas devoid or nearly devoid of vegetation. If necessary, ground crews would use existing access roads and hike into these training support areas to trim vegetation using hand tools. The landing areas within the landing zones may vary from year to year and therefore vegetation trimming is unlikely to kill vegetation. However, vegetation trimming within the assault landing zone would permanently remove desert tortoise habitat. Aircrews would identify specific landing areas within the training support areas and therefore this type of habitat degradation would be localized, but not affect the entire proposed training support area. However, the purpose of these training support areas is to simulate realistic combat scenarios and would be maintained as natural as possible therefore it is unlikely for vegetation trimming to cause a measurable effect to desert tortoises.

Preparation activities in the artillery firing area would disturb desert tortoise habitat. Preparation activities would include digging localized pits for ordnance expenditure and potentially temporarily disturb desert tortoise critical habitat within the proposed artillery firing area (42 acres of desert tortoise critical habitat). MCASY will ensure that any excavations/localized pits will be covered or filled to prevent effects to desert tortoises (CM 7). The implemented conservation measures should reduce the number of desert tortoises that are injured or killed during these types of activities.

Access Roads

Existing access roads to the landing zones would not require improvements or additional grading prior to training activities. However, existing access roads to the assault landing zone (Bull) and artillery firing area (Burt 2.0) would require grading to ensure safe access to each of these training support areas. Existing access roads to Bull would not result in new disturbance however, the Burt 2.0 existing access road would result in the loss of 33.4 acres of desert tortoise critical habitat. Additionally, Burt 2.0 would create a new combat road for entry into the artillery firing area. This would result in the permanent loss of 11.4 acres of critical habitat for desert tortoise.

Improving these existing access roads and creating a new combat road may result in capturing and moving desert tortoises from roadways and road mortalities to prevent tortoises from being crushed by vehicles. However, MCASY will require authorized biologists or trained Tortoise Management Representatives to handle desert tortoises (CM 1, 2, and 4) and follow the appropriate handling procedures (CM 4). These animals will be moved out of harm's way into adjacent suitable habitat and would remain within their home ranges because they would be

moved short distances and the habitat disturbance would not remove their territories. In addition, vehicles will be inspected underneath prior to operation to prevent crushing desert tortoises (CM 10). We expect the number of mortalities to be low based on the implementation of these conservation measures.

Landing Airstrip

The assault landing zone would require grading a landing airstrip. This would result in the permanent loss of 12.9 acres of desert tortoise habitat. Heavy equipment and vehicles may crush desert tortoises. However, prior to this type of activity, MCASY will ensure that desert tortoise clearance surveys are conducted (CM 3) and authorized biologists and trained Tortoise Management Representatives would move desert tortoises out of harm's way (CM 1 and CM 2). MCASY will also ensure that all personnel will participate in a desert tortoise education program to train personnel in situations where desert tortoises may be encountered (CM 5). Therefore, we do not expect desert tortoises to be killed or injured.

Dust Suppression

A dust palliative may be applied to specific areas with ground-disturbing activities in the training support areas. Heavy equipment and vehicles used to apply the dust palliative may crush desert tortoises. MCASY will ensure that conservation measures (CM 1, 2, 3, 4, 5, and 10) are implemented to minimize the effect of this activity on desert tortoises.

Numerous variables complicate our estimations of the number of desert tortoises in a training support area. For example, we usually do not know the precise number of desert tortoises in the training support area, the size of those individuals, whether eggs will be present at the time of preparation activities, and the weather before or during preparation activities. Regardless of these factors, we expect that few large desert tortoises are likely to be killed or injured during preparation activities because MCASY will implement conservation measures that have proven effective in the past in reducing mortality and injury, such as having an authorized biologist move desert tortoises out of harm's way (CM 2). Small desert tortoises are likely to be killed or injured in greater numbers because they are more difficult to detect. However, because MCASY will implement conservation measures, we do not expect large numbers of small desert tortoises to be killed or injured. The loss of small desert tortoises is also not as deleterious to the population as the loss of reproductive animals, because small animals have low reproductive potential, require up to 20 years to reach sexual maturity and experience relatively high mortality early in life (Service 2011)

Overall, we anticipate few, if any, desert tortoise mortalities from preparation activities. Since the issuance of the 1996 programmatic biological opinion, no take has been reported by MCASY. We also anticipate that the implemented conservation measures would avoid and minimize the effects of these preparation activities on desert tortoises.

Operations and Maintenance of Training Support Areas

Operations and maintenance of the training support areas would not increase the quantity of sorties flown, increase the amount and types of ordnance expended, increase artillery training tempo, or alter the existing facilities or airspace within the CMAGR. Once these training support areas are established, they would be added to the available locations for MV-22 aircraft operations and locations for all MAWTS-1/WTI purposes. All training support areas would be used in a natural or near-natural setting except, as necessary, for minor vegetation trimming and occasional grading maintenance to maintain accessibility of the access roads that may occur biannually. Operations would be consistent with existing training schedules and activities and there would be no effects other than described in the original programmatic consultation (Service 1996).

During operations and maintenance activities desert tortoises may be captured and moved, injured or killed, and habitat may be degraded and permanently removed. As described above in the Conservation Measures section, MCASY will implement conservation measures to avoid and minimize these effects on desert tortoises.

Over the life of the Project, MCASY is likely to conduct ground-disturbing operation and maintenance activities. These activities have the potential to injure or kill desert tortoises primarily by vehicle strikes, as personnel travel to and from training support areas; a limited possibility exists for desert tortoises to be injured or killed by equipment or personnel during training activities.

After the completion of each ground operation or training activity, the Tortoise Management Representative or authorized biologist will survey all the training support areas for dead or injured desert tortoises and report any dead or injured desert tortoises to the Service within three working days of the discovery (CM 14 and CM 15).

We expect that the operations and maintenance of the training support areas is likely to injure or kill relatively few desert tortoises because desert tortoise clearance surveys (CM 3) will be conducted to avoid and move desert tortoises from harm's way (CM 4). Also, since the issuance of the 1996 programmatic biological opinion, no take has been reported by MCASY. We cannot quantify the number of desert tortoises that these operation and maintenance activities may affect because we do not know how many animals personnel will encounter during operations and maintenance. We also anticipate that the implemented conservation measures would avoid and minimize the effects of operation and maintenance activities on desert tortoises, specifically, we expect that authorized biologists would be able to detect and protect most desert tortoises found.

Loss and Degradation of Habitat

The proposed action would cause the loss and/or degradation of desert tortoise habitat. We consider the loss of habitat to be the complete removal of all habitat value from a parcel of land. For example, grading a new landing airstrip at the assault landing zone would displace any potential resident desert tortoises from the area and removes all potential for desert tortoises to

reside within the area occupied by the airstrip. Degradation of habitat occurs when activities alter the structure of the substrate or annual and perennial plant communities but do not completely remove it. For example, degradation of habitat would occur if personnel excavate a pit to conduct ordnance expenditure and then refill it with the excavated soils. Desert tortoises may still move across the refilled pit and forage there; in the long term, perennial plants may re-establish themselves and the substrate may become suitable for burrowing. Therefore, the permanent loss and potential degradation of habitat would affect desert tortoises.

We expect that most disturbance will be localized due to the nature of training activities and that the conservation measures will limit the number of desert tortoises that may be affected (CM 7).

The designation, preparation, operation, and maintenance of the training support areas would disturb desert tortoise habitat. The proposed Project would permanently remove 12.9 acres from grading the landing airstrip at the assault landing zone, as described in the Description of the Proposed Action section. In addition, the proposed Project would temporarily disturb 755.6 acres of desert tortoise habitat. However, the majority of training activities would be localized and avoid locations of desert tortoises (CM 3). Therefore, the entire 755.6 acres would not be temporarily disturbed, but have the potential to be disturbed over the course of the training activities and military operations. Over time, desert tortoises would continue to use training support areas to forage, burrow, nest, and traverse. Therefore, the loss and degradation of habitat would not result in long-term impacts to resident desert tortoises.

Common Ravens, Coyotes, and other Predators

Designation, preparation, operation, and maintenance of the training support areas have the potential to attract common ravens, coyotes, and other predators, provide subsidies to predators in the form of food, water, and shelter, and allow for an increase in predator abundance. These species prey on desert tortoises; increases in their numbers would increase the threat of predation on desert tortoises.

Regular vehicle traffic on access roads to training support areas is likely to kill wildlife. If this mortality becomes a regular occurrence, common ravens may frequent the area to feed on carcasses. This would provide a food subsidy that would lead to an overall increase in abundance of common ravens. We cannot predict the degree to which vehicular use on access roads would result in these adverse effects.

MCASY will ensure the implementation of several conservation measures to minimize attracting predators, providing subsidies, and increasing predator abundance. Vehicles on access roads shall not exceed 25 miles per hour and 20 miles per hour in critical habitat and all road-killed wildlife will be buried to prevent attracting ravens and other predators (CM 9). MCASY will also decrease predator attractants by ensuring all waste is removed regularly and stored in securely closed containers (CM 12) and implement raven management, monitoring, and reporting programs to discourage increasing raven abundance (CM 13).

We cannot reasonably predict the amount of predation on desert tortoises that the proposed action is likely to add to the baseline levels within the action area. Generally, these measures are effective in eliminating some, but not all, use of the action area by predators, thereby reducing the potential for predators to increase as a result of the proposed action.

Non-native Plants and Wildfires

Designation, preparation, operation, and maintenance of the training support areas may introduce or spread non-native, invasive plant species into habitats on and adjacent to the action area. Associated Project activities may increase distribution and abundance of non-native species within the action area due to ground-disturbing activities that these species favor. In addition, Project equipment may transport non-native propagules into the Project area where they may become established and proliferate.

Non-native plants may have a variety of effects on desert tortoises. Specifically, non-native plants may adversely affect the physiological health of desert tortoises because they do not contain the same types and levels of nutrients of native plants (Oftedal 2002 in Service 2010). Non-native plants may out-compete native species and change the seasonal availability of forage necessary for desert tortoises to meet their nutritional requirements. Also, the introduction of non-native plants may lead to increased wildfire risk, which ultimately may result in future habitat losses (Brooks 2003).

MCASY will ensure that the spread of non-native weeds is controlled by washing all equipment and vehicles before entering the CMAGR (CM 16). In addition, the conservation measure states that any non-native plants detected during desert tortoise surveys will be reported and evaluated for management.

The proposed Project may increase the potential for wildfires in desert tortoise habitat. Specifically, heat from vehicles and equipment, artillery recoil, and ordnance expenditure use during training activities may cause wildfires in habitat with dry grasses. Wildfires would result in habitat loss and degradation by destroying native wildlife and plant species, removing foraging habitat for desert tortoises, and furthering the spread of non-native plants. In addition, wildfires could kill or injure desert tortoises exposed to the heat. Many of the dominant desert plant species are slow to recover from fire and large fires could fragment desert tortoise habitat. Recurrent fires may reduce the abundance and diversity of native forbs, which are the major food source of desert tortoises.

MCASY will ensure that aircrafts have engine exhaust deflectors, which would reduce the potential for the ground temperature to be high enough to support combustion of plant-based materials such as dry grasses (USMC and USFS 2013 as cited in MCASY 2021). In addition, MCASY will control the spread of non-native plants that would increase the potential for wildfires (CM 16).

We cannot predict the degree to which non-native plant species would proliferate within or spread beyond the boundaries of the action area for several reasons. For example, above-average

rainfall immediately after disturbance may encourage the spread of weeds whereas drought may have the opposite effect. We cannot predict whether Project equipment would introduce new non-native plants or whether such new species would be able to germinate, grow, and reproduce in the action area. Because the objective of CM 16 is to ensure the spread of invasive plant species is controlled, we predict that the proposed Project would not lead to an increase in the number or abundance of non-native plant species. Additionally, MCASY will have fire prevention measures in place, and we predict that the potential for wildfire is low.

Effect on Recovery

The 2011 revised recovery plan for desert tortoise (Service 2011) identifies the following three recovery criteria for use in determining when it may be appropriate for delisting:

1. Rates of population change for desert tortoises are increasing over at least 25 years (a single tortoise generation), as measured by extensive, range-wide monitoring across tortoise conservation areas within each recovery unit and by direct monitoring and estimation of vital rates (recruitment, survival) from demographic study areas within each recovery unit.

2. Distribution of desert tortoises throughout each tortoise conservation area is increasing over at least 25 years.

3. The quantity of desert tortoise habitat within each tortoise habitat conservation area is maintained with no net loss until tortoise population viability is ensured.

A total of 8 large desert tortoises were observed within the action area; as discussed above (Status of the Species in the Action Area), these individuals are not integral to maintaining a stable or increasing desert tortoise population. Access roads are expected to disturb a small fraction of intersected desert tortoise home ranges, and desert tortoises along linear components would not be displaced from their home ranges. Consequently, the proposed action will not affect the ability to achieve criterion 1.

Because of the relatively small Project footprint of localized disturbance, the proposed action is not likely to affect the expansion of regional desert tortoise distribution within the Chuckwalla Critical Habitat Unit. Consequently, the proposed action will not affect the ability to achieve criterion 2.

While the Project may result in a net loss of habitat due to impacts from training activities, the loss is negligible (effects that are too small to meaningfully measure, detect, or evaluate) relative to the size of the recovery unit/critical habitat unit. Therefore, the proposed action likely would not adversely affect the ability to achieve criterion 3. Given all of the above, we conclude that the proposed action is not likely to cause impairment of recovery efforts or adversely affect the desert tortoise’s prospects for recovery.

Effects on Critical Habitat

The proposed action would disturb approximately 642.1 acres of designated critical habitat in the Chuckwalla Critical Habitat Unit. Habitat within the action area is largely undisturbed with the exception of the unpaved roads that provide access to various parts of CMAGR. In the following paragraphs, we will analyze the effects of the proposed action on the physical and biological features of critical habitat for desert tortoise.

Sufficient Space to Support Viable Populations within Each of the Six Recovery Units and to Provide for Movement, Dispersal, and Gene Flow

Approximately 40 percent of the CMAGR overlaps the Chuckwalla Critical Habitat Unit. The acreage of designated critical habitat on CMAGR is 187,046 acres (Service 2008), which constitutes about 18 percent of the overall acreage of the Chuckwalla Critical Habitat Unit. Approximately 642.1 acres of the 1,410.6-acre proposed action area would occur in critical habitat. Because operations and training activities are localized within the training support areas (0.3 percent of critical habitat on the CMAGR), most of those lands would be minimally impacted. Training activities would occur for 120 day, with 60 days during WTI and the remaining 60 days would be throughout the calendar year. Additionally, resident desert tortoises would continue to have access to these training support areas. Therefore, the disturbance of 642.1 acres of desert tortoise critical habitat would not appreciably (scale of impact that may be physically monitored and measured) reduce the ability of the critical habitat unit to support viable populations or to provide for movement, dispersal, and gene flow.

Sufficient quality and quantity of forage species and the proper soil conditions to provide for the growth of these species; Suitable substrates for burrowing, nesting, and overwintering; Burrows, caliche caves, and other shelter sites; and Sufficient vegetation for shelter from temperature extremes and predators

The second through fifth physical and biological features of critical habitat represent the plant species desert tortoise require for food and shelter, the substrates necessary for these plants to grow and for desert tortoises to construct burrows, and the burrows and other shelter sites they use. These features are the components of the environment necessary to meet desert tortoise's need for food and shelter. Because the condition of substrates, annual forage species, and perennial shrubs are so interrelated, we have combined our analysis of the effects of the proposed action on these physical and biological features.

The action area supports all of the physical and biological features for desert tortoises and is relatively undisturbed. The designation, preparation, and operations and maintenance of these training support areas would temporarily degrade 597.3 acres of desert tortoise critical habitat and permanently remove 44.8 acres. Habitat degradation may result from ordnance delivery, operation range clearance, and maintenance activities and the associated disturbance of surface materials. Impacts to ground surfaces and debris from the proposed Project have the potential to locally remove or alter the plant composition. However, consistent with similar military-type operations in the CMAGR, effects would be localized, and their loss would not compromise the

ability of the local area to provide these needs to desert tortoise. That is, the surrounding habitat would continue to support suitable substrate for annual plants and burrows, and shrubs for cover.

The greater concern with these physical and biological features lies in the potential for the spread of non-native, invasive plants species, first within the action area, then over time, into surrounding habitat. As we discussed in the Status of Designated Critical Habitat of the Desert Tortoise and Effects of the Action, Non-native Plants and Wildfires sections above, non-native weedy species can form dense concentrations of plants that allow wildfires to spread. Desert scrub communities are not adaptive to fire; a fire would likely kill most shrubs in the area and lead to increased colonization by non-native, invasive weeds. In such an event, the native annual species that desert tortoises require for food and the shrubs upon which they depend for cover would decrease in abundance and impair the ability of critical habitat to serve the conservation functions of the second through fifth physical and biological features (i.e., sufficient quality and quantity of forage species and sufficient vegetation for shelter from temperature extremes and predators).

Additionally, weedy species can out-compete native species and thereby reduce the abundance and diversity of the native species upon which desert tortoises depend. Oftedal's work (2002 in Service 2010) demonstrates that invasive weeds may adversely affect the physiological health of desert tortoises because they do not contain the same types and levels of nutrients of native plants; desert tortoises that are undergoing nutritional stress may be more susceptible to diseases, drought, and predation. Therefore, a proliferation of non-native invasive plants would impair the conservation function of the second physical and biological feature (i.e., sufficient quality and quantity of forage species). However, we anticipate that CM 16 would effectively control the potential spread of non-native invasive species and not appreciably reduce the ability of these physical and biological features to support the conservation of the desert tortoise.

Habitat protected from disturbance and human-caused mortality

The programmatic biological opinion for military activities at the CMAGR concluded that activities associated with target areas and other training were not likely to result in significant destruction or adverse modification of designated critical habitat for desert tortoise (Service 1996). In aggregate, military use within the CMAGR since the issuance of the 1996 biological opinion has resulted in low to negligible levels of habitat disturbance. Nonetheless, direct impacts to designated critical habitat from the proposed action would include physical disturbance to ground surfaces, vegetation communities, and surface drainages. Effects from training activities could extend beyond the training support areas; however, the habitat disturbance associated with military training is focused within a small area and is infrequent, primarily coinciding with the bi-annual WTI. Although disturbance and human caused mortality of desert tortoises could occur and impacts to habitat will result, the scale and duration of these disturbances would be relatively minor. Additionally, the military land use designation, which restricts public access to the range, incidentally, benefits the desert tortoise and its habitats within the CMAGR boundary and aids in the protection of designated critical habitat from unauthorized disturbance and human-caused mortality. Therefore, we expect that all disturbance and human-

caused mortality would not appreciably reduce the function of this physical and biological feature.

Effects of the Action Summary

As stated previously in this biological opinion amendment, to "jeopardize the continued existence of" means to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species (50 CFR 402.02). This regulatory definition focuses on how the proposed action would affect the reproduction, numbers, or distribution of the species under consideration in the biological opinion. For that reason, we have used those aspects of the desert tortoise's status as the basis to assess the overall effect of the activities considered in this biological opinion amendment.

Additionally, we determined whether a proposed action is likely "to jeopardize the continued existence of the species" through an analysis of how a proposed action affects the listed taxon within the action area in relation to the range of the entire listed taxon. For the desert tortoise, this process involves considering the effects at the level of the action area, then at the level of the recovery unit (in this case, Colorado Desert recovery unit), and then finally for the entire range of the listed taxon. Logically, if a proposed action is unlikely to cause a measurable effect on the listed taxon within the action area, it is unlikely to affect the species throughout the recovery unit or the remainder of its range. Conversely, an action with measurable effects on the listed species in the action area may degrade the status of the species to the extent that it is affected at the level of the recovery unit or range-wide.

In the following sections, we will synthesize the analyses of the activities, considered together, discussed in the Effects of the Action section of this amendment to determine their effect on the reproduction, number, and distribution of the desert tortoise.

Reproduction

Activities considered in this amendment have the potential to introduce new species of invasive, non-native plants into habitat of the desert tortoise; they may also increase the distribution and abundance of non-native plants that are already present. In a study using captive individuals, Drake *et al.* (2016) found that invasive grasses negatively affect health and survival, and this can ultimately lead to negative effects on population recruitment for desert tortoises. MCASY will ensure the management of invasive and non-native plants during all activities (CM 16), which would decrease the likelihood that invasive and non-native plants will increase in abundance or distribution within CMAGR.

Given this conservation measure, we conclude that the activities considered in this amendment are likely to have a negligible effect on the reproductive capacity of desert tortoises in CMAGR, and therefore would not reduce appreciably the reproduction of the species.

Numbers

Activities that the MCASY proposes to authorize, or implement will include conservation measures to avoid and minimize the death of desert tortoises. Since the issuance of the 1996 programmatic biological opinion, we have not received reports of mortalities by MCASY. However, we expect that a few desert tortoises, probably mostly smaller individuals, may be injured or killed during activities but not detected. Because of the conservation measures MCASY is proposing and implementing, the nature of those activities, and the lack of historical records of injuries or mortalities associated with these activities within CMAGR, we expect desert tortoise mortality to be low. Furthermore, because desert tortoise clearance surveys are likely to find and avoid most large desert tortoises, we expect that few, if any larger desert tortoises would be wounded or killed. We also expect that most take would occur in smaller size classes of individuals or eggs, whose remains will be difficult to detect.

Because smaller desert tortoises are more difficult to find, they are more likely to be undetected during surveys; if they are not detected prior to the start of training activities, they will likely be injured or killed. Since our range-wide sampling does not include estimates for smaller desert tortoises and smaller individuals have naturally higher rates of mortality than larger animals, we expect that the loss of these smaller individuals from activities considered in this amendment would not likely appreciably reduce the numbers of desert tortoises within CMAGR.

Overall, based on the reasoning above, we conclude that the proposed Project in this amendment would not appreciably reduce the numbers of desert tortoises range-wide.

Distribution

The proposed Project is entirely within the boundaries of CMAGR. Because the training support areas will be in a near-natural state to simulate realistic combat scenarios and that desert tortoises may continue to use the training support areas to forage, burrow, nest, and traverse, we conclude that the training activities considered in this amendment are not likely to appreciably reduce the overall distribution of the desert tortoise.

CUMULATIVE EFFECTS

Cumulative effects are effects of future State or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation (50 CFR § 402.02). Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act. At this time, the Service is unaware of any reasonably certain to occur, future, non-Federal actions.

CONCLUSION

After reviewing the current status of the desert tortoise and its critical habitat, the environmental baseline for the action area, the effects of the proposed activities, and the cumulative effects, we have determined that the activities considered in this amendment are not likely to jeopardize the

continued existence of the desert tortoise or adversely modify its critical habitat. We have reached this conclusion for the following reasons:

1. The proposed action is not likely to appreciably reduce the number, distribution, and reproduction of desert tortoises within the action area and, by extension throughout the range of the desert tortoise, as discussed in the Effects of the Action Summary section above.

2. The activities considered within this amendment are not likely to cause impairment of recovery efforts or adversely affect the desert tortoise's prospects for recovery.

INCIDENTAL TAKE STATEMENT

INTRODUCTION

Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. The Service further defines "harm" to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not the purpose of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the proposed protective measures and the terms and conditions of an incidental take statement and occurs as a result of the action as proposed.

Overall, we expect death and injury of large desert tortoises to be avoided during the designation, preparation, operations, and maintenance of the training support areas through implementation and compliance with the conservation measures identified as part of the proposed action. However, because juvenile desert tortoises and eggs are difficult to detect, surveyors may overlook most of them during clearance surveys and monitoring, leaving these life stages susceptible to death and injury. Based on the numbers in the Environmental Baseline section, we estimated 1 to 6 juvenile desert tortoises may occur within the action area. We also estimated that reproductive females may produce up to 35 eggs per year. Because the estimate for the number of eggs is for total annual production, we cannot predict what portion of this total will be present onsite during designation, preparation, and operations and maintenance activities; as a result, we cannot estimate how many eggs would be destroyed by the proposed action. Additionally, desert tortoises in all life stages will be susceptible to injury and mortality within the proposed action area but would be avoided and minimize through implementation of conservation measures.

The 1996 programmatic biological opinion states that the Service anticipated that take would occur in the form of injury or mortality of 11 desert tortoises and capture/harassment of 112 animals annually, across the CMAGR (Service 1996). Estimated take of large desert tortoises

associated with the proposed action (8 desert tortoises over the course of operations) falls within the threshold previously established. No take has been reported in recent years under the programmatic biological opinion; thus, the incremental amount of estimated take associated with the proposed action is not likely to exceed take limits set forth in 1996.

The nature of the proposed action is similar in scope to the activities previously addressed in the programmatic biological opinion (Service 1996), and it includes all measures identified for the original action. The measures described in the 1996 programmatic biological opinion as well as the additions and revisions included herein are non-discretionary and must be undertaken by MCASY and/or its contractors for the exemption in section 7 (o)(2) to apply. If MCASY fails to assume and implement the terms and conditions, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, MCASY must report the progress of the action and its impact on the species to the Service as specified in the incidental take statement [50 CFR § 402.14(i)(3)].

If you have any questions, please contact Vincent James of my office at vincent_james@fws.gov or (760) 322-2070, extension 415.

Sincerely,

Rollie White
Assistant Field Supervisor

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APPENDIX A

SOLAR PROJECTS FOR WHICH THE U.S. FISH AND WILDLIFE SERVICE HAS ISSUED BIOLOGICAL OPINIONS OR INCIDENTAL TAKE PERMITS

(AUGUST 2021)

Table A1 summarizes information regarding the solar projects for which the U.S. Fish and Wildlife Service has issued a biological opinion, pursuant to section 7(a)(2), or an incidental take permit, pursuant to section 10(a)(1)(B) of the Endangered Species Act, with regard to the desert tortoise. We are aware of five solar projects for which we issued biological opinions that are no longer on the Federal agency's list of projects; we have removed these projects from this list.

Table A1. List of solar projects that have received biological opinions or incidental take permits.

Project	Recovery Unit	Acres of Desert Tortoise Habitat[1]	Desert Tortoises Estimated[2]	Desert Tortoises Observed[3]	Citations[4]
Ivanpah Solar Electric Generating System	Eastern Mojave	3,582	1,136	175	Service 2011a, Davis 2014
Stateline	Eastern Mojave	1,685	947	55	Service 2013a, Ironwood Consulting 2014
Silver State North	Eastern Mojave	685	14	7	Service 2010, Newfields 2011
Silver State South	Eastern Mojave	2,427	1,020	152	Service 2013a, Cota 2014
Nevada Solar One	Eastern Mojave	400	-[5]	-[5]	Burroughs 2012, 2014
Copper Mountain North	Eastern Mojave	1,400	-[5]	-[5]	Burroughs 2012
Copper Mountain	Eastern Mojave	380	-[5]	-[5]	Burroughs 2012, 2014
Townsite	Eastern Mojave	885	-[5]	-[5]	Service 2014b
Techren Boulder City	Eastern Mojave	2,200	-[5]	-[5]	Service 2012b
Valley Electric Association	Eastern Mojave	80	4	4	Service 2015a
Canyon Mesa	Eastern Mojave	123	2	-	Service 2019a
Yellow Pine	Eastern Mojave	4,285	1,032	-	Service 2020b
Mojave	Western Mojave	Primarily in abandoned agricultural fields	4	0	Service 2011b
Cinco	Western Mojave	500	53	2	Service 2015b, Daitch 2015
Soda Mountain	Western Mojave	1,726	78	-	Service 2015c

Project	Recovery Unit	Acres of Desert Tortoise Habitat[1]	Desert Tortoises Estimated[2]	Desert Tortoises Observed[3]	Citations[4]
High Desert	Western Mojave	547	24	4	Service 2019b, ECORP Consulting 2020
Res Americas Moapa Solar Energy Center (MSEC; totals adjusted based on overlapping ACSP acreage)	Northeastern Mojave	104	37	-	Service 2014a
Moapa K Road	Northeastern Mojave	2,141	208	177	Service 2012a, Cardno 2018
Playa	Northeastern Mojave	1,538	258	77	Service 2015d, Ironwood Consulting 2016
Invenergy Harry Allen	Northeastern Mojave	594	242	-	Service 2015d
NV Energy Dry Lake Solar Energy Center	Northeastern Mojave	751	45	-	Service 2015d
NV Energy Dry Lake Solar Energy Center at Harry Allen	Northeastern Mojave	55	15	-	Service 2015d
Aiya	Northeastern Mojave	672	91	-	Service 2015e
Mountainview	Northeastern Mojave	146	-[5]	-[5]	Wise 2018
Gemini	Northeastern Mojave	7,113	5,215	-	Service 2019c
Eagle Shadow Mountain	Northeastern Mojave	2,285	2,941	-	Service 2019d
Arrow Canyon Solar Project (ACSP; MSEC expansion)	Northeastern Mojave	2,124	1,863	-	Service 2020c
Southern Bighorn Solar I	Northeastern Mojave	2,642	3,128	-	Service 2021a
Southern Bighorn Solar II	Northeastern Mojave	1,025	1,336	-	Service 2021b
Genesis	Colorado	1,774	8	0	Service 2010b, Fraser 2014a
Blythe	Colorado	6,958	30	0	Service 2010c, Fraser 2014b
Desert Sunlight	Colorado	4,004	56	7	Service 2011c, Fraser 2014a
McCoy	Colorado	4,533	15	0	Service 2013c, Fraser 2014b
Desert Harvest	Colorado	1,300	5	-	Service 2013b

Project	Recovery Unit	Acres of Desert Tortoise Habitat[1]	Desert Tortoises Estimated[2]	Desert Tortoises Observed[3]	Citations[4]
Rice	Colorado	1,368	18	1	Service 2011d, Fraser 2014a
Palen Solar Power Project	Colorado	3,140	42	0	Service 2018
Desert Quartzite	Colorado	2,831	4	-	Service 2019e
IP Athos	Colorado	3,440	5	3	Service 2019f, Rincon Consultants 2021a, Rincon Consultants 2021b
Crimson	Colorado	2,201	20	-	Service 2020a
Total		73,644	19,896	664	

[1] The acreages may include substations and other ancillary facilities.

[2] The numbers in this column are not necessarily comparable because the methodologies for estimating the numbers of desert tortoises occasionally vary between projects. The largest numbers included the estimated number of small desert tortoises, which likely far exceeded the numbers of individuals present. In some cases, desert tortoises will remain inside the security fence for the solar project; we anticipated that some mortalities would occur during operation of the facility and included these numbers in the estimated total.

[3] This column reflects the numbers of desert tortoises reportedly taken within project areas. It includes translocated animals and those that were killed by project activities. Project activities may result in the deaths of more desert tortoises than are found. Dashes represent projects for which we have no information at this point; some projects had not broken ground at the time of this biological opinion.

[4] The first citation in this column is for both the acreage and the estimate of the number of desert tortoises. The second is for the number of desert tortoises observed during construction of the project; where only one citation is present, construction has not begun or data are unavailable at this time.

[5] These projects occurred under the Clark County Multi-species Habitat Conservation Plan; the provisions of the habitat conservation plan do not require the removal of desert tortoises. In some case, the Service issued biological opinions for access roads and generator tie-in line for these projects. We did not include the acreages and number of desert tortoises for those aspects of the overall action; we did not want to provide the impression that those effects were directly associated with the solar facility.

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APPENDIX B
Air Quality Calculations and Record of Non-Applicability

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UNITED STATES MARINE CORPS
RECORD OF NON-APPLICABILITY FOR CLEAN AIR ACT CONFORMITY AND AIR QUALITY EMISSIONS ESTIMATES

Introduction

This Proposed Action falls under the Record of Non-Applicability (RONA) category and is documented with this RONA.

Federal regulations state that no department, agency, or instrumentality of the Federal Government shall engage in, support in any way or provide financial assistance for, license to permit, or approve any activity that does not conform to an applicable State Implementation Plan (SIP). It is the responsibility of the Federal agency to determine whether a Federal action conforms to the applicable SIP before the action is taken (40 Code of Federal Regulations [CFR] Part 1 51.850[a]).

Federal actions are exempt from conformity determinations if their emissions do not exceed designated *de minimis* levels for criteria pollutants (40 CFR Part 93.153c). The general conformity rule also exempts certain federal actions from the requirements of the rule, as these actions are assumed to conform to a SIP. Conformity *de minimis* levels (in tons/year) for Imperial and Yuma counties, the regions potentially affected by the Proposed Action, are listed in Table 1.

Table 1 Conformity De Minimis Levels for Criteria Pollutants for Imperial and Yuma Counties

Criteria Pollutant	*De Minimis Level (tons/year)*	*Imperial County*	*Yuma County*
Volatile Organic Compounds (VOC)	100	Nonattainment (marginal)	Nonattainment (marginal)
Oxides of Nitrogen (NO_x)	100	Nonattainment (marginal)	Nonattainment (marginal)
Particulate Matter 2.5 ($PM_{2.5}$)	100	Nonattainment (moderate)	N/A
Particulate Matter 10 (PM_{10})	100	Maintenance (serious)	Nonattainment (moderate)

Proposed Action

Activity: Establish and use landing zones (LZs), assault landing zones (ALZs), drop zones (DZs), and an artillery firing area (AFA) at the two tactical ranges within the Bob Stump Training Range Complex: the Chocolate Mountain Aerial Gunnery Range (CMAGR) and the Barry M. Goldwater Range (BMGR)-West.

Location: Imperial County, California (CMAGR) and Yuma County, Arizona (BMGR-West).

Proposed Action Name: Environmental Assessment for Establishment and Use of Training Support Areas in the Bob Stump Training Range Complex.

Proposed Action Summary: The U.S. Marine Corps proposes to establish and use LZs, ALZs, DZs, and an AFA at the two tactical ranges within the Bob Stump Training Range Complex (BSTRC): the CMAGR, California and the BMGR-West, Arizona. The USMC does not propose to increase the quantity of sorties flown, increase the amount and/or types of ordnance expended, increase artillery training tempo, or alter the existing facilities or airspace within the BSTRC under the Proposed Action. The primary activities that

would generate air emissions would be establishing and maintaining the access road and combat trail to AFA Burt 2.0 and the expeditionary landing strip at Unimproved ALZ Bull. These activities would occur in the Imperial County portion of the CMAGR. In addition, as needed maintenance trips would occur for the LZs established at the BMGR-West, located in Yuma County.

Air Emissions Summary: Based on the air quality analysis, the emissions for establishment and use of LZs, ALZs, DZs, and an AFA at the two tactical ranges within the BSTRC, would be well below conformity *de minimis* levels. Attachment (1) of this RONA presents the air emission calculations for the proposed action.

Date RONA Prepared: 07 May 2021

RONA Prepared By: MCAS Yuma with direct support from Cardno

Proposed Action Exemptions

The Proposed Action is exempt because the calculated total emissions would be below *de minimis* levels set forth in the Clean Air Act General Conformity Regulation.

Attainment Status and Emissions Evaluation and Conclusion

The General Conformity Rule requires conformity evaluations for proposed emissions that would occur within areas that are in nonattainment or maintenance of a national ambient air quality standards. The Proposed Action, which includes grading activities within Imperial County and as needed maintenance activities occurring in both Imperial and Yuma counties. Therefore, the focus of this conformity applicability analysis is to compare project emissions to *de minimis* levels applicable to Imperial County and Yuma County.

Imperial County presently is classified as in nonattainment (marginal) for the 8-hour federal ozone (O_3) standard. Ozone is a secondary pollutant formed when O_3 precursors, nitrogen oxides (NO_x) and volatile organic compounds (VOCs) combine in the atmosphere in the presence of sunlight. Therefore, the United States Environmental Protection Agency general conformity regulations set *de minimis* levels for O_3 precursors instead of O_3. Imperial County also is in maintenance (serious) of PM_{10} and is in nonattainment (moderate) of $PM_{2.5}$. Yuma County presently is classified as in nonattainment (marginal) for the 8-hour federal ozone (O_3) standard and is in nonattainment (moderate) of PM_{10}. Based upon these designations, the applicable annual conformity *de minimis* thresholds for these areas are 100 tons of VOCs, NO_x, PM_{10}, and $PM_{2.5}$.

Table 2 summarizes the conformity-related emissions that would occur from grading and maintenance activities of the Proposed Action at the CMAGR. The main sources of conformity-related emissions associated with the project grading would include combustive emissions due to the use of fossil fuel-powered equipment and particulate matter emission from grading activities. Operational emissions generated at BMGR-West from nonscheduled, as needed vegetation maintenance for LZs, would be less than those identified for the operational emissions for the CMAGR in Table 2. The data show that conformity-related emissions for the Proposed Action would be well below the applicable *de minimis* levels. Therefore, emissions from the proposed action would show conformity under the Clean Air Act, as amended.

Table 2 Annual Conformity-Related Emissions from the Proposed Action at the CMAGR

Activity	*Air Pollutant Emissions (tons/year)*			
	VOCs	**NO_x**	**PM_{10}**	**$PM_{2.5}$**
Grading Emissions – 2022	0.15	1.56	0.34	0.20
Operational Emissions – 2023	0.0014	0.0118	0.0004	0.0004
Conformity *de minimis* Levels (tons/year)	100	100	100	100
Exceeds Conformity *de minimis* Levels?	**No**	**No**	**No**	**No**

RONA Approval

I concur in the finding that air emissions associated with the proposed action would be below *de minimis* levels and therefore do not require further conformity evaluation.

27 Apr 22

Signature Date

CHARLES E. DUDIK
Colonel, U.S. Marine Corps
Commanding Officer
Marine Corps Installations West-Marine Corps Air Station Yuma

Cactus West EA

Salton Sea Air Basin, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Non-Asphalt Surfaces	0.00		57.70	0.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	3.4	**Precipitation Freq (Days)**	20
Climate Zone	15			**Operational Year**	2023
Utility Company	Imperial Irrigation District				
CO2 Intensity (lb/MWhr)	1270.9	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - No timeframe for the Proposed Action was identified in the DOPAA, so it was assumed the construction phase would begin in 2022.

Land Use - The areas that need grading and earthwork were combined into one total area. Unimproved ALZ Bull = 12.9ac, AFA access road = 33.4ac, and the new combat road = 11.4ac.

Construction Phase - Per the Cactus West EA DOPAA, it woul dtake 80 days for the Unimproved ALZ Bull to be established. Since the DOPAA did not specify the time in which the access road and new combat trail woul d be completed, it was assumed that each would also be established within this timeframe.

Grading - Grading for construction is 57.7 acres, which is the total acraege identified in the DOPAA for the ALZ Bull, AFA access road and combat trail.

Operational Off-Road Equipment - The ALZ Bull landing strip, AFA access road and combat trail would require biannual grading maintenance, per the DOPAA. Additionally, vegetation maintenance (done with hand tools) and any application of soil stabilizer would be done when deemded necessary for training exercises and not scheduled regularly. So the Off-Highway truck was added to the model to go out for these such area maintenance activities a total of 4 days a year.

Off-road Equipment - Since there was no information provided as to the specifics of the equipment needed for the establishement of the ALZ Bull, AFA access road and the combat trail, it was assumed that the default CalEEmod grading construction equipment would be used.

Energy Use -

Cactus West EA - Salton Sea Air Basin, Annual

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	110.00	80.00
tblConstructionPhase	PhaseEndDate	6/3/2022	4/22/2022
tblGrading	AcresOfGrading	200.00	57.70
tblOperationalOffRoadEquipment	OperDaysPerYear	260.00	2.00
tblOperationalOffRoadEquipment	OperDaysPerYear	260.00	4.00
tblOperationalOffRoadEquipment	OperOffRoadEquipmentNumber	0.00	1.00
tblOperationalOffRoadEquipment	OperOffRoadEquipmentNumber	0.00	1.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2022	0.1485	1.5562	1.1871	2.5400e-003	6.3958	0.0654	6.4612	0.7475	0.0602	0.8077	0.0000	223.3973	223.3973	0.0708	0.0000	225.1661
Maximum	**0.1485**	**1.5562**	**1.1871**	**2.5400e-003**	**6.3958**	**0.0654**	**6.4612**	**0.7475**	**0.0602**	**0.8077**	**0.0000**	**223.3973**	**223.3973**	**0.0708**	**0.0000**	**225.1661**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2022	0.1485	1.5562	1.1871	2.5400e-003	0.2752	0.0654	0.3407	0.1368	0.0602	0.1970	0.0000	223.3970	223.3970	0.0708	0.0000	225.1658
Maximum	**0.1485**	**1.5562**	**1.1871**	**2.5400e-003**	**0.2752**	**0.0654**	**0.3407**	**0.1368**	**0.0602**	**0.1970**	**0.0000**	**223.3970**	**223.3970**	**0.0708**	**0.0000**	**225.1658**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**95.70**	**0.00**	**94.73**	**81.70**	**0.00**	**75.62**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	1-1-2022	3-31-2022	1.3699	1.3699
2	4-1-2022	6-30-2022	0.3350	0.3350
		Highest	1.3699	1.3699

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Offroad	1.3900e-003	0.0118	8.2700e-003	3.0000e-005		4.1000e-004	4.1000e-004		3.8000e-004	3.8000e-004	0.0000	2.9036	2.9036	9.4000e-004	0.0000	2.9270
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**1.3900e-003**	**0.0118**	**8.2700e-003**	**3.0000e-005**		**4.1000e-004**	**4.1000e-004**		**3.8000e-004**	**3.8000e-004**	**0.0000**	**2.9036**	**2.9036**	**9.4000e-004**	**0.0000**	**2.9270**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Offroad	1.3900e-003	0.0118	8.2700e-003	3.0000e-005		4.1000e-004	4.1000e-004		3.8000e-004	3.8000e-004	0.0000	2.9036	2.9036	9.4000e-004	0.0000	2.9270
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**1.3900e-003**	**0.0118**	**8.2700e-003**	**3.0000e-005**		**4.1000e-004**	**4.1000e-004**		**3.8000e-004**	**3.8000e-004**	**0.0000**	**2.9036**	**2.9036**	**9.4000e-004**	**0.0000**	**2.9270**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Grading	Grading	1/1/2022	4/22/2022	5	80	Grading and major earthwork to establish the ALZ Bull, AFA access road, and combat trail.

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 57.7

Acres of Paving: 57.7

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Grading	Excavators	2	8.00	158	0.38
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Graders	1	8.00	187	0.41
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Grading	Scrapers	2	8.00	367	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Grading	8	20.00	0.00	0.00	11.00	5.40	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Grading - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.2715	0.0000	0.2715	0.1357	0.0000	0.1357	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1450	1.5537	1.1617	2.4800e-003		0.0654	0.0654		0.0602	0.0602	0.0000	218.1384	218.1384	0.0706	0.0000	219.9022
Total	**0.1450**	**1.5537**	**1.1617**	**2.4800e-003**	**0.2715**	**0.0654**	**0.3369**	**0.1357**	**0.0602**	**0.1959**	**0.0000**	**218.1384**	**218.1384**	**0.0706**	**0.0000**	**219.9022**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.5300e-003	2.4900e-003	0.0255	6.0000e-005	6.1243	4.0000e-005	6.1244	0.6118	4.0000e-005	0.6118	0.0000	5.2589	5.2589	2.0000e-004	0.0000	5.2639
Total	**3.5300e-003**	**2.4900e-003**	**0.0255**	**6.0000e-005**	**6.1243**	**4.0000e-005**	**6.1244**	**0.6118**	**4.0000e-005**	**0.6118**	**0.0000**	**5.2589**	**5.2589**	**2.0000e-004**	**0.0000**	**5.2639**

3.2 Grading - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.2715	0.0000	0.2715	0.1357	0.0000	0.1357	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1450	1.5537	1.1617	2.4800e-003		0.0654	0.0654		0.0602	0.0602	0.0000	218.1381	218.1381	0.0706	0.0000	219.9019
Total	**0.1450**	**1.5537**	**1.1617**	**2.4800e-003**	**0.2715**	**0.0654**	**0.3369**	**0.1357**	**0.0602**	**0.1959**	**0.0000**	**218.1381**	**218.1381**	**0.0706**	**0.0000**	**219.9019**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.5300e-003	2.4900e-003	0.0255	6.0000e-005	3.7400e-003	4.0000e-005	3.7800e-003	1.0500e-003	4.0000e-005	1.0900e-003	0.0000	5.2589	5.2589	2.0000e-004	0.0000	5.2639
Total	**3.5300e-003**	**2.4900e-003**	**0.0255**	**6.0000e-005**	**3.7400e-003**	**4.0000e-005**	**3.7800e-003**	**1.0500e-003**	**4.0000e-005**	**1.0900e-003**	**0.0000**	**5.2589**	**5.2589**	**2.0000e-004**	**0.0000**	**5.2639**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Total					

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Other Non-Asphalt Surfaces	0.492822	0.035624	0.185121	0.119005	0.014436	0.005121	0.022629	0.112565	0.003037	0.001863	0.006214	0.000779	0.000783

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type
Graders	1	8.00	2	187	0.41	Diesel
Off-Highway Trucks	1	8.00	4	402	0.38	Diesel

UnMitigated/Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Equipment Type	tons/yr										MT/yr					
Graders	3.8000e-004	4.6500e-003	1.6900e-003	1.0000e-005		1.5000e-004	1.5000e-004		1.4000e-004	1.4000e-004	0.0000	0.5814	0.5814	1.9000e-004	0.0000	0.5861
Off-Highway Trucks	1.0100e-003	7.1400e-003	6.5800e-003	3.0000e-005		2.6000e-004	2.6000e-004		2.4000e-004	2.4000e-004	0.0000	2.3222	2.3222	7.5000e-004	0.0000	2.3410
Total	**1.3900e-003**	**0.0118**	**8.2700e-003**	**4.0000e-005**		**4.1000e-004**	**4.1000e-004**		**3.8000e-004**	**3.8000e-004**	**0.0000**	**2.9036**	**2.9036**	**9.4000e-004**	**0.0000**	**2.9270**

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation