



2016

REPORT TO CONGRESS ON

SUSTAINABLE RANGES

Submitted by the Secretary of Defense
Under Secretary of Defense
(Personnel and Readiness)



The estimated cost of this report or study for the Department of Defense is approximately \$220,000 in Fiscal Years 2015 – 2016. This includes \$152,000 in expenses and \$68,000 in DoD labor.

Generated on 2016Feb29 RefID: 7-503BFDF

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EXECUTIVE SUMMARY

This is the thirteenth Sustainable Ranges Report (SRR) to Congress, summarizing relevant Department of Defense (DoD) actions intended to ensure the long-term sustainability of its training ranges. The SRR responds to Section 366 of the Bob Stump National Defense Authorization Act (NDAA) for fiscal year (FY) 2003. The FY2003 NDAA requires DoD to develop and submit to Congress a comprehensive plan to address training constraints caused by limitations on the use of available military lands, marine areas, and airspace in the United States and overseas. Section 311 of the FY2013 NDAA extended the reporting requirement through FY2018.

Although this report focuses on DoD training ranges only, it also touches on test and evaluation (T&E) ranges to the extent that these ranges support training activities. The DoD test community separately reports on encroachment factors affecting research, development, test, and evaluation activities in their *Strategic Plan for DoD T&E Resources*. The training and testing communities, with the support of the installations and environment community, continue to work together to address encroachment issues under the Sustainable Ranges Initiative (SRI).

Although DoD has been proactively addressing the many challenges related to range capabilities and encroachment, those challenges continue to grow, new ones emerge, and dynamic conditions and events exacerbate the original challenges. These challenges are common themes that resonate throughout this year's report and are summarized in the following paragraphs.

SUMMARY OF IDENTIFIED TRAINING RANGE CAPABILITY ISSUES

The implementation of the Budget Control Act of 2011 continues to affect DoD and the Military Services through changes in force structure and significant reductions in funding for operations and maintenance (O&M), military construction (MILCON), research and development (R&D) investments, as well as acquisition programs. These limitations affect training range capabilities. The Department continues to anticipate that funding reductions will affect both training range capability and the Department's ability to respond to encroachment challenges moving into the future. The Military Services also identified significant challenges they face with both insufficient resources (e.g., special use airspace [SUA], insufficient training range land) and insufficient equipment and systems that require updates in order to complete current training requirements. Lastly, DoD is facing the challenge of unmanned aircraft systems (UAS) training with their unique airspace requirements.

SUMMARY OF IDENTIFIED TRAINING RANGE ENCROACHMENT ISSUES

The Military Services continue to face encroachment challenges. These challenges include resident endangered species and species-at-risk management; incompatible development and land use adjacent to DoD training activities, to include both foreign investment located in proximity to military training areas as well as renewable energy development; effects related to the reallocation of electromagnetic spectrum as a result of the National Broadband Plan; and effects related to climate change.

The 2016 SRR provides Congress with updates to the 2015 SRR, to include the following:

- ▶ Revalidates the 2015 SRR individual range capability and encroachment assessments
- ▶ Revalidates current and future Military Service training range requirements
- ▶ Identifies critical range and training issues raised by the Military Services
- ▶ Updates Congress on DoD's comprehensive training range sustainment plan
- ▶ Provides updates to the complete range inventory reported in the 2015 SRR

This year's report returns to the shortened format that validates the individual range capability and encroachment assessments but does not include them. The decision to follow a three-year cycle for conducting full range assessments was based on the analysis that range capability and encroachment do not change significantly from year to year. The next full range assessment will take place in FY2017 and will be reported as part of the 2018 SRR.



1 | MILITARY SERVICE UPDATES

1.1 ARMY

The Army's 2015 range capability and encroachment assessments are valid as current with the exception of issues highlighted in this section.

GENERAL ISSUES RELATED TO RANGE CAPABILITY AND ENCROACHMENT

While capabilities are currently at an acceptable level to support readiness, there are still numerous challenges the Army is working to address related both to capability and encroachment. Specific challenges include reductions and reorganization of the Army's Active Component (AC) force as well as endangered and candidate species management and its potential to affect the Army training mission. The following sections discuss these challenges in greater detail.

CRITICAL ISSUES: RANGE CAPABILITY

As outlined in the 2014 Quadrennial Defense Review (QDR), the Army has continued its plan to reduce the AC end-strength from a war-time peak of 570,000 in 2012 to 450,000 by the end of FY2017. In July 2015, the Department of the Army announced force structure decisions and stationing plans for the reduction of the Regular Army from 490,000 to 450,000 Soldiers. This reduction of 40,000 Soldiers will occur in FY2016 and FY2017. These reductions were strategically considered to preserve the warfighting capability but will also impact nearly every Army installation. As with past reductions of this magnitude, there will be significant effects on Army range complexes, and range modernization plans will align with the new stationing decisions.

CRITICAL ISSUES: ENCROACHMENT

The lands, airspace, and waters of Army ranges are the critical elements required to support Army missions for training and testing. DoD has recognized 12 encroachment factors, detailed in the 2015 SRR, that affect military training mission readiness. Two of the 12 encroachment factors, 'threatened and endangered species' and 'adjacent land use', continue to be the primary factors affecting encroachment on Army installations.

Compliance with the Endangered Species Act (ESA) is the responsibility of the majority of Army training and testing installations due to the presence of one or more federal and/or state-listed species populations on Army lands. The Army continues to be a good steward of the land and often takes a proactive approach to management of candidate species by self-imposing conservation actions in support of critical species. Yakima Training Center is a prime example of the implementation of conservation actions to address habitat needs for the ESA-candidate greater sage grouse. On October 2, 2015 the U.S. Fish and Wildlife Service announced it would not list the greater sage grouse as a threatened or endangered species due in large part to conservation efforts made by federal, state, and private landowners ameliorating primary threats to the species. This example of successful conservation efforts will hopefully provide a foundation and framework for future efforts of pro-active initiatives aimed at species conservation with goals of precluding ESA listings.

A second example of the Army's proactive approach to conservation is exemplified in the Southeast U.S. with the ongoing negotiation among the DoD, U.S. Fish and Wildlife Service (USFWS), and several states for a range-wide conservation credit strategy to protect the Gopher Tortoise, an ESA-candidate species. This strategy implements a 'credit' system for establishing off-base

Gopher Tortoise Conservation Areas (GTCA) while maintaining on-base readiness activities. The goal of meeting mission training requirements is a continuous balancing effort between mission execution and compliance with environmental regulatory requirements.

Incompatible land use surrounding Army installations has continued to put encroachment pressures on military training. Issues stemming from, but not limited to, noise, dust, wildfires, and nighttime training operations continue to affect communities outside the fence line. These issues in turn affect the training value of soldiers and units by restricting their time, duration, and location of training events on the installation training lands. It remains imperative that Army installations collaborate with local conservation organizations and state and local governments to develop effective land use planning goals. The Readiness and Environmental Protection Integration (REPI) Program has made tremendous strides in protecting lands adjacent to military installations. The Army carries out its REPI authority through the Army Compatible Use Buffer (ACUB) Program. This program encourages Army installations to work with partners to facilitate compatible land use development on buffer lands around their boundaries. The Army does not acquire new lands, but rather supports its conservation partners in purchasing buffer lands or conservation easements on land parcels adjacent to installation boundaries. By curtailing incompatible development off the installation, the Army is protecting its training value on the installation.

An additional avenue to promote compatible development in communities neighboring Army installations is through the Compatible Use Program administered through the Office of Economic Adjustment (OEA). OEA provides both technical and financial support to communities to conduct Joint Land Use Studies (JLUS); a planning effort aimed at promoting cooperative land use strategies between local governments and military installations. In FY2015, the Army nominated seven installations (Fort Sill, OK; Watervliet Arsenal, NY; Fort Bragg, NC; Fort Drum, NY; Camp McCain, MS; Camp Grayling, MI; and Pinal County, AZ) for consideration of a JLUS. One such nomination currently in review is in the community of Watertown, NY (Fort Drum). This proposal is a two-year effort aimed at identifying areas suitable for energy development within a 30-mile radius of Fort Drum; with intent to mitigate any adverse effects on air and military readiness training. The JLUS process encourages comprehensive planning and community cooperation with the goal of ensuring the installation training mission is sustained.

SUMMARY OF MAJOR CHANGES IN ENCROACHMENT LIMITATIONS

In 2015, an Environmental Impact Statement (EIS) was completed for Pinon Canyon Maneuver Site (PCMS), Colorado. This location is the maneuver site for Fort Carson, Colorado, and is located approximately 150 miles southeast of Fort Carson. With the completion of the EIS and the signing of the Record of Decision (ROD), Fort Carson's mechanized, infantry, support, and combat aviation units are now able to conduct realistic, coordinated, and large-scale training that integrates both ground and air resources. The ROD explains potential environmental and socioeconomic impacts of the training missions and balances that with the protection of the environment by adopting mitigation that will reduce or eliminate adverse impacts. PCMS is now able to support brigade-level training intensity measures, the Stryker family of vehicles, and will include additional infrastructure in support of mission readiness.

SUMMARY OF EMERGING ENCROACHMENT ISSUES

Climate Change

Climate change and extreme weather events continue to be emerging issues for installations in all geographic regions. Atypical weather patterns and increased frequency of catastrophic weather events impact training and testing range infrastructure. Programming for repair and/or mitigation of weather events is difficult due to their unpredictable time, duration, severity, and location. Examples of extreme weather events include excessive thawing of permafrost in Alaska, drought and wildfires in the West, and unprecedented rains and flooding in the Southeast. These events result in direct operational impacts to military training such as halting training activities, restrictions on types of ammunition used and excessive damage to maneuver training lands.

In October 2015, Fort Jackson, South Carolina, experienced an extreme weather event with over 15 inches of rain falling in a 24-hour time period. Impacts of this event caused extreme damage to 8 of the 31 ranges at the installation. Damages include flooded targets, severe erosion and gully formations within the range and training complex, and washed out range berms, roads and bridges. The storm disrupted the power supply, potable water systems, and sewer systems at the installation. Estimated repair cost to the range and training complex alone exceeded \$4.8 million. In addition to the physical damage within the training complex, the storm impacted

unit training for an immediate duration of several days with sustained training delays on those ranges that are still in need of repair.

Many installations across the country have historically experienced some form of extreme weather event and subsequently had to react to damages within the range complex and delays of unit training events. These weather events are recoverable and impacts to training are finite in duration. Long-term implications of climate change on installation range complexes are unknown at this time, and should be differentiated from atypical weather events. Whereas ‘weather’ is characterized by the near-term changes in temperature, humidity, wind, and/or precipitation; ‘climate’ is measured over years, decades, and centuries. A proactive approach of considering past weather events and regional climates will aid in designing, updating, and managing ranges and training land infrastructure in order to ensure they can meet mission requirements now and into the future.

ARMY SERVICE SPECIAL INTEREST SECTION

Army and the Readiness and Environmental Protection Integration (REPI) Program

In April 2015, the Departments of Agriculture, Defense, and Interior announced the designation of Fort Huachuca, Arizona as a Sentinel Landscape. This designation recognized the collaboration of local, state, and federal partners in reducing land and water development while preserving native grassland and ranches surrounding Fort Huachuca. In addition, buffer lands protect over 160,000 annual air operations and create an electromagnetic quiet area for the Buffalo Soldier Electronic Test Range.

In August 2015, two Army installations were recognized as winners of the REPI Challenge. The REPI Challenge seeks to incentivize practices that preserve large parcels of land for compatible land use while conserving natural landscapes, all in support of the military readiness mission. Fort Benning and Fort Stewart, in Georgia, were recognized for their work in protecting over 7,000 acres of gopher tortoise habitat. The Army and REPI partners are working together to preclude an ESA listing that could affect military installations across the Southeast by collaborating to protect species habitat. A total of \$4 million (\$2 million REPI Challenge award funding plus \$2 million from the Army) will be leveraged with more than \$12 million in partner contributions for the Fort Benning-Fort Stewart project. REPI partners include the Georgia Department of Natural Resources, the Knobloch Family Foundation, USFWS, and the U.S. Forest Service (USFS).

The combined efforts of Fort Benning-Fort Stewart, as well as the partnering organizations, will promote military mission flexibility on its training lands while protecting some of the best tortoise habitat in Georgia.

1.2 MARINE CORPS

The Marine Corps’ 2015 range capability and encroachment assessments are valid and current with the exception of issues highlighted in this section.

GENERAL ISSUES RELATED TO RANGE CAPABILITY AND ENCROACHMENT

The Mission Capable Ranges Program (MCRP) is designed to meet the guidance of the *Marine Corps Service Campaign Plan (MCSCP)*. It supports the concepts published in the Commandant of the Marine Corps’ Planning Guidance (CPG) 2015 and in *Expeditionary Force 21*. The program provides the Marine Corps with a comprehensive, fully developed range program that defines current, emerging, and future range requirements.

The MCRP executes range modernization and sustainment initiatives focused on the diverse training needs of Marine Air Ground Task Forces (MAGTF). The cornerstones of the Program are:

- ▶ Range modernization through investments that provide new range capabilities to address emerging operational training requirements
- ▶ Recapitalization through expenditures that upgrade or replace existing range capabilities that are destroyed or damaged beyond repair
- ▶ Sustainment with expenditures that provide the O&M of existing range capabilities/systems and provide capacity with range safety and range operations services
- ▶ Prevention of encroachment through identification and active intervention of encroachment issues affecting the ranges

A substantial, ongoing commitment of resources is required to address each of these categories. Despite the currently constrained fiscal climate, the Marine Corps has prioritized funding to ensure the sustainment of current range capability and to selectively permit some level of modernization to meet emerging operational requirements. The CPG 2015, Expeditionary Force 21, and MCSCP advance the post-Operation Enduring Freedom

requirements to train scalable MAGTFs and their component units in an expanding number of essential missions. The broad spectrum of training requirements and greater capability of weapons systems increase the demand for ranges to support multiple training missions. This results in more intensive use of Marine Corps installations for individual and unit-level training, as well as concentrated maneuver, live-fire engagements, and amphibious operations and training areas that support the sea-basing concept and provide MAGTF-level training.

Concurrently, the requirements of a 21st century battlespace will increase the demand for extensive training areas and airspace that exceed the limitations of a single installation. The lack of adequate training lands and SUA will require range managers and Operating Force trainers to address training capability shortfalls with a mix of off-base solutions and regional training range capabilities. Moreover, as Marine Corps forces are re-deployed from contingency operations to home stations, the training load on bases has increased. More intensive and extensive training demands on Marine Corps installations, other DoD installations, and non-DoD lands and airspace used for training are already realized, notwithstanding reductions in the size of the force. Any decrease in range demands due to force reductions will be more than offset by expansion in the spectrum of training requirements and the increase in overall training areas necessary to execute them.

In summary, Marine Corps installations will be required to support training of Marines and Marine Corps units in an expanding array of mission-essential tasks that require ever-increasing amounts of training space and increasingly sophisticated range resources. To that end, the Marine Corps views ranges and training area resources as an interdependent system of Marine Corps, DoD, and non-DoD resources, with the Marine Corps providing core ranges for live-fire and maneuver training, amphibious access, and mobility corridors for the projection of sea-based forces inland.

CRITICAL ISSUES: RANGE CAPABILITIES

The Marine Corps has previously identified Service-level deficits in its ability to train for the many missions linked to maintaining a well-trained force in readiness. Continued analysis and the fielding of new systems may cause other requirements to surface in the future, but today, the projected operational range requirements at the Service-level focus on the following critical deficiencies:

- ▶ Marine Corps ranges have lacked the capability to fully exercise a large MAGTF in a realistic, doctrinally appropriate training scenario. Specifically, the Marine Corps Air Ground Combat Center (MCAGCC) at Twentynine Palms, as the center of excellence for developing and executing combined arms live-fire training of the MAGTF, has not been able to accommodate a full-scale, live-fire Marine Expeditionary Brigade (MEB) exercise. The expansion of MCAGCC, made possible with significant congressional support, will correct this training and readiness deficiency and significantly enhance the Marine Corps' ability to continue providing fully-capable MAGTFs in pursuit of national security objectives. The 2014 NDAA, signed by the President in December 2013, authorized the withdrawal of approximately 103,000 acres for exclusive military use and an additional 50,000 acres for joint military and recreational use in the Johnson Valley, contiguous to the current installation boundary. Land acquisition efforts are underway, and a formal airspace proposal supporting the land expansion has been submitted to the Federal Aviation Administration (FAA). Use of the land for training will "phase in" over the next several years as policies and procedures are put in place to manage the land. The first large scale exercise involving newly acquired lands is planned for August 2016.
- ▶ Inadequate live-fire and maneuver training opportunities exist for the Marine units stationed in the Western Pacific and Hawaii. Marine Corps ranges in Hawaii and Okinawa lack sufficient capabilities to fully support training for their assigned units. Consequently, these units must satisfy their training requirements on other-Military Service facilities, particularly U.S. Army ranges in Hawaii or U.S. Air Force and Japanese ranges in Okinawa and Japan. It is a constant challenge to de-conflict the various Military Service missions to ensure Marines receive adequate training opportunities. The Marine Corps is in the process of assessing approaches to the challenging issue of mitigating range deficiencies in Hawaii by establishing additional training areas and aviation training opportunities. This problem will be further exacerbated in coming years as some Okinawa-based forces relocate to Hawaii as part of the Defense Policy Review Initiative (DPRI). DPRI also includes relocating deploying units from Okinawa to Guam and developing associated basic training ranges and infrastructure. On Guam, individual

Marine skills ranges are part of the Guam Supplemental EIS. In a separate action, U.S. Pacific Command (PACOM), with the Marine Corps as executive agent, has sponsored the Combined Joint Military Training (CJMT) EIS to address existing and future training deficiencies in the Western Pacific, specifically the Mariana Islands. The CJMT EIS effort is studying the possibility of developing new unit and combined arms training range capability and capacity in the Commonwealth of the Northern Mariana Islands (CNMI). These ranges and their associated airspace will provide additional training opportunities for Marines stationed in Okinawa and the Hawaiian Islands. Finally, efforts to establish training opportunities in Australia are also underway to address Rotational Force training requirements in the Northern Territory.

- ▶ The Marine Corps has identified the need for an aviation training range on the East Coast of the United States capable of supporting precision guided munition training. To address this requirement, the Marine Corps has assessed potential alternatives, including expanding the Townsend Bombing Range in Georgia. Based on a thorough assessment of area capabilities, a Final EIS for the Proposed Modernization and Expansion of Townsend Bombing Range was publicly distributed in March 2013, selecting the expansion of Townsend Bombing Range as the best alternative for securing this East Coast capability. A ROD to expand Townsend was signed in January 2014. Acquisition efforts are underway and a formal airspace proposal supporting the land expansion has been submitted to the FAA. Due to refined projections for completion of real estate and funding actions, full operational capability, originally estimated to occur during 2017, is now planned for July 2019.
- ▶ As affirmed in the CPG 2015 and *Expeditionary Force 21*, the capability to fight from the sea and to operate within the littorals is a core Marine Corps competency. The Marine Corps, as an innovative, relevant, naval, expeditionary force in readiness, is committed to preserving and enhancing the capabilities of its primary amphibious training bases at Camp Pendleton and Camp Lejeune, and to developing opportunities for increased littoral training in Hawaii. These installations lack fully developed maneuver corridors, training areas, and airspace to adequately support ground and air maneuver inland from landing beaches. Addressing these deficits is a priority and is currently under study.

SUMMARY OF MAJOR CHANGES IN RANGE CAPABILITY

Changes in range capabilities tend to be incremental; therefore, any year-to-year changes in capability are generally minor and the Marine Corps has no specific changes to report at this time. Major changes are likely to be apparent only in trends measured over multi-year periods or at the completion of major initiatives, such as the range expansions at MCAGCC Twentynine Palms and Townsend Bombing Range.

EMERGING ISSUES: RANGE CAPABILITIES

An uncertain and declining fiscal environment may affect the ability of the Marine Corps to invest in required training infrastructure and to effectively manage its required existing resources in support of training. In particular, fiscal constraints may well restrict investment in new ranges needed to support training in advanced weapon systems. For example, in addition to expanding Townsend Bombing Range and establishing new SUA at MCAGCC Twentynine Palms, the Marine Corps is engaged in developing airspace access, landing zones, and range support requirements to accommodate MV-22 Osprey and UAS capabilities, and in confirming range and airspace needs for the Joint Strike Fighter (JSF). The Chocolate Mountain Aerial Gunnery Range (CMAGR), the subject of a recent successful transfer of administrative jurisdiction from the U.S. Department of the Interior (DOI) to the U.S. Department of the Navy (DON) in the FY2014 NDAA, will enhance range and airspace capabilities in support of Marine Corps and Special Operations unit training. The ability to support these acquisitions with the appropriate range infrastructure will be challenged if the current fiscal profile is diminished. The MCRP is also planning to support increased immersive training opportunities that promote critical decision-making in realistic environments. Such fielding of advanced range systems technologies may include reactive targets, video/audio capture to provide more accurate and responsive after-action review, and an update of its combat marksmanship programs and full spectrum combined arms forcible entry operations training capability.

With congressional support, the Marine Corps has invested over \$800 million in range capabilities over the past decade. An ongoing challenge, the provision of modern, capable training ranges remains a Service priority as articulated in the CPG 2015 and the *MCSCP*. Programming to support new range-related investments, however, may be threatened in an uncertain funding climate. Funding priority will remain focused on the

sustainment and recapitalization of existing capabilities and the currently projected level of FY2016 funding will meet the basic requirements of sustaining current capabilities. As previously noted, future fiscal reductions may adversely affect the Marine Corps' ability to maintain range resources. Without sufficient commitments focused at a minimum on maintenance and re-capitalization, today's range capabilities will become tomorrow's liabilities, with adverse impacts on the ability of Marine Corps installations to support required training with mission-capable ranges.

FUTURE CAPABILITY OUTLOOK

The Marine Corps expects its range capabilities to continue to evolve in support of the tenets of the 2015 National Military Strategy, the CPG 2015, *Expeditionary Force 21* and the MCSCP. Meeting the demands of the Operating Forces for ranges will require predictable and consistent funding for range sustainment and successful completion of critical expansions to correct for known training and readiness deficiencies. Failure to realize the objectives of key initiatives, including the expansion of Townsend Bombing Range, the establishment of Guam/CNMI ranges, the further development of installation-level combined arms live-fire and maneuver space, and the reduction of constraints on amphibious landing beaches would introduce risks to the training enterprise that would require reevaluation of the adequacy of range capabilities.

CRITICAL ISSUES: ENCROACHMENT

Encroachment that constrains the use of Marine Corps ranges for realistic military training remains a significant concern. The regions that are home to Marine Corps installations and ranges face continued population growth, increased levels of environmental regulation and expanding development coupled with emphasis on renewable energy generation and development. These elements generate pressure on scarce resources (land, airspace, water space, electro-magnetic spectrum) critical to current and future military training, testing, and general mission activities. The Marine Corps programmatically assesses and addresses encroachment issues.

The most significant encroachment issues at Marine Corps range complexes include effects on maneuver combined with live-fire training from the presence of species listed under the ESA, restrictions on allowed munitions, degraded access to the electromagnetic spectrum, noise-based restrictions on training, incompatible adjacent land use, and crowded adjacent airspace. Encroachment

also impacts Marine Corps installations that do not provide significant range resources, but which are home to operational forces that utilize nearby training areas. Encroachment at these installations also affects training and mission readiness.

The Marine Corps effort to mitigate the impacts of encroachment on training, while still complying with applicable regulations, requires substantial resource commitment. Carefully monitoring both federal and local legislation and ensuring strong community partnerships, the Marine Corps continues to address all areas of encroachment aggressively with focused programs, such as Encroachment Control Plans (ECPs), Encroachment Partnering (through the REPI Program), Joint Land Use Studies, Air Installation Compatible Use Zone studies, and Range Compatible Use Zone studies, achieving notable successes. Nevertheless, the Marine Corps remains concerned that encroachment continues to present a substantial threat to the capability of installations to perform their military missions.

SUMMARY OF MAJOR CHANGES IN ENCROACHMENT LIMITATIONS

Changes in encroachment impacts tend to be incremental. Major changes are likely to be apparent only in trends measured over multi-year periods or as the result of new regulatory initiatives, such as renewable energy, listing of species as threatened or endangered, or designation of critical habitat.

SUMMARY OF EMERGING ENCROACHMENT ISSUES

Within Marine Corps Installations Command (MCICOM), the G-7, Government and External Affairs Directorate, is responsible for encroachment management in support of mission requirements. This role is critical to Marine Corps operations and training as ongoing and emerging types of encroachment continue to challenge the capability of Marine Corps ranges to accomplish their mission. Among these emerging encroachment issues is the increasing rate of renewable energy development in the vicinity of installations and training space. Development of wind, solar, and geothermal power and associated transmission infrastructure both on- and off-shore will require close attention, creative planning, and proactive effort to ensure the Marine Corps' access to training areas in the air, on land, at sea, and within the electromagnetic spectrum is not degraded. This has been problematic in eastern North Carolina and the desert southwest, but also poses a

particular threat to operations in Hawaii. The nature of Hawaii's location, geography, and the needs of its citizens combine to make competing land uses increasingly attractive. The Marine Corps' ability to train in Hawaii, especially on and around Oahu, stands to be critically threatened, particularly by wind energy development, unless close partnerships with key stakeholders are sustained in support of solutions that accommodate renewable energy initiatives without negative impacts to essential training space. This concern is not limited solely to Hawaii. The Marine Corps will have to remain attuned to similar encroachment challenges at its other Pacific installations.

Climate change has potentially wide-ranging effects, especially in the coastal areas where the Marine Corps trains and operates. The Marine Corps is concerned that such effects could alter the capabilities of installations over time; therefore, these risks must be analyzed, monitored, and addressed in installation planning.

Emerging encroachment issues have the potential to be exacerbated as new weapon systems enter the inventory and/or re-deploy from combat. For example, the F-35, MV-22, KC-130J, and the burgeoning UAS inventory bring new capabilities to the Marine Corps that require greatly expanded training areas. Encroachment not only impacts access to existing training space, but also affects the ability of the Marine Corps to access the extended training areas and airspace necessary to train to standards using new systems and associated tactics and procedures.

Realistically, there are insufficient resources to acquire, through real estate and easement actions, adequate range availability for the Marine Corps' combined arms training needs. Range availability will, therefore, rely on mutually beneficial partnerships that support access to air, land, sea, and electromagnetic spectrum beyond range boundaries. As manned and unmanned warfighting platforms require increasing standoff distances, a more flexible approach to range planning must be developed. An impact area's use is diminished if it does not have tactical air, land, and sea approaches. A complete range capability requires maneuver space to ingress and egress the range proper; tactical approach corridors to training venues such as Military Operations in Urban Terrain (MOUT) and amphibious assault courses; and air routes that support maneuverability and evasive actions, and munitions trajectory routes from significant distances away from their points of impact. Appropriate partnering that provides access to these critical spaces beyond range boundaries is needed and will be a significant challenge in the years ahead.

1.3 NAVY

The Navy's 2015 range capability and encroachment assessments are valid and current with the exception of issues highlighted in this section.

GENERAL ISSUES RELATED TO RANGE CAPABILITY AND ENCROACHMENT

Operationally, the Navy focuses on deployed and forward presence of warfighting capabilities; the foremost fiscal priorities for acquisition and O&M resources are aligned with those priorities. Because of the current fiscal environment, requirements are under continual scrutiny and difficult choices must be made to deliver a complete Navy program. Along the spectrum of risk, training range capabilities have been assigned a higher level of funding risk among other readiness enablers. However, ranges are currently funded at the level required to support operational readiness qualifications and pre-deployment certifications.

CRITICAL ISSUES: RANGE CAPABILITIES

The current fiscal environment affects every Navy priority and can limit the Navy's ability to sustain presence, operate shore infrastructure, and sustain training range capability. Shortfalls or degradations in range training capability or particular encroachment issues require prioritization for possible application of resources. Range issues are prioritized in accordance with the Chief of Naval Operations' guidance. Resources for programs, such as force structure acquisition, platform readiness, steaming days, and flying hours accounts that support Navy Defense Strategic Guidance missions are the Service's priority.

Two issues present the greatest challenge to Navy range capabilities. The first is insufficient training space, to include both SUA and land space for supporting new generation aircraft and weapons. This is most critically apparent at Naval Air Warfare Development Command (NAWDC—formerly known as the Naval Strike and Air Warfare Center [NSAWC]) at Fallon, Nevada. Training Space for new generation aircraft and weapons is also a concern for the Marianas Islands Range Complex (MIRC), where Japan based Forward Deployed Naval Forces (FDNF) increasingly train. The second issue involves undersea range instrumentation. The deteriorating undersea Time Space Position Information (TSPI) instrumentation at the Pacific Missile Range Facility (PMRF) is limiting ASW training opportunities.

Restrictive Airspace and Impact Area Size

Training requirements for Strike Warfare have outgrown the available training space at all Navy air-to-ground training ranges; especially at NAWDC, Fallon, Nevada. This is driven by real-world threats, as well as the need for longer range stand-off for training with precision guided munitions (PGM) with substantially larger release envelopes. These range capability gaps restrict NAWDC's current tactical weapon training employment to 30 to 40 percent of advanced weapons' employment capability. The inability to train to designed weapon release envelopes inhibits available tactics used in training and limits Carrier Air Wing combat skills.

Additional SUA volume is required to accommodate employment of the latest weapons and improved tactics. An increase in restricted or limited access ground surface area is also required to ensure public safety with expanded weapon danger zones (WDZs) (potential impact area) resulting from tactically realistic weapon release profiles. NAWDC has developed an approach and is leading the implementation of solutions to these air and landscape shortfalls.

Significant growth in exercise volume and frequency of use of airspace in the MIRC by USN, USMC, and Air Force combatant assets led to a PACOM sponsored SUA plan submittal. All three Services await FAA determination and approval of the proposed plan.

Ocean Systems — Underwater TSPI Instrumentation

The proven value of TSPI instrumentation in providing anti-submarine warfare (ASW) training event ground truth and tactical feedback to operators is being put at risk by an aging legacy system and by a lack of portable instrumentation required to train pre-deployment Strike Groups and Forward Deployed Naval Forces. Air, surface, and submarine warfare areas are being impacted.

The Hawaii Range Complex's permanent underwater range, designated as Barking Sands Tactical Underwater Range (BARSTUR), is operating beyond its expected service life. Accumulated wear and tear on trunk cables running through and beyond the surf zone has damaged connectivity between deep water hydrophones and the PMRF range control spaces. Range coverage area is being lost. Refurbishment will reestablish range capability and enable anti-submarine warfare training instrumentation coverage in water depths critical to various warfare platform readiness training events.

Portable Underwater Training Range (PUTR) ASW range requirements in the Pacific and U.S. Fleet Forces Command (USFF) areas of responsibility are growing in

importance as availability of resources for procurement are shrinking. Both Fleets have requirements to train Forward Deployed Naval Forces that do not have access to permanent underwater instrumentation capability.

SUMMARY OF MAJOR CHANGES IN RANGE CAPABILITY

The Navy noted no major changes in range capability to report in the 2016 SRR.

SUMMARY OF EMERGING CAPABILITY ISSUES

Because of the increasing strategic focus on Forward Deployed Naval Forces, the PUTR TSPI capability is becoming more important to the Navy's air, surface, and submarine communities. Adding two PUTRs to the Navy inventory will enable expanded coverage of weapons firings in the Mariana Islands, Okinawa, and Rota, Spain.

FUTURE CAPABILITY OUTLOOK

The Navy expects its range capabilities to continue supporting readiness training for deploying units indefinitely. However, the reality of fiscal trends is that sustaining resources for instrumentation, range operations, and manpower will likely be pressurized. The long-term impact is that ranges' ability to support training events is at risk as demand to train to near-peer opposing forces of increasing capability and density increases over the foreseeable future.

In assessing training range complexes as a whole, encroachment mitigation actions to manage specific encroachment factors are likely to result in either restrictions or limitations on training range capability. Post mitigation training invariably reduces realism, and restrains freedom of operational maneuver, or in some cases weapon system or platform use in training, thereby reducing the value of live training.

CRITICAL ISSUES: ENCROACHMENT

Critical issues identified in the 2015 SRR remain for the Navy, including alternative energy development of wind farms; foreign investment in the United States; proliferation of ocean observing systems (OOS); and candidate species management. In addition, the competition for electromagnetic spectrum use has now moved from a range capability issue to an encroachment concern. The emerging issue of geothermal energy development also continues to be a concern.

The Navy is developing guidance for conducting risk assessments to identify mission critical areas that may be susceptible to encroachment by foreign investment. The purpose of this guidance will be to identify appropriate mitigations for at-risk locations. This guidance will not override any existing security processes; rather, it will be an internal planning tool that will help focus Navy efforts.

Seaspace encroachment off the Virginia Capes due to port access routing has been taken off of the critical issues list due to changes in priorities by the Virginia Port Authority, which has caused this issue to go dormant. This issue will be a concern for future Navy operations because it involves the realignment of a surface danger zone where the Navy conducts live weapons firing.

Alternative and Conventional Energy Development

Alternative energy development creates multiple encroachment issues such as obstruction concerns related to height of wind turbines and/or associated infrastructure (power/transmission lines). Conventional energy development, such as offshore oil/gas development, can interfere with at-sea training by placing obstacles in areas where they impede ship freedom of movement, which is required to launch and recover aircraft and exercise tactical options during warfare training events. Infrastructure related to geothermal development can lead to training concerns by placing obstacles and obstructions such as steam, dust, and artificial infrared signals in paths of aircraft and maneuvering ground forces.

The Navy is working to mitigate the effects of conventional and alternative energy exploration and exploitation. In the case of offshore wind, oil, and gas energy project proposals, DoD, specifically the Under Secretary of Defense for Personnel and Readiness (USD(P&R)), maintains close coordination with the Bureau of Ocean Energy Management (BOEM) and individual state offshore renewable energy task forces. The consistent communications continue to pay dividends in establishing compatibility between range training requirements and energy interests.

For alternative energy projects ashore, the Navy continues to negotiate and identify mutually acceptable terms with developers to facilitate development without significant impacts to readiness. In the past year, Navy has been party to three mitigation agreements for wind energy projects. A project in South Texas would have potentially impacted aviator training at Naval Air Station (NAS) Kingsville and NAS Corpus Christi. In Nevada, a pending project would have potentially impacted missions at the Naval Air Weapons Station (NAWS) China Lake ranges.

Foreign Investment in the United States

Foreign acquisition of resources or land assets in proximity to Navy ranges presents significant encroachment and range capability issues. Any development or investment near a critical training asset provides an opportunity for persistent visual and electronic observation of tactics, techniques, and procedures (TTP) training. Existing statutory mechanisms do not cover all categories of proposed transactions or projects with the potential to result in adverse impacts to military readiness and national security.

Proliferation of Ocean Observing Systems

OOS are increasing for marine mammal and weather research, climate research, tsunami warning/verification, and seismic/earthquake monitoring. The littoral nature of Navy training ranges and the unique activities that occur there make the ranges valuable for data gathering in each of those categories. The open nature of the high seas makes it possible for data to be gathered under innocent circumstances, but ultimately be exploited as an operational vulnerability.

Where Navy range complexes are encroached by OOS, Navy and national security interests are negatively impacted. The three training ranges of immediate concern are (1) the Northwest Training Range Complex, (2) the Southern California Offshore Range Complex (SOCAL), and (3) the Hawaii Range Complex. In the future, the East Coast Shallow Water Training Range will be vulnerable to the same challenges.

The Navy created an OOS Situational Awareness Office to improve knowledge about systems entering the water. Through these efforts, the Navy will continue cooperation and consultation with civilian agencies, foreign navies, academic institutions, and industry to build on current agreements and allow for additional negotiated agreements as appropriate on the placement of sensors and shared data management.

Candidate Species Management

In FY2013, the Navy entered into an ESA "conference" pursuant to Section 7(a)(4) for the Washington ground squirrel with the USFWS to lessen or obviate future impacts to military readiness activities proposed for the Navy's Boardman Range in Oregon should the species ultimately become listed under the ESA. While not currently protected by the ESA, the Washington ground squirrel has been identified by the USFWS as a candidate for listing. The Washington ground squirrel has been added to the USFWS's Multiple District Litigation Plan (MDLP) to address the listing needs of many candidate

species as part of a court-ordered settlement agreement. Some of the best remaining habitat of the squirrel is located on the Navy's Boardman range, and non-governmental organizations (NGOs) expressed concerns that any increase in ground-disturbing activities on the range will cause adverse effects to the squirrel. The Navy's conference with the USFWS on this candidate species is a unique approach to ensuring all conservation needs for this species are identified early so the Navy has prior knowledge of actions to lessen impacts on training should the species ultimately be listed. The MDLP target date for a proposed listing determination is February 2016.

Electromagnetic Spectrum Encroachment

The Navy faces challenges related to electromagnetic spectrum on multiple fronts. The National Broadband Plan seeks to reallocate spectrum for commercial uses, potentially impacting frequencies used by the military for training and testing. Additionally, individual projects have the potential to affect activities or equipment sensitive to interference or represent a physical obstruction that interferes with existing transmissions.

SUMMARY OF MAJOR CHANGES IN ENCROACHMENT LIMITATIONS

The Navy noted no major changes in encroachment factor impacts on individual ranges for the 2016 SRR. However, pressures related to threatened and endangered species impact, munitions restrictions, electromagnetic spectrum encroachment, airspace restrictions, and adjacent land use continue and are expected to continue into the future.

SUMMARY OF EMERGING ENCROACHMENT ISSUES

Climate Change

The Navy is approaching the climate change challenge by modifying existing planning processes to include adaptation to climate change.

Navy is evaluating risks to infrastructure, range space, and range capabilities posed by potential future sea level rise and other climate effects. As scientific data trends are identified, processes will be refined to evaluate impacts and the associated viable options that will lead to operational readiness sustainment.

NAVY SPECIAL INTEREST AREAS

The Navy and National Marine Fisheries Service (NMFS) have developed science-based protective and mitigation measures that adequately protect marine species while accommodating military readiness activities. The Navy continues to work with NMFS and other stakeholders to allow at-sea training while minimizing adverse effects to marine mammals.

Endangered species/critical habitat encroachment from the North Atlantic right whale has created avoidance areas that have resulted in some reduced training days and certain training event exclusions. This area is relatively small in scope; however, if these types of restrictions were applied to other species and areas, there could be some impacts on readiness.

The Navy will continue to invest in marine mammal research; rely on scientifically valid empirical data results as the basis of marine mammal mitigation development; factor mitigation effectiveness into permit requests; and continue education of Fleet units to adhere to the maritime protective and mitigation measures and public education outreach efforts. The Navy's authorizations under the Marine Mammal Protection Act (MMPA) and ESA include an adaptive management approach to continually evaluate existing mitigation measures for their potential effects on training. If impacts on training from mitigation measures are identified and documented, the Navy will raise these impacts with NMFS for resolution during an annual adaptive management review process.

1.4 AIR FORCE

The Air Force's 2015 range capability and encroachment assessments are valid and current with the exception of issues highlighted in this section.

GENERAL ISSUES RELATED TO RANGE CAPABILITY AND ENCROACHMENT

The Air Force is addressing several critical and emerging issues with regard to our operational training infrastructure. Those issues include posturing for the current defense strategy, providing integrated, full spectrum training, enhancing the capability to support 5th generation aircraft and associated weapons systems, and integrating virtual and constructive entities into live training.

CRITICAL ISSUES: RANGE CAPABILITY

Posture for the Current Defense Strategy

The current Defense Strategic Guidance requires re-focusing operations to counter a more technologically advanced peer adversary. These potential adversaries possess complex air defenses and highly-sophisticated electronic countermeasures, including global positioning system (GPS) and radar jamming capabilities. The current Air Force range enterprise does not adequately replicate this environment. To provide the realistic training required for combat-ready aircrews, the Air Force is seeking to significantly upgrade range infrastructure at a few select ranges to accurately reflect the complex, dense combat environment crews will likely encounter during operations. These upgrades include realistic integrated air defenses, target arrays that challenge advanced sensors, high-fidelity moving targets, and capabilities that simulate a contested and/or degraded environment.

Provide Integrated Full Spectrum Training

Full spectrum Air Force operations increasingly involve space and cyber capabilities and threats; however, current ability to conduct cross-domain training does not reflect this increasing prominence of space and cyber capability. Air Force operations rely on integrated air, space, and cyber capabilities; therefore, the training enterprise must also evolve to incorporate full spectrum training. The Air Force is evaluating enterprise options for which locations will meet this need and resource those ranges appropriately, as it is not currently feasible to provide this level of training at all locations.

Enhance Capability to Support 5th Generation Aircraft and Associated Weapon Systems

The technological advances incorporated in 5th generation and 4th generation-plus aircraft and associated weapons represent an unprecedented leap in combat capability. These advances enable crews to identify and engage multiple targets from greater distances with improved accuracy. The technology of precision-guided munitions has generally shifted the focus of training from weapon employment to target identification, subsequently increasing the complexity of the targets required to accomplish realistic training. The greater employment distances of these weapon systems add another stressor to range management as individual sorties require larger portions of the range and airspace to train safely and effectively.

Consequently, the Air Force believes these advances will change the nature and balance of training. There will be diminishing requirements to drop live sub-scale and heavy weight munitions and a greater need to practice target identification. Additionally, the most advanced mission sets will likely take place in the simulator, further reducing the need for local range access. While TTPs for 5th generation aircraft are still evolving, the current trend indicates the focus of live training will move away from dropping sub-scale practice munitions on low-altitude ranges to medium- to high-altitude sorties that will require larger volumes of airspace.

Integrate Virtual and Constructive Entities to Enhance Live Training

Historically, units used virtual capabilities to accomplish basic training tasks while accomplishing all complex training in the live environment. The complexities of new weapon systems and operational security concerns have driven the most complex training into the virtual environment. As the Air Force develops programs of record for virtual and constructive training, it is imperative for the range enterprise to incorporate these abilities into the live domain.

Risks

The Air Force range enterprise presently meets the live-training requirements of current 5th generation aircraft, but programmed advances in platform and sensor capability and standoff weapon ranges will soon exceed the capability of the current range enterprise to provide the superior live-training environment that has long been a U.S. strategic advantage in combat readiness. The Air Force is investing to ensure select ranges have the ability to meet these increasing demands as simulators are relied on more for local training.

SUMMARY OF MAJOR CHANGES IN RANGE CAPABILITY

The Air Force noted no major changes in individual range capability for the 2016 SRR.

FUTURE CAPABILITY OUTLOOK

The outlook for future range capability is mixed. The Air Force is currently pursuing several programs of record that will expand training capabilities. These programs include procurement of new advanced threat radars/simulators, upgrades of legacy threat systems, and development of a realistic constructive-to-live capability. These investments

in advanced technology will greatly enhance the ability to provide relevant and realistic training to ensure combat ready crews. As Air Force ranges advance technologically, however, they are increasingly constrained geographically. The largest ranges and blocks of airspace are no longer sufficient for the demands of the increased combat capability. The physical constraints of the current range enterprise necessitate adjustments to training profiles, which detract from the realism of the training.

CRITICAL ISSUES: ENCROACHMENT

The Air Force continues to address several critical and emerging encroachment issues. These issues include: wind turbine development, solar energy development, electromagnetic spectrum use, and foreign investment in the vicinity of Air Force ranges.

Wind Turbine Development

Wind power is one of the fastest-growing sources of renewable energy in the United States, and continued advancements in wind technologies, including higher hub heights, larger rotors, and improved energy capture, enables deployment in new geographic regions of the nation, with many of those in close proximity to Air Force ranges. As wind energy development increases, so does the potential for wind turbines to present conflicts with the safe and effective operation of Air Force ranges. The rapid proliferation of wind turbine development has outpaced the capability of software systems to fully analyze and predict the effects of wind turbine farms on radars. The Air Force supports the inter-agency Wind Turbine Radar Interference Mitigation (WTRIM) Working Group effort to remedy the analytical challenges. The Air Force partnered with the FAA and the Department of Homeland Security (DHS) to enhance the capabilities of long-range surveillance radars by improving their ability to detect aircraft flying in the vicinity of wind turbines.

Solar Energy Projects

Solar energy projects present their own unique encroachment challenges to the Air Force, the biggest challenge being the lack of a comprehensive analytical tool that can adequately determine potential impacts to operations. The Solar Glare Hazard Analysis Tool (SGHAT) is designed to model potential glint and glare from solar voltaic panels to commercial airfield departure and arrival flight patterns. Analyzing potential glint and glare at diverse locations away from airfields is beyond SGHAT's design and consequently a deficient process. The Air Force is in discussion with a solar developer who is planning a project in the vicinity of the Barry M. Goldwater Range,

but the immediate concern for that project is the physical placement of the vertical solar collection tower in proximity to the nearby dirt assault airstrip. Other encroachment issues include commercial industry demands on electromagnetic spectrum as well as foreign investment activities near Air Force ranges that continue to require diligent review for operational security reasons.

Risks

The host of flying and related operations conducted on Air Force ranges continues despite the varied encroachment challenges posed by renewable energy projects, commercial development, spectrum demand, and foreign investment in projects in proximity to the ranges. Risks are incurred when air traffic control radars have excessive radar false targets generated due to the presence of wind turbines, thereby degrading the controllers' ability to provide service to those aircraft. Some geographic areas must be avoided due to noise and/or safety parameters, thus incurring additional flight time or spatial constraints on mission profiles, risking the ability to fully complete tasked operations and/or reducing training realism. One example is the conduct of low-level high-speed flight events that must be altered to avoid obstructions or noise abatement regions.

SUMMARY OF MAJOR CHANGES IN ENCROACHMENT LIMITATIONS

The Air Force has no major changes to report in encroachment factors on individual ranges. The Air Force is actively involved with the Office of the Secretary of Defense (OSD) and the other Military Services in addressing impacts and mitigation options for development-related encroachment issues near both Air Force and joint-use ranges. Current Air Force collaborative discussions include the proposed foreign investment in energy development near Vandenberg Air Force Base launch complex and the Naval Air Systems Command Sea Range at Point Mugu, California.

SUMMARY OF EMERGING ENCROACHMENT ISSUES

One emerging issue for Air Force ranges is the proliferation of small unmanned aircraft systems in the civilian community and their growing presence in range airspace. The sensitive nature of some facilities, and the concerns for flight safety and mid-air collision avoidance has raised the level of concern. The Air Force is working closely with Headquarters FAA as it continues to develop rules and procedures for these activities in the National

Airspace System. Another issue is the growing volume and diversity of foreign investment in proximity to ranges. This investment often falls outside of the existing protections in the Committee on Foreign Investment in the United States (CFIUS) process and the nature of the objects acquired can lend particular support to foreign information gathering (*i.e.*, sprawling oil and gas facilities, or mining complexes).

FUTURE ENCROACHMENT OUTLOOK

Proactive engagement with industry, community, and military stakeholders; enhanced electromagnetic spectrum cohabitation technologies; and mitigation of the effects from renewable energy projects on Air Force ground and airborne sensors will enable ranges to provide a safe and realistic training environment well into the future.

AIR FORCE SPECIAL INTEREST SECTION

The Air Force supports engagement at the lowest civic, business, and military organizational levels in order to foster both sustainment of military missions and the rapidly growing opportunities for renewable energy and other development. As many of the encroachment projects span multiple local jurisdictions, military installations, and training airspaces, the benefit of a state-level review and project permitting process can be significant. Air Force missions would benefit from the establishment of more state-level oversight and permitting processes for projects that encroach on ranges and key training airspace.

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2 | MILITARY SERVICE RANGE ASSESSMENTS

As stated earlier in this report, USD(P&R) and the Military Services validated the 2015 range assessments as current for the 2016 reporting period. USD(P&R) intends to conduct a full evaluation of range capabilities and the adequacy of ranges to provide the required training support and current impacts of encroachment every three years. The next range assessment review will be included as part of the 2018 SRR to Congress.

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3 | DOD'S COMPREHENSIVE TRAINING RANGE SUSTAINMENT PLAN

Section 366(a)(1) of the FY2003 NDAA required DoD to develop a comprehensive training range sustainment plan. DoD has established a complete range planning and management program under its SRI addressing this requirement. The SRI provides a flexible and adaptive planning framework that guides continuing, cooperative, and coordinated range sustainment efforts between the OSD and the Military Services, as well as mechanisms that facilitate cooperation with local, state, and regional governments; other federal agencies; and NGOs. The program includes policy, programming, outreach, legislative, and related efforts to address training requirements and long-term access to ranges, airspace, and seaspace.

This chapter builds upon the information from the 2015 SRR and highlights key aspects to meet Section 366(a)(4)(c) requirements to report on SRI status.

Using these goals as a common framework, each Military Service developed a set of milestones and actions to achieve common objectives. Tables 3-1 through 3-7 show the current status of each milestone. Based on annual assessment data, programmatic goals and milestones are reviewed and updated annually to ensure the SRI continues to effectively address potential future training requirements and constraints.

3.1 GOALS AND MILESTONES

DoD has used the following set of seven shared goals and milestones since the 2006 SRR; they have been revalidated and are applicable for this report:

- ▶ Mitigate Encroachment Pressures on Training Activities from Competing Operating Space (landspace, airspace, seaspace, and cyber issues)
- ▶ Mitigate Electromagnetic Spectrum Competition
- ▶ Meet Military Airspace Challenges
- ▶ Manage Increasing Military Demand for Range Space
- ▶ Address Impacts from New Energy Infrastructure and Renewable Energy Impacts
- ▶ Anticipate Climate Change Impacts
- ▶ Sustain Excellence in Environmental Stewardship

Table 3-1: Encroachment Actions and Milestones
(Goal: Mitigate Encroachment Pressures on Training Activities from Competing Operating Space [landspace, airspace, seaspace, and cyber issues])

ARMY

ACTIONS	MILESTONES	STATUS	ADDITIONAL SERVICE COMMENT
Review and maintain Installation Range Complex Master Plans (RCMPs).	<ul style="list-style-type: none"> Review and update RCMPs annually for required installations. 	Updated; ongoing	100% of required installation RCMPs were updated and approved in 4th Quarter FY2013.
Execute the Army Compatible Use Buffer (ACUB) Zone Program to protect the military mission and offset training restrictions.	<ul style="list-style-type: none"> Implement ACUBs at installations to protect training, testing, and operations from encroachment effects, permanently protecting acreage of land from incompatible land uses. Continue programming validated environmental requirements to support ACUBs during Program Objective Memorandum (POM) 2016–2020. 	Updated; ongoing	As of 2013, ACUBs have been implemented at 30 locations and more than 160,000 acres of land have been protected from incompatible use.
	<ul style="list-style-type: none"> Continue development of a consistent and clearly defined ACUB strategy, including metrics for program success and prioritization measures that build from the ACUB Implementation Guidance issued in FY2012. 	Updated; ongoing	The ACUB strategy is a continuous follow-on effort to ensure synchronization with Army strategies and mission priorities.

Table 3-1: Encroachment Actions and Milestones (continued)
(Goal: Mitigate Encroachment Pressures on Training Activities from Competing Operating Space [landspace, airspace, seaspace, and cyber issues])

MARINE CORPS

ACTIONS	MILESTONES	STATUS	ADDITIONAL SERVICE COMMENT
<p>Continue to analyze and assess encroachment, quantitatively and qualitatively, at the installation, regional, and Service levels.</p>	<p>Include encroachment analysis in Regional Range Complex Management Plans (RCMPs):</p> <ul style="list-style-type: none"> ▶ Marine Corps Service-Level ▶ Marine Corps Installation (MCI)-East ▶ MCI-West ▶ MCI-PAC 	Ongoing	<p>Marine Corps Service-Level RCMP was commenced in August 2015 with a planned completion date of August 2016.</p>
	<p>Execute ECPs</p>	Complete	<p>No new ECPs underway</p>
	<p>ECPs completed:</p> <ul style="list-style-type: none"> ▶ Combined ECP for Southern California installations (Marine Corps Base [MCB] Camp Pendleton, Marine Corps Air Station [MCAS] Camp Pendleton, MCAS Miramar, Marine Corps Recruit Depot [MCRD] San Diego) ▶ Joint Base (Navy/Marine Corps) Guam ▶ MCAS Iwakuni 	Complete	
<p>Continue to evaluate, plan for, and execute encroachment partnering opportunities per 10 U.S.C. § 2684a.</p>	<p>Facilitate/support regional inter-agency and inter-governmental partnerships:</p> <ul style="list-style-type: none"> ▶ Western Regional Partnership (WRP) ▶ Southeast Regional Partnership for Planning and Sustainability (SERPPAS) 	Ongoing	
	<p>Execute buffer lands acquisition:</p> <p>MCI-National Capital Region</p> <ul style="list-style-type: none"> ▶ Quantico (417 acres) <p>MCI-EAST</p> <ul style="list-style-type: none"> ▶ MCAS Beaufort (3,618 acres) ▶ Townsend Bombing Range (34,745 acres) ▶ MCAS Cherry Point/Piney Island Range (5,862 acres) ▶ Camp Lejeune (3,844 acres) <p>MCI-WEST</p> <ul style="list-style-type: none"> ▶ Camp Pendleton (1,700 acres) ▶ Twentynine Palms (2,217 acres) 	Ongoing	
	<ul style="list-style-type: none"> ▶ Establish partnership with USFWS and State of North Carolina to manage endangered species on acquired buffer land to increase species population off-base and thereby reduce training restrictions on-base. 	Ongoing	
	<ul style="list-style-type: none"> ▶ Evaluate opportunities in all Continental U.S. (CONUS) MCI regions. 	Ongoing	

Table 3-1: Encroachment Actions and Milestones (continued)
(Goal: Mitigate Encroachment Pressures on Training Activities from Competing Operating Space [landscape, airspace, seaspace, and cyber issues])

NAVY

ACTIONS	MILESTONES	STATUS	ADDITIONAL SERVICE COMMENT
Employ proactive interaction with all Services to sustain installation and range capabilities.	<ul style="list-style-type: none"> Continue Naval Special Warfare Command (NSWC) and Training and Education Command (TECOM) collaboration and support for establishment of SUA over Navy Special Warfare training space. 	FAA approval is pending	Awaiting FAA approval.
Continue to analyze and assess encroachment, quantitatively and qualitatively at the installation and regional levels.	<ul style="list-style-type: none"> Update Encroachment Action Plans (EAPs) as required. As updated, EAPs are to be published electronically for review by all required Navy stakeholders. 	Ongoing	
	<ul style="list-style-type: none"> Use the Navy Community Liaison and Plans Officers to continuously engage communities where the potential encroachment of installations and land ranges may arise. 	Ongoing	
Continue to evaluate, plan for, and execute partnering opportunities per 10 U.S.C. Section 2684a.	<ul style="list-style-type: none"> Use existing parallel processes to update applicable EAPs and identify all encroachment partnering opportunities for associated Navy training ranges. 	Ongoing	
Coordinate an integrated approach to address Service-wide, as well as locally isolated, encroachment issues	<ul style="list-style-type: none"> Establish and use a "task force" approach with representation from Office of the Chief of Naval Operations (OPNAV), System Commands, Commander, Navy Installations Command, and Fleet-level Commands to address encroachment challenges. 	Ongoing	The Navy's "Task Force Compatibility and Readiness Sustainment" manages the Navy's encroachment program to ensure mission sustainment for all Navy installations, test and training ranges, air and water operating areas, SUA, and military training routes.

AIR FORCE

ACTIONS	MILESTONES	STATUS	ADDITIONAL SERVICE COMMENT
Develop the Center Scheduling Enterprise (CSE) system and integrate flight scheduling systems with other scheduling systems.	<ul style="list-style-type: none"> Modify utilization reports to provide a complete and accurate account of airspace and range usage (FY2011–FY2017). 	Ongoing	Progress continuing into FY2017.
	<ul style="list-style-type: none"> Use enterprise architecture to institute a streamlined version of CSE (FY2009–FY2017). 	Ongoing	
	<ul style="list-style-type: none"> Deploy CSE system throughout the Air Force. 	Ongoing	
	<ul style="list-style-type: none"> Provide a quantitative basis for defending current requirements and developing future needs. 	Ongoing	
	<ul style="list-style-type: none"> Develop an interface between CSE and the Army/ Marine Corps Range Facility Management Support System (RFMSS) (FY2011–FY2015). 	Ongoing	

Table 3-2: Electromagnetic Spectrum Actions and Milestones
(Goal: Mitigate Electromagnetic Spectrum Competition)

ARMY

ACTIONS	MILESTONES	STATUS	ADDITIONAL SERVICE COMMENT
Execute an ACUB to protect spectrum at Fort Huachuca, home of the Electronic Proving Ground.	▶ Continue implementing the Fort Huachuca ACUB proposal.	Ongoing	Fort Huachuca was designated by the Departments of Agriculture, Defense, and Interior as a Sentinel Landscape in April 2015.
	▶ Monitor and assess the ACUB at Fort Huachuca through the biennial review process.	Ongoing	
Design new ranges to minimize spectrum competition	▶ Complete the installation of fiber optic cabling to support a wireless network and control targetry in order to minimize electromagnetic spectrum interference on ranges by FY2017.	Ongoing	

MARINE CORPS

ACTIONS	MILESTONES	STATUS	ADDITIONAL SERVICE COMMENT
Analyze and assess electromagnetic spectrum issues potentially impacting training capabilities at range complexes.	▶ Assess operational impacts of frequency encroachment at the range complex level.	Ongoing	Electromagnetic spectrum encroachment analysis is being incorporated into the RCMP and the ECP processes, as RCMPs and ECPs are prepared, reviewed, and/or revised. MCICOM is working with OPNAV N45 and the Assistant Secretary of the Navy Energy Installations & Environment (ASN EI&E) to coordinate review of spectrum effects of renewable energy proposals between all stakeholders.
	▶ Incorporate electromagnetic spectrum encroachment analysis and potential mitigation measures into planned ECPs; incorporate updates to existing ECPs.	Ongoing	See Table 3-1 for schedule.

NAVY

ACTIONS	MILESTONES	STATUS	ADDITIONAL SERVICE COMMENT
Analyze and assess electromagnetic spectrum issues potentially impacting training capabilities at the range complex and regional level.	▶ Update the RCMPs and EAPs to identify and assess electromagnetic spectrum conflicts, shortfalls, and the impacts on Navy training as the documents undergo periodic updates.	Ongoing	
	▶ Advocate for the protection of military frequencies used by range capabilities that could be affected by frequency re-allocation and/or the National Broadband Plan.	Ongoing	The Navy's efforts to maintain ranges' access to spectrum as part of Navy-wide action is led by OPNAV N2/N6.

AIR FORCE

ACTIONS	MILESTONES	STATUS	ADDITIONAL SERVICE COMMENT
No current actions underway.			

Table 3-3: Airspace Actions and Milestones
(Goal—Meet Military Airspace Challenges)

ARMY

ACTIONS	MILESTONES	STATUS	ADDITIONAL SERVICE COMMENT
Develop an EA process to facilitate increased access to restricted airspace in support of UAS training.	<ul style="list-style-type: none"> ▶ Initiate two pilot project EAs to adjust SUA in support of UAS training at major training and testing installations. 	Ongoing	Airspace Management Work Group mission to develop problem statement and initial mitigation methodology completed January 2015. Will initiate follow on Airspace Management Integrated Operations Team January 2016 to refine Army installation tiered courses of action, develop procedural improvements, and identify needs.

MARINE CORPS

ACTIONS	MILESTONES	STATUS	ADDITIONAL SERVICE COMMENT
Define future requirements for military airspace, current and projected airspace shortfalls, and possible courses of action to mitigate shortfalls at installation, range complex, regional, and Service levels.	<ul style="list-style-type: none"> ▶ Include airspace analysis in RCMPs. 	Ongoing	See Table 3-1 for schedule.
	<ul style="list-style-type: none"> ▶ Assess airspace requirements and shortfalls in preparation for and submission of Regional Airspace Plans. Cherry Point Air Traffic Control continues to work with Washington Center to acquire 'controlling agency' responsibilities for the airspace above the Cherry Point ranges as well as airspace over the northern Dare County Ranges extending to FL230 with a capability up to FL290. This would increase the Air Traffic Control Assigned Airspace significantly and lead to a more dynamic high altitude training capability over eastern NC. 	Ongoing	Preparing the Regional Airspace Plans is an annual requirement for Marine Corps Regional Airspace Coordinators.
	<ul style="list-style-type: none"> ▶ Complete strategic-level assessment of range requirements and shortfalls regarding training land and airspace. 	Ongoing	Presently in analysis per Commander, Marine Corps Planning Guidance 2015, Expeditionary Force 21, and the Marine Corps Strategic Campaign Plan published in 2014.
	<ul style="list-style-type: none"> ▶ Continue airspace expansion efforts supporting newly acquired lands at MCAGCC Twentynine Palms. 	Ongoing	Proposals to establish new airspace and modify existing airspace supporting newly acquired lands delivered to the FAA in April 2014 for processing. A request to establish Temporary SUA supporting the first Large Scale Exercise in newly acquired lands planned for August 2016 was submitted to the FAA for processing in September 2015.
	<ul style="list-style-type: none"> ▶ Continue to track airspace issues and FAA initiatives potentially affecting military activities.. 	Ongoing	
	<ul style="list-style-type: none"> ▶ Continue airspace expansion planning for Townsend Bombing Range. 	Ongoing	Proposals to expand existing airspace supporting newly acquired lands delivered to the FAA for processing in December 2014.
	<ul style="list-style-type: none"> ▶ R2507 Expansion. The expansion will establish military restricted airspace over the entire range's boundaries. It will support range de-confliction of aviation and ground training activities occurring simultaneously within the airspace expansion area as well as support airspace shortfalls for aviation training requirements. 	Ongoing	Proposal to establish new airspace delivered to the FAA in August 2014 for processing. A final rule establishing R-2507W is expected in 2016.

Table 3-3: Airspace Actions and Milestones (continued)
(Goal—Meet Military Airspace Challenges)

NAVY

ACTIONS	MILESTONES	STATUS	ADDITIONAL SERVICE COMMENT
Define future requirements for military airspace, current and projected airspace shortfalls, and possible courses of action to mitigate shortfalls at installation, range complex, and regional and service levels.	<ul style="list-style-type: none"> Use RCMPs and EAPs to assess future airspace requirements based on projected force structure changes/positioning and new weapon systems and missions; recommend possible courses of action to mitigate climate change trends, and Regional Airspace Plans; identify requirements for complementary airspace for land and sea training space for each Navy range complex during the POM process. 	Ongoing	Airspace Management Work Group mission to develop problem statement and initial mitigation methodology completed January 2015. Will initiate follow on Airspace Management Integrated Operations Team January 2016 to refine Army installation tiered courses of action, develop procedural improvements, and identify needs.

AIR FORCE

ACTIONS	MILESTONES	STATUS	ADDITIONAL SERVICE COMMENT
Initiate and develop a comprehensive analysis of all the current Air Force missions, airspace, and ranges within specific FAA Air Traffic Control Centers in order to determine if the requirements to meet new missions and to support current operations are met. This analysis will enable the Air Force to identify requirements and optimal regional airspace configuration to support current missions with significant consideration for NAS efficiency and thoughtful concern for a broad range of stakeholder interests.	<ul style="list-style-type: none"> Strategic level assessment of regional airspace and range requirements and shortfalls. Develop MAJCOM(s) comprehensive plan of regional airspace use. Report on airspace and range use (ensure optimization of airspace and range assets). 	Ongoing	Outreach program underway to understand MAJCOM requirements.

Table 3-4: Range Space Actions and Milestones
(Goal: Manage Increasing Military Demand for Range Space)

ARMY

ACTIONS	MILESTONES	STATUS	ADDITIONAL SERVICE COMMENT
Field Live, Virtual, Constructive-Integrating Architecture (LVC-IA) to enable the Integrated Training Environment (ITE).	<ul style="list-style-type: none"> Field LVC-IA to 15 AC installations supporting the operational unit training. 	Ongoing	
Validate the Regional Collective Training Capability (RCTC) sites.	<ul style="list-style-type: none"> Review and re-validate the RCTC sites (installations) following future stationing announcements. 	Ongoing	
Enable Joint Pacific Multinational Readiness Capability (JPMRC)	<ul style="list-style-type: none"> Enable enhanced home-station training in the Pacific by the 4th Quarter FY2015. 	Ongoing	JPMRC Initial Operation Capability Exercises were conducted on 23-27 February 2015, 1-3 March, and 1-6 March and found to be successful. JPMRC was then used to support Pacific Pathways via Exercise Talisman Saber in August 2015.
Update the TC 25-1 Training Lands that define doctrinal land requirements.	<ul style="list-style-type: none"> Publish new doctrine by the 3rd Quarter FY2015. Update Army Range Requirements Model to determine Army training land requirements by the 3rd Quarter FY2015. 	Ongoing	Final publication anticipated for March 2016.
Review the Army Training Land Strategy (ATLS) for incorporation into the Facility Investment Strategy (FIS). Prioritize Army training land investments through land acquisition, compatible use buffering, sustainable management, and use of other federal land.	<ul style="list-style-type: none"> Coordinate review and incorporate training land investment priorities into FIS for POM 2018-2021. 	Ongoing	
	<ul style="list-style-type: none"> Implement an annual review and update process for the ATLS as part of the FIS. 	Ongoing	
Execute Training Land Acquisitions to offset the nearly five million acre shortfall in training land assets.	<ul style="list-style-type: none"> Fort Irwin/National Training Center (NTC), CA—Open the Western and Southern Expansion Areas (WEA and SEA) for training. 	On hold	Opening of the WEA has been put on hold (possibly indefinitely) due to significant ongoing delays and costs related to endangered species (desert tortoise) management and mitigation.
	<ul style="list-style-type: none"> Fort Polk/Joint Readiness Training Center (JRTC), LA—U.S. Army Corps of Engineers (USACE) complete title work and appraisals of property located in priority expansion areas and initiate formal negotiations with land owners. 	Partially completed	USACE continues to complete necessary title work and appraisals. Total acquired exceeds 41,500 acres.
	<ul style="list-style-type: none"> Fort Benning, GA—Complete the EIS to study proposed areas for training land acquisition by 4th Quarter FY2011. 	Cancelled	Suggested force structure decisions have negated the need for land expansion. As a result, Fort Benning plans to have an EIS withdrawal notice published in the federal register.

Table 3-4: Range Space Actions and Milestones (continued)
(Goal: Manage Increasing Military Demand for Range Space)

MARINE CORPS

ACTIONS	MILESTONES	STATUS	ADDITIONAL SERVICE COMMENT
<p>Define future requirements for land ranges and other areas to support training, current and projected land shortfalls, and possible courses of action to mitigate shortfalls at range complex, regional, and Service levels.</p>	<p>▶ Include range requirements analysis in regional RCMPs.</p>	Ongoing	See Table 3-1 for schedule.
	<p>▶ Facilitate enhanced cross-service utilization of range areas in Regional RCMPs. Strong relationships and an effective network of operating forces' experts and range managers provide operational planners and unit-level trainers assistance in identifying non-Marine Corps locations that can support their training requirements. Agility of operating forces' training plans is shifting somewhat to explore newer training venues for revised mission sets that span greater geographic areas. Other DoD installations are the most desired venues. Range scheduling is often problematic, as each service's unit training and pre-deployment training tempos vary and each service-level training responsibilities take primacy over other desired users. Access and transit to other public lands addresses primary requirements to connect MCLs with other DoD installations and or public lands.</p>	Ongoing	
	<p>▶ Initiate strategic-level assessment of range requirements and shortfalls regarding training land and airspace.</p>	Ongoing	Preliminary assessment prepared in FY2011; additional studies in furtherance of strategic assessment objectives per Expeditionary Force 21, Marine Corps Strategic Campaign Plan, and DPRI are ongoing, including OSD-directed Pacific Training Analysis, and Marine Corps assessments of training land requirements in the Pacific region.
	<p>▶ Continue range expansion efforts for MCAGCC Twentynine Palms.</p>	Ongoing	Lands acquired per FY2014 NDAA, efforts to acquire private lands, establish associated SUA and establish required range support/ infrastructure are ongoing. The first Large Scale Exercise in newly acquired lands is planned for August 2016.
	<p>▶ Continue range expansion planning for Townsend Bombing Range.</p>	Ongoing	ROD signed Jan 2014, Phase I land acquisition underway. Full operational capability is estimated to occur in 2019.
	<p>▶ Conduct strategic land requirements analysis.</p>	Ongoing	Presently in analysis per CMC Planning Guidance 2015, Expeditionary Force 21, and the Marine Corps Strategic Campaign Plan published in 2014.

Table 3-4: Range Space Actions and Milestones (continued)
(Goal: Manage Increasing Military Demand for Range Space)

NAVY

ACTIONS	MILESTONES	STATUS	ADDITIONAL SERVICE COMMENT
<p>Define future requirements for land training ranges and possible courses of action to mitigate land space shortfalls at Navy range complexes.</p>	<ul style="list-style-type: none"> U.S. Pacific Fleet and USFF will use the yearly Planning, Programming, Budgeting, and Execution (PPBE) cycle to identify and assess future training space requirements for Navy air, sea, and land ranges. Requirements will be based on force structure change, changes in Training and Readiness standards, and introduction of new weapon systems and missions. 	<p>Ongoing</p>	<p>The PPBE cycle will identify and validate new training range space requirements as well as trigger change input to land withdrawal requirements and budgetary input for land procurement. Validated shortfalls in range capabilities will be assessed and competed for resources during each POM development.</p>

AIR FORCE

ACTIONS	MILESTONES	STATUS	ADDITIONAL SERVICE COMMENT
<p>No current actions underway.</p>			

Table 3-5: Energy Actions and Milestones
(Goal: Address Impacts from New Energy Infrastructure and Renewable Energy Impacts)

ARMY

ACTIONS	MILESTONES	STATUS	ADDITIONAL SERVICE COMMENT
Assess on-going Army energy security projects for impact on mission.	<ul style="list-style-type: none"> Participate in the DoD Energy Subcommittee and assess strategic implications of infrastructure policy on Army training equities. 	Ongoing	

MARINE CORPS

ACTIONS	MILESTONES	STATUS	ADDITIONAL SERVICE COMMENT
Support OSD-directed energy infrastructure policy and assessments.	<ul style="list-style-type: none"> Support OSD initiatives to assess ability to support renewable energy development projects in the vicinity of military installations via the Mission Compatibility Analysis Tool (MCAT), per NDAA 2011. 	Ongoing	
Implement Marine Corps Interim Policy on Conduct of Compatibility Assessments for Off-Installation Renewable Energy Projects.	<ul style="list-style-type: none"> Establish criteria for assessing potential impacts of renewable energy development on military training ranges and airspace. Comply with requirements set forth in 32 CFR 211 for the conduct of Mission Compatibility Evaluations of renewable energy project proposals. Ensure that all echelons of MCICOM and other appropriate Marine Corps entities monitor proposed energy infrastructure development in vicinity of MCIs and military training airspace. Execute formal outreach and engagement programs with all governmental, non-governmental, private, and commercial stakeholders of renewable energy programs relevant to Marine Corps activities. Conduct formal and informal renewable energy Mission Compatibility Assessments at installation, MCI region, and Headquarters levels. 	Ongoing	
Implement the Marine Corps Expeditionary Energy Strategy.	<ul style="list-style-type: none"> Continue operations at the Marine Corps Expeditionary Energy Office (E2O) (established 2009). Plan and execute strategy to substantially reduce energy footprint of operational forces (e.g., 50% reduction in fossil fuel use by operating forces by 2025). 	Ongoing	
Implement MCI Energy Conservation Strategy.	<ul style="list-style-type: none"> Implement MCI Energy Conservation Strategy. 	Ongoing	

Table 3-5: Energy Actions and Milestones (continued)
(Goal: Address Impacts from New Energy Infrastructure and Renewable Energy Impacts)

NAVY

ACTIONS	MILESTONES	STATUS	ADDITIONAL SERVICE COMMENT
Engage renewable energy proponents to mitigate or minimize impacts on naval training.	▶ Continuously respond to requests for analysis on potential impacts to range capabilities and range space from proposed energy infrastructure on range capabilities.	Ongoing	
	▶ Use the Navy electronic management tool to conduct mission impact assessments.	Ongoing	A Navy electronic management tool is under development for use Navy-wide. Once complete, it will serve as the Navy enterprise tool for reviewing, coordinating, documenting, and reporting encroachment management activities and strategies.
	▶ Continue to interact with BOEM state renewable energy task forces to support an iterative assessment of wind energy development proposals to minimize impacts to Navy/DoD readiness requirements in federal waters.	Ongoing	
	▶ Continue to support the DoD Siting Clearinghouse in assessing renewable energy development proposal impacts.	Ongoing	

AIR FORCE

ACTIONS	MILESTONES	STATUS	ADDITIONAL SERVICE COMMENT
Engage renewable energy proponents in order to collaborate on site selections.	▶ Continue to coordinate with Department of Energy (DOE) and American Wind Energy Association (AWEA) to share data from development screening tools.	Ongoing	Air Force coordinates through Siting Clearinghouse process.
Study potential impacts and mitigation techniques.	▶ Expand Radar Toolbox to predict impacts on ASR-11 radar from wind turbines.	Complete	Air Force Flight Standards Agency is using radar toolbox for ASR-11 evaluations.
Create and field a DoD tracking and visualization tool for energy proposals.	▶ Develop MCAT.	Ongoing	Awaiting OSD evaluation of current technology.
Incorporate Energy Action into official guidance on encroachment.	▶ Develop Air Force Instruction (AFI) that includes energy encroachment initiatives.	Complete	AFI 90-2001, Encroachment Management, was published September 2014.
Prepare for increased renewable energy priority and development	▶ Participate in the White House Task Force on Wind Turbine Impacts on Radar.	Ongoing	
	▶ Engage the Bureau of Land Management (BLM) to improve siting process.	Ongoing	

Table 3-6: Climate Actions and Milestones
(Goal: Anticipate Climate Change Impacts)

ARMY

ACTIONS	MILESTONES	STATUS	ADDITIONAL SERVICE COMMENT
Assess Global Climate Change risks and vulnerabilities.	<ul style="list-style-type: none"> Track changes in range Sustainment, Restoration, and Modernization (SRM) and Integrated Training Area Management (ITAM) systems resulting from unexpected weather patterns. 	Ongoing	New Installation Status Report (ISR)-Mission Capacity metrics developed to capture weather/climate impacts.

MARINE CORPS

ACTIONS	MILESTONES	STATUS	ADDITIONAL SERVICE COMMENT
Support OSD-directed climate change policy and assessments.	<ul style="list-style-type: none"> Continue to respond to requests for data and analysis on potential climate change impacts on range operations and capabilities (as directed by OSD). 	Ongoing	
	<ul style="list-style-type: none"> Assess climate change and appropriate encroachment management actions in installation and regional ECPs. 	Ongoing	
	<ul style="list-style-type: none"> Continue leadership role at Headquarters level in DoD Clean Air Act Services' Steering Committee, Subcommittee for Global Climate Change. 	Ongoing	Marine Corps representative is currently the Subcommittee chair.

NAVY

ACTIONS	MILESTONES	STATUS	ADDITIONAL SERVICE COMMENT
Support OSD-directed climate change policy and assessments.	<ul style="list-style-type: none"> Implement DoD QDR Global Climate Change directives. 	Ongoing	
	<ul style="list-style-type: none"> Observe and assess climate change impacts and include in POM planning the specific applied climate change trends and vulnerabilities to range capabilities identified by DoD. 	Ongoing	

AIR FORCE

ACTIONS	MILESTONES	STATUS	ADDITIONAL SERVICE COMMENT
Assess Global Climate Change risks and vulnerabilities.	<ul style="list-style-type: none"> Assess climate change risks and vulnerabilities. 	Ongoing	

Table 3-7: Environmental Stewardship Actions and Milestones
(Goal: Sustain Excellence in Environmental Stewardship)

ARMY

ACTIONS	MILESTONES	STATUS	ADDITIONAL SERVICE COMMENT
Monitor the Army Range Assessment Program.	<ul style="list-style-type: none"> Continue reviews of assessments every five years. 	Ongoing	

MARINE CORPS

ACTIONS	MILESTONES	STATUS	ADDITIONAL SERVICE COMMENT
Maintain Service-wide environmental management and range sustainability programs in accordance with applicable laws and regulations.	<ul style="list-style-type: none"> Engage in national regulatory and legislative processes on issues that may potentially impact range sustainability or range readiness in coordination with the OSD. 	Ongoing	
	<ul style="list-style-type: none"> Continue to engage local, regional, and state regulatory agencies on issues that may affect range sustainability or range readiness. 	Ongoing	
	<ul style="list-style-type: none"> Explore broader, landscape-level approaches and partnerships to meet regulatory and stewardship responsibilities for natural resources (e.g., wetland and endangered species banks) at the regional and national levels in coordination with the other branches of service, the DOI, USACE, and the Environmental Protection Agency. 	Ongoing	
	<ul style="list-style-type: none"> Encourage NGOs and local communities to work on regional solutions for land use conflicts (e.g., SERPPAS and WRP). 	Ongoing	

NAVY

ACTIONS	MILESTONES	STATUS	ADDITIONAL SERVICE COMMENT
Execute Service-wide environmental management and range sustainability programs as required by law/regulation.	<ul style="list-style-type: none"> Evaluate the implementation and effectiveness of Integrated Natural Resources Management Plans (INRMPs) at the end of each FY. 	Ongoing	
	<ul style="list-style-type: none"> Continue NEPA, MMPA, and ESA compliance requirements for at-sea operational areas and range complexes. 	Ongoing	
	<ul style="list-style-type: none"> Continue to conduct range environmental assessments every five years 	Ongoing	

AIR FORCE

ACTIONS	MILESTONES	STATUS	ADDITIONAL SERVICE COMMENT
Continue environmental management and range sustainability programs.	<ul style="list-style-type: none"> Maintain active participation in Range Sustainment Initiatives, (e.g., SERPPAS and WRP). 	Ongoing	

3.2 FUNDING

Section 366(a)(3)(C) of the FY2003 NDAA requires DoD and the Military Services to report on funding requirements associated with implementing range sustainability initiatives. Four categories are used as a

frame of reference for reporting training range sustainability requirements. Descriptions and examples of the funding categories are found in Table 3-8 below.

Table 3-8: DoD SRI Funding Requirements Categories

FUNDING CATEGORY	DESCRIPTION	SPECIFIC EXAMPLES
Modernization & Investment	Research, development, acquisition, and capital investments in ranges and range infrastructure. It includes related items such as real property purchases, construction, and procurement of instrumentation, communication systems, and targets.	<ul style="list-style-type: none"> ▶ Constructing new multi-purpose training ranges at Army installations ▶ Constructing Improvised Explosive Device (IED) Defeat Lanes ▶ Upgrading Small Arms Ranges
Operations & Maintenance	Funds allocated for recurring activities associated with operating and managing a range and its associated infrastructure, including funds dedicated to range clearance, real property maintenance, and range sustainment plan development.	<ul style="list-style-type: none"> ▶ Clearing unexploded ordnance prior to range construction ▶ Implementing CivPay for Range Operators at Army installations
Environmental	Funds dedicated to environmental management of ranges, including range assessments, response actions, and natural and cultural resource management planning and implementation.	<ul style="list-style-type: none"> ▶ Conservation funding for INRMPs and Integrated Cultural Resources Management Plans (ICRMPs) ▶ Environmental mitigation costs associated with range modernization and range construction ▶ Conducting Range Assessments
Encroachment	Funds dedicated to actions optimizing accessibility to ranges by minimizing restrictions that do or could limit range activities, including outreach and buffer projects.	<ul style="list-style-type: none"> ▶ ACUB program administration and support ▶ Encroachment plans

Table 3-9 presents the funding data for FY2015 – FY2020. FY2015 actual funded levels are provided as a reference point. Data for FY2016 – FY2020 represents the requested Military Service requirements submitted for the FY2016 Presidential Budget, and should not be confused with actual funded levels for those years.

Starting with the 2010 SRR, REPI program funds, which are centrally managed by OSD, have been broken out

separately from Military Service encroachment funding for more accurate reporting. REPI funds support buffer initiatives across the Military Services and are allocated by OSD to the Military Services based on a competitive selection process that considers an assessment of threats, needs, and military priorities. Any Military Service funds budgeted for buffer projects are captured in that Military Services' encroachment lines.

Table 3-9: Service Training Range Sustainment Funding (\$M)

SERVICE*	FY2015	FY2016	FY2017	FY2018	FY2019	FY2020
ARMY	ACTUAL	REQUESTED	REQUESTED	REQUESTED	REQUESTED	REQUESTED
Modernization & Investment	\$19.5	\$75.0	\$70.9	\$44.8	\$120.7	\$112.4
Operations & Maintenance	\$378.3	\$354.7	\$359.1	\$357.6	\$355.8	\$330.8
Environmental	\$360.5	\$429.0	\$483.5	\$532.1	\$540.5	\$549.4
Encroachment	\$17.8	\$7.1	\$9.7	\$11.1	\$11.4	\$11.6
ARMY TOTAL	\$776.1	\$865.8	\$923.2	\$945.5	\$1,028.4	\$1,004.3
MARINE CORPS						
Modernization & Investment	\$0.0	\$17.9	\$23.3	\$21.9	\$32.2	\$22.3
Operations & Maintenance	\$77.3	\$77.4	\$76.6	\$76.2	\$80.4	\$79.3
Environmental	\$14.9	\$9.6	\$13.9	\$14.6	\$14.5	\$14.8
Encroachment	\$13.7	\$14.2	\$14.6	\$15.2	\$15.7	\$16.3
MARINE CORPS TOTAL	\$105.8	\$119.1	\$128.5	\$128.0	\$142.8	\$132.7
NAVY						
Modernization & Investment	\$69.9	\$70.1	\$75.8	\$77.8	\$92.9	\$77.4
Operations & Maintenance	\$183.6	\$158.3	\$182.1	\$174.4	\$179.0	\$182.0
Environmental	\$47.8	\$42.3	\$33.9	\$37.5	\$36.4	\$35.5
Encroachment	\$24.5	\$21.7	\$26.1	\$26.6	\$27.2	\$27.7
NAVY TOTAL	\$325.8	\$292.4	\$317.9	\$316.3	\$335.5	\$322.6
AIR FORCE						
Modernization & Investment	\$59.0	\$40.9	\$36.9	\$41.3	\$62.3	\$63.4
Operations & Maintenance	\$181.0	\$296.3	\$292.8	\$301.2	\$308.2	\$308.2
Environmental	\$20.0	\$20.0	\$20.6	\$21.2	\$21.9	\$21.9
Encroachment**		\$0.0	\$0.0	\$0.0	\$0.0	
AIR FORCE TOTAL	\$260.0	\$357.1	\$350.4	\$363.7	\$392.3	\$393.4
OSD/OSD						
REPI Program	***\$58.6	\$75.3	\$29.8	\$28.4	\$26.6	\$27.0
DoD						
DoD Total	\$1,526.3	\$1,709.7	\$1,749.7	\$1,781.9	\$1,925.6	\$1,880.0

*Range sustainability programs are fully represented in the Military Services' programming and budgeting processes. Program fluctuations generally reflect the best alignment of resources across competing Military Service priorities based on programming guidance and validated by the Service Chiefs and Department Secretaries.

**The Air Force tracks SRI-related funding through two channels (A3/5 and A4/7) and do not precisely sync with how the SRR defines the four categories. As a result, the Air Force is unable to report on Encroachment funds, as defined in the SRR.

***USD(P&R) contributed nearly \$4M in end of year funding to the REPI Program in FY2015.

Table 3-10 outlines Military Service explanations for fluctuations of 10 percent or greater from one year to the next. Funding requirements for range sustainability efforts are fully represented in the Military Services' programming and budgeting processes. Program fluctuations often reflect the choices Military Service Chiefs and Department

Secretaries have to make in accepting risk and balancing their total portfolios across competing priorities in a fiscal environment that continues to increase in austerity. The reasons for those fluctuations and their impacts are highlighted in the table below.

Table 3-10: Funding Fluctuation Explanation

MILITARY SERVICE	MODERNIZATION & INVESTMENT	OPERATIONS AND MAINTENANCE	ENVIRONMENTAL	ENCROACHMENT
Army	Because of planned force structure reductions, range modernization plans are being updated and a significant reduction in funding will be required to meet the needs of the force. Any further reductions in of Active or Reserve Component end strength imposed due to the Budget Control Act of 2011 may require the reprogramming of existing range modernization to updated plans but an emphasis in the continuous technology refreshing of existing capabilities will take precedence over new capability.	Because of planned force structure reductions, range operations resourcing has been reduced proportionally and results in a smaller capacity on Army ranges. This reduced capacity will include a smaller range operations workforce and prioritizing available resources to units that require a higher state of readiness. The planned reductions should be completed by FY2019 resulting in stable resources beyond FY2019.	Increase in program funding should enable better environmental management of the Army's ranges.	Fluctuations between FY2015 actual funding and out-year requested funding is largely the result of the variance between what the Army requests and what they are able to capture in year-end funding in the year of execution.
Marine Corps	Increases beginning in FY2016 reflect resource management decisions to support range expansions scheduled at MCAGCC, Twentynine Palms, and Townsend Bombing Range and to ensure critical replacement/ replenishment of high-use training systems. The Marine Corps has prioritized funding to selectively permit some level of modernization to meet emerging operational requirements tied to scheduled range expansions and to ensure critical replacement/ replenishment of high-use training systems.	The Marine Corps has prioritized funding to ensure the sustainment of current range capability. This projected level of O&M funding will ensure that current range capabilities and capacities are fully sustained across the Future Years Defense Program (FYDP).	The Operational Range Assessment program (ORAP) was previously reporting all funding to Program Management and Miscellaneous support. ORAP now only reports costs to conduct an assessment and sampling in response to that assessment. This is based on the most recent POM submitted for FY2016. No funding was expended in FY2015 on the ORAP.	Fluctuations from FY2015 through FY2017 are due to program realignments within the Marine Corps.
Navy	Changes reported in resources are relatively minor and reflect normal fluctuation given execution year fiscal management and normal changes in budget requirements that sustain range operations requirements.	O&M resources are relatively stable given the overarching fiscal environment. Increase in FY2015 is due to final approval of overseas contingency operation resources.	The decline beginning in FY2016 was due to a concentrated deep dive effort to separate Range Environmental Compliance from Environmental Compliance for accurate reporting of both Range Sustainment and Environmental Compliance.	Encroachment resources remain relatively stable.
Air Force	Fluctuations are based on R&D efforts focused on pod encryption and increased threat capabilities.	Positive fluctuation in FY2016 is an error in the Reimbursable Budget Authority line. Air Force plans to fix this error during the FY2017 POM. Funding is adequate to meet current mission requirements.	Funding data for FY2016 and beyond is a projection based on the FY2015 integrated priority list with a small inflation factor.	Not applicable; actual numbers reported via OSD.

3.3 DEFENSE READINESS REPORTING SYSTEM-RANGE ASSESSMENT MODULE

The Defense Readiness Reporting System – Range Assessment Module (DRRS RAM) provides the means to manage and report on the readiness and capability of military ranges. The DRRS RAM is intended to better integrate range assessments and readiness issues and is consistent with the Section 366(b) of the FY2003 NDAA requirement to improve readiness reporting by reflecting the training and readiness impacts caused by constraints on the use of military lands, marine areas, and airspace.

3.4 THE READINESS AND ENVIRONMENTAL PROTECTION INTEGRATION PROGRAM

The REPI Program works to protect the military's ability to accomplish its training, testing, and operational missions by helping relieve or avoid land-use conflicts near military installations through projects that prevent incompatible development; preserve off-installation habitat to address ESA regulations that restrict use of DoD training and testing lands; and support education, engagement, and regional sustainability and planning efforts. Through the REPI Program, DoD works with stakeholders to find solutions to military-community-environmental encroachment issues, in particular by supporting cost-sharing agreements between the Military Services and private conservation organizations or state and local governments to maintain compatible land uses and preserve habitats important to military installations.

These unique partnerships, authorized by Congress (10 U.S.C. § 2684a) in 2002, acquire easements or other interests in land from willing sellers to preserve compatible land uses and sustain wildlife habitat of importance to installations and ranges where the military tests, trains, and operates. By acting proactively, the REPI Program protects investments made during the previous decade to modernize and build range infrastructure and other training, testing, and operating assets, while avoiding spending on more costly alternative approaches to training or mission relocations.

OSD manages the REPI Program to provide DoD policies, standards, and oversight and to administer congressional funding for authorized projects. In addition, REPI supports

stakeholder engagement activities, participates in large landscape partnerships, and works to integrate various tools to enhance mission-supporting partnerships. It is a critical component of DoD's SRI. In light of ongoing budget constraints across DoD and for REPI partners—private and government alike—the REPI Program is pursuing a number of initiatives to create greater value and provide greater flexibility to trainers, testers, and operators.

SENTINEL LANDSCAPES

One of the REPI Program's newest and high profile initiatives is the Sentinel Landscapes Partnership with the U.S. Department of Agriculture (USDA) and the DOI. Sentinel Landscapes are places where preserving the working and rural character of key landscapes strengthens the economies of farms, ranches, and forests; conserves habitat and natural resources; and protects vital test and training missions conducted on military installations that anchor such landscapes. The Sentinel Landscapes Partnership is looking to recognize and incentivize landowners to continue maintaining these landscapes in ways that contribute to the nation's defense.

In 2015, Fort Huachuca and NAS Patuxent River–Atlantic Test Ranges became the second and third Sentinel Landscapes to be designated following the pilot at Joint Base Lewis-McChord. Both new landscapes demonstrated exceptional federal, local, private, and public coordination around protecting the unique environments, working lands and rural economies, and military missions at each location.

Across the three Sentinel Landscapes, \$14.1 million in REPI Program funds have leveraged an additional \$25.5 million from partners, including USDA's Natural Resources Conservation Service (NRCS), USFWS, USFS, BLM, states, local governments, universities, and private organizations. Under the leadership of each anchor installation and key local partners, these funds are providing technical assistance, capacity, and unique job training and research opportunities within the military mission footprint of the three Sentinel Landscapes. The joint prioritization of funding support and deliberate co-location of efforts will ultimately serve to protect the long-term testing, training, and operational capabilities of Fort Huachuca, NAS Patuxent River-Atlantic Test Ranges, and Joint Base Lewis-McChord while also achieving partners' species, habitat, and land conservation goals.

THE 2015 REPI CHALLENGE

In its fourth year, the 2015 REPI Challenge continues to reveal partner excitement and desire to innovate to protect valuable lands that support training, testing, and operations. In 2015, winning projects will leverage over \$21 million in partner funding at a greater than 3:1 match to protect 28,050 acres at three locations. As the REPI Challenge proposals show, the REPI Program is helping to broaden the scale and practices of land conservation across the U.S.

The REPI Program designed the REPI Challenge to harness the creativity of the private sector to access and leverage unconventional sources of funding, attract additional philanthropic sources, and take advantage of market-based approaches to secure the most land at the least cost. Of the 10 finalists in 2015, submissions from partners at Fort Benning and Fort Stewart in Georgia, NAS Fallon in Nevada, and NSY Portsmouth SERE School in Maine rose above and beyond in proposing innovative, larger-scale, and ambitious projects.

Fort Benning and Fort Stewart are working with a coalition of partners, including the Georgia Department of Natural Resources, the Knobloch Family Foundation, USFWS, and USFS to protect the most important available habitat, based on gopher tortoise counts, within Georgia. A REPI award of \$2 million plus another \$2 million from the Army is leveraging more than \$12 million in partner contributions to protect 7,016 acres of habitat that contains approximately 1,877 gopher tortoises. This project aims to help to preclude an ESA listing that could impact maneuver areas for all types of tactical tracked and wheeled vehicles at installations across the region.

At NAS Fallon, the Nevada Department of Wildlife, Nevada Land Trust, the Nature Conservancy, Nevada Districts Conservation Program, BLM, and NRCS are protecting three key parcels within the Fallon Range Training Complex military influence area. A REPI award of just over \$2 million will leverage more than \$4 million in partner funding to protect 11,306 acres from incompatible development to keep critical range training areas unrestricted. In addition to sustaining the mission, this project will contribute to larger efforts to reduce sagebrush habitat loss and fragmentation, restore prime greater sage grouse habitat areas, and conduct biological research.

Meanwhile, NSY Portsmouth Survival, Evasion, Resistance, and Escape (SERE) School, Trust for Public Land, Trout Unlimited, the Mountain Conservancy Collaborative, High Peaks Alliance, Maine Audubon Society, Mahoosuc

Initiative, and NRCS are working together to preserve timberlands that maintain a realistic, remote environment for SERE School field training. A REPI award of \$2 million is being leveraged more than 2:1 to permanently restrict development on 9,728 acres that will provide timber harvesting and wildlife habitat, and is part of a long-term plan to create a nationally renowned remote lands triathlon dedicated to veterans' rehabilitative services.

OFF-INSTALLATION REGULATORY SOLUTIONS

The REPI Program is also looking at innovative ways to use the various authorities Congress has provided DoD to address the Department's ESA obligations using off-installation lands. To that end, the Department entered into a strategic partnership with the USFWS and state agencies in the Southeast to focus landscape scale ecosystem restoration efforts in a manner that can help preclude species from being listed under the ESA, provide regulatory flexibility and predictability related to mission activities, and promote recovery of listed species to reduce regulatory pressure on military missions. While the effort is still underway, it is believed that this initiative holds promise to help ensure the availability of DoD's lands for critical military testing and training, now and into the future.

3.5 REGIONAL PARTNERSHIPS

DoD continues to serve as a key partner in two multistate, multiagency regional partnerships in rapidly growing areas of the country with significant military activity: SERPPAS and WRP. DoD engages in these partnerships to find ways to work across boundaries, both organizational and geographic, to explore innovative solutions and leverage resources to address increasingly complex national defense, land management, and environmental issues. By linking efforts, both of these partnerships provide a mechanism for senior policy-level federal, state, and tribal leaders to identify and develop solutions to common and emerging challenges. This type of collaborative partnering on a broader scale and scope helps to avoid duplicating work, encourages sharing best practices, and maximizes value to the taxpayer. As a result of SERPPAS and WRP, DoD has established and maintained new relationships, educated partners about the military's mission and priorities, and connected ideas and resources among these stakeholders. More specifically, these partnerships have brought together various stakeholders that operate on the same landscape and compete for resources to

address particular shared cross-boundary issues that link military readiness, conservation, and local economies through a common collaborative framework. These relationships now have the ability to help prevent, or at least mitigate, future threats to the military mission.

In August 2015, the WRP Principals voted to add Colorado to the partnership, expanding WRP's membership to six southwestern states. Colorado shares many of the unique characteristics of the other states within the WRP region, including a large military presence, majority publicly-owned land, and a semi-arid, drought-prone landscape.

3.6 OFFICE OF ECONOMIC ADJUSTMENT COMPATIBLE USE AND JOINT LAND USE STUDIES PROGRAM

The Office of Economic Adjustment's (OEA) Compatible Use and Joint Land Use Studies (JLUS) Program is the only program of direct federal assistance to help states and communities work with the Military Services to prevent and mitigate impacts where civilian community encroachment impairs military operations. Technical and financial assistance is available to state and local governments for a Compatible Use or JLUS project to partner with the local military installation to plan and carry out strategies promoting compatible civilian use adjacent to an installation complex, including related ranges, SUA, and associated military training routes and military operations areas.

Through the community-driven planning process, adjacent communities and often the state, in partnership with the installation, identify and evaluate a wide range of both existing and potential future encroachment challenges that may impair the continued operational utility of the military installation complex. The affected communities then develop a strategic action plan to identify specific actions, responsible parties, a proposed timeline, and possible funding sources to address the encroachment challenges.

More than 75 JLUS and Compatible Use projects currently are underway across the country to remedy encroachment and promote compatible civilian development. Some examples of current projects are as follows.

NAS Fallon, Nevada. The NAS Fallon JLUS, introduced in the 2015 SRR, was completed in May 2015. It includes a set of 95 recommended strategies that address the identified compatibility issues; establishment of a JLUS

Coordination Committee is key to successful implementation of the strategies. Through this committee, local jurisdictions, NAS Fallon, federal and state agencies, and other interested parties will continue their initial work together to establish procedures, recommend or refine specific actions for members, and make adjustments to strategies over time to ensure the JLUS continues to resolve key compatibility issues. Concurrent with the efforts of the JLUS Coordination Committee, each study area jurisdiction is responsible for establishing their own course of action to execute strategies unique to them through collaboration of planners, elected leadership, and the public. Since the JLUS Implementation Plan is intended to be a living document, each jurisdiction has the flexibility to revise and refine the plan for their unique circumstances and use for tracking implementation actions and progress.

Establishment of five Military Compatibility Areas (MCAs) and a Military Compatibility Development Coordination Area (MCDCA) are key strategies included in the NAS Fallon JLUS to guide compatible development and activities. The MCA and MCDCA maps illustrate the geographic areas to which each strategy in the JLUS applies. This ensures strategies are only applied to geographic areas where the compatibility issue was identified.

The MCAs were designated to accomplish the following:

- ▶ Promote an orderly transition between community and military land uses so that land uses remain compatible
- ▶ Protect public health, safety, and welfare
- ▶ Maintain operational capabilities of military installations and areas
- ▶ Promote an awareness of the size and scope of military training areas to protect areas separate from the actual military installation (e.g., critical air space) used for training purposes
- ▶ Establish compatibility requirements within the designated area, such as requirements for sound attenuation and navigation easements

Naval Base (NB) Ventura County, California. NB Ventura County, located in western Ventura County along the Pacific Ocean, encompasses four facilities under a single command: Point Mugu, Port Hueneme, San Nicolas Island, and the Sea Test Range. The installation has more than 80 tenant commands with complex, varied missions, including Research, Design, Acquisition, Testing &

Evaluation (RDAT&E), Naval Construction Forces, and operational aviation units. The 13,370-acre San Nicolas Island, one of the Channel Islands, is located within the 36,000 square mile Sea Test Range, and is used as a location for radar, telemetry, and other equipment for use in RDAT&E missions in the Sea Test Range. The Sea Test Range, with its military training route connection to the R-2508 range complex and its restricted airspace from surface to infinity, allows for unique testing and evaluation capabilities, linking air, land, and seaspace.

Compatibility challenges facing NB Ventura County include urban growth near Point Mugu; Anti-Terrorism/Force Protection and security concerns around Port Hueneme; traffic along mobilization corridors, especially between Port Hueneme and Highway 101; potential electromagnetic spectrum conflicts affecting T&E missions; and competition for land, sea, and airspace. A Point Mugu Sea Range MCA is identified in the JLUS, encompassing the entire Point Mugu Sea Range, San Nicolas Island, portions of the commercial shipping lane, restricted airspace, and military training routes. While the entire commercial shipping lane is not incorporated in the Sea Range, for the purpose of the JLUS, it is incorporated due to its potential impact to the MCA footprint. Guidance on compatibility of commercial shipping activities, vertical heights, and renewable energy development areas will apply in this MCA.

The goal of the NB Ventura County JLUS is to reduce potential conflicts between military installations and surrounding areas while accommodating new growth and economic development, sustaining economic vitality, protecting public health and safety, and protecting the operational missions of the installation. The JLUS was completed September 2015.

MCAS Yuma, Arizona. MCAS Yuma is an aviation training base located in the City of Yuma, comprising approximately 4,600 acres with two runways and access to 2.8 million acres of bombing and aviation training ranges. Home to Marine Aircraft Group 13 and the new F-35 JSF, MCAS Yuma hosts year-round rotational training and supports 80 percent of the air-to-ground aviation training for the Marine Corps. MCAS Yuma also hosts integrated exercises and aviation T&E, and conducts approximately 200,000 airfield operations annually, more than any other MCAS. MCAS Yuma is a joint use airport. Yuma County Airport Authority oversees civilian airport operations for two additional runways.

In 1952, the DOI, Bureau of Reclamation, dedicated 80 acres of land immediately north of the airfield to Yuma County for public use as a park, playground, and

fairground. A portion of the Yuma County Fairgrounds falls within the Clear Zone (CZ) and Accident Potential Zone I (APZ I) for Runways 21R/03L and 21L/03R. Concentration of people within the CZ and APZ I can pose significant encroachment challenges to military airfield operations.

The Yuma County Fair occurs each year during the first week of April, and coincides with the semi-annual Weapons and Tactics Instructors (WTI) course, which runs for six to eight weeks in April/May and September/October each year and brings upwards of 90 additional aircraft and select pilots and aircrews (approximately 2,500 personnel) from across the Marine Corps, to conduct graduate-level training activities that represent the most complex and challenging flight operations outside of combat. Aircraft are often loaded with external fuel tanks and live or inert ordnance. During the 2015 Yuma County Fair, MCAS Yuma had to alter its airfield instrument approach procedures to avoid obstructions created by fair activity.

To address public safety and flight safety concerns resulting from the close proximity of the fairgrounds to the MCAS Yuma runways, the City of Yuma has partnered with MCAS Yuma, Yuma County, Yuma County Airport Authority, and the Yuma County Fair, Inc. to complete a feasibility study and project assessment for the relocation of the Yuma County Fairgrounds. In May 2015, these parties entered into a Memorandum of Understanding (MOU) to assess possible relocation of the Yuma County Fairgrounds from its current location within the CZ and APZ I to another location within the County. The State of Arizona Military Affairs Commission agreed to provide \$200,000 toward the cost of the relocation study, provided that the remaining half of needed study cost is provided by another source. The City of Yuma requested OEA support for the remaining half of the estimated cost of the study.

The feasibility study and project assessment will provide the community and military with critical information required for decision-making regarding the future of the fairgrounds and MCAS Yuma operations. The study objectives include identifying suitable alternative fairground sites, short- and long-term cost projections for relocation, land acquisition, construction and maintenance, and utility access; developing information on constraints and options for repurposing the existing fairgrounds; and identifying environmental conditions and impacts, surrounding densities and zoning, noise levels, and proximity to projected growth for the alternative sites. The feasibility study is projected for completion in July 2016.

3.7 DOD NATURAL RESOURCES PROGRAM

DoD's Natural Resources Program enables military mission-critical training, testing, operations, and other readiness activities by ensuring continued access to realistic habitat conditions, while simultaneously working to sustain our nation's natural heritage. It does this by providing policy, guidance, and oversight of natural resources management activities across the approximately 25 million acres of military land, air, and water resources owned or managed by DoD.

DoD lands are critically important places where we train personnel and test equipment to prepare our service men and women to properly execute mission requirements. These lands are also home to more threatened, endangered, and at-risk species per acre than are overseen by any other federal land management agency, including over 400 listed as threatened or endangered and nearly 520 at-risk of needing listing protection. In FY2004, Congress amended the ESA to recognize the significant contributions that installation INRMPS make to promote the recovery of listed species. The amendment states that where the USFWS or NMFS determines that an INRMP provides a conservation benefit to a species for which critical habitat has been proposed, the USFWS or NMFS need not designate critical habitat on the military lands encompassed by that INRMP. This is because INRMPS provide protections as good as, or often better, than the protections afforded by critical habitat designation. Since the amendment was passed, 57 installations and satellite facilities have used INRMP exclusion based on the amended language, 23 have used it more than once, for over 100 unique species (recent occurrences were primarily for Hawaiian plants). Since 2006, only one installation has used the readiness exclusion [ESA Section 4(b)(2)], which was for two coral species.

In 2009, Congress amended Section 103(a) of the Sikes Act to authorize the use of cooperative agreements to maintain and improve off-installation natural resources where doing so may relieve or eliminate current or anticipated restrictions to military activities. This provision allows installation commanders to address some portion of their conservation responsibilities—especially those related to ESA-listed and candidate species—by supporting natural resources projects off their installations, resulting in installation land preservation to support military training and testing. DoD's Natural Resources Program is partnering with DoD's REPI Program

and OEA's community-driven JLUS planning process to develop collaborative, habitat-based projects that benefit on-installation flexibility by conserving resources outside installation boundaries.

These collaborative efforts have resulted in meaningful and mutually beneficial outcomes. Highlights in 2015 include DoD issuance of new guidelines for streamlined INRMP reviews to clarify and describe the process for reviewing and concurring on updates to existing INRMPS, and the incorporation of these guidelines into the updated USFWS Sikes Act Guidance. This new policy will save DoD and USFWS significant man-hours and countless delays in getting INRMPS approved. Through further coordination, DoD also completed a new Amphibian and Reptile Conservation and Management Strategic Plan, providing technical guidance to ensure amphibian and reptile inventory and biological information are up-to-date; implementing habitat-based management strategies; promoting proven conservation partnerships; and minimizing encroachment by listed and at-risk species and/or their habitat. In support of the White House Pollinator Initiative, DoD renewed and expanded its policy to promote pollinator protection and management on military installations. DoD also updated an MOU with the Pollinator Partnership to establish a framework for cooperative programs that promote the conservation and management of pollinators, their habitats and associated ecosystems.

3.8 DOD CLIMATE CHANGE INITIATIVES

During 2015, DoD worked to execute the strategy outlined in the 2014 DoD Climate Change Adaptation Roadmap. The first goal outlined in the Roadmap is to identify and assess the effects of climate change across the Department. DoD has focused initial efforts on screening the many assets, policies, and programs to identify those that are already experiencing damage and/or impacts to mission from the phenomena usually associated with a changing climate. These include flooding due to storm surge, flooding due to extreme precipitation, wind, extreme temperatures (both heat and cold), wildfires, and drought. This screening level vulnerability assessment survey process was completed in late 2015 and results are being analyzed for implications and trends. A report is expected to be completed in early 2016. This is just the first phase of an on-going process to identify what needs to be further assessed.

DoD is continuing to update policies and procedures for incorporation of the consideration of future climate changes. The procedures section of the recently issued DoD Instruction (DoDI) 3200.21, "Sustaining Access to the Live Training Domain," requires DoD Components to identify and evaluate the risks to training and range capability from the impacts of climate change as part of their planning process. Specifically, DoD Components are requested to consider increases in severe weather events, temperature, sea level, and changes to land cover and vegetation and precipitation as well as effects on threatened, endangered, or species at risk. DoD Components are also required to use DoD adopted climate scenarios and predictive tools to qualify and quantify these risks.

Climate change does not recognize political boundaries and DoD understands that the communities outside our fences must respond to the same effects as we do. In October 2014, DoD launched a series of climate change adaptation planning pilots to work with communities to develop intergovernmental planning processes and procedures for implementation that could be replicated across the Department. The Military Departments were each asked to identify a location for a pilot and they identified Michigan (Army National Guard); Mountain Home, Idaho (Air Force); and participation in the Old Dominion University-led Greater Hampton Roads, Virginia (Navy). The pilots are underway and completion is expected in mid-2016. Status reports indicate they are well received in the communities and progress is good.

In order to take a systematic and consistent approach to considering climate risk, DoD issued DoD Directive 4715.21, "Climate Change Adaptation and Resilience" on January 14, 2016. The directive articulates DoD's policy to integrate consideration of climate change in existing and future policies, processes, procedures, and operations, and DoD Component roles and responsibilities.

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4 | EVOLVING SRI ACTIVITIES AND EMERGING ISSUES

As DoD's SRI has continued to mature over the last 14 years, range capabilities have also developed to meet evolving and shifting encroachment challenges. The following subsections highlight some focus areas that are growing within SRI designed to meet burgeoning challenges.

4.1 NEW SRI-RELATED INFLUENCES AND ACTIONS

DoD continues to evolve in its approach to managing encroachment-related issues on its military training ranges. In 2015, USD(P&R) published two new DoDIs. DoDI 3200.21, "Sustaining Access to the Live Training Domain," outlines DoD policies, responsibilities, and procedures for DoD encroachment planning. Specifically, 3200.21 addresses encroachment challenges, appropriate stakeholder engagement and partnering, managing training resources using sound environmental principles, and records maintenance to account for training range inventory and associated activities. DoDI 3200.16, "Operational Range Clearance," outlines the policies, responsibilities, and procedures the Department follows to preserve the long-term use of its training ranges and reduce the acute safety hazards and costs associated with cleanup if the range is closed or transferred outside DoD control.

DoD acknowledges the recommendation set forth in the Senate Armed Services Committee (SASC) Report 11-49, "Military Training Ranges for Special Operations Forces," to include a review of the general capabilities, critical issues, and future capabilities necessary for ranges supporting unique Special Operations Forces (SOF) training requirements. In response to the SASC recommendation, DoD will incorporate the specifically identified topic areas for any affected SOF training ranges

into future SRRs. Per the SASC report, DoD, in coordination with the Air Force, is reporting separately on these requirements for 2016 for the Melrose Range.

4.2 BUDGET REDUCTIONS IMPACTING RANGE CAPABILITY

Implications from the Budget Control Act of 2011 continue to remain an impediment to DoD and the Military Service's ability to maintain readiness. The decrease in total obligation authority necessitated changes to force structure, current and future readiness, O&M, R&D investments, as well as acquisition programs in competition for DoD appropriations to effectively balance competing requirements across the Department as well as within each Military Service. Coupled with this are congressionally mandated procurement and expenses that further compound fiscal constraints. Each Service weighs current versus future readiness in an attempt to achieve an executable POM strategy. The readiness accounts for each of the Military Services are the training enablers that ensure forces are proficient and prepared to deploy for contingencies across the range of military operations, including major combat operations. Continual decrements to these readiness-funding accounts are delaying range modernization plans and negatively impacting range capacity and throughput as range operations support functions are reduced.

4.3 FOREIGN INVESTMENT AND NATIONAL SECURITY

The Department remains focused on the issue of foreign investment activities located in proximity to military training and testing areas. The potential persistent

surveillance and collection capabilities afforded foreign entities through investment in assets near military training and testing equities presents significant national security and encroachment challenges to DoD. Multiple Services have addressed this issue in this year's report and DoD continues to develop strategies designed to mitigate the impacts to training and testing from foreign investment and national security encroachment.

In 2014, the Government Accountability Office (GAO) released a report evaluating the risk to DoD ranges and installations from foreign investment encroachment and the Department's ability to address these risks. DoD concurred with the recommendations stemming from this report. Specifically, DoD is pursuing opportunities to obtain information related to foreign investment and transactions in proximity to DoD activities from agencies with land and airspace management authority. DoD and BOEM have initiated a pilot project to develop a process that will provide information regarding transactions near submerged lands of the outer continental shelf (OCS). DoD is also considering legislative relief as an avenue to mitigate national security-related encroachment and has engaged the various federal land managers to expound on potential issues related to DoD concerns.

In addition, DoD is developing guidance to plan and conduct a risk assessment of testing and training ranges and installations to assess vulnerabilities and potential impacts from foreign investment in response to one of the recommendations in the GAO study, GAO-15-149, "DEFENSE INFRASTRUCTURE: Risk Assessment Needed to Identify if Foreign Encroachment Threatens Test and Training Ranges." The Navy has piloted a similar risk assessment process for Navy training and testing ranges and airspace. DoD also recently submitted "Security of Defense Report to the Congressional Defense Committees Security Risks Related to Foreign Investment in the United States" in response to House Report 113-466 of the FY2015 NDAA. The unclassified report includes an assessment of current statutory and regulatory framework governing real property transactions involving the federal government and foreign-controlled entities within the United States as they relate to military readiness and national security, as well as recommendations for improving the existing framework. Two classified case studies were also submitted to Congress as an annex to the report. The Department will continue to report on progress related to interagency coordination, legislative relief efforts, and internal planning and risk assessment efforts in next year's SRR.

4.4 THREATENED AND ENDANGERED AND CANDIDATE SPECIES

DoD continues to work with the USFWS to address the 251 multi-district litigation candidate species for which USFWS is required by court order to make listing determinations by September 2017. As discussed in the previous chapter of this report, DoD is working with the Southeast Region of USFWS to develop a model process that would encourage military installations to contribute to habitat management and enhancement on private, state, and federal lands in return for greater predictability concerning the need for future ESA-related restrictions on DoD lands. This effort is in its early stages but is a promising undertaking that benefits all parties involved.

4.5 DEMAND FOR ELECTROMAGNETIC SPECTRUM

DoD operations in the air, on land, on and under the sea, in space, and in cyberspace are fundamentally dependent on use and control of electromagnetic spectrum. It is essential that training activities (both on-range and off-range) also articulate the need for spectrum dependent systems (SDS) and capabilities, to ensure that warfighting capabilities are honed and that warfighters are proficient in the associated TTP. All joint functions, such as movement and maneuver, fires, command and control, intelligence, protection, sustainment, and information exchange, are accomplished with systems that use spectrum. The DoD depends on access to spectrum to evaluate and maintain the readiness of our forces.

In comparing the DoD's use of spectrum in training activities versus real operations, the training community requires access to more RF spectrum than the forces need during real operations. In addition to the spectrum needed to support warfighting systems, spectrum is needed to support training-related SDSs that provide a "training support wrapper" to:

- ▶ Replicate the electromagnetic profile that would be presented by the adversary forces—to provide realistic training for U.S. Signals Intelligence and Electronic Attack components

- ▶ Control/coordinate synthetic representations of adversary forces—to reduce the cost of training by replacing live elements with synthetic replicas
- ▶ Exchange ground truth position and other data—to support real time casualty assessment and kill notification/removal

Electromagnetic spectrum access to support warfighter training activities continues to be a challenge and any additional loss of spectrum will directly impact DoD's ability to conduct live training. To address this challenge, DoD continues to focus on spectrum efficiency, flexibility, and adaptability to accelerate the fielding of technologies that enable spectrum sharing and improve access opportunities. The Department is also positioning to increase the agility of DoD spectrum operations, moving toward advanced assignment tools and technology to compress the usage requirements, along with modified policies, regulations, and standards, to enable DoD to exploit improvements to SDS spectrum flexibility and facilitate spectrum sharing.

DoD systems will become more spectrally efficient, flexible, and adaptable, and DoD spectrum operations will become more agile to increase the opportunities available to mission planners. This includes many factors, such as increasing the operating frequency range of systems; increasing the ability to share spectrum with other systems (domestic or foreign, federal, non-federal, or commercial); amending DoD processes pertaining to spectrum use; increasing the speed of system adaptation; becoming more tolerant of interference; and developing near-real-time spectrum operations that integrate spectrum management and training operations. The Department plans to use proceeds from the spectrum Relocation Fund to prototype a waveform capability designed to meet the training community's needs and cohabitate with LTE cellular devices.

Continued Congressional support to ensure the Department maintains access to spectrum in the future is critical to maintaining the readiness of our forces.

4.6 CONTINUED GROWTH IN DOMESTIC USE OF UNMANNED AERIAL SYSTEMS

In recent years UASs have been widely used to perform a variety of overseas military missions including collecting critical intelligence data, taking lethal action, and

enhancing situational awareness. Current UAS capabilities span a broad spectrum, ranging from small systems (e.g., Raven, Dragon Eye, and Pointer), through tactical-level systems (e.g., Shadow, Hunter), theater-level systems (e.g., Predator), and finally up to the national-level systems (e.g., Global Hawk). Increased requirements to man and train the proliferation of remotely piloted aircraft (RPA) and UAS operators has continued to drive a strong demand for suitable training ranges and adequate airspace. Coupled with these requirements to perform advanced level training to maintain proficiency and combat readiness standards across the Military Services are the increased demands on electromagnetic spectrum allocations to enable realistic inter-operability with manned units and prevent interference from the proliferation of commercial off-the-shelf devices.

The primary purpose of domestic UAS training and exercises is for DoD forces to conduct realistic training in their core mission areas. Since domestic UAS training presents unique legal, privacy, and coordination issues, the use of these systems must be in accordance with standing DoD regulations and policy. This includes applicable laws, regulations, and agreements concerning UAS operations in the National Airspace System (NAS), which reflect extensive consultation between the DoD and the FAA. Currently, the Secretary of Defense is the approval authority for all domestic Homeland Defense, Defense Support of Civil Authorities, and National Guard state support UAS operations, including DoD UAS operated by National Guard personnel in Title 32 or State Active Duty status. The current defense policy guidance regarding domestic UAS use is captured in Deputy Secretary of Defense Policy Memorandum 15-002, "Guidance for the Domestic Use of Unmanned Aircraft Systems," dated February 17, 2015.

The proximity of military training areas to the FAA-controlled NAS remains an issue, but great strides have been made to alleviate this issue through interagency policy, procedure, and the continued introduction of ground-based sense-and-avoid and airborne sense-and-avoid (GBSAA) systems. Previous RAND studies have identified the unique limitations of UASs pertaining to operations in the NAS that can make integration into home station training difficult. Currently, UASs can only operate in restricted military airspace or in the NAS with certificates of authorization from the FAA. DoD is exploring ways to increase stateside training with UASs while minimizing the impact on the NAS. Part of this effort involves expanding the amount of restricted airspace located near units flying small-sized UASs that

have limited range and flight duration. As more restricted airspace becomes available to these units, access to the NAS becomes less of a requirement. Additionally, for those units employing larger UAS platforms (with greater range and loiter ability), less-cumbersome procedures for gaining access to the NAS must be adopted in order to facilitate training opportunities.¹

Recent developments that show promise to enhance domestic training with UASs are the GBSAA technologies. These technologies are designed to open up regions of civil airspace for properly equipped UASs by allowing them to operate safely in accordance with the FAA's mandate to "do no harm." It would also allow them to operate without requiring certificates of authorization to be issued. After several successful demonstrations of GBSAA, the Army is planning to equip a number of its UAS training bases with this technology in order to extend current military airspace into adjoining civil airspace. By doing this, the Army hopes to increase its UAS training capacity by 2015. Moreover, even though the Army is leading the development of GBSAA, this technology is designed for use by all the Military Services.²

4.7 EARLY COORDINATION WITH RENEWABLE ENERGY INDUSTRY

DoD has highlighted the issue of encroachment due to wind energy development and the substantial impacts to ranges and training capability it can create in previous SRRs. While DoD and the renewable energy industry have made progress with wind energy planning and siting in compatible areas, significant challenges due to renewable energy development remain. Project proposals continue to increase and the potential for conflict with military activities is still a major concern. Many of the challenges and impacts of renewable energy siting in proximity to DoD ranges and operating areas can be addressed early in the project planning process. Early discussion and consultation with DoD greatly improves the chances for compatible siting of renewable energy projects and avoidance or successful mitigation of impacts to military training and readiness. Project developers should engage DoD at the earliest possible time in the development process to gauge the compatibility of their project with

military mission activities, radar operations, and range capability. By forgoing early consultation with DoD, developers risk late-notice barriers associated with potential impacts to DoD that can stall projects late in planning and development phases.

In 2013, DoD issued a primer on renewable energy siting considerations in partnership with the Natural Resources Defense Council. The primer is an excellent reference that provides early consultation information and procedures that address compatibility with military training and test requirements. In addition, the DoD Siting Clearinghouse is the Department's focal point for coordination of renewable energy project reviews. Developers are encouraged to contact the Clearinghouse at the earliest possible time to request an informal review of potential impacts to DoD's mission.

OEA announced a funding opportunity for community planning assistance to help prevent the siting of energy projects from adversely affecting DoD's test, training, and military operations in an April 3, 2015, Federal Register Notice. OEA will consider on a continuing basis, subject to available appropriations, proposals for grant assistance to support communities, regions, and states to assist in the siting of energy project investments so they do not impair the continued operational utility of a DoD installation. A proposal must respond to the need to ensure proposed energy projects may proceed without compromising DoD's test, training, and military operations.

4.8 OFFSHORE OIL AND GAS DEVELOPMENT

The Military Services conduct a number of mission readiness activities across multiple areas of the OCS. The Navy uses the airspace, sea surface, sub-surface, and seafloor of the OCS for events ranging from instrumented equipment testing to live-fire exercises. The Air Force conducts flight training and systems testing over extensive areas on the OCS. Marine Corps amphibious warfare training extends from offshore waters on to the beach and inland. The OCS provides unique training and range capability resources critical to DoD testing, training and operations.

¹ Rostker, Bernard D. [and ten others] (2014). Building Towards a UAS Training Strategy (Report No. RR-440-OSD). Washington D.C.: RAND National Defense Research Institute. 34-5.

² Ibid., 40-1.

In an ongoing partnership with the DOI and BOEM, DoD continues to evaluate energy resource development on the OCS for potential impacts to military readiness. In 2015, the Office of the Assistant Secretary of Defense (Readiness) and representatives from the Military Services have worked extensively with the BOEM Office of Strategic Resources to complete DoD's input related to the *2017-2022 Outer Continental Shelf Oil and Gas Leasing Draft Proposed Program*. DoD conducted a comprehensive analysis of mission compatibility with offshore oil and gas development in the planning areas included in the 2017-2022 draft proposed program. The assessment was finalized and submitted to BOEM in December 2015.

4.9 DOD'S LONG-TERM SRI OUTLOOK

Effective training is the cornerstone for success in carrying out DoD's missions. Ensuring effective training will continue to challenge the Department through this period of constrained budgets, rapidly evolving military capabilities, competition for the land, sea, air, and electromagnetic spectrum that training requires, and evolving threats. Training ranges give our nation's military personnel the space to develop and sharpen their warfighting skills, maximizing the probability of mission success and reducing our losses. DoD ranges must provide the capacity and capabilities needed for effective training. Through the SRI and related efforts, DoD continues to work to sustain the capability to train on its ranges, airspace, and seaspace.

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APPENDIX A | RANGE INVENTORY

NDAA Section 366(c) specifically details the requirement for DoD and the Military Services to develop and maintain an inventory of operational ranges. DoD maintains an inventory of its ranges, range complexes, military training routes, and special use areas and has reported this inventory annually in previous SRRs. For this year's SRR, DoD is providing Congress with only that inventory information that has changed from the last year's report.

The Army is the only Military Service with changes to its inventory. For the Army, several updates and corrections to acreage were made to improve the overall accuracy of the information reported. Those Army ranges with acreage changes are presented in Table A-1.

USD(P&R) will ensure the Military Services review and update their inventories annually and report any necessary changes to Congress.

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Table A-1: Army Training and Testing Range Complex Inventory Updates

RANGE COMPLEX	UNITED STATES (US) OR OVERSEAS (OS)	STATE OR COUNTRY	COMMAND/ COMPONENT	Range Descriptions				Range Type											
				LAND AREA FOR RANGES (ACRES)	SPECIAL USE AIRSPACE (SQ NM)	SEA SURFACE AREA (SQ NM)	UNDERWATER TRACKING AREA (SQ NM)	AIR-TO-AIR OR AIR-TO-SURFACE	AIR-TO-GROUND	LAND MANEUVER	LAND IMPACT AREA	LAND FIRING RANGE	C2W/EW	OCEAN OPERATING AREA	MOUT	UNDERWATER TRACKING RANGE	AMPHIBIOUS AREA	OTHER	
Bog Brook/ Riley Deepwoods Training Site	US	ME	ARNG	799	0	0	0	N	N	Y	N	N	N	N	N	Y	N	N	Y
Camp Ashland	US	NE	ARNG	671	0	0	0	N	N	Y	N	N	N	N	N	N	N	N	Y
Camp Blanding	US	FL	ARNG	68883	0	0	0	N	N	Y	Y	Y	N	N	Y	N	N	Y	
Camp Butner	US	NC	ARNG	4378	0	0	0	N	N	Y	Y	Y	N	N	N	N	N	Y	
Camp Grafton	US	ND	TRADOC	9949	0	0	0	N	N	Y	N	Y	N	N	N	N	N	Y	
Camp Guernsey	US	WY	ARNG	80307	46	0	0	N	N	Y	Y	Y	N	N	Y	N	N	Y	
Camp McCain	US	MS	ARNG	12659	0	0	0	N	N	Y	Y	Y	N	N	N	N	N	Y	
Camp Rilea	US	OR	ARNG	1649	0	0	0	N	N	Y	Y	Y	N	Y	N	N	Y	Y	
Camp Robinson	US	AR	ARNG	30870	0	0	0	N	N	Y	Y	Y	N	N	Y	N	N	Y	
Catoosa Volunteer Training Site	US	TN	ARNG	1572	0	0	0	N	N	Y	Y	N	N	N	N	N	N	Y	
Eglin AFB (ALARNG)	US	FL	ARNG	33196	0	0	0	N	N	Y	N	Y	N	N	N	N	N	N	
Fort Custer Training Center	US	MI	ARNG	7403	0	0	0	N	N	Y	Y	Y	N	N	Y	N	N	Y	
Fort Lee	US	VA	TRADOC	2323	69	0	0	N	N	Y	Y	Y	N	N	N	N	N	Y	
Fort Pickett	US	VA	ARNG	38841	161	0	0	N	N	Y	Y	Y	N	N	Y	N	N	Y	
Greenlief Training Site	US	NE	ARNG	3160	0	0	0	N	N	Y	N	Y	N	N	Y	N	N	Y	
Milan Volunteer Training Site	US	TN	ARNG	2388	0	0	0	N	N	Y	N	Y	N	N	N	N	N	N	
MTA Camp Dodge	US	IA	ARNG	3719	0	0	0	N	N	Y	Y	Y	N	N	Y	N	N	Y	
Ravenna Training and Logistics Site	US	OH	ARNG	6254	0	0	0	N	N	Y	Y	Y	N	N	N	N	N	Y	
Tulahoma MIL RES	US	TN	ARNG	7931	0	0	0	N	N	Y	N	Y	N	N	N	N	N	Y	

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APPENDIX B | ABBREVIATION LIST

Table B-1: Abbreviation List

ACRONYM	DESCRIPTION
AC	Active Component
ACUB	Army Compatible Use Buffer
AFI	Air Force Instruction
APZ I	Accident Potential Zone I
ASN EI&E	Assistant Secretary of the Navy Energy, Environment, and Installations
ASW	Anti-submarine Warfare
ATLS	Army Training Land Strategy
AWEA	American Wind Energy Association
BARSTUR	Barking Sands Tactical Underwater Range
BLM	Bureau of Land Management
BOEM	Bureau of Ocean Energy Management
CJMT	Combined Joint Military Training
CMAGR	Chocolate Mountains Aerial Gunnery Range
CNMI	Commonwealth of the Northern Mariana Islands
CONUS	Continental United States
CPG	Marine Corps' Planning Guidance
CSE	Center Scheduling Enterprise
CZ	Clear Zone
DHS	Department of Homeland Security
DoD	Department of Defense
DoDI	DoD Instruction
DOE	Department of Energy
DOI	Department of the Interior
DON	Department of the Navy
DPRI	Defense Policy Review Initiative
DRRS RAM	Defense Readiness Reporting System – Range Assessment Module

Table B-1: Abbreviation List (continued)

ACRONYM	DESCRIPTION
E2O	Expeditionary Energy Office
EA	Environmental Assessment
EAP	Encroachment Action Plan
ECP	Encroachment Control Plan
EIS	Environmental Impact Statement
ESA	Endangered Species Act
FAA	Federal Aviation Administration
FIS	Facility Investment Strategy
FY	Fiscal Year
FYDP	Future Years Defense Program
GAO	Government Accountability Office
GBSAA	Ground Based Sense and Avoid Airborne
GPS	Global Positioning System
GTCA	Gopher Tortoise Conservation Areas
ICRMP	Integrated Cultural Resources Management Plan
IED	Improvised Explosive Device
INRMP	Integrated Natural Resources Management Plan
IPL	Integrated Priority List
ISR	Installation Status Report
ITAM	Integrated Training Area Management
ITE	Integrated Training Environment
JLUS	Joint Land Use Study
JPMRC	Joint Pacific Multinational Readiness Capability
JRTC	Joint Readiness Training Center
JSF	Joint Strike Fighter
LVC-IA	Live, Virtual, Constructive - Integrating Architecture
MAGTF	Marine Air Ground Task Forces
MCA	Military Compatibility Area
MCAGCC	Marine Corps Air Ground Combat Center
MCAS	Marine Corps Air Station
MCAT	Mission Compatibility Analysis Tool
MCB	Marine Corps Base

Table B-1: Abbreviation List (continued)

ACRONYM	DESCRIPTION
MCDCA	Military Compatibility Development Coordination Area
MCI	Marine Corps Installation
MCICOM	Marine Corps Installations Command
MCRD	Marine Corps Recruit Depot
MCRP	Mission Capable Ranges Program
MCSCP	Marine Corps Service Campaign Plan
MDLP	Multiple District Litigation Plan
MEB	Marine Expeditionary Brigade
MILCON	Military Construction
MMPA	Marine Mammal Protection Act
MOU	Memorandum of Understanding
MOUT	Military Operations in Urban Terrain
NAS	National Airspace System
NAS	Naval Air Station
NAWDC	Naval Air Warfare Development Command
NAWS	Naval Air Weapons Station
NB	Naval Base
NDAAs	National Defense Authorization Act
NEPA	National Environmental Policy Act
NGO	Non-Governmental Organization
NMFS	National Marine Fisheries Service
NRCS	Natural Resources Conservation Service
NSAWC	Naval Strike and Air Warfare Center
NSWC	Naval Special Warfare Command
NTC	National Training Center
OCS	Outer Continental Shelf
OEA	Office of Economic Adjustment
O&M	Operations and Maintenance
OOS	Ocean Observing System
OPNAV	Office of the Chief of Naval Operations
ORAP	Operational Range Assessment Program
OSD	Office of the Secretary of Defense

Table B-1: Abbreviation List (continued)

ACRONYM	DESCRIPTION
PACOM	U.S. Pacific Command
PCM	Pinon Canyon Maneuver Site
PGM	Precision Guided Munitions
PMRF	Pacific Missile Range Facility
POM	Program Objective Memorandum
PPBE	Planning, Programming, Budgeting, and Execution
PUTR	Portable Underwater Training Range
QDR	Quadrennial Defense Review
R&D	Research and Development
RCMP	Range Complex Management Plan (Navy/Marine Corps)
RCMP	Range Complex Master Plan (Army)
RCTC	Regional Collective Training Capability
RDAT&E	Research, Design, Acquisition Testing & Evaluation
REPI	Readiness and Environmental Protection Integration
RFMSS	Range Facility Management Support System
ROD	Record of Decision
RPA	Remotely Piloted Aircraft
SASC	Senate Armed Services Committee
SDS	Spectrum Dependent Systems
SEA	Southern Expansion Area
SERPPAS	Southeast Regional Partnership for Planning and Sustainability
SGAT	Solar Glare Hazard Analysis Tool
SOCAL	Southern California Offshore Range Complex
SOF	Special Operations Forces
SRI	Sustainable Ranges Initiative
SRM	Sustainment, Restoration, and Modernization
SRR	Sustainable Ranges Report
SUA	Special Use Airspace
T&E	Test and Evaluation
TECOM	Training and Education Command
TSPI	Time Space Position Information
TTP	Tactics, Techniques, and Procedures

Table B-1: Abbreviation List (continued)

ACRONYM	DESCRIPTION
U.S.C.	United States Code
UAS	Unmanned Aircraft System
USACE	U.S. Army Corps of Engineers
USD(P&R)	Under Secretary of Defense for Personnel and Readiness
USDA	U.S. Department of Agriculture
USFF	U.S. Fleet Forces Command
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
WDZ	Weapon Danger Zone
WEA	Western Expansion Areas
WRP	Western Regional Partnership
WTI	Weapons and Tactics Instructors
WTRIM	Wind Turbine Radar Interference Mitigation

