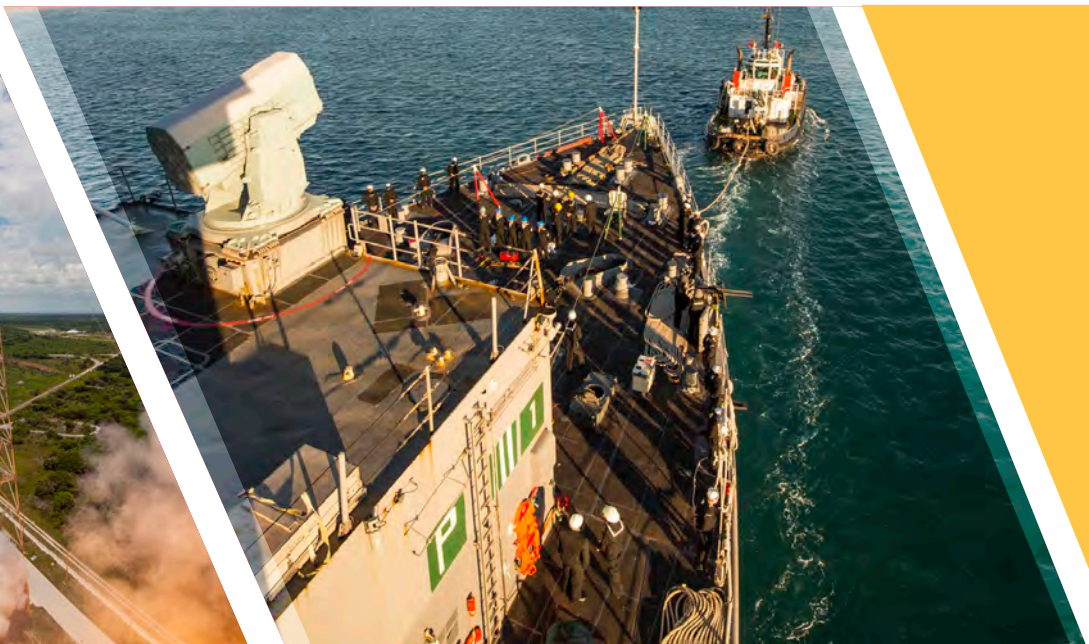




2020 Report on REPI Program Outcomes and Benefits to Military Mission Capabilities

Department of Defense
Office of the Assistant Secretary of Defense for Sustainment
Readiness and Environmental Protection Integration (REPI) Program



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EXECUTIVE SUMMARY

The Department of Defense's (DoD) Readiness and Environmental Protection Integration (REPI) program is a key tool for combating encroachment that can limit or restrict military training, testing, and operations. The REPI program facilitates cost-sharing partnerships between the Military Departments, other federal agencies, state and local governments, and private conservation organizations to help relieve or avoid land use conflicts near military installations and address regulatory restrictions that inhibit military activities. These partnerships, authorized by Congress in 10 United States Code (U.S.C.) § 2684a, preserve and enhance military readiness by providing base and range commanders with the flexibility necessary to optimally conduct their critical missions. This report leverages data submitted by the Military Services to demonstrate the REPI program's outcomes and benefits to military readiness. The report's key findings are summarized below.

ENCROACHMENT IS THREATENING MILITARY INSTALLATIONS AND RANGES ACROSS THE COUNTRY

Encroachment, defined as pressures adversely affecting the military's use of testing, training, and operational lands, is a widespread and growing challenge that DoD must continue to address. Based on available REPI project data, the three most common restrictors of military activity are noise complaints, tall structures, and danger or safety zone regulations. As discussed in Section 2, 91 percent of the 66 proposals submitted in fiscal year (FY) 2020 report at least one of these three restrictions. Accordingly, a majority of REPI funds seek to mitigate or prevent these restrictions.

ENCROACHMENT IMPACTS ARE SET TO EXPAND RAPIDLY IN THE NEAR FUTURE

Section 2 highlights the ongoing trend of natural and agricultural buffer lands converting to residential and commercial properties that restrain military operations. Family farms and large timber companies are declining while transportation, utility, and other infrastructure networks are expanding across lands that were previously viewed as undesirable to developers. The rapid expansion of development has and will continue to exacerbate a challenging situation for installations and ranges. Roughly half of properties targeted by the Military Services as part of their most recent REPI project funding requests are at risk of incompatible development within six months and another quarter within the next two years. Protection of these parcels is time sensitive. Once these lands are subdivided and developed, the loss of their military training value is likely irreversible. For example, a rifle range was permanently closed at Camp Butner which is located north of Durham, North Carolina, due to noise complaints. Helicopter training noise complaints have grown recently, and with even more development near Camp Butner expected, operations could be further restricted.

ESSENTIAL MISSION CAPABILITIES ARE INCREASINGLY CHALLENGED BY ENCROACHMENT

Encroachment currently restricts or potentially threatens a wide variety of mission-critical activities across air, land, sea, and frequency spectrum domains. Specifically, encroachment is threatening fixed-wing and rotary-winged flight training, unmanned aircraft system operations, and radar and navigation activities. Section 3 illustrates that

the acreage protected through REPI helps to preserve or enhance specific critical capabilities.

REPI'S MINIMAL INVESTMENT HELPS TO PROTECT DOD'S HIGH-VALUE ASSETS FROM COSTLY WORKAROUNDS

REPI is preserving and enhancing valuable DoD assets for a small fraction of what it costs to build, modernize, and replace them. The Department spends billions of dollars in military construction (MILCON), capital improvement, and maintenance of its facilities and equipment. To modernize and maintain unfettered access to key capabilities for decades into the future, DoD must leverage tools to protect these assets from known or potential encroachment threats. Section 4 validates REPI as an effective and cost-efficient way to preserve and enhance the military's capabilities. For example, Joint Base San Antonio – Camp Bullis leveraged \$7 million in DoD funding with almost \$27M million in external partner contributions to help preserve or enhance \$108 million in MILCON investments to accommodate the installation's expanding force and training capabilities such as \$8 million for 21 ranges, a shoot house, and a combined arms combat training facility. In fact, the sum of all assets and capabilities supported by REPI and valued between \$1 million and \$100 million is over \$5.9 billion.

REPI HAS SAVED THE DEPARTMENT OF DEFENSE \$850 MILLION BY LEVERAGING PARTNER CONTRIBUTIONS TO COMPLETE TRANSACTIONS

The REPI program is a cost-effective and efficient approach to sustaining military readiness. The program helps to prevent suboptimal test and training, costly construction of new ranges to replace encroached assets, and relocation of operational missions. Since Congress enacted 10 U.S.C. § 2684a in 2002, REPI partnership agreements have attracted contributions from federal agencies, state and local governments, conservation organizations, and other private organizations that nearly match the investments made

by the Department. Through partnerships, the REPI program has achieved a total cost savings of over \$850 million, close to 50 percent, for DoD through FY 2019.

While 13 REPI projects are already complete, the Military Services are proposing new projects and requesting funding for existing projects every year as described in Section 5. Through the end of FY 2019, DoD has protected 16 percent of land targeted for protection using 10 U.S.C. § 2684a. By preserving and enhancing essential mission capabilities, the REPI program is ensuring our country's most critical defense infrastructure and assets are available to build a more lethal and resilient combat force in the foreseeable future.



1

OVERVIEW AND PURPOSE OF THE ANALYSIS

The Department of Defense's (DoD) Readiness and Environmental Protection Integration (REPI) program is a key tool for curbing encroachment that can limit or restrict military training, testing, and operations. These activities can be grouped into one of the following three general categories: incompatible land uses, environmental restrictions driven by the presence of imperiled species and their habitats, and the improvement of military installation resilience. Through partnerships with other federal agencies, state and county governments, and conservation organizations, the program preserves or enhances mission capabilities by relieving or avoiding land-use conflicts near installations and mitigating regulatory restrictions.

This report summarizes over 15 years of REPI data submitted by the Military Services to quantify the program's value to the military mission. The data shows the extent of known or potential land use conflicts, the REPI projects that address these conflicts, and overall investments in and benefits to military capabilities. It does not capture the numerous qualitative benefits resulting from the REPI program. For example, REPI stimulates innovative and diverse relationships between DoD and external partners that improve the understanding of each organization's priorities, an important step in preventing future restrictions on the military mission.

Information included in this report reflects project objectives submitted and verified by the Military Services through the FY 2020 proposal process to request REPI funding. Additionally, this report utilizes accomplishment data reported by the Military Services through FY 2019. To prepare this report, the REPI program office reformatted, aggregated, and summarized underlying data to provide the following analysis.



2

REPI'S MITIGATION AND PREVENTION OF MAJOR ENCROACHMENT THREATS TO MILITARY ACTIVITY

DoD's ability to conduct realistic live-fire training and weapons system testing is vital to preparing Service men and women, and their equipment, for real-world combat. There is a direct relationship between realistic training and success on the battlefield. In short, "We fight like we train, so we train like we fight."

Since the late 1990s, DoD has grown increasingly concerned about "encroachment"—pressures adversely affecting the military's use of training and testing lands. At the time, DoD identified two main encroachment threats: nearby incompatible land uses and Endangered Species Act (ESA) regulatory restrictions on DoD lands intended to protect imperiled species and their habitats. Within these two broad categories, many distinct types of threats have emerged. Below are examples of how development near installations, ranges, and operating areas can affect training, testing, and operations:

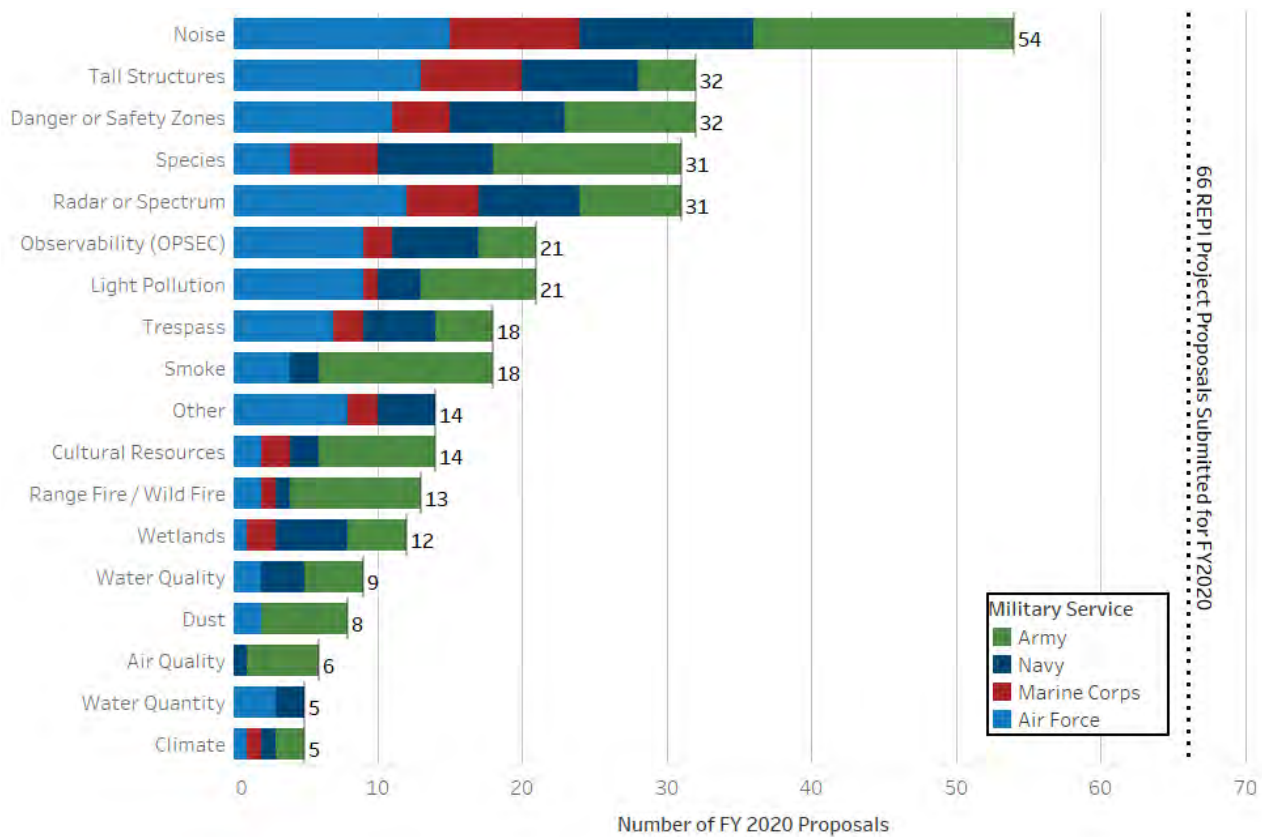
- Light from developments near installations and ranges reduces the effectiveness of night-vision training
- Residents near installations and ranges complain about the noise, dust, and smoke generated by military activities, resulting in restrictions on the timing, frequency, and types of training activities
- Competition for electromagnetic spectrum limits critical communication activities and the number of unmanned aircraft systems able to operate at a given time
- Communication towers, wind turbines, energy transmission lines, and other tall structures near or through military areas may interfere with DoD utilized airspace, radars, and sensitive testing equipment

- Land development that destroys or fragments endangered species habitat around DoD lands increases DoD's responsibility to manage species habitat on DoD less-developed land

Over time, the impacts of these pressures multiply, ultimately resulting in diminished capabilities. For example, a rifle range was permanently closed at Camp Butner which is located north of Durham, North Carolina, due to noise complaints. Helicopter training noise complaints have grown recently, and with even more development near Camp Butner expected, operations could be further restricted.

The number of REPI proposals that identified various types of encroachment threats in FY 2020 is presented in Figure 1. Of the 66 proposals the Military Services submitted for FY 2020, 91 percent report that at least one of these encroachment threats—noise, danger or safety zones, and tall structures—affect their installations. The Military Services submitted 54 proposals to address noise complaints and pressure to avoid noise impacts, making noise the most commonly-reported threat. Encroachment threats from danger or safety zones, including accident potential zones (APZs), and the presence of tall structures are tied for the second most common encroachment threats listed in proposals. Tall structures surpassed the species impact encroachment threat to rise into the top three, primarily due to a rise in the number of proposals in the past year from Marine Corps projects. Potential or existing mission restrictions resulting from regulatory actions to protect threatened and endangered species are still just as prevalent, but impacts from tall structures are becoming an increasingly significant issue.

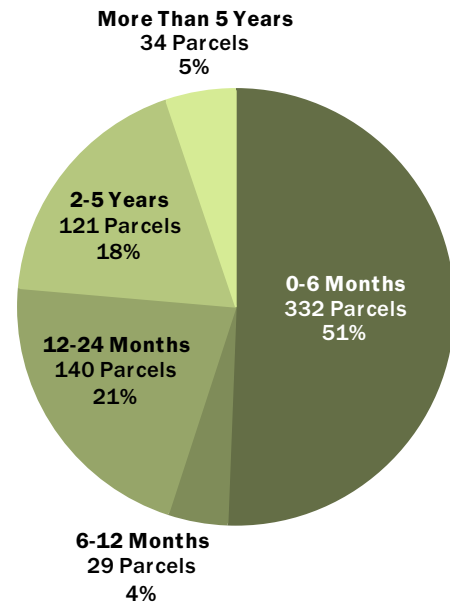
Figure 1 Encroachment Threats Identified in FY 2020 REPI Proposals¹



Source: FY 2020 REPI Proposals from the Military Services

Most of these threats are driven by growing pressure to develop open lands. Property ownership continues to shift as large landholdings convert to smaller, subdivided units. In many cases, younger family members that inherit farmland decide to pursue other occupations. At the same time, large timber companies no longer have the same markets available to keep their working forests economically viable. These macro level factors, in combination with access to expanded local transportation, utility, and other infrastructure networks across lands once considered less attractive to developers, are compromising vital spaces that DoD counts on to buffer their testing, training, and operations. Figure 2 illustrates the estimated timeframe for potential incompatible development of parcels proposed for FY 2020 funding. Over half of the proposed parcels are projected for development within the next six months, making protection initiatives for those acres especially time sensitive. As a result, there

Figure 2 Estimated Timeframe for Potential Incompatible Development of Parcels Targeted in FY 2020 REPI Proposals



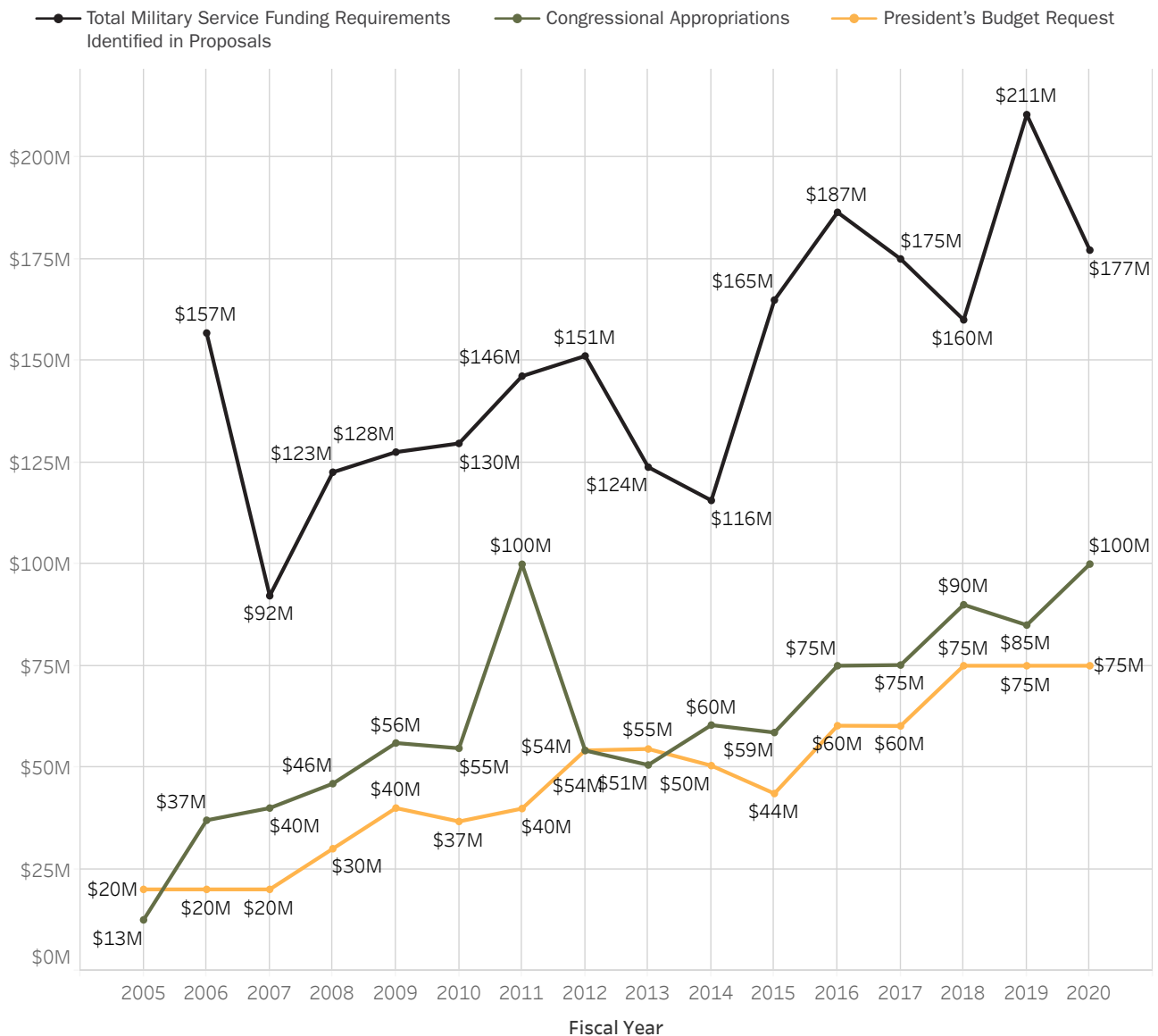
Source: FY 2020 REPI Proposals from the Military Services

¹ Projects may select multiple encroachment threats. Projects that reported more than one encroachment threat are included in all categories selected. Installations that did not submit an FY 2020 proposal are not included. These totals do not reflect the severity of the threat, nor do they include encroachment pressures mitigated by other means. For underlying data by Military Service, see Table 1 in Appendix B.

resilience. These win-win partnerships leverage DoD investments with significant funding from other federal, state, local, and private sources to share the cost of acquisition of easements, development rights, or other interests in land from willing sellers near installations and ranges. As envisioned, the partner usually holds title to the easement subject to the right of the Military Service to demand or transfer the title if deemed necessary to ensure the property stays compatible with the mission. As suburban sprawl and the number of potential ESA listings grow across the country, the

ability to leverage non-DoD contributions through REPI partnerships to relieve restrictions is becoming even more important. REPI projects are shielding installation assets and operational capability from encroachment at various Army, Navy, Marine Corps, and Air Force installations, joint bases, ranges, and reserve centers. All DoD installations in the United States and its territories are eligible for REPI program funds. Figure 3 displays new, in progress, and completed REPI projects across the country as of the end of FY 2019.

Figure 4 REPI Program Funding History



Source: REPI Proposals from the Military Services

THE BASICS OF REPI PROJECT FUNDING

The REPI program leverages funds and resources between DoD, other federal agencies, state and local governments, and private conservation organizations to finance encroachment mitigation and prevention efforts. On the DoD side, there are two specific types of funding for REPI partnerships:

- **REPI program funds** – Provided by Congress as a line-item appropriation in DoD’s annual budget. The Military Services submit proposals requesting REPI funds on an annual basis. These funds are then obligated to projects based on the outcomes of the proposal process. Historically, REPI program funds have accounted for 32 percent of total project costs.
- **Military Service funds** – Army, Navy, Marine Corps, or Air Force can expend Operations and Maintenance (O&M) or Research, Development, Test, and Evaluation funding to assist in financing their respective projects. Since the program’s inception, approximately 21 percent of total project costs have been covered by Military Service expenditures.

DoD partner contributions to REPI projects account for approximately half of total project costs to date. Partner contributions include other federal grants, state and local grants or cost savings programs, private capital from conservation partners, bargain sales or donations from willing landowners, and in-kind services provided by partners. Leveraging REPI funds with these partner contributions is vital because the total Military Service funding requirements greatly exceed available funding, as illustrated in Figure 4. This investment by DoD and its partners continues to demonstrate the value of REPI partnerships to Congress and the taxpayers.



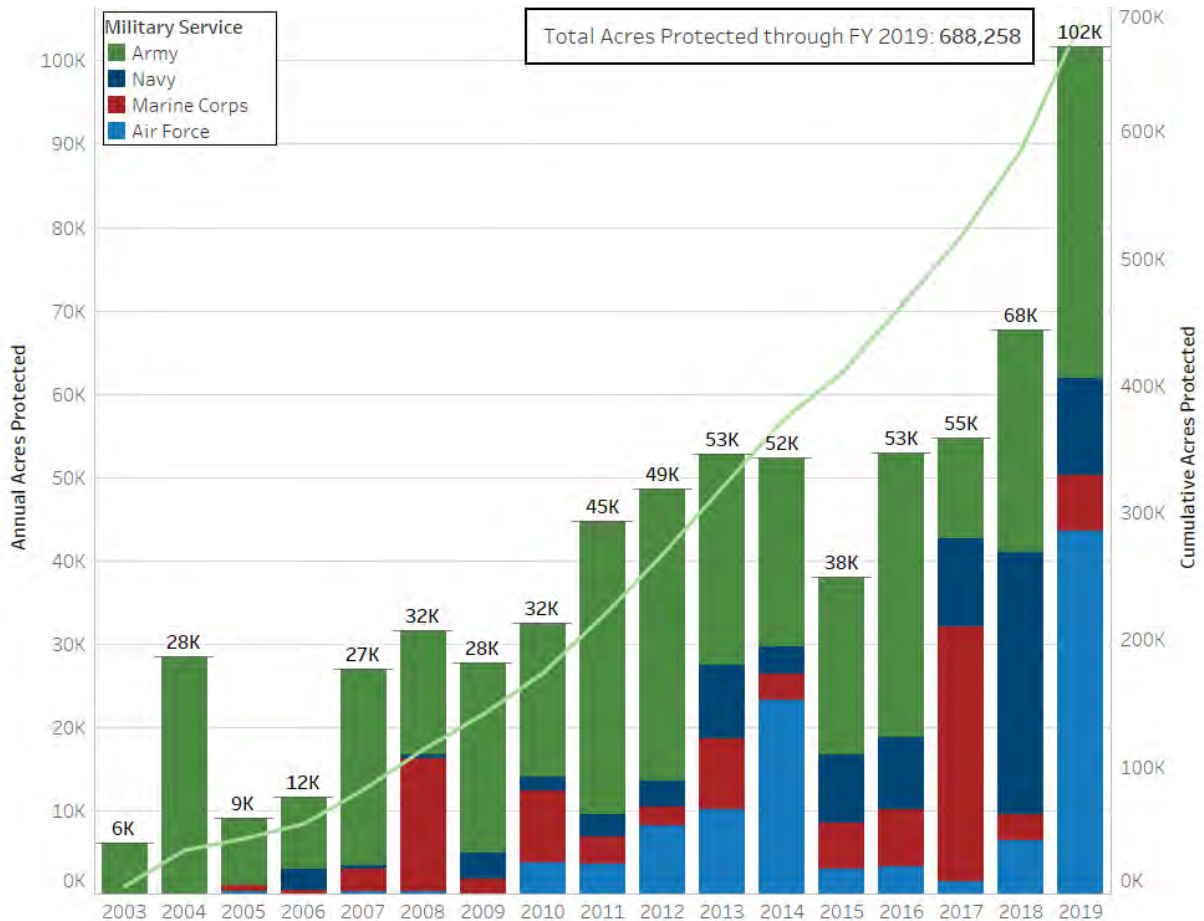
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THE REPI PROGRAM HAS PROTECTED ALMOST 700,000 ACRES SINCE INCEPTION

DoD and its partners have protected over 688,000 acres at 109 REPI projects in 33 states through the end of FY 2019. These protected lands enable installation commanders to successfully accomplish

their vital testing, training, and operational missions with fewer impediments. As illustrated in Figure 5, the number of protected acres has steadily increased over time, commensurate with the level of DoD and partner

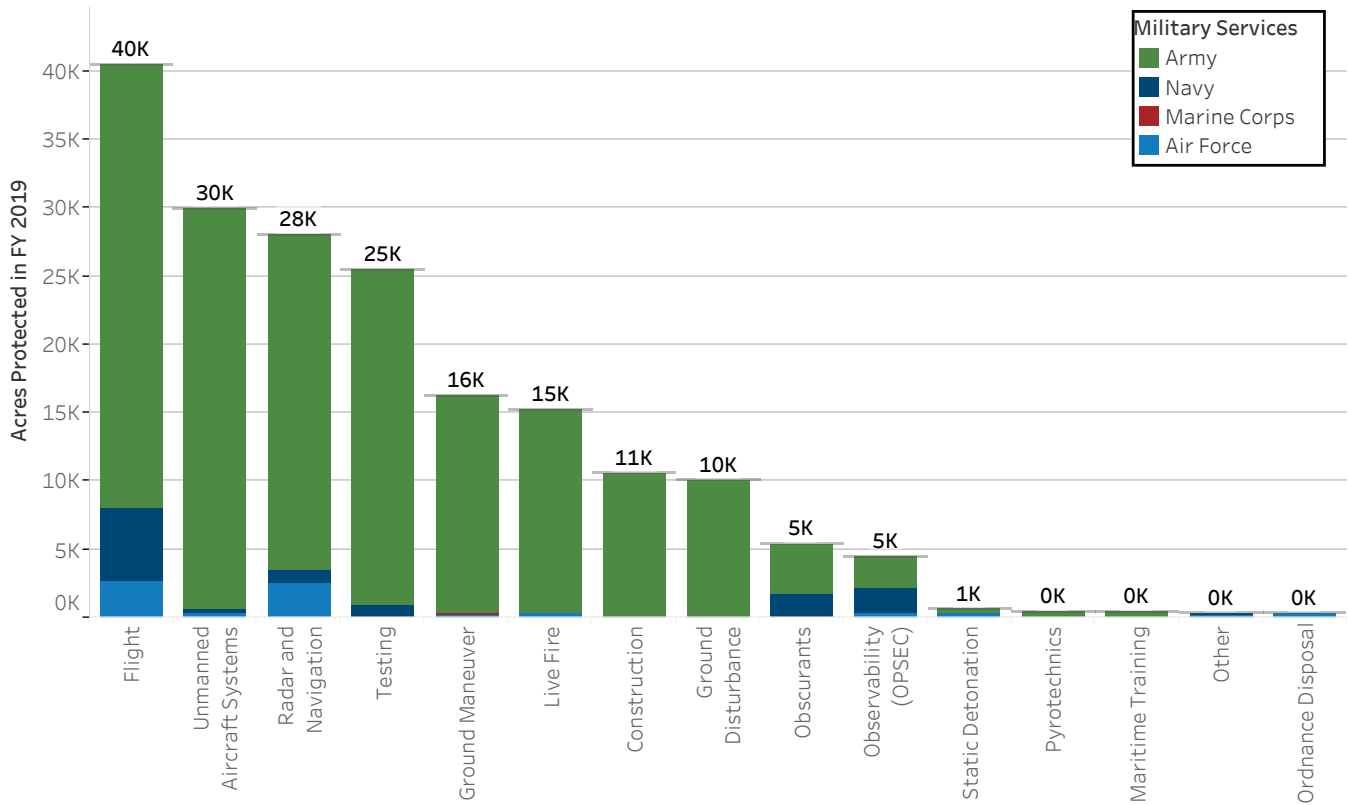
Figure 5 Total Acres Protected by REPI Projects through FY 2019³



Source: Execution Data Submitted by the Military Services in the REPI Database through FY 2019

³ Data is current as of the end of FY 2019, as reported in the 2020 REPI Report to Congress. Includes reported land protection efforts prior to 2003. For underlying data by Military Service, see Table 2 in Appendix B.

Figure 6 Acres Protected in FY 2019 to Preserve or Enhance Mission Capabilities⁴



Sources: REPI Proposals Submitted by the Military Services, Execution Data Submitted by the Military Services in the REPI Database in FY 2019

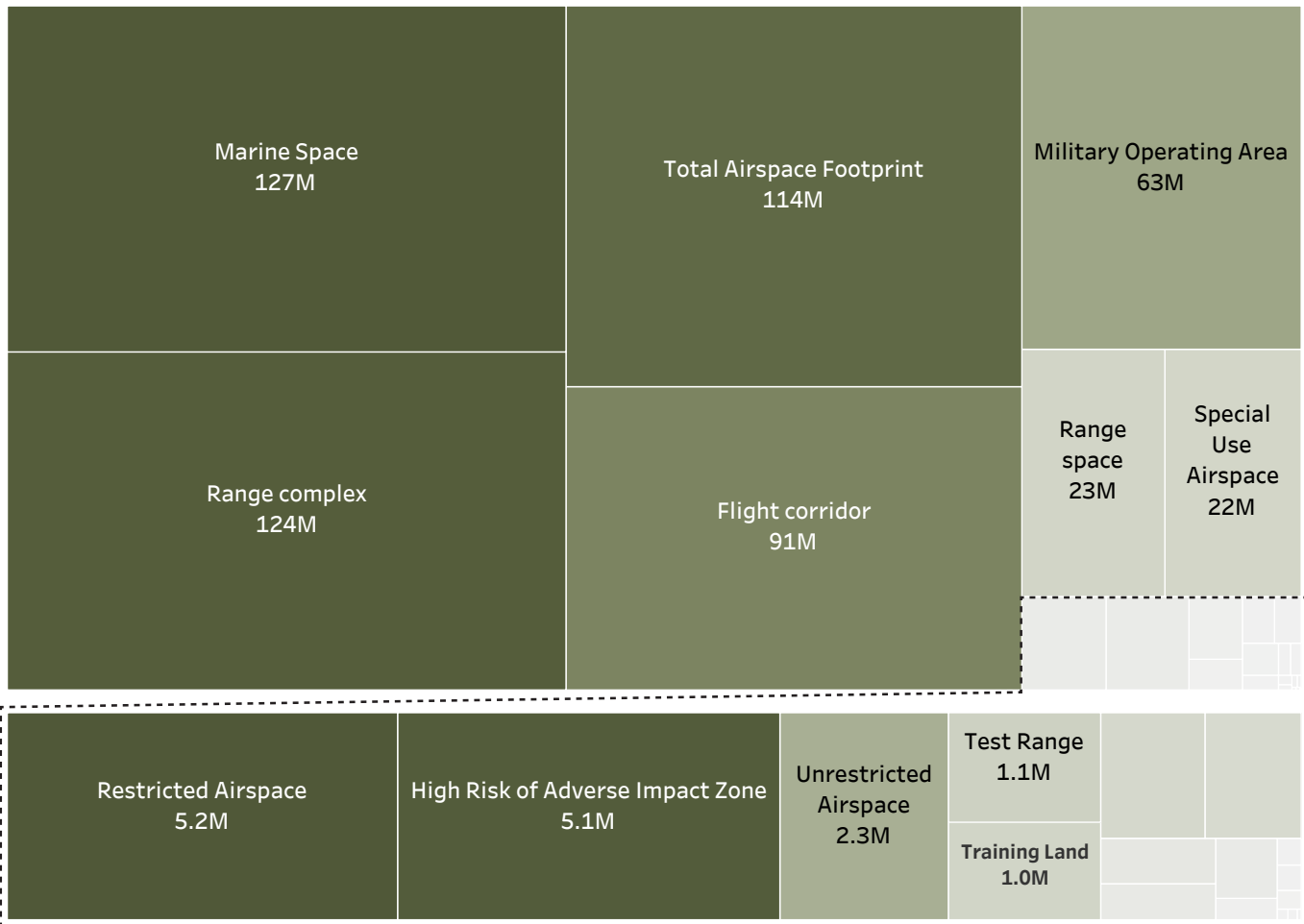
investments over that same period. Availability of funding, local real estate markets, landowner interest, and due diligence requirements can significantly impact the scale and timeline for completing individual transactions. The significant growth in FY 2019 can be attributed to REPI’s single largest closing in history at Melrose Air Force Base, protecting over 30,000 acres. In addition to protecting lands by obtaining a real property interest, DoD and partners are also making investments in restoring and managing wildlife habitat on some of these off-base lands if those conservation activities eliminate or relieve current or anticipated environmental restrictions on military activities.

Each REPI project must support the local military installation or range mission as required by 10 U.S.C. § 2684a or 16 U.S.C. § 670c-1. These mission benefits reflect test training, and operational capabilities that are currently restricted or could potentially be restricted in the future absence of REPI. The 2018 Sustainable Ranges Report to Congress captures DoD’s training range inventory. Of the 339 training ranges reported, the Military Services identified 78 that represent the greatest share of military training activity in the United States and its territories. Out of those 78 key training ranges, 37 ranges (47 percent) have a REPI partnership.⁵ While REPI is a useful tool for preserving or enhancing the capabilities of these

⁴ The Military Services may select multiple mission capabilities for each parcel. Acres protected are included in all mission capability categories displayed if the Military Services reported more than one for any given parcel. REPI began collecting parcel-level mission capability data in FY 2017; as a result, many executed parcels still do not contain this information even though the data gap is improving each year. Excludes 45,403 acres for parcels that were protected in FY 2019 but do not have any corresponding mission capability data. Acreage data is current as of the end of FY 2019. For underlying data by Military Service, see Table 3 in Appendix B.

⁵ Source: 2018 Sustainable Ranges Report to Congress from the Office of the Secretary of Defense, Under Secretary of Defense (Personnel and Readiness).

Figure 7 Area (millions of acres) and Length (miles) of DoD Assets that FY 2020 REPI Proposals Seek to Preserve or Enhance



Length Asset Values:
Military Operating Area: 6,675.8 Miles (99.2%)
Runway: 45.8 Miles (0.7%)
Airfield: 5.77 Miles (0.1%)

Source: FY 2020 REPI Proposals from the Military Services

ranges, the absence of a suitable encroachment threat or interested funding partner may require alternative solutions at other locations.

Figure 6 shows that the top three mission capabilities supported by the most by protected acreage in FY 2019 were fixed-wing and rotary-winged flight training, unmanned aircraft system operations, and radar and navigation activities. These capabilities are primarily driven by the active Army and Army National

Guard’s efforts to reduce encroachment impacts to their installations. This is emphasized in this year’s analysis, as the Army’s efforts were the main reason that the unmanned air systems and radar and navigation capabilities rounded out the top three mission capabilities preserved or enhanced. With this focus, the number of acres benefitting unmanned air systems and radar and navigation increased by 27,000 and 26,000 acres, respectively. These two replaced mounted and dismounted ground maneuver

⁶ Projects may not provide asset capacities as part of their REPI proposals. These totals reflect asset capacities reported in the FY 2020 REPI proposals and should not be interpreted as comprehensive statistics for the entirety of REPI projects nationwide. Assets at installations that did not submit an FY 2020 proposal are not included. Submissions using linear units (e.g., miles) to describe traditionally multi-dimensional assets (e.g., range complex, airspace) or using multi-dimensional units (e.g., acres) to describe traditionally linear assets (e.g., flight corridor, runway) are not included. Nautical miles and square nautical miles were converted to miles and acres, respectively. Not all items are depicted to scale.

exercises as well as air-to-ground, artillery, small arms, and large caliber live fire activities from last year's report, even though the total acres protected for these two capabilities still increased. It is important to note that a single parcel can support multiple mission capabilities, and protected parcels for which the Military Services reported more than one mission capability are displayed in all associated categories. Additionally, some protected parcels do not have listed mission capabilities, so these values are excluded from the analysis entirely. The REPI program has increasingly emphasized reporting this data by parcel to better link parcel protection to mission.

The total training, testing, or operating capacity within the boundary or control of the installations that REPI projects are seeking to shield from encroachment encompasses over 580 million acres, as shown in Figure 7, which includes military areas on land, in the air, and over water. Through REPI, installations are preserving and enhancing their largest assets — including more than 127 million acres of marine space, 124 million acres of range complexes, and 91 million acres of critical flight corridors. They are also protecting smaller but significant assets, such as 46 miles of runways. Unrestricted use of these assets is critical for realistic testing and training that supports mission success and increases the lethality of our military.

Aggregated statistics on annual usage or throughput of mission capabilities that REPI projects seek to preserve or enhance by mitigating encroachment are depicted in Figure 8. One such example is the continued preservation of Lompoc Valley, Miguelito Canyon, and Dangermond Preserve near Vandenberg Air Force Base, all of which are critical to maintaining the capacity for over 400 air runway operations and 13 space launches annually.

In the process of developing this report, the REPI program has continued to identify and develop new data collection methods and sources that will enable the program to better analyze and communicate benefits to the Military Services and their missions in future reports.

⁷ Projects may not provide usage and throughput data as part of their REPI proposals. These totals reflect usage and throughput data reported in the FY 2020 REPI proposals and should not be interpreted as comprehensive statistics for the entirety of REPI projects nationwide. Usage and throughput data from installations that did not submit an FY 2020 proposal are not included.

Figure 8 Examples of Annual Usage or Throughput of Mission Capabilities Preserved or Enhanced by REPI⁷



Source: FY 2020 REPI Proposals from the Military Services

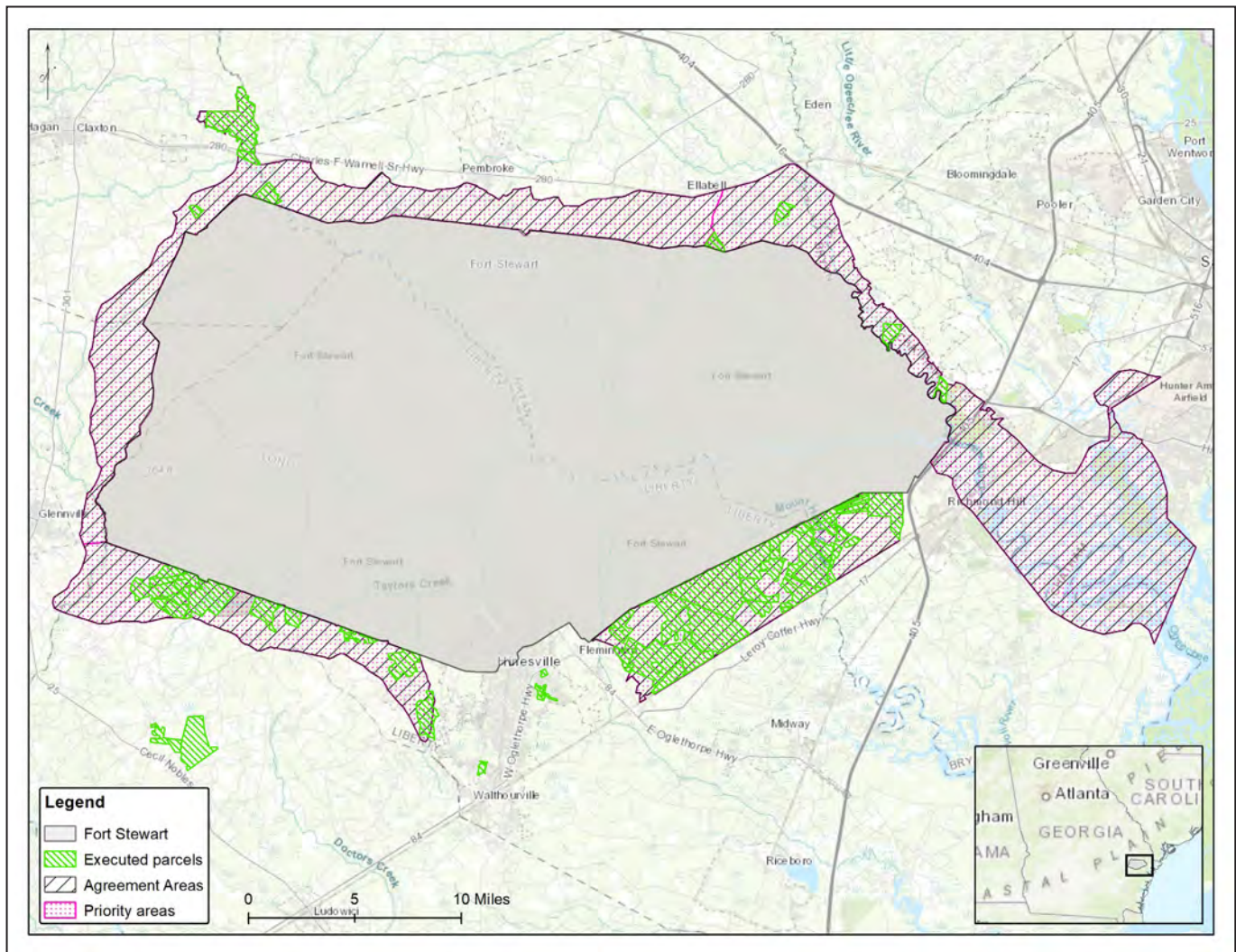
Fort Stewart

Overview

The REPI project at Fort Stewart and Hunter Army Airfield, the largest Army installation east of the Mississippi River, has helped to protect and preserve lands containing red-cockaded woodpecker (RCW) habitat and minimize potential restrictions from endangered species regulations on installation operations. These acquisitions continue to reduce threats to Fort Stewart’s mission capabilities related to smoke and noise complaints from neighboring communities. By protecting ranges for armored vehicles, a live fire training site, and a large region of special use airspace, the REPI project has preserved the installation’s ability to train up to 50,000 service members each year.

Encroachment Threats

Prior to FY 2010, Fort Stewart operated under on-base regulatory restrictions related to the presence of the endangered RCW and its habitat. These restrictions caused “go-slow” zones around the base and restricted training realism. In an effort to lift these restrictions, Fort Stewart implemented prescribed burning to improve and maintain the longleaf pine habitat for the RCW and other at-risk species. Although the prescribed burning removed all on-base restrictions related to the RCW, it produces significant amounts of smoke that can disrupt residential and commercial operations outside the base. By offering solutions to further mitigate encroachment threats, the REPI project can help the installation manage increased impacts from smoke and training noise caused by Georgia’s accelerating population growth.



REPI Solution

The REPI project has helped Fort Stewart protect almost 40,000 acres surrounding the base. Along the southeast border, where development pressure is greatest, 20,770 acres have been protected. This protected area, the installation's largest, helps shield two airfields, a staging field, and manned and unmanned aircraft airspace from the restrictions posed by incompatible development around the towns of Hinesville and Flemington. Shifting focus to the southwest border, the installation and its partners are taking action to protect almost 10,000 more acres. In the northeast area, the Army has worked with the Georgia Department of Natural Resources, The Nature Conservancy, and other partners to conserve significant wetlands along the Ogeechee River and other lands at the installation's border.

Fort Stewart participates in conservation planning initiatives including Georgia's State Wildlife Action Plan, the Chatham-Savannah Metropolitan Planning Commission, and smaller initiatives revolving around the Longleaf Alliance, Coastal Regional Commission, and Georgia Department of Natural Resources. These efforts influenced Fort Stewart to expand its use of DoD conservation programs, implement traditional tools such as zoning and noise attenuation, and improve regional planning and coordination. Recent successes include the creation of a Unified Zoning Ordinance, an Airfield Overlay District, and a DoD-USDA-DOI Sentinel Landscape designation, all of which have helped address encroachment around the installation.

Return on Investment

Fort Stewart has leveraged **\$58.6 million** in DoD funding with **\$31 million** in partner contributions to permanently prevent incompatible development on over **39,000 acres** surrounding the installation. Much of this land is also critical in reducing and preventing further on-base restrictions related to the presence of the endangered RCW. This REPI investment has helped to preserve or enhance at least **\$288 million** in critical assets and mission capabilities including:

- Total Training Land: **\$285 million**
- Range Complex: **\$3 million**

Partners

- Chatham County
- City of Savannah
- The Conservation Fund
- Georgia Department of Natural Resources
- Georgia Forestry Commission
- Georgia Land Trust
- Knobloch Foundation
- The Longleaf Alliance
- The Nature Conservancy
- The Trust for Public Land
- USDA – Natural Resources Conservation Service
- USFWS
- USFS

About Fort Stewart

Fort Stewart, hosts over 280,000 acres for the Army's 3rd Infantry Division, the 1st and 75 Ranger Battalions, the 3rd Combat Aviation Brigade, and 165th Air Wing. With multiple drop zones, armored vehicle gunnery ranges, helicopter gunnery ranges, small arms ranges, and livefire maneuver areas, the installation can train up to 50,000 soldiers per year. Fort Stewart's proximity to multiple deep water ports and access to the Hunter Army Airfield also play a critical role in equipping and deploying soldiers and their gear anywhere worldwide.



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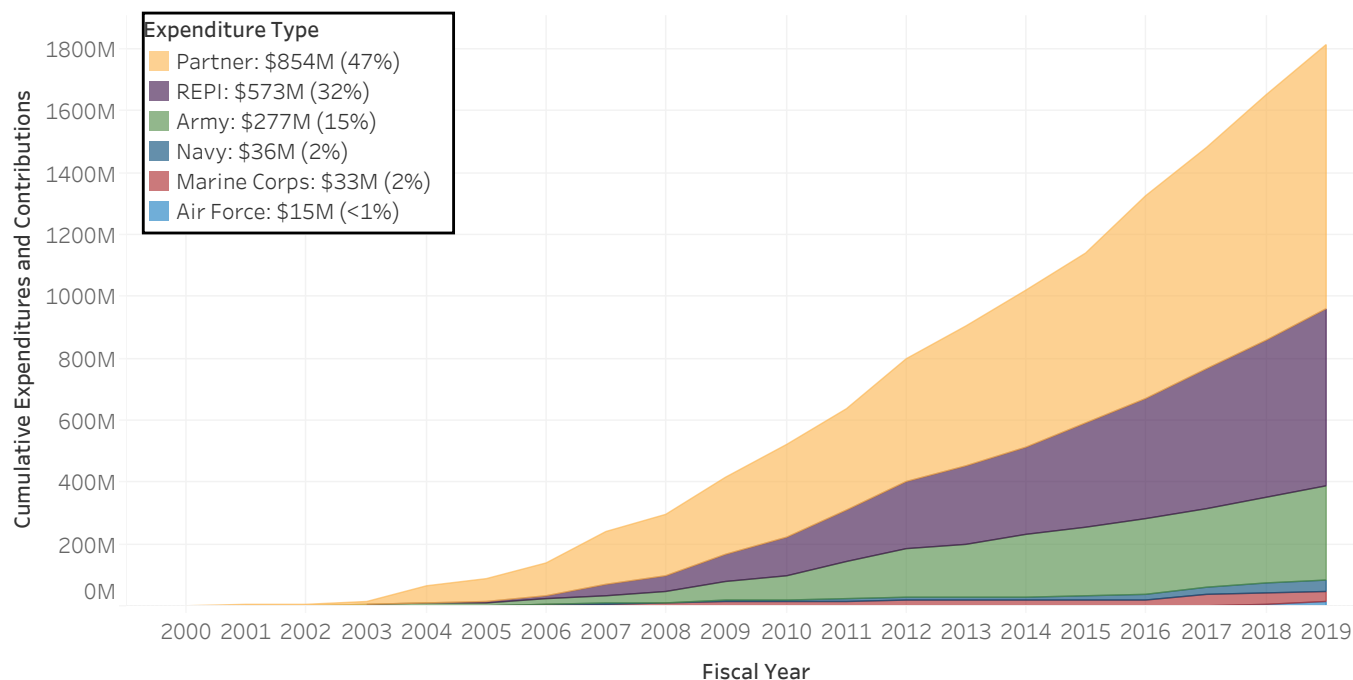
WHAT IS DOD'S RETURN ON INVESTMENTS MADE THROUGH THE REPI PROGRAM?

Since Congress enacted 10 U.S.C. § 2684a in 2002, REPI partnership agreements have attracted partner funding that nearly doubles the investment made by the Department. As illustrated in Figure 9, this represents a total investment of more than \$1.6 billion at a cost of only \$934 million to DoD, saving the Department approximately \$854 million to fund other priorities. Across DoD, the REPI program has funded \$573 million in projects compared to \$361 million from the Military Services, most of which was provided by the Army.

DoD strategically spends REPI funds to address the most prevalent encroachment restrictions at the time.

Figure 1 showed that noise, tall structures, and danger or safety zones presented the three most common encroachment restrictions that REPI funds are called upon to mitigate. Figure 10 breaks down the REPI expenditures by the encroachment restrictions that they address. Unsurprisingly, DoD spent over \$40 million to address noise-related encroachment restrictions. REPI projects also invested nearly \$30 million to address species-related restrictions, and more than \$29 million to address observability and operational security restrictions during FY 2019. It is important to note that a single parcel with expenditures can address

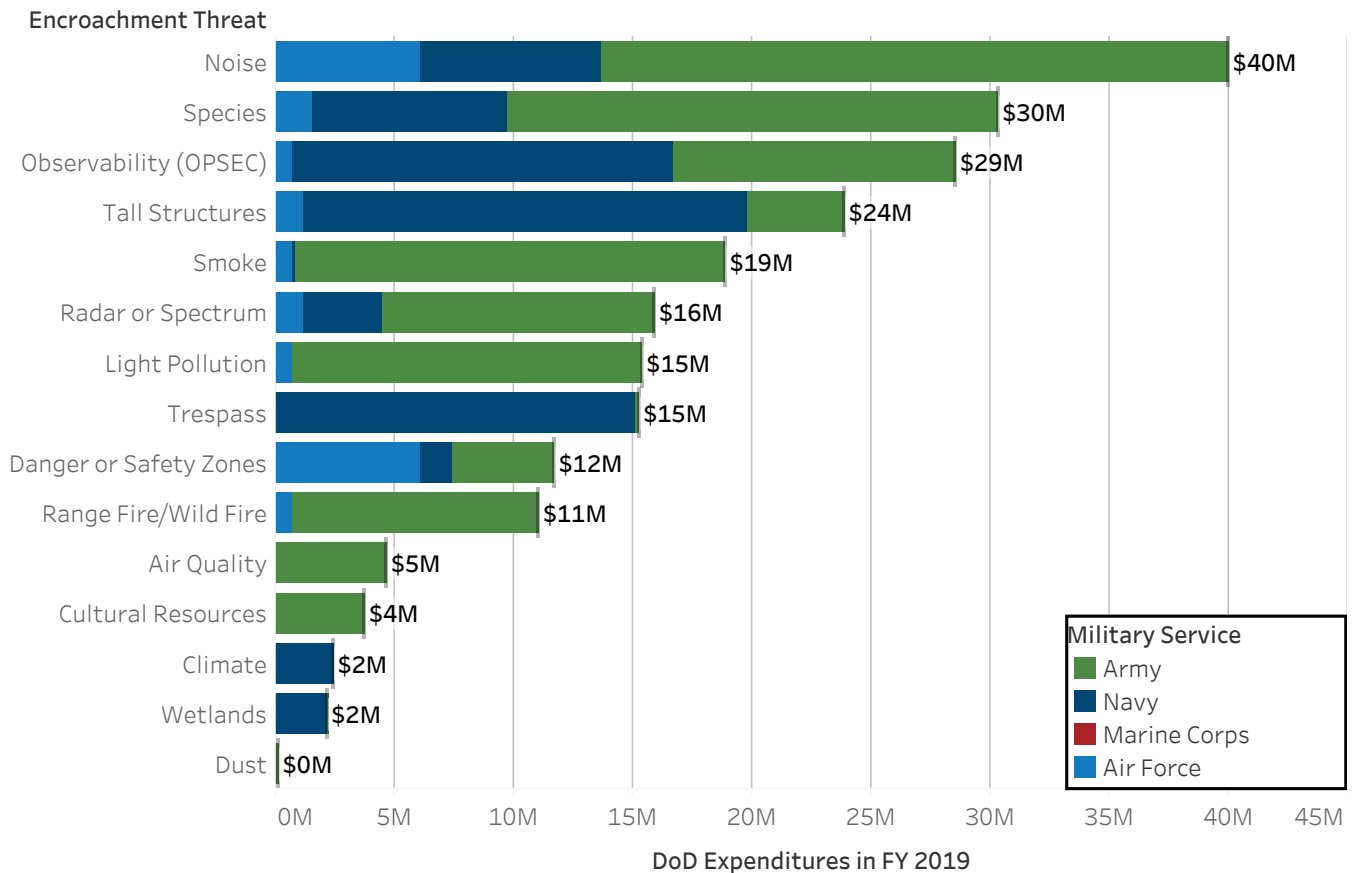
Figure 9 Cumulative DoD Expenditures and Partner Contributions through FY 2019⁸



Source: Execution Data Submitted by the Military Services in the REPI Database through FY 2019

⁸ Includes reported land protection efforts prior to 2003. For underlying data by Military Service, see Table 4 in Appendix B.

Figure 10 DoD Expenditures in FY 2019 to Address Encroachment Threats⁹



Sources: REPI Proposals from the Military Services, FY 2019 Execution Data Submitted by the Military Services in the REPI Database

multiple encroachment restrictions, and expenditures for which the Military Services reported more than one encroachment restriction are displayed in all associated categories.

REPI program investments help to sustain key DoD assets and capabilities, with many identified as high priorities in the National Defense Strategy. Enabling unrestricted access to and use of training, testing, and operations across DoD installations supports military readiness in an effort to maintain and build a more lethal Joint Force capable of defeating enemies and protecting the American people and the nation’s vital interests. Figure 11 groups these capabilities by value to display the variation in assets and capabilities that

the REPI program safeguards from encroachment. Overall, installations have submitted over \$640 billion in assets and capabilities that have benefited from the REPI program’s protection and mitigation. It is important to note that some projects submitted by the installations estimated the value of the entire installations, as the REPI project supports all missions at the installation to varying degrees. As was the case with projected development timelines, the REPI program office is working with the Military Services and installations to improve how they characterize the parcels association with the value of the assets. At this stage in metric reporting, the valuations as submitted by the installations and validated by Service Headquarters have remained in the data as reported.

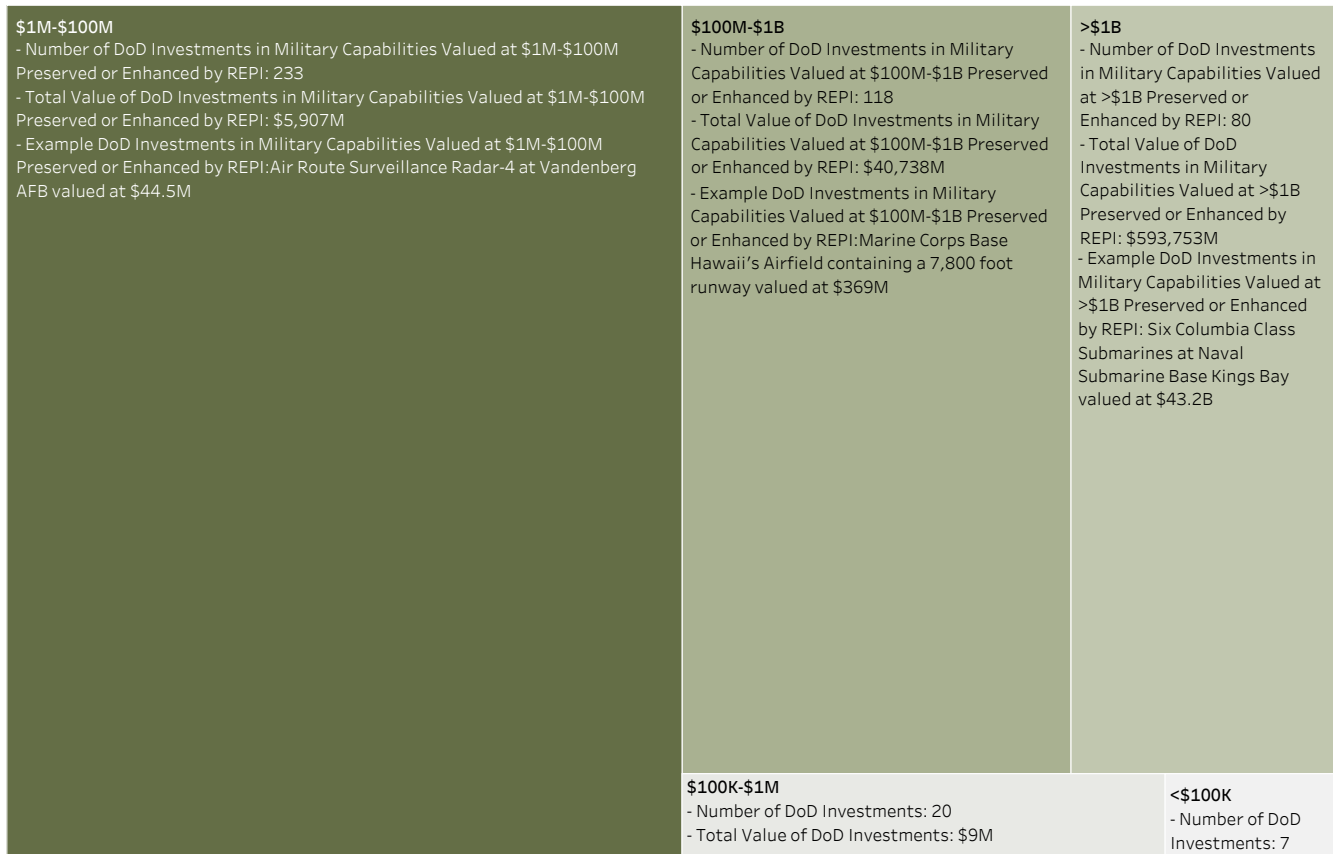
⁹ “DoD Expenditures” include REPI and Military Service expenditures. The Military Services may select multiple encroachment threats for each parcel that has expenditures. Expenditures are included in all encroachment categories displayed if the Military Services reported more than one for any given parcel. REPI began collecting parcel-level encroachment threat data in FY 2017; as a result, many executed parcels still do not contain this information even though the data gap is improving each year. Excludes \$47.9 million spent on parcels in FY 2019 that do not have any corresponding encroachment threat data. Expenditure data is current as of the end of FY 2019. For underlying data by Military Service, see Table 5 in Appendix B.

Some examples of assets and capabilities protected through the REPI program include six Columbus class submarines based at Naval Submarine Base Kings Bay valued \$43.2 billion, the squadron of F-35 Lightning II stationed at Eglin Air Force Base valued at \$322 million, and the Air Surveillance Radar at Vandenberg Air Force Base valued at \$44.5 million. The REPI program supports a wide variety of assets that are critical in support of the National Defense Strategy.

As Figure 11 shows, REPI and Military Service expenditures combined with partner contributions prevent and mitigate adverse encroachment impacts to billions of dollars of DoD mission capabilities and

assets. Assets valued between \$1 million and \$100 million alone account for over \$5.9 billion in capabilities preserved or enhanced by REPI. Therefore, the estimated value of existing installation infrastructure, real estate, military construction projects, capital improvement projects, and O&M costs that REPI projects partially or fully shielded from encroachment restrictions is significantly higher than DoD's investment of around \$934 million in REPI projects.

Figure 11 Estimated Values of Example DoD Investments in Mission Capabilities Preserved or Enhanced by REPI¹⁰



Sources: REPI Proposals from the Military Services, Execution Data Submitted by the Military Services in the REPI Database through FY 2019, Construction Programs (C-1) Reports from DoD Comptroller

¹⁰ Projects may not provide monetary values for mission capabilities as part of their REPI proposals. These examples reflect a small sample of mission capability value data reported in the FY 2020 REPI proposals and should not be interpreted as comprehensive statistics for the entirety of REPI projects nationwide.

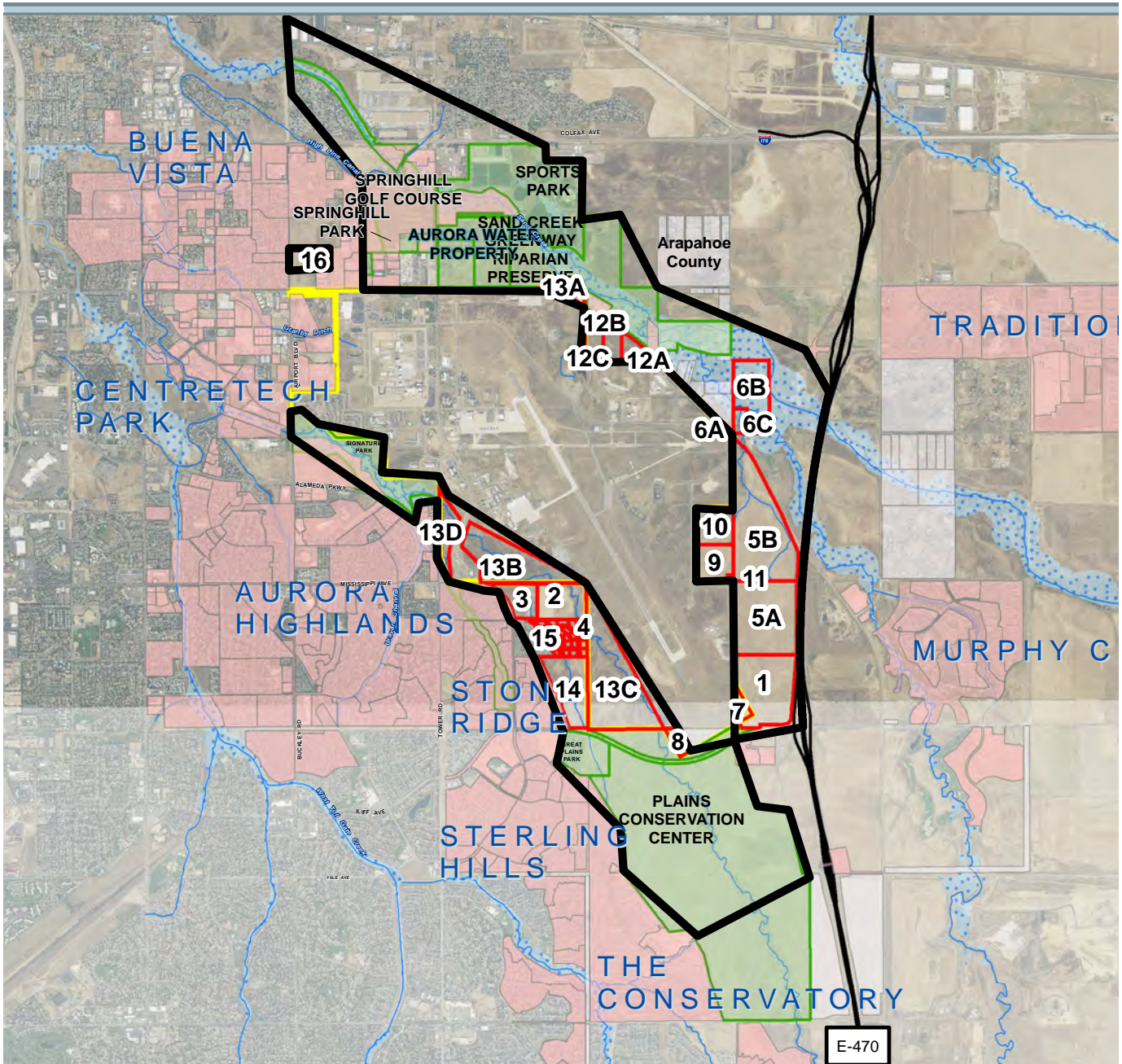
CASE STUDY

Buckley Air Force Base

Overview

Located in a Denver suburb, Buckley Air Force Base (AFB) has successfully operated a REPI project from start to finish. After identifying encroachments that

threatened its ability to provide airfield capabilities, the installation deployed a REPI plan to acquire restrictive easements that prevented incompatible development. By protecting 663 acres, the REPI project has helped Buckley AFB conserve wildlife habitat and continue to host its one-of-a-kind Overhead Persistent Infrared operation that maximizes missile warning for the U.S. Military and allies worldwide.



PARCEL SPECIFIC - MAP 3

Parks, Recreation & Open Space
The Quality of Life Department
July 2018

1 SEE SPREAD SHEET FOR PARCEL SPECIFIC INFORMATION

- BAFB BOUNDARY
- CITY-OWNED PARCELS
- Parcels
- Local Subdivisions
- 100 YEAR FLOODPLAIN
- E-470

0 1,000 2,000 Feet

Encroachment Threats

The Air Force has historically faced operating challenges in the Denver metropolitan area. For example, flight operations ended at Lowry AFB in 1966, and the installation closed in 1994. In light of these changes, leaders at Buckley AFB, just 6 miles east of Lowry's former location, recognized the need to address encroachment threats. These threats included rapid property development around the installation that could result in noise complaints, air space congestion, and impacts to night vision training. Mitigating these risks would position Buckley AFB to continue supporting DoD cross-country flights and the Overhead Persistent Infrared operation.

REPI Solution

Through partnerships with government and nonprofit partners, Buckley AFB, in coordination with REPI, successfully mitigated significant encroachment threats to the installation. The REPI project first focused on inhibiting development along the eastern border, particularly the E-470 corridor. With these parcels being in the 60 decibels day-night average sound level contour, any development had potential to restrict the operations of transient aircraft and helicopters. Similarly, development in the southwest area, which was in the 65 decibel sound level contour, could have led to strict airfield limits. Along with mitigating threats to installation operations, the protection of these parcels benefited the region through flood plain protection, the establishment of a wildlife corridor, and the creation of a recreational perimeter trail. As a result, Buckley AFB exemplifies the far-reaching benefits of REPI projects, as this collaboration mitigated threats to military readiness while safeguarding natural resources and delivering other positive outcomes for the region.

Partners

- City of Aurora, Arapahoe County
- The Trust for Public Land, State of Colorado
- Colorado Department of Military and Veterans Affairs, Urban Drainage and Flood Control District
- Great Outdoors Colorado

Return on Investment

Buckley AFB has leveraged **\$11.6 million** in DoD funding with **\$6.6 million** in partner contributions to permanently prevent incompatible development on **663 acres** surrounding the installation. This REPI investment has helped to preserve or enhance at least **\$54 million** in critical assets and mission capabilities including:

- Space Based Infrared System Operation Facility: **\$38 million**
- Combat Arms Training and Maintenance facility: **\$13.5 million**
- Lare Vehicle Inspection Point Facility: **\$3.4 million**

About Buckley Air Force Base

Buckley AFB is located in Aurora, Colorado, a large suburb of Denver. It hosts the 140th Wing, the Navy Operational Support Center, the Aerospace Data Facility-Colorado, Army Aviation Support Facility, and the Air Reserve Personnel Center. Supporting an airspace footprint throughout Colorado, Wyoming, New Mexico, Nebraska, and Kansas, the installation provides key airfield capabilities and missile warning assets. Buckley's Overhead Persistent Infrared capability supports Combatant Commanders around the world, including those of foreign militaries such as Great Britain, Canada, Australia, and New Zealand.

¹¹ **Source:** Execution data submitted by the Air Force in the REPI Database through FY 2019.



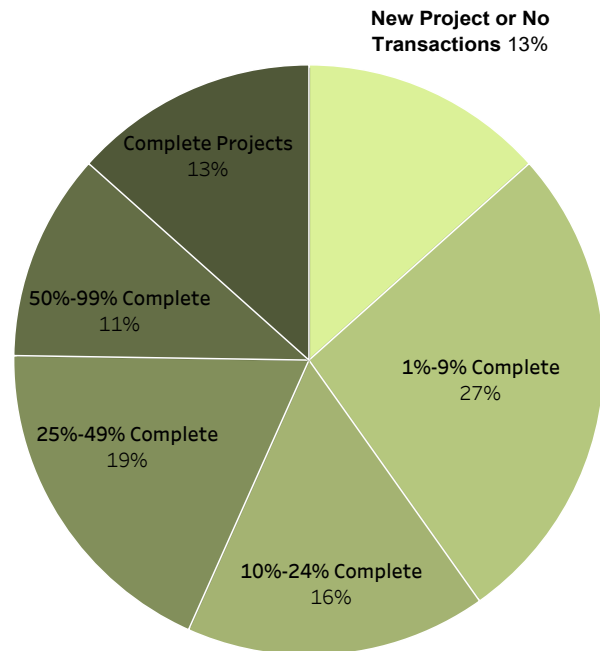
5

REPI'S PROGRESS TOWARD A DESIRED END STATE

When submitting a proposal for REPI funds, the Military Services must articulate each project's desired end state. This requires listing the total amount of land protection necessary to preserve and enhance mission capabilities while eliminating restrictions on testing, training, and operations. As of the end of FY 2019, the program has preserved 16 percent of the land targeted for protection using 10 U.S.C. § 2684a, excluding new projects that only began receiving funding in FY 2019. Progress decreased from 22 percent to 16 percent compared to last year because 42 projects have been added to this year's analysis due to improved data reporting.

Figure 12 presents the distribution of REPI projects based upon the percentage of targeted acres currently protected. Over 13 percent of REPI projects are complete, an increase from 10 percent last year, and another 11 percent are more than halfway to completion. New projects and projects that have yet to execute any real estate transactions constitute 13 percent of projects. Though over half of the projects are less than 25 percent complete, it is important to recognize that REPI projects do not necessarily need to be complete before the installations can begin to benefit from REPI investments. In most cases, the protection of high-priority land parcels through REPI allows for the mitigation and prevention of some adverse effects of encroachment.

Figure 12 Distribution of Progress Toward Completion for REPI Projects by Status^{12,13}



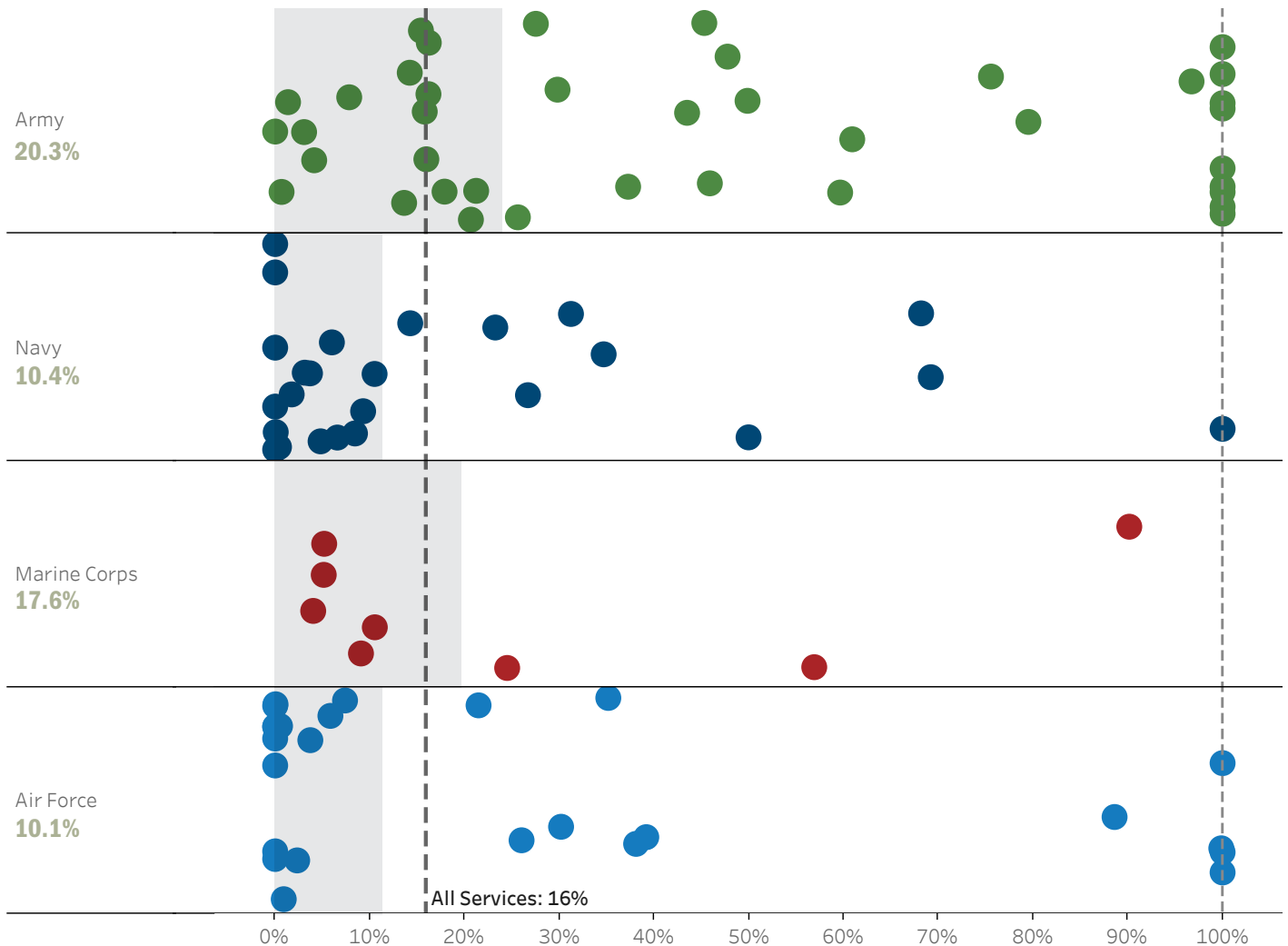
Source: REPI Proposals and Execution Data submitted by the Military Services

Historically, the Army has had the most active land preservation program through REPI and has accordingly made the most significant progress toward completion. However, in recent years the other Military Services have expanded implementation of their REPI programs

¹² Does not include projects that have not closed any parcels or projects with incomplete or invalid desired end state data. Completed acreage is current as of the end of FY 2019.

¹³ Progress is represented by the number of acres that a project has preserved as a proportion of its desired end state goal requiring protection under 10 U.S.C. § 2684a. Does not include projects that have not closed any parcels or projects with incomplete or invalid desired end state data. Completed acreage is current as of the end of FY 2019. In this year's analysis, 42 projects were added that were previously excluded due to a lack of sufficient desired end state data or expenditure history. For underlying data by Military Service, see Table 7 in Appendix B.

Figure 13 Distribution of Progress Toward Completion for REPI Projects by Military Service¹⁴



Source: REPI Proposals from the Military Services, Execution Data Submitted by the Military Services in the REPI Database through FY 2019

significantly. Figure 13 illustrates each project's progress toward completion across each Military Service's portfolio. As evidenced in the number of projects in the early stages, there's a growing need for REPI to address mission changes, technological advances that require new platforms, and increased encroachment restrictions at installations across the

country. The Congressional authority provided by 10 U.S.C. §2684a also continues to be amended, expanding opportunities for new projects, such as the recent addition of projects focused on maintaining and improving military installation resilience. These performance measures are dynamic and only represent a snapshot of the program at the time of this report.

¹⁴ Progress is represented by the number of acres that a project has preserved as a proportion of its desired end state goal requiring protection under 10 U.S.C. § 2684a. Does not include projects that have not closed any parcels or projects with incomplete or invalid desired end state data. Completed acreage is current as of the end of FY 2019. This year's analysis includes all installations listed in the FY20 Report to Congress with the exception of those projects that lack sufficient desired end state data or expenditure history. For underlying data by Military Service, see Table 7 in Appendix B.

As missions, priorities, and encroachment restrictions change, the Military Services often adjust a project's desired end state. These updates, along with the addition of new projects without any execution history, can cause fluctuations on overall progress metrics despite significant gains at the project level.

Since the inception of the REPI program, the types of encroachment pressures impacting military activities have evolved, and the number of installations reporting encroachment threats has grown. Nearly all REPI projects are multi-year projects, and many require over a decade of sustained planning and transactions with partners and landowners to mitigate all known threats. As a result, most projects are still ongoing.

CASE STUDY

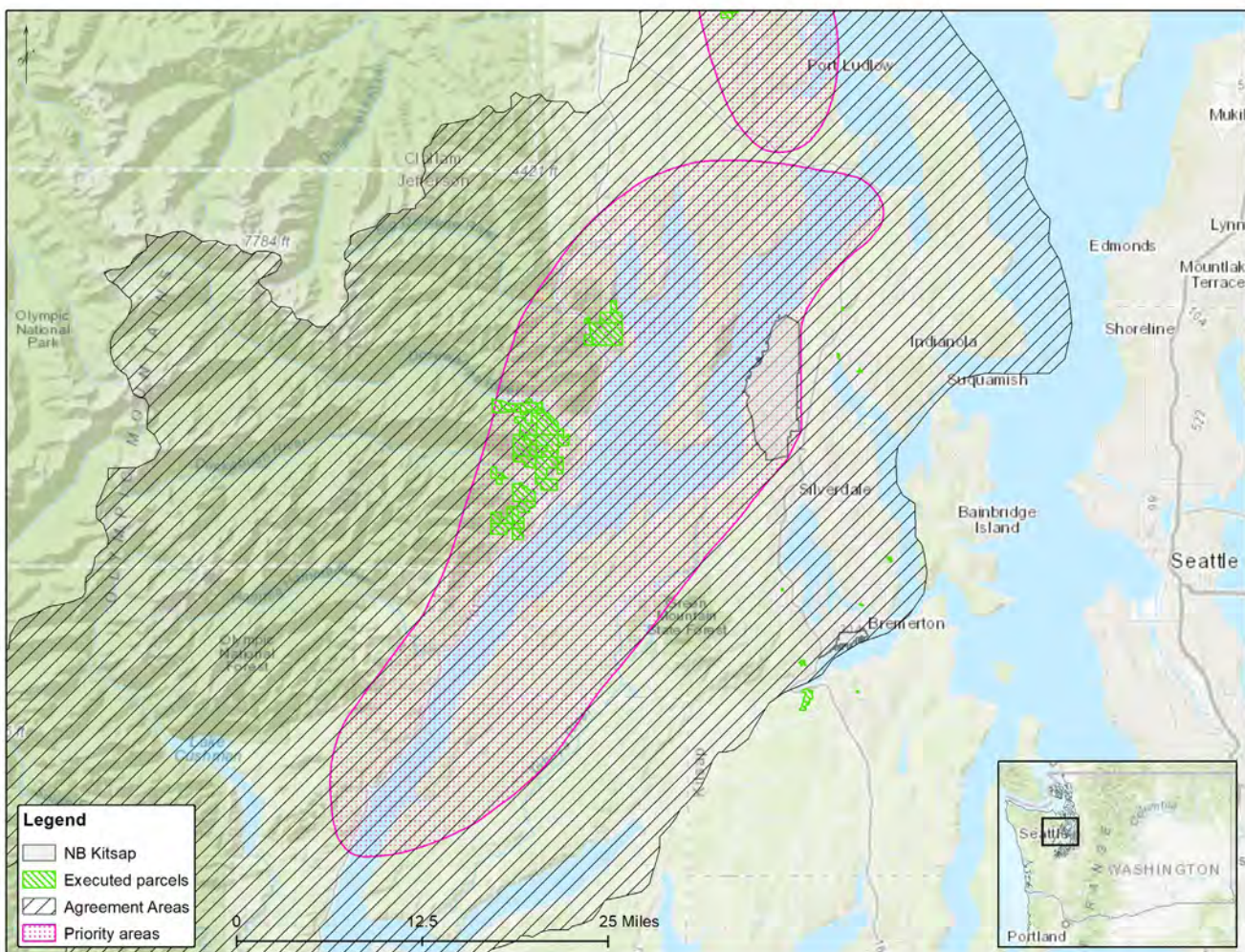
Naval Base Kitsap

At a Glance

Naval Base Kitsap, the Nation's third-largest U.S. Navy installation, is home to several research, development, testing, and evaluation (RDT&E) commands that aim to ensure the Navy maintains a technological edge. Sensitive underwater testing activities at the installation require an undisturbed acoustic environment. However, encroachment threatens these capabilities by creating noise pollution from nearby residential development, recreational boating, and commercial activity. With a strategy to secure critical land along the Dosewallips and Duckabush Rivers, the REPI project at Naval Base Kitsap has protected 13,649 acres in support of the base's RDT&E capabilities, strengthening torpedo, unmanned underwater vehicle, and ship systems critical to the National Defense Strategy.

Encroachment Threats

The RDT&E missions at the base are very sensitive to noise and energy interference from motorized boat traffic and other outside sources. To sustain these capabilities, Naval Base Kitsap must maintain the current quiet acoustic conditions. Other Navy installations around the Nation with similar testing capabilities, such as Naval Surface Warfare Center Carderock and Naval Undersea Warfare Center Keyport, have already experienced an increase in acoustic pollution. As a result, they have been forced to shift facility locations or access alternate support to conduct this aspect of their mission. To avoid similar disruptions, Naval Base Kitsap needed to prevent commercial and recreational development, and the associated boat traffic, before acoustic interference created mission barriers. Preventing development around Hood Canal to restrict boat traffic would enable Naval Base Kitsap to continue meeting its RDT&E requirements.



REPI Solution

Through the REPI project, Naval Base Kitsap took action to maintain land uses that support the optimal acoustic conditions required by the base. The project specifically enabled protection of priority areas around the Hood Canal military operating area and the Dabob Bay Range Complex. In these areas, higher-density development threatened to limit water uses and range activity. With REPI support, Naval Base Kitsap can restrict incompatible industrial and marine development along the shorelines. It can also prioritize lands adjacent to the installation or those that support the water quality of Hood Canal.

Return on Investment

Naval Base Kitsap has leveraged **\$24.5 million** in DoD funding with **\$22.2 million** in partner contributions to permanently prevent incompatible development on over **13,600 acres** near the installation. The Dosewallips and Duckabush River corridors have been sufficiently protected, while the Dewatto River system is the focus of the next series of transactions. This REPI investment has helped to preserve or enhance at least **\$40.855 billion** in critical assets and mission capabilities including:

- Explosives Handling Wharf 2 Project: **\$715 million**
- Planned improvement to the Explosives Handling Wharf 2 Project: **\$140 million**
- Naval Base Kitsap Submarine Fleet: **\$40 billion**

About Naval Base Kitsap

Naval Base Kitsap encompasses over 12,000 acres and is located on the Kitsap Peninsula in Washington. The installation hosts a diverse range of strategic missions that support the National Defense Strategy. The base, along with Dabob Bay Range Complex, is home to one of the Navy's premier locations for RDT&E of new underwater systems such as torpedoes, unmanned underwater vehicles, and ship systems. Naval Base Kitsap also ports all types of submarines, two Nimitz-class aircraft carriers, Puget Sound Naval Shipyard, and the largest fuel depot in the Continental U.S. – representing a significant portion of the Navy's strategic deterrent capability.

Partners

- Jefferson Land Trust
 - National Fish and Wildlife Foundation
 - State of Washington
 - The Trust for Public Land
 - The Nature Conservancy
 - Washington Department of Natural Resources
 - Washington State Parks
 - Washington State Recreation and Conservation Office
 - Washington State Salmon Recovery Board
-

¹⁵ **Source:** Execution data submitted by the Navy in the REPI Database through FY 2020.

¹⁶ **Source:** FY 2020 Proposal from Naval Base Kitsap.

APPENDIX A:
**ENCROACHMENT THREATS AND RESTRICTED ACTIVITIES REPORTED
IN REPI PROJECT PROPOSALS**

Figure 14 Encroachment Threats Reported in REPI Project Proposals¹⁷

		Encroachment Threat																	
		Air Quality	Climate	Cultural Resources	Danger or Safety Zones	Dust	Light Pollution	Noise	Observability (OPSEC)	Other	Radar or Spectrum	Range Fire/ Wild Fire	Smoke	Species	Tall Structures	Trespass	Water Quality	Water Quantity	Wetlands
Army	Camp Blanding	•		•			•	•				•	•	•					•
	Camp Butler							•					•	•					•
	Camp Navajo		•		•			•					•	•					
	Camp Ripley			•		•		•					•	•					
	Camp Roberts	•		•				•					•	•					•
	Camp Williams							•					•	•					
	Fort A.P. Hill						•	•			•		•	•					
	Fort Benning				•			•					•	•					
	Fort Bragg							•					•	•					
	Fort Bragg USASOC							•	•					•					•
	Fort Campbell							•			•			•	•				
	Fort Harrison				•	•		•					•	•					
	Fort Hood	•	•			•	•	•					•	•					
	Fort Huachuca							•						•	•				
	Fort Indiantown Gap			•		•	•	•						•	•				
	Fort Pickett							•						•	•				
	Fort Stewart				•	•		•					•	•					
	MAJIC	•		•	•	•	•	•					•	•	•				
	USAG-HI C			•				•						•	•				
West Point															•				
White Sands Missile Range	•		•	•	•	•	•	•				•	•	•					
Navy	Fallon Range Training Complex													•					•
	Guam Region													•	•				•
	Jacksonville Area Installations				•			•			•		•	•	•				•
	Joint Base Pearl Harbor Hickam								•					•	•				•
	NAS Fallon							•			•			•	•				•
	NAS Meridian				•			•			•			•	•				•
	NAS Patuxent River		•		•			•			•			•	•				•
	NAS Pensacola				•			•			•			•	•				•
	NAS Whidbey Island				•			•			•			•	•				•
	NAS Whiting Field			•	•			•			•			•	•				•
	Naval Base Coronado							•			•			•	•				•
	NB Kitsap				•			•			•			•	•				•
	NB Ventura County							•		•		•		•	•				•
	NSA Hampton Roads							•			•			•	•				•
	NSB Kinas Bay			•				•			•			•	•				•
NSF Dahlgren	•			•			•			•			•	•				•	
NWS Earle							•			•			•	•				•	
NWSTF Boardman				•			•			•			•	•				•	
Marine Corps	Chocolate Mountain Aerial Gunnery Range							•			•			•	•				•
	MCAS Beaufort				•		•	•	•	•				•	•				•
	MCAS Cherry Point				•		•	•	•	•				•	•				•
	MCAS Yuma and Barry M. Goldwater Range				•		•	•	•	•				•	•				•
	MCB Camp Lejeune and MCAS New River				•		•	•	•	•				•	•				•
	MCB Camp Pendleton		•	•	•			•	•	•				•	•				•
	MCB Hawaii			•				•			•			•	•				•
MCB Quantico							•			•			•	•				•	
Townsend Bombing Range							•	•			•		•	•				•	
Air Force	Altus AFB				•			•			•			•	•				•
	Avon Park Air Force Range				•			•			•			•	•				•
	Columbus AFB				•	•		•			•			•	•				•
	Dave County Bombing Range				•			•			•			•	•				•
	Edwards AFB & Plant 42 Installation Complex				•			•			•			•	•				•
	Eielson REPI Proposal				•			•			•			•	•				•
	Ellsworth AFB				•			•			•			•	•				•
	JB Charleston				•			•			•			•	•				•
	JB Elmendorf-Richardson				•			•		•			•	•	•				•
	JBLE-Langley				•			•			•			•	•				•
	JBSA - Camp Bullis			•				•			•			•	•				•
	JBSA-Lackland				•			•			•			•	•				•
	JBSA-Randolph				•			•			•			•	•				•
	Schriever AFB				•			•			•			•	•				•
	Scott AFB		•					•			•			•	•				•
Seymour Johnson AFB				•			•			•			•	•				•	
US Air Force Academy				•	•	•	•			•			•	•				•	
Vandenberg AFB			•	•			•			•			•	•				•	

Source: REPI Proposals from the Military Services

¹⁷ Does not include projects that did not submit this encroachment data as part of their proposals. Includes existing or potential threats avoided or mitigated by the REPI project. Does not include threats addressed by other means.

Figure 15 Restricted Mission Capabilities Reported in REPI Project Proposals¹⁸

		Restricted Mission Capability																		
		Flight	Live Fire	Ground Maneuver	Radar and Navigation	Construction	Ground Disturbance	OPSEC	Testing	Obscurants	Static Detonation	UAS Testing/Operations	Pyrotechnics	Maritime Training	Ordnance Disposal	Intelligence (C4ISR)	Logistics and Maintenance	Missile Defense	Space	Other
Army	Camp Blanding	•	•	•		•	•		•	•	•	•	•							
	Camp Butler	•	•	•		•	•		•	•	•	•	•							
	Camp Navajo	•	•	•		•	•		•	•	•	•	•							
	Camp Ripley	•	•	•		•	•		•	•	•	•	•							
	Camp Roberts	•	•	•		•	•		•	•	•	•	•							
	Camp Williams	•	•	•		•	•		•	•	•	•	•							
	Fort A. P. Hill	•	•	•		•	•		•	•	•	•	•							
	Fort Benning	•	•	•		•	•		•	•	•	•	•							
	Fort Bragg	•	•	•		•	•		•	•	•	•	•							
	Fort Bragg USASOC	•	•	•		•	•		•	•	•	•	•							
	Fort Campbell	•	•	•	•		•				•	•	•							
	Fort Harrison	•	•	•		•	•				•	•	•							
	Fort Hood	•	•	•		•	•				•	•	•							
	Fort Huachuca	•	•	•		•	•			•	•	•	•							
	Fort Indiantown Gap	•	•	•		•	•				•	•	•							
	Fort Pickett	•	•	•		•	•				•	•	•							
	Fort Stewart	•	•	•	•		•				•	•	•							
	JBSA - Camp Bullis	•	•	•		•	•				•	•	•							
	MAJIC	•	•	•		•	•				•	•	•							
	USAG-HI C	•	•	•		•	•				•	•	•		•	•				
West Point	•	•	•		•	•				•	•	•								
White Sands Missile Range	•	•	•	•	•	•			•	•	•	•			•					
Navy	Fallon Range Training Complex	•																		
	Guam Region			•		•								•		•	•	•		
	Jacksonville Area Installations	•							•											
	Joint Base Pearl Harbor Hickam	•							•	•				•						
	NAS Fallon	•			•															•
	NAS Meridian	•																		
	NAS Patuxent River	•			•	•						•								
	NAS Pensacola	•			•															
	NAS Whidbey Island	•			•															
	NAS Whiting Field	•			•															
	Naval Base Coronado	•	•																	
	NB Kitsap	•							•	•					•					
	NB Ventura County	•								•	•				•					•
	NSA Hampton Roads	•			•															
	NSB Kings Bay	•							•	•					•					
NSF Dahlgren	•	•									•			•						
NWS Earle	•													•						
NWSTF Boardman	•			•					•			•								•
Marine Corps	Chocolate Mountain Aerial Gunnery Range	•				•						•				•				
	MCAS Beaufort	•																		
	MCAS Cherry Point	•	•	•	•	•						•	•							
	MCAS Yuma and Barry M. Goldwater Range	•	•	•	•	•			•			•	•							
	MCB Camp Lejeune and MCAS New River	•	•	•	•	•						•	•		•					
	MCB Camp Pendleton	•	•	•			•					•	•							
	MCB Hawaii	•	•	•			•					•	•							
	MCB Quantico	•	•	•		•						•	•							
Townsend Bombing Range	•																			
Air Force	Altus AFB	•																		•
	Avon Park Air Force Range	•	•	•	•			•			•	•			•					•
	Columbus AFB	•																		
	Dare County Bombing Range	•	•		•															
	Edwards AFB	•								•										
	Eielson REPI Proposal	•																		
	Ellsworth AFB	•		•	•	•	•													
	JB Charleston	•							•											
	JB Elmendorf-Richardson	•	•			•						•	•							•
	JBLE-Langley	•																		
	JBSA-Lackland	•	•																	•
	JBSA-Randolph	•	•																	
	Schriever AFB	•								•							•			•
	Scott AFB	•																		
	Seymour Johnson AFB	•			•															
US Air Force Academy	•	•	•								•	•	•							
Vandenberg AFB	•			•															•	

Source: REPI Proposals from the Military Services

¹⁸ Does not include projects that did not submit this encroachment data as part of their proposals. Includes existing or potential restrictions avoided or mitigated by the REPI project. Does not include restrictions addressed by other means.

APPENDIX B: MILITARY SERVICE DATA TABLES

Table 1 Encroachment Restrictions Identified in FY 2020 REPI Proposals by Military Service (Number of Proposals)¹⁹

Encroachment Threat	Army	Navy	Marine Corps	Air Force	Total
Noise	18	12	9	15	54
Danger or Safety Zones	9	8	4	11	32
Tall Structures	4	8	7	13	32
Species	13	8	6	4	31
Radar or Spectrum	7	7	5	12	31
Observability (OPSEC)	4	6	2	9	21
Light Pollution	8	3	1	9	21
Trespass	4	5	2	7	18
Smoke	12	2	0	4	18
Cultural Resources	8	2	2	2	14
Other	0	4	2	8	14
Range Fire/Wild Fire	9	1	1	2	13
Wetlands	4	5	2	1	12
Water Quality	4	3	0	2	9
Dust or Avoidance	6	0	0	2	8
Air Quality	5	1	0	0	6
Water Quantity	0	2	0	3	5
Climate	2	1	1	1	5

Table 2 Total Acres Protected by REPI Projects through FY 2019 by Military Service²⁰

Military Service	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total Acres Protected
Army	6,165	28,442	8,114	8,676	23,564	14,856	22,785	21,393	36,129	38,806	25,824	22,530	21,333	34,098	12,059	26,626	39,504	390,903
Navy	-	48	-	2,508	648	430	3,088	1,908	2,595	5,197	10,056	3,398	8,156	8,712	10,555	31,438	11,504	100,241
Marine Corps	-	-	821	475	2,716	16,052	1,777	8,672	3,349	2,200	8,491	3,011	5,508	6,771	30,835	3,063	6,489	100,208
Air Force	-	-	236	-	-	275	29	491	2,640	2,255	8,891	23,332	2,972	3,338	1,377	6,954	44,117	96,907
Total Annual Acres Protected	6,165	28,490	9,171	11,659	26,928	31,613	27,679	32,463	44,713	48,458	53,262	52,270	37,968	52,918	54,827	68,081	101,594	688,258
Cumulative Acres Protected	6,165	34,655	43,826	55,484	82,412	114,026	141,705	174,168	218,882	267,340	320,601	372,871	410,839	463,757	518,584	586,665	688,258	688,258

¹⁹ Projects may select multiple encroachment threats. Projects that reported more than one encroachment threat are included in all categories selected. Installations that did not submit an FY 2020 proposal are not included. These totals do not reflect the severity of the threat, nor do they include encroachment pressures mitigated by other means.

²⁰ Data is current as of the end of FY 2019, as reported in the 2020 REPI Report to Congress. Includes reported land protection efforts prior to 2003.

Table 3 Acres Protected in FY 2019 to Preserve or Enhance Mission Capabilities by Military Service²¹

Military Service	Mission Capability												
	Ground Maneuver	Live Fire	Flight	Construction	Ground Disturbance	Unmanned Aircraft Systems	Testing	Obscurants	Operations Security (OPSEC)	Radar and Navigation	Static Detonation	Pyrotechnics	Other
Army	15,884	14,933	32,489	7,884	10,059	29,390	24,524	1,824	2,391	24,524	356	361	-
Navy	-	-	5,331	-	-	272	935	-	1,822	951	-	-	33
Marine Corps	50	w -	-	694	-	-	-	-	-	-	-	-	-
Air Force	300	300	2,677	-	-	300	1,170	-	300	2,526	300	-	300
Total	13,571	15,233	40,497	8,578	10,059	29,962	25,459	1,824	4,513	28,001	656	361	333

Table 4 Cumulative DoD Expenditures and Partner Contributions through FY 2019 (Millions)²²

Source	Fiscal Year									
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Partner	\$9.5	\$58.9	\$73.9	\$105.9	\$168.6	\$194.8	\$250.5	\$300.8	\$331.1	\$396.1
REPI	\$0	\$0	\$4.6	\$10.4	\$37.2	\$54.2	\$86.2	\$123.4	\$166.7	\$217.2
Army	\$6.4	\$7.4	\$9.1	\$17.6	\$25.4	\$34.9	\$61.5	\$79.1	\$120.7	\$158.3
Navy	\$-	\$0.5	\$0.5	\$2.2	\$2.6	\$2.6	\$4.6	\$4.8	\$5.8	\$7
Marine Corps	\$-	\$-	\$1.7	\$3.1	\$4.7	\$7.1	\$13.7	\$15	\$15	\$18.2
Air Force	\$-	\$-	\$-	\$-	\$-	\$-	\$0.2	\$0.3	\$0.3	\$0.32
Total	\$15.9	\$66.8	\$89.8	\$139.1	\$238.4	\$293.5	\$416.6	\$523.3	\$639.5	\$797.2

Table 4 (continued) Cumulative DoD Expenditures and Partner Contributions through FY 2019 (Millions)²²

Source	Fiscal Year						
	2013	2014	2015	2016	2017	2018	2019
Partner	\$454.6	\$503.5	\$547.3	\$653	\$712.9	\$788.6	\$853.7
REPI	\$253.2	\$283.7	\$337.8	\$391.5	\$453.1	\$507.1	\$572.8
Army	\$171.6	\$201.7	\$222.3	\$241.6	\$251	\$277.1	\$305.3
Navy	\$7.8	\$9.5	\$14	\$18.7	\$27.1	\$33.6	\$35.9
Marine Corps	\$18.2	\$18.6	\$18.6	\$18.6	\$32.7	\$32.7	\$32.8
Air Force	\$0.3	\$0.6	\$0.6	\$1.5	\$2.3	\$6.7	\$15.8
Total	\$905.7	\$1,017.5	\$1,140.6	\$1,324.9	\$1,479.2	\$1,645.8	\$1,816.0

²¹ The Military Services may select multiple mission capabilities for each parcel. Acres protected are included in all mission capability categories displayed if the Military Services reported more than one for any given parcel. Excludes 45,403 acres that were protected in FY 2019 but do not have any corresponding mission capability data. Acreage data is current as of the end of FY 2019.

²² Includes reported land protection efforts prior to 2003.

Table 5 DoD Expenditures in FY 2019 to Address Encroachment Restrictions by Military Service (Millions)²³

Encroachment Threat	Army	Navy	Marine Corps	Air Force	Total
Noise	\$31.2	\$1.6	\$0.2	\$4.4	\$37.4
Species	\$24.0	\$ -	\$3.7	\$ -	\$27.7
Smoke	\$16.9	\$ -	\$ -	\$ -	\$16.9
Danger or Safety Zones	\$10.2	\$0.1	\$0.2	\$4.0	\$14.5
Light Pollution	\$8.2	\$ -	\$0.2	\$ -	\$8.4
Range Fire/Wild Fire	\$7.0	\$ -	\$ -	\$ -	\$7.0
Radar or Spectrum	\$3.2	\$1.1	\$0.2	\$ -	\$4.4
Observability (OPSEC)	\$2.7	\$ -	\$ -	\$ -	\$2.7
Tall Structures	\$0.6	\$1.1	\$ -	\$ -	\$1.7
Dust or Avoidance	\$1.2	\$ -	\$0.2	\$ -	\$1.4
Other	\$ -	\$1.1	\$ -	\$ -	\$1.1
Trespass	\$0.4	\$ -	\$ -	\$ -	\$0.4
Cultural Resources	\$0.0	\$ -	\$ -	\$ -	\$0.0

²³ “DoD Expenditures” include REPI and Military Service expenditures. The Military Services may select multiple encroachment threats for each parcel that has expenditures. Expenditures are included in all encroachment categories displayed if the Military Services reported more than one for any given parcel. Excludes \$47.9 million spent on parcels in FY 2019 that do not have any corresponding encroachment threat data. Expenditure data is current as of the end of FY 2019.

Table 6 Progress Toward Completion through FY 2019 by Military Service

Army	Navy	Marine Corps	Air Force
Complete	Complete	Complete	Complete
99th Armed Forces Reserve Center	NAS JRB New Orleans		Cape Canaveral AFS
Fort Bliss			Fairchild AFB
Fort Carson			Warren Grove Range
Fort Custer			
Fort Gordon			
Fort Knox			
Fort Polk			
JBSA - Camp Bullis			
Southeast Regional Army Project			
50%-99% Complete	50%-99% Complete	50%-99% Complete	50%-99% Complete
Camp Ripley	Joint Base Pearl Harbor Hickam (JBPHH)	MCB Camp Lejeune and MCAS New River	Eglin AFB
Fort Bragg USASOC	NAS Oceana	Townsend Bombing Range	Robins AFB
Fort Campbell ACUB	NS Mayport		
Fort Drum	NSY Portsmouth		
USAG-HI C	OLF Coupeville		
	OLF Whitehouse		
25%-49% Complete	25%-49% Complete	25%-49% Complete	25%-49% Complete
Camp Blanding	NAS Fallon		Avon Park Air Force Range (APAFR)
Camp Rilea	NAS Whiting Field		Beale AFB
Fort A.P. Hill	Naval Base Coronado (NBC)		Buckley AFB
Fort Benning	NB Kitsap		JBLE-Langley
Fort Bragg			Melrose AFR
Fort Pickett			
Fort Riley			
Fort Sill			
Fort Stewart			
10%-24% Complete	10%-24% Complete	10%-24% Complete	10%-24% Complete
Camp Butler REPI proposal	NAS Meridian	MCAS Beaufort	Elsworth AFB
Camp Roberts	NAS Pensacola	MCB Quantico	
Camp San Luis Obispo	NWS Yorktown		
Camp Shelby			
Camp Swift			
Camp Williams			
Fort Hood			

Table 6 (Continued) Progress Toward Completion through FY 2019 by Military Service

Army	Navy	Marine Corps	Air Force
Fort Huachuca			
Fort Indiantown Gap			
Joint Base Lewis McChord			
1%-9% Complete	1%-9% Complete	1%-9% Complete	1%-9% Complete
Aberdeen Proving Ground	El Centro Range Complex	MCAGCC Twentynine Palms	Dare County Bombing Range
Fort Harrison	Fallon Range Training Complex	MCAS Cherry Point	Davis-Monthan AFB
Fort Wainwright	NAS Lemoore	MCAS Miramar	JBSA-Randolph
Midlands Area Joint Installation Consortium	NAS Patuxent River	MCB Camp Pendleton	Joint Base McGuire-Dix-Lakehurst
White Sands Missile Range (WSMR)	NAS Whidbey Island		Tinker AFB
	NB Ventura County		Travis AFB
	NSA Hampton Roads Northwest Annex		Vandenberg AFB
	NSF Dahlgren		
	NSF Indian Head		
	NWSTF Boardman		
No Transactions	No Transactions	No Transactions	No Transactions
Camp Navajo	ARD Bayview		Altus AFB
	NCBC Gulfport		Hill AFB
	NO Flagstaff		JB Charleston - North Auxiliary Air Field
	NSA Crane-Lake Glendora		JB Elmendorf-Richardson
	NWS Earle		JBSA-Lackland
			Tyndall AFB
			US Air Force Academy
New Projects	New Projects	New Projects	New Projects
	Guam Region-Wide	Chocolate Mountain Aerial Gunnery Range	Dover AFB
	NAS Jacksonville	MCAS Yuma and Barry M Goldwater Range	Eielson AFB
	NSB Kings Bay	MCB Hawaii	Malmstrom AFB
	NSA Annapolis		Nellis AFB
			Schriever AFB
			Scott AFB
			Selfridge AFB
			Seymour Johnson AFB
			Sheppard AFB
			Edwards AFB
			Edwards AFB

REPI investments protect training, testing, and operational assets that the Department spent much of the past decade building or modernizing. As training, testing, and operations increase, the ability to leverage REPI partner contributions to relieve restrictions becomes even more important. Investing in and taking advantage of current opportunities to advance REPI's key objectives is paramount to securing the training, testing, and operational viability of local installations. Through REPI's partnerships and engagement efforts we can continue to support the warfighter, provide value to the taxpayer, and protect military readiness.

For more information about the REPI program and supportive DoD efforts, visit www.REPI.mil or contact osd.repi@mail.mil.



2020 Report on REPI Program Outcomes and Benefits to Military Mission Capabilities

*This report has been prepared by Booz Allen Hamilton in support of the
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