



THE CONSERVATION OF DEFENSE:

Opportunities to Promote
Conservation Through
Military Readiness

Suggested citation:

Ya-Wei Li and Timothy Male, 2020. "Conservation of Defense: Opportunities to Promote Conservation Through Military Readiness," Environmental Policy Innovation Center, Washington DC.

©2020 Environmental Policy Innovation Center.

Authors:

Ya-Wei Li
Tim Male

For more information, email tmale@policyinnovation.org

Cover image:
US Army, 2012
Makua Valley, Hawaii



The mission of the Environmental Policy Innovation Center is to build policies that deliver spectacular improvement in the speed and scale of conservation. We believe that innovation and speed are central to broadening efforts to conserve wildlife, to restore special natural places, and to deliver people and nature with the clean water they need to thrive. To achieve those goals, conservation programs must evolve to accommodate our modern understanding of human behavior and incentives, and the challenges posed by humanity's expanding footprint.

Acknowledgments: This report would not have been possible without the contributions of dozens of people, including everyone who helped convene our three workshops and participated in them. We also thank DoD staff who allowed us to interview them for this report. Several people provided valuable feedback on earlier drafts of this report, including Andrea Keller Helsel, Jonathan Pershing, Troy Ettel, Bruce Beard, Jim Van Ness, and Peter Stangel. Finally, we thank the Hewlett Foundation for funding our work on this project.

This work was supported through a grant from the William and Flora Hewlett Foundation.

Dust storms already limit training at U.S. installations and will likely get worse with climate change.



TABLE OF CONTENTS

Executive Summary	4
Part I: Purpose and Organization of Report	7
Part 2: Background: The Unparalleled Opportunity for Conservation by Partnering with DoD	9
National Defense as an Important Conservation Ally	13
DoD’s successful record of expanding or changing stewardship authorities.....	14
Overarching Natural Resources Program and Policy.....	15
Funding programs.....	16
Programs to conserve specific groups of species or ecosystems.....	18
Climate change.....	19
Shifts in how DoD thinks about its activities.....	20
Background: Landscape Scale Conservation and Planning	22
Part 3: Recommendations: Strengthening Military Readiness and Conservation	24
Evaluating DoD as a Conservation Steward	25
Building Human Capacity to Engage with DoD	26
External, non-profit capacity.....	27
Federal agency capacity.....	28
Coordinate and Combine Existing Funding Better	28
Expanding Flexibility in the Use of Funding	30
Landscape Scale Conservation and Planning	31
Land withdrawals for military use.....	32
Sentinel Landscapes Partnership.....	33
Integrated Natural Resource Management Plans and the Sikes Act.....	34
Federal land use planning.....	35
REPI program.....	36
Biodiversity Conservation	36
Resilience to Climate Change	38
Drought.....	39
Coastal resiliency.....	40
Wildfire.....	40
Part 4. Closing Thoughts	41
Sources	42

EXECUTIVE SUMMARY

The Department of Defense (DoD) manages some of the most valuable lands for conserving biodiversity, freshwater, and ecological integrity in the United States. One reason is that military training and testing often require natural or other undeveloped areas that simulate wartime conditions. Another is that the military often needs large buffers around its installations for public safety—those buffers also protect nature. As one senior military representative told us, “fields, farms, and forests are the best neighbors of the military.”

Given the frequent alignment between military and conservation goals, how can conservationists embrace opportunities created by national defense and military readiness to promote conservation? And how can DoD better help conservationists understand and support the military’s mission?

“The more that non-military lands are managed for wilderness or other conservation uses, the better it is for the Department of Defense.”

— Senior Pentagon representative

DoD lands are important to conservation:

27 **MILLION ACRES**
under DoD management

2X **THE SIZE** of all state
parks combined

1/2 **THE SIZE**
of all of America’s national parks

1/2 **MILLION ACRES**
of conservation and farm lands
in the last decade the military
helped protect

ALMOST
4X **MORE**
ENDANGERED
SPECIES

per acre than any
other federal lands

75 **SPECIES** only found
on DoD lands

MORE
THAN
80% of America’s ecological
systems supported

DoD could invest millions of additional dollars into protecting and managing lands, species, and other natural resources, but it needs clear incentives to do so. Conservation has to yield a measurable benefit to the military's mission. If conservationists can help make that benefit real, DoD likely has the political capital to secure funding, legislative authority, and other tools needed to unleash a new wave of conservation that also advances the military mission.

Now is a critical time to think about national defense and natural resources. In the coming decades, DoD will need more land, air, and ocean space to accommodate hypersonic weapons and other technological advances in long-distance weapons, sensors, and hardware. These forces will likely result in DoD needing to manage, access, or put use restrictions on millions of additional acres beyond the 27 million acres under its control today. Simultaneously, DoD is making deep investments in renewable energy production and is more aware than ever of its dependence on scarce water supplies.

If conservationists make bigger investments in understanding national defense, they can help DoD maintain and expand the lands under its management to benefit wildlife, water resources, and ecosystems. At least five strategies are critical to make this happen:

- 1 **Increase the number of experts within conservation groups dedicated to engaging with DoD,** particularly on funding, landscape-scale conservation and planning, endangered and at-risk species management, and resilience to climate change. Former military staff or those who have worked closely with an armed service are more likely to successfully bridge the cultural differences between nonprofits and the military. This new capacity within conservation groups, however, is unlikely to make major progress unless DoD also secures more natural resources staff to work with the groups.
- 2 **Make improvements to Endangered Species Act policies** that will result in even stronger incentives for DoD to conserve species and their habitats.
- 3 One of the Pentagon's most important environmental programs is its **Readiness and Environmental Protection Integration (REPI) program**, which is currently funded at \$100 million annually to address land use conflicts that restrict military activities. To date, REPI funding has protected over 586,000 acres of land for the military, often with an environmental benefit too. For example, REPI funding has allowed DoD to work with the Interior Department and U.S. Department of Agriculture to acquire and manage lands that promote military, conservation, and agricultural interests as part of the agencies' Sentinel Landscapes Partnership. Greater funding for REPI and more ambitious implementation of the Partnership would enhance local land use decisions that protect conservation resources near installations; expand land acquisition by other agencies in DoD's priority areas; and incentivize private landowners to promote conservation and national defense.
- 4 **DoD needs more tools** that allow pooling of funds across federal agencies to effectively manage natural resources on a landscape scale, because DoD will rarely have the resources to fund this work on its own. What do we mean by pooling? It is the ability to obligate funds from multiple agencies or U.S. Treasury accounts through single funding mechanisms (e.g., contracts, cooperate agreements, interagency agreements) without having to track and account separately for each agency's allocation. Pooling of funds is also very important for resilience planning, such as pre-disaster mitigation, across multiple agencies. The White House Council on Environmental Quality or the Congressionally chartered National Fish and Wildlife Foundation already have limited authorities that could help pool funds. DoD needs much more ambitious use of those authorities or new legislative authority to establish more expansive pooling authority for DoD.

5 **Public land withdrawal is a very controversial issue** but one that may present overlooked opportunities for conservation. When DoD seeks to withdraw lands from the public domain, conservation groups often reflexively fight the proposals. We do not believe that those withdrawals are always bad for the environment because DoD's use of the lands and waters may be considerably more benign than those permitted by the land management agencies (e.g., BLM mineral extraction) and because a withdrawal might be accompanied by DoD's commitment to protect additional land as a safety or security buffer around an installation or to provide significant land management funding. In the future, conservationists might even succeed at encouraging DoD to mitigate for its activities on withdrawn lands by acquiring conservation lands elsewhere or by adopting stronger protections for other areas of federal land. The conservation community needs a more rigorous and objective approach to evaluate the benefits and drawbacks of each proposed DoD withdrawal, and more capacity to negotiate with DoD to find solutions that meet the needs of DoD and conservation.

These are five of many opportunities highlighted in this report that would help ensure that more conservation victories are a legacy of DoD's operations and strategies over the coming decades.



Encroachment of housing into former wild lands makes it harder for the military to train nearby.

1

PURPOSE AND ORGANIZATION OF REPORT

For two reasons, no strategy for conserving biodiversity, resilience, and ecological integrity in the United States is complete without a major emphasis on DoD. First, DoD lands provide some of the most extensive, connected, and diverse habitat for sustaining biodiversity.¹ In fact, many DoD lands are maintained in a relatively undisturbed state to provide realistic training situations for troops and to provide a safety or security buffer around installations. From this perspective, there is often strong alignment between the military mission and conservation. Second, DoD is a crucial ally for conservation because of its unique political and economic strength compared to other federal agencies. For example, the department enjoys strong bipartisan support and has repeatedly secured legislation that helps it meet conservation goals and address natural resource challenges.

Despite the current and potential future importance of military lands, however, few conservation strategies include any significant focus on DoD. Often, it appears that DoD is pursuing conservation in parallel but too isolated from other national conservation agendas. We are confident that both conservation and national security would be better off if the two were better integrated. With support from the William and Flora Hewlett Foundation, the Environmental Policy Innovation Center (EPIC) set out to understand how best to integrate the two.

EPIC completed in-person and literature research on the intersection between natural resource conservation and the military mission. Specifically, we investigated what incentives would prompt DoD to expand its conservation efforts on and around military sites over the next decade, and what conservation victories would be possible by using strategies that provide those incentives.

This report synthesizes our research, which included three roundtable discussions we convened with DoD staff and its external partners. The first roundtable, held in Washington D.C. in April 2019, allowed us to gain national-level perspectives on the challenges and opportunities at the nexus of conservation and the military mission. The second roundtable, held at Naval Base Ventura County, CA in September 2019, allowed us to understand the challenges and opportunities specific to the southwest region, where many of our country's most important military installations are located. The third roundtable, held at Fort Benning, GA in November 2019, allowed us to understand how two of the largest installations in the southeast—Fort Benning and Fort Stewart—have successfully advanced the military mission and conservation. This last roundtable also allowed us to get a more in-depth perspective from the U.S. Army, which has the most installations and land area of any U.S. military service (51% of the 27 million acres that DoD manages).²



In total, we had over 60 experts participate in the three roundtables. We were likely given unprecedented access to DoD personnel, including current and former Pentagon assistant secretaries, former generals, attorneys, and regional and installation level staff who work full-time on natural resources. This access was possible not because DoD had previously resisted such convenings and interviews, but because no conservation group had asked for them in recent years.

In addition to these in-person discussions, we also reviewed published literature on natural resource conservation and the military mission, and interviewed additional DoD staff. To encourage candid dialogue, we promised not to attribute any statements in this report to specific people.

The main purpose of the report is to provide: (1) an overview of the challenges and opportunities for promoting conservation alongside the military mission; and (2) recommendations that philanthropic organizations, federal agencies, conservationists, and others can pursue over the next decade. Part 2 of the report provides background on DoD's conservation programs and why they offer unique opportunities for conservation. The concepts and terminology discussed in this section will help the reader understand Part 3 of the report, which discusses five important conservation topics related to DoD: building capacity for conservation groups to engage with DoD; funding; landscape-scale conservation and planning; endangered and at-risk species management; and resilience to climate change. For each topic, the report summarizes the challenges and opportunities for conservation, including recommendations for the Hewlett Foundation where applicable.



California has a Governor's Military Council that works to protect California's military installations and operations and provide high level state support on issues of encroachment and community planning.

2

BACKGROUND: THE UNPARALLELED OPPORTUNITY FOR CONSERVATION BY PARTNERING WITH DOD

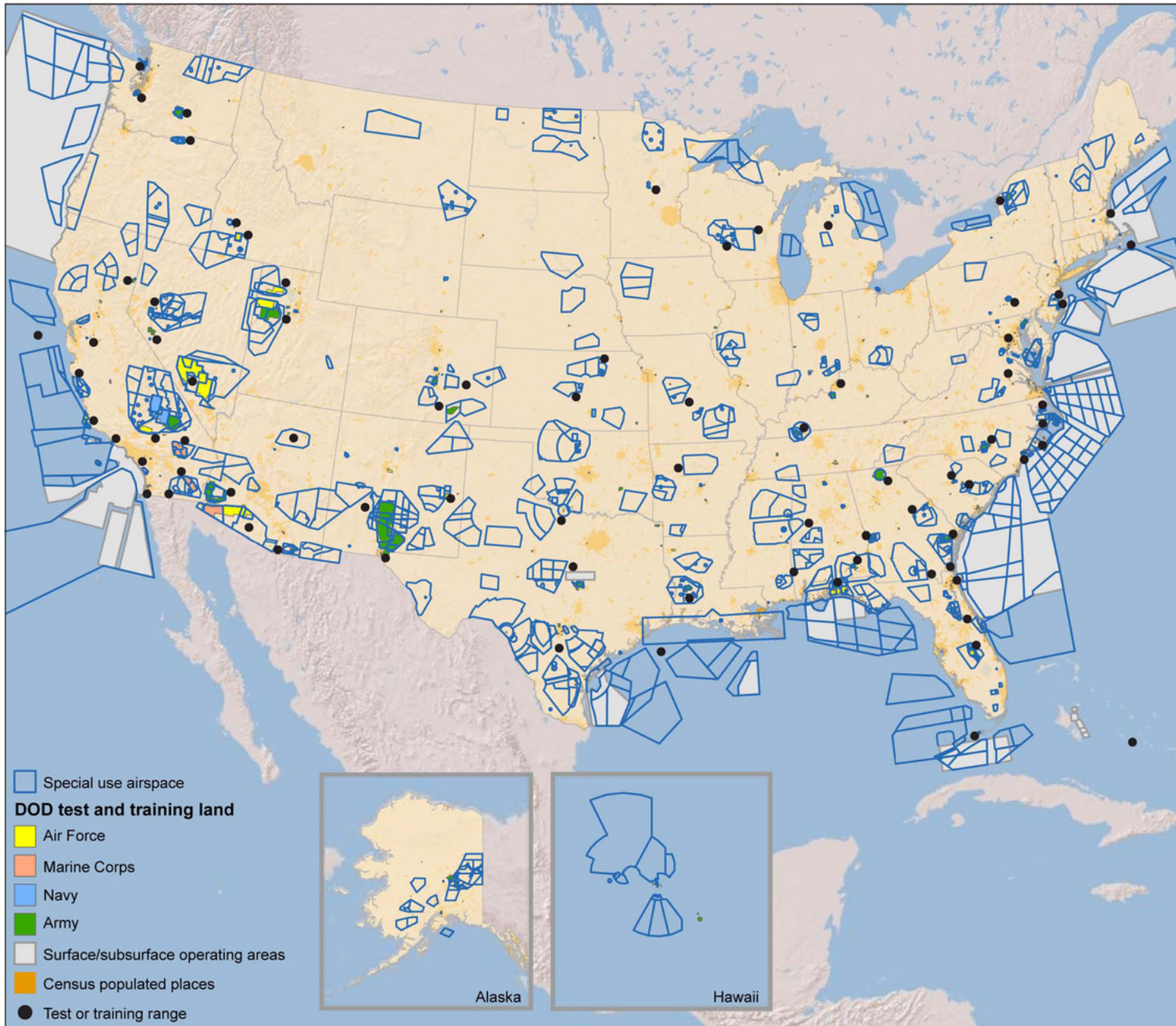


Figure 1. Department of Defense air, land, and seascape in the contiguous U.S.³

DoD manages approximately 27 million acres of land across about 420 large military installations (greater than 500 acres), with 339 of those installations having natural resources significant enough to require management plans.⁴ DoD lands occur in every state and represent 467 of the 565 ecological systems within the continental U.S. Only the National Park Service has more ecologically diverse lands (479 ecological systems). In contrast, U.S. Forest Service and Bureau of Land Management (BLM) lands represent 458 and 293 ecosystems, respectively, even though each is over eight times larger than DoD lands.⁵ To manage its lands for conservation, DoD employs hundreds of military personnel and contractors who perform natural resources management activities.

Land Management and the Military Services

Among the six U.S. military branches, our report focuses on four of them—the Army, Navy, Air Force, and Marine Corps—because they have the largest role in DoD’s land management decisions.¹ As the table below shows, the Army has by far the most acres of managed lands. In general, the military services own only 33 percent and lease 3 percent of their managed lands. The remaining 63 percent are managed under other arrangements, including restrictive easements.

Military Service	Acres of Managed Lands	Number of Sites in U.S.
Army	13,699,399 (51%)	1,565
Air Force	8,479,371 (32%)	1,535
Marine Corps	2,489,833 (9%)	190
Navy	2,213,278 (8%)	785

Number of species per 100,000 hectares

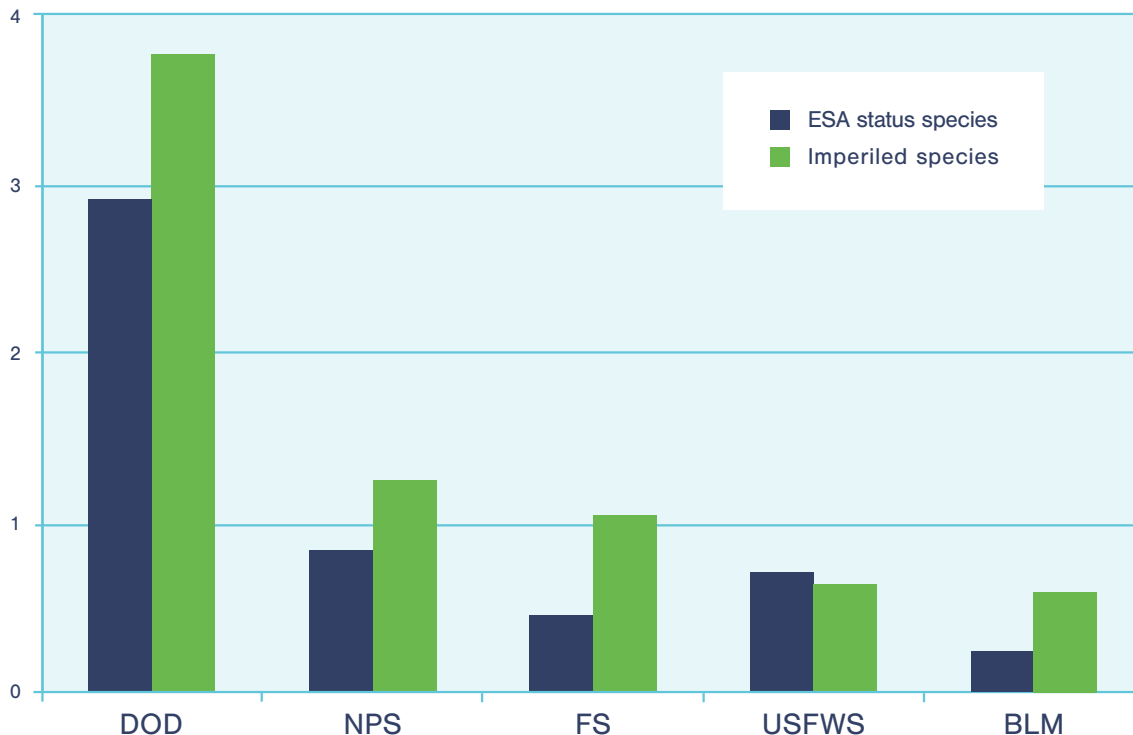


Figure 2. On a per-acre basis, the Department of Defense has the most imperiled species of any federal agency.⁶

DoD lands harbor an abundance of biodiversity. This includes approximately 450 species federally listed as threatened or endangered, over 550 species at risk of becoming listed, and 75 species that occur only on DoD lands. Compared to other federal lands, DoD lands have the highest density of ESA and imperiled species.⁷ Besides imperiled species, DoD lands also host a number of common or declining species. For example, a recent inventory of 415 DoD installations/sites confirmed the presence of a remarkable 66 percent of the total native reptile and amphibian species documented in the continental U.S.⁸

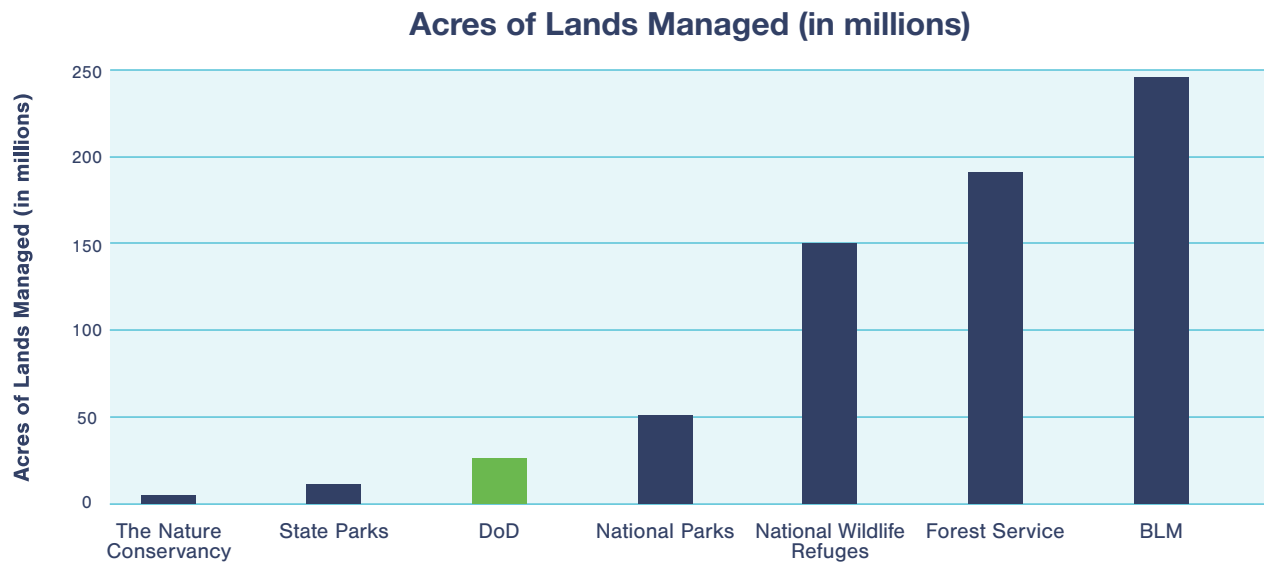


Figure 3. Area of Department of Defense Installations compared to other major conservation lands.

DoD lands also provide many ecosystem services and help protect watersheds from pollution and excess water withdrawal that would result from other, more intensive uses of the lands, such as residential development and agriculture. In the southwest, for example, DoD continues to seek opportunities to fallow agricultural lands to conserve groundwater and reduce other forms of “encroachment” on the military mission.⁹

Encroachment and why it matters

Understanding the military’s concern about encroachment is key to understanding DoD’s conservation potential. Encroachment involves the expansion of civilian activity (residential and commercial development) ever closer to formerly remote military training areas. Military noise, air pollution, and water pollution threaten or annoy the public. And public activity, from traffic to electromagnetic spectrum use to even a rise in ambient light levels at night, may interfere with military operations. A simple working definition is:

The real or perceived conflict between the military training mission and the physical environment of habitat, species, people and communities

In the southeast, DoD is instrumental to conserving and managing the region’s longleaf pine ecosystem, including by carrying out the prescribed burns needed to maintain that ecosystem. A well-managed ecosystem benefits DoD by reducing wildfire risk and conserving species that might otherwise become regulated through the Endangered Species Act (ESA). And in the Chesapeake Bay, where DoD installations make up approximately one percent of the watershed and 20 percent of federal lands, the agency has various initiatives to promote clean water, abundant wildlife, conservation of priority landscapes, and community engagement.¹⁰

The biological diversity and conservation value of DoD lands are attributable to several factors:

- > **The public has limited access to these lands because of security and safety concerns.** Further, the security and safety zones that buffer installations generally experience little to no military activities, which negatively affect species and their habitats.
- > **DoD lands were intentionally distributed across the U.S. to provide training opportunities for the military** under a variety of geographic conditions, which vary depending on the warfare and security circumstances of the era during which the installation was established. In other words, DoD's lands have evolved intentionally to be ecologically diverse. By contrast, BLM and Forest Service lands were not acquired with the same type of diversity objective.
- > **Many types of military training activities and land uses are compatible with maintaining or enhancing endangered species and other natural resources**, and DoD has implemented conservation measures to minimize and offset unavoidable impacts. Because DoD's activities generally do not involve extracting resources from its lands, the environmental footprint of those activities can be considerably less than those on BLM or Forest Service lands.
- > **DoD almost always gains an enormous benefit to its mission from having conservation lands adjacent to DoD installations.** Those conservation lands act as a crucial buffer against urbanization and other forms of encroachment on DoD's training and testing activities. For example, lighting from cities impedes military nighttime training; residential development near military bases results in noise and smoke restrictions on training activities; and wind turbines interfere with military radar testing. DoD fully embraces the statement made by one senior military representative that "fields, farms, and forests are the best neighbors of the military." No other federal agency faces the same type of existential threat to its mission from the loss of neighboring natural areas. For example, agencies like the National Park Service, BLM, and Forest Service certainly benefit from having their properties buffered by conservation lands, but in many places the agencies can still accomplish their mission without the buffers.

These four factors set DoD apart from all other federal agencies and explain why its mission is more closely tied to conservation than most people assume. They also underscore the many opportunities for conservationists to partner with DoD on land conservation and management.



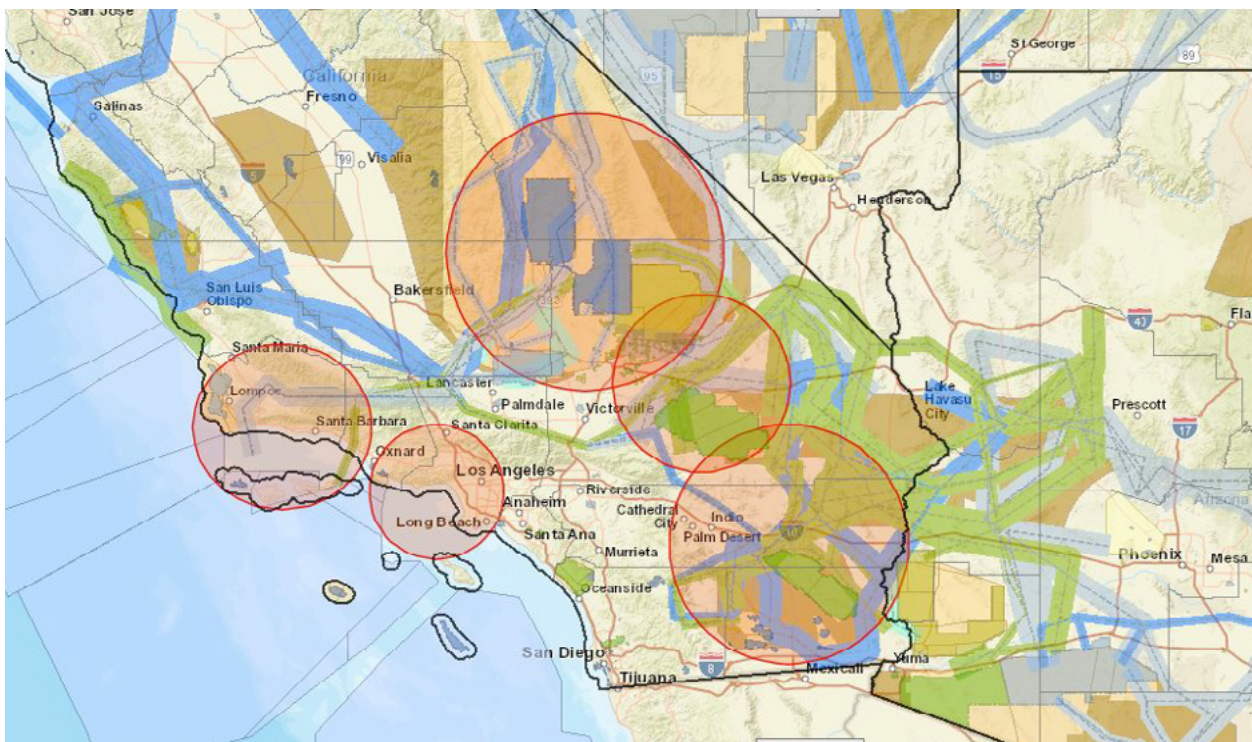
National Defense as an Important Conservation Ally

National defense is an important conservation ally not only because of the biodiversity value of DoD lands, but also because of how the Pentagon thinks about conservation. The BLM and Forest Service are multiple-use mandate agencies; conservation is just one of their many coequal priorities. DoD always has the same priorities—training, testing, and military operations—but it has no other priority beyond those other than the conservation and stewardship of the lands and resources entrusted to it.

DoD's focus on and capacity for conservation is reflected in its existing conservation programs and its ability to secure the budget, legal authority, and other administrative tools needed to meet its mission while conserving natural resources. These capacities make DoD a potent ally for conservation and one of the most capable federal departments to carry out conservation. Further, DoD has a legal and a political mandate to protect national security—one that has enjoyed broad bipartisan support across every presidential administration and among the general

public. For this reason, DoD does not face the partisan attacks to its mission and budget that we see with agencies like BLM and EPA. Under the broad umbrella of national defense, Congress and DoD can promote conservation that supports the military mission without the intensity of political opposition that standalone conservation initiatives can attract.

For DoD and other federal agencies to invest more in conservation under the umbrella of national defense, the conservation community must work with DoD to identify and provide incentives for the agencies to carry out this work. A strategy that assumes DoD will undertake conservation for its own sake is likely to generate only incremental progress. Conservationists, however, have not always made clear to DoD how conservation will enhance the military mission. Conservationists cannot engage with DoD the same way they engage with BLM, which has a multiple-use mandate that makes conservation as important as other uses of the land but which, in practice, focuses a lot on extractive uses of the land. By contrast, DoD's primary mission is national security. Thus, the best incentive for DoD to carry out conservation is to link conservation to this mission.



Southern California Military Installations and Operational Areas

The extent of the Department of Defense's lands, airspace, important ocean areas and other features in southern California shows why the military is so important to conservation.

Beyond DoD, other federal agencies could similarly secure more resources for conservation under the broad umbrella of national defense. In other words, DoD is not the only avenue through which to expand conservation in the name of national defense. For example, working agricultural lands can support military readiness by buffering military installations from incompatible land uses and encroachment. Yet negotiations on the Farm Bill have not capitalized on this linkage as a rationale to request more funding for those working lands. Likewise, incorporating national defense as an explicit factor in BLM land use planning could result in more acres protected from extractive uses of the land where there are BLM lands important to both national defense and conservation. Thus, the question is not just how DoD can help conservationists achieve their goals, but how conservationists can help DoD promote national defense and conservation through USDA, BLM, and other overlooked channels.

Below, we summarize DoD's conservation authorities, programs, and budgets to explain why the conservation community should invest more in helping DoD advance its mission in ways that promote conservation. This summary is intended to provide enough background to understand Part 3 of the report.



Unmanned aerial drones are being used to map invasive species habitat on Camp Bullis in Texas.

DoD's Successful Record of Expanding or Changing Stewardship Authorities

As with all federal agencies, DoD must comply with a variety of federal environmental laws that constrain or guide DoD activities including the ESA, Clean Water Act, and National Environmental Policy Act (NEPA). But beyond these laws, the department also has several important legal authorities to affirmatively pursue conservation that advances the military mission. This section summarizes the DoD's authorities to proactively pursue conservation and why they matter to conservation.

DoD has successfully garnered congressional support to periodically amend these authorities to promote conservation. By contrast, our nation's bedrock environmental laws such as the ESA, NEPA, and Federal Land Policy and Management Act (FLPMA) have rarely if ever been updated in the last two decades. DoD's environmental record in securing Congressional support for environmental initiatives and changes in statutory authorities shows that it benefits from more bipartisan support than most other federal departments enjoy.¹¹ Further, when DoD has sought a legal exemption, it has not disavowed further responsibilities under the environmental statute at issue.

DoD has two key legal authorities to advance conservation. First is the authority under 10 U.S.C. § 2684a to enter into cost-sharing agreements with partners to limit encroachment around military bases or preserve high quality habitat in a manner that alleviates restrictions on military activities or promotes military installation resilience. Under this arrangement, the partner acquires an off-base property interest as a restrictive easement (unless the land owner will convey the interest as a fee simple), with the DoD holding the right to monitor and enforce the easement. Although DoD does not always acquire real property interest under this arrangement, it has protected over 586,000 acres since 2002 using this approach through its Readiness and Environmental Protection Integration (REPI) Program created under § 2684a (discussed below).

A noteworthy aspect of § 2684a is that it was DoD that drafted the legislative language, and it has been DoD that has asked Congress to amend the language many times since it was first enacted in 2003. For example, a 2008 amendment authorized DoD to pay for active natural resource management on protected lands; a 2014 amendment allowed § 2684a funds to satisfy any matching or cost-share requirement of a U.S. Department of Agriculture (USDA) or Department of the Interior grant program; and a 2019 amendment expanded the scope of § 2684a to include the maintenance or improvement of military installation resilience to address extreme weather events and changing environmental conditions. DoD has persuaded Congress to amend § 2684a many times since 2003, in each case to make it easier for DoD to use this authority to promote mission-compatible conservation. We have trouble thinking of another example involving federal land management where an agency itself has asked Congress to expand or strengthen its conservation mission. In most cases, conservation nonprofits, political appointees, or Congress have imposed that mission change on the agency.

The second legal authority is the Sikes Act of 1960 (16 U.S.C. § 670), which serves several purposes. First, it works in parallel with § 2684a to allow DoD to enter into agreements to maintain and improve natural resources off of military bases to reduce or forestall restrictions on military activities. This authority is particularly important for protecting habitat for ESA-listed species. Second, it requires DoD, the U.S. Fish and Wildlife Service (USFWS), and state fish and wildlife agencies to jointly develop Integrated Natural Resource Management Plans for installations with significant natural resources. Those plans describe how an installation will conserve its natural resources and promote sustainable multipurpose use of those resources. A military installation must review its plan annually. And unlike most other federal agencies, DoD must coordinate with USFWS and state wildlife agencies on the review and revision of each plan at least every five years and to update the plan if needed.

Integrated Natural Resource Management Plans are important for several reasons.

- > First, DoD persuaded Congress to amend the ESA in 2004 to give the USFWS discretion to exempt an area from critical habitat designation if the area is covered by one of these plans. DoD is the only agency that has succeeded in obtaining a legislative exemption to critical habitat designation. This is an important example because DoD has funded and executed more natural resources conservation on military lands that would have been designated as critical habitat than would have occurred as the result of critical habitat designation alone.¹²
- > Second, the DoD management plans are reviewed and revised far more often than land management plans by the Forest Service or BLM, even though many of the DoD revisions do not rise to the levels that trigger public attention or engagement.
- > Third, DoD is looking to expand the use of its management plans to conserve ecosystems more broadly and address climate resilience and has funded the National Wildlife Federation to develop guidance on how to incorporate climate change planning into those plans.¹³ In the future, the plans will likely play an even larger role in shaping conservation on and around DoD installations.

Overarching Natural Resources Program and Policy

The DoD has a robust Natural Resources Program that provides policy, guidance, and oversight to manage natural resources on all military land, air, and water resources. Among its many specific duties, the Program oversees the development and implementation of natural resource-related policy for DoD, coordinates with external stakeholders, and manages DoD's natural resources funding programs. In FY 2017, the Program invested nearly \$340 million in conservation.

Compared to some other federal land management departments, DoD has a fairly strong internal directive to pursue conservation where it is compatible with the military mission. DoD Instruction 4715.03, which is the primary policy document for the Natural Resource Program, explains that “the principal purpose of DoD lands, waters, airspace, and coastal resources is to support mission-related activities.”¹⁴ The document, however, also establishes many conservation mandates to the extent they are compatible with or support the military mission.

For example:

- > “DoD shall demonstrate stewardship of natural resources in its trust by protecting and enhancing those resources for mission support, biodiversity conservation, and maintenance of ecosystem services.”
- > “DoD shall manage DoD lands, waters, airspace, and coastal resources or natural resources for multiple uses when appropriate, including sustainable yield of all renewable resources, scientific research, education, and recreation.”
- > “Biodiversity conservation on DoD lands and waters should be followed whenever practicable to...maintain or restore remaining native ecosystem types...viable populations of native species...[and] ecological processes.”
- > “DoD Components shall ensure no net loss of size, function, and value of wetlands, and will preserve the natural and beneficial values of wetlands....”

These mandates rival those of other federal land management agencies and are largely independent of direct benefits to DoD’s training, testing, and operational goals.

Funding Programs

DoD has several important funding programs that can advance conservation and the military mission. In total, DoD spends over \$500 million annually on conservation-related activities, including through the Natural Resources Program discussed earlier. An important mission sustainment program that often has conservation benefits is REPI, which funds cost-sharing agreements with state and local governments and conservation organizations to address encroachment on military activities by promoting compatible land uses, preserving habitats near or ecologically related to military installations and ranges, and enhancing or improving military installation resilience. For this reason, REPI is one of DoD’s most important programs to promote the military mission while also furthering conservation goals in many instances (not all REPI projects have a conservation component). Congressional appropriations for REPI have increased from \$60.41 million in 2014 to \$100 million in 2019, allowing the program to complete over 1,900 transactions to protect over 586,000 acres.¹⁵ Because REPI is a cost-sharing program, it has leveraged an additional \$92 in partner funding for every \$100 spent by DoD, allowing the program to allocate nearly \$1.65 billion from its inception in 2002 through 2018. The bottom line is that REPI is now a \$100 million/year program often focused on land protection and large landscape planning. This fact alone makes the program worth paying far more attention to within the conservation community. And all things being equal, it would likely be far easier to convince a bipartisan Congress to add another \$100 million annually to this land protection program than any other similar program.

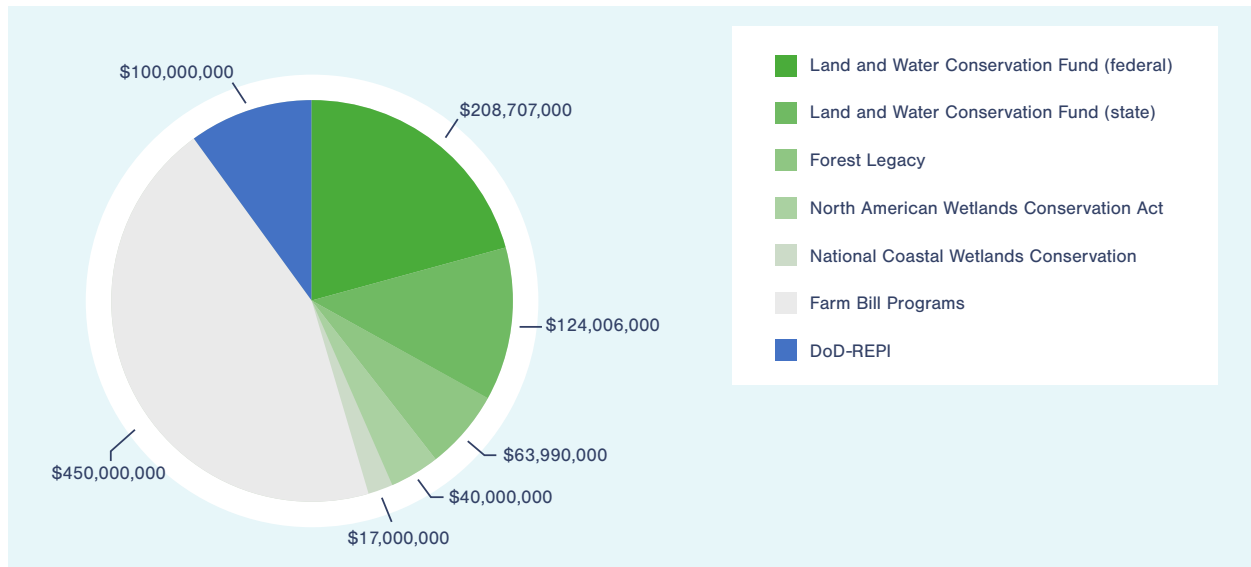


Figure 4. 2019 Congressional appropriation levels for all federal programs for land protection. REPI is the fourth largest.¹⁶

The Army has the largest program to implement REPI through its Army Compatible Use Buffer (ACUB) program. Under ACUB, a non-military partner such as The Nature Conservancy acquires a property either in fee simple or as an easement. The partner manages and enforces the easement, but the Army retains the right to monitor and enforce the easement if the partner fails to do so. The Air Force’s program operates in a similar manner. By contrast, the Navy’s and Marine Corps’ REPI programs typically request transfer of at least a restrictive easement to themselves at the time of closing.

Another partner that plays a vital role helping to implement REPI is the U.S. Endowment for Forestry and Communities, a nonprofit grant-making foundation that focuses on working forest lands but also supports REPI in various ways. This includes receiving funding from DoD and, in effect, administering a portion of REPI funds. Their specific partnership is called the REPI Challenge, which is an annual program to support innovative uses of REPI funding to conserve land at a greater scale, test promising ways to finance land protection, and harness the creativity of the private sector and market-based approaches. The Endowment has also contributed more than \$600,000 of its own funds to match REPI investments, thus underscoring the value of external partners to the success of REPI.



Figure 5. 2019 REPI program locations are geographically diverse and overlap considerably with biodiversity hotspots in the United States (southeast and California).

Besides REPI, DoD has three smaller programs that fund natural resources work.

- > The Strategic Environmental Research and Development Program provides about \$60 million per year for basic and applied research, development, and application of innovative technologies to address DoD's environmental challenges.
- > The Environmental Security Technology Certification Program provides about \$40 million per year for demonstrating and validating energy and environmental technologies.
- > The Legacy Program, which Congress established in 1990, supports military readiness by funding projects that help protect and enhance DoD's natural and cultural resources and which is funded at about \$2.5 million annually, far less than the nearly \$50 million it received annually in the late 1990s. The Legacy Program is particularly important for natural resource conservation because it funds a variety of research and on-the-ground conservation work, often carried out by universities and conservation organizations. Recent projects include understanding desert tortoise conservation on military test ranges; development of best management practices for monarch butterfly breeding and migratory habitat in the West; and an online toolkit for putting environmental DNA techniques into practice. These and other funded projects are highly relevant to conservation practitioners and help fill crucial gaps in knowledge, while also advancing the military mission. We strongly recommend an increase to the program's budget to help pay for future applied research on biodiversity and ecosystem conservation. In the past, the program paid for many research projects that benefitted DoD's natural resource work. Increased funding for the program would likely deliver similar benefits today.

Programs to Conserve Specific Groups of Species or Ecosystems

DoD has several programs to conserve specific species or ecosystems. The department has two programs focused on specific taxonomic groups. One is the DoD Partners in Flight Program, which has a mission "to conserve migratory and resident birds and their habitats on Department of Defense lands."¹⁷ The Program's activities include conservation planning, providing information to inform Integrated Natural Resource Management Plans, monitoring birds, and reducing aircraft bird strikes. The department also has a DoD Partners in Amphibian and Reptile Conservation Program, which provides coordination, monitoring, and funds other related activities that benefit herpetofauna.¹⁸ No other federal land management agency has taxon-specific programs like DoD's, suggesting that the department has a strong interest in and the expertise to conserve biodiversity.

DoD also has programs to conserve species that may create conflicts with the military mission. In particular, DoD in 2017 established the Gopher Tortoise Conservation and Crediting Strategy, which allows military installations in the unlisted range of the gopher tortoise to get credit for conserving the species and use those credits in the future to offset military impacts to the tortoise if it is someday listed.¹⁹ DoD has created similar species banking programs for the golden-cheeked warbler and the red-cockaded woodpecker.

At the broader ecosystem level, DoD has helped fund the Longleaf Stewardship Fund, which aims to restore the longleaf pine ecosystem in the southeast.²⁰ DoD helps fund this initiative because many imperiled species that rely on the ecosystem are also found on DoD installations. By helping to improve the status of those species, DoD can reduce ESA restrictions on its installations.

Climate Change

A consistent theme throughout our workshops is that climate change poses a danger to DoD's mission and operations. The dangers include recurrent flooding, drought, desertification, wildfires, and thawing permafrost. As shown in Figure 5, about two-thirds of the 79 installations that DoD analyzed in a 2019 report on climate change are vulnerable to current or future recurrent flooding and more than one-half are vulnerable to current or future drought.²¹ About one-half are vulnerable to wildfires.

Service	# Installations	Recurrent Flooding		Drought		Desertification		Wildfires		Thawing Permafrost	
		Current	Potential	Current	Potential	Current	Potential	Current	Potential	Current	Potential
Air Force	36	20	25	20	22	4	4	32	32	–	–
Army	21	15	17	5	5	2	2	4	4	1	1
Navy	18	16	16	18	18	–	–	–	7	–	–
Total	75	51	58	43	45	6	6	36	43	1	1

Figure 6. Installations facing current and future vulnerabilities to climate change.²²

DoD's response to climate change is noteworthy in two respects. First, unlike some federal agencies that shy away from mentioning climate change, DoD considers the threat frequently and substantively. This was evident not only at our workshops, but also from DoD's investment in understanding and adapting to the effects of climate change. For example, in 2016 DoD issued a directive that established policy and assigned responsibilities to provide DoD with the resources to assess and manage risks associated with climate change.²³ More recently, DoD funded the National Wildlife Federation to develop guidance for integrating climate change into Integrated Natural Resource Management Plans.²⁴ These and other examples show that DoD is incorporating climate resilience as a crosscutting consideration in its planning and decision-making processes, not as a separate program or specific set of actions.

We believe that conservationists, advocates, and scientists often talk to DoD about climate change in the wrong way. There is still an element of persuasion around trying to convince the services of the validity of the science. DoD, however, was one of the first agencies to embrace this issue at a leadership level and they don't need to be "talked at" but rather partnered with so that they get the help they need to change their operations to address and mitigate climate risks. This is not an issue of semantics.

Embracing DoD as an equally advanced partner and respecting their expertise on this issue would strengthen its desire to work with conservation advocates on climate change risk mitigation. They are the federal agency that appears to have remained most steady on climate change through the Obama to Trump transition. That alone should show how much they understand the issue.

Second, DoD offers a potential avenue to enact climate change adaption legislation if necessary. As discussed earlier, DoD's § 2684a authority was recently expanded to authorize projects that help installations manage for climate resilience. More broadly, the department has succeeded at amending natural resource laws to accommodate its needs. What could an amendment to the Sikes Act that incorporates climate change adaption and mitigation do for conservation? What if legislation gave DoD greater authority to comment on the actions of other federal actions related to climate change? These are some directions for legislative amendments that we think would benefit climate adaption because DoD's motivations on this issue seem consistent with the actions that conservation planning and science tell us are needed. Further, sometimes legislative authority can encourage DoD to pursue an action for which it currently has unclear legal authority. Thus, new legislation on climate change adaptation might prompt DoD to invest even more into this arena.

Shifts in How DoD Thinks About its Activities

Like most other federal agencies over the years, DoD has evolved its thinking in ways that generally favor conservation. First, the department has tried to shift from reacting to environmental compliance requirements to proactively addressing them. This is perhaps most evident in DoD's work on the ESA, with the department investing considerable funding and staff hours to conserve species like the gopher tortoise in southeastern states to avoid an ESA listing. This shift to proactive thinking corresponded with a shift in the geographic scope of DoD's conservation work from inside installation fence lines to outside, because DoD found it impossible to sustain the military mission without addressing encroachment occurring outside of installations. This change paved the way for programs like REPI and offsite mitigation programs for endangered species. Today, DoD needs even more ability to manage off-base natural resource issues that encroach on the military mission. Invasive species are a prime example. Some

Naval bases spend considerable funds controlling invasive plants on their property to combat the deliberate and unintentional proliferation of invasive plants immediately outside of the military fenceline.

Another change is that each of the military services used to be fairly stovepiped in their response to conservation challenges. Although there are still remnants of this division today, DoD has several major initiatives that span not only the military services but other federal agencies. For example, the Sentinel Landscapes Partnership, discussed later, is a collaboration with the Interior Department and USDA to manage seven large landscapes for conservation, agriculture, and the military mission, with DoD serving as the lead agency. Similarly, DoD is a significant contributor to the National Fish and Wildlife Foundation's Longleaf Stewardship Fund, which includes federal, state, and private partners. The growing number of major conservation initiatives that DoD has adopted underscores its evolution from an inward facing department to one that actively seeks external partnerships.



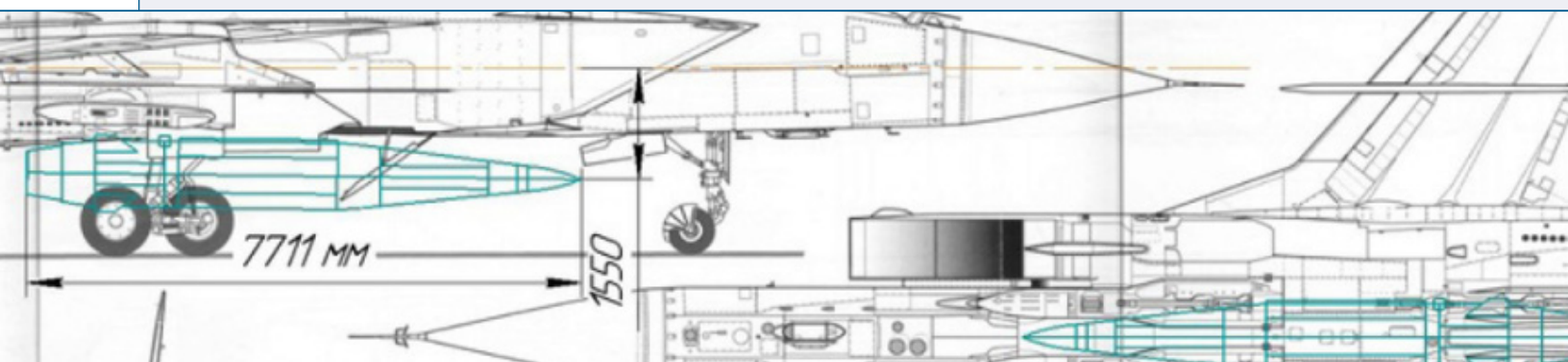
The Army's Fort Hood in Texas has reduced biodiversity-related training restrictions from 29% to 4% of the installation.

Future of Warfare and How It Affects Conservation

A major incentive for DoD to expand its land base is that its current installation portfolio is increasingly inadequate to train for modern weapons and future warfare techniques, particularly the use of technology in combat. Vandenberg Air Force Base in California offers one example of this challenge. The base is becoming landlocked by neighboring land development, whereas its testing and training needs are increasingly requiring more airspace between testing ranges. This includes expanded airspace needed for future generations of the F-35 fighter jet. Likewise, hypersonic weapons (those able to travel at Mach 5 and above) will become increasingly important in the future and will require a much broader spectrum of clear communication channels, which is impacted by cellular interference from mobile phone networks. Other future trends include robots with artificial intelligence, increased use of lasers and the need for distant target practice, space and near-space military training exercises, and SpaceX and other commercial space ventures launching from military installations. DoD will need to develop, test, and train on these emerging technologies faster than in the past. Doing so on the same 27 million acres is impossible.

These future trends create both threats and opportunities for conservation. On the one hand, some areas may experience new and greater environmental impacts from military testing and training. On the other hand, DoD's need for large expanses of land with limited human occupation offers an excellent opportunity to increase the amount of habitat protected from urbanization and other higher impact development. Many lands reserved for future military training and testing may experience little to no impact because the military needs to use only the airspace above those lands.

Future trends in warfare also pose novel questions about how they will intersect with federal environmental laws. For example, how will DoD draft NEPA environmental impact analyses and Integrated Natural Resource Management Plans for long-range weapons? There appears to be no one in the conservation community with the expertise and responsibility to address these types of questions and advocate for better environmental outcomes by engaging with DoD. Rather, the community generally reacts to needs like these when they arise. A better approach is to proactively shape the next generation of environmental laws and policies that can intelligently deal with emerging technologies used in warfare.



Background: Landscape Scale Conservation and Planning

The protection of larger tracts of land from incompatible uses is of great interest to DoD because it can help to buffer installations from encroachment and provide much needed capacity for training and testing. At the same time, DoD's use of the lands is often consistent with conservation. This section of the report discusses challenges and opportunities to help DoD expand the lands it manages in a manner that also advances conservation goals.

DoD has three strategies to obtain a legal interest in land:

- > One is to purchase the land in fee simple, sometimes in partnership with other federal agencies and the private sector. One recent example is the Alapaha River Wildlife Management Area in Georgia, home to the third largest population of gopher tortoises in the state and acquired partially using REPI funding, which allows USFWS to provide DoD with credits that DoD can use to offset any future impacts to the species if it is listed under the ESA. Fee acquisitions, however, are a minority of the lands that DoD acquires an interest in. The main reason is that DoD, by law, is required to acquire the smallest interest in property necessary to achieve its mission.
- > Because of this requirement, a restrictive easement is the most common approach for DoD to secure a legal interest in land. For the most part, REPI funding pays for easements, often in partnership with funding from other entities.
- > A third approach is to withdraw public lands for DoD's use. A significant percentage of DoD's 25 million acres consist of withdrawn lands. As explained earlier, DoD currently has two new proposed withdrawals under consideration: one to withdraw portions of Desert National Wildlife Refuge for use by Nellis Air Force Base, and a second to withdraw portions of BLM land in Nevada for the proposed expansion of the Navy's Fallon Range Training Complex. A withdrawal, however, does not necessarily mean that DoD manages the withdrawn land on its own. For example, the Barry M. Goldwater Range withdrawal, which is generally regarded as a good conservation outcome by most stakeholders, involves DoD co-managing the lands with USFWS, BLM, and Arizona Game and Fish Department. Similarly, the proposed withdrawal of portions of Desert National Wildlife Refuge could involve USFWS continuing to manage the lands for wildlife, which the Air Force would help fund. Another important point we learned about withdrawals is that they do not always result in more environmental impacts to the land. For example, DoD explained that the proposed withdrawal of Desert National Wildlife Refuge is intended to restrict public access to portions of the refuge during training but will not result in more ammunition being dropped onto the refuge. Nonetheless, the withdrawal has generated strong opposition from local and national conservation groups.

Military Land Withdrawals

The Engle Act of 1958 requires Congress to approve military land withdrawals of 5,000 acres or more. As a result, Congress has passed various legislation to withdraw lands for military use, with the requirement of a periodic renewal of the withdrawal, typically every 15, 20, or 25 years. For example, the National Defense Authorization Act for Fiscal Year 2000 extended the withdrawals for the Naval Air Station Fallon Ranges and Nellis Air Force Range (NV), the Barry M. Goldwater Range (AZ), and several other large installations. Similarly, the Military Land Withdrawals Act of 2013 (S. 1309), almost all of which was adopted in the NDAA of 2014, completed the withdrawals for White Sands Missile Range (NM), China Lake Naval Weapons Station (CA), Twentynine Palms Marine Corps Base (CA), and other installations. For many of those withdrawals, the Interior Department will continue to manage "shared use" areas that previously belonged to BLM.

The three approaches above involve DoD acquiring a legal interest in land. But in many instances, DoD only needs permission to carry out activities on land owned by another entity or may be able to achieve its objective through agreements that do not involve a fee or easement interest. Below are three strategies that DoD uses to advance the military mission without obtaining such an interest.

- > The public often does not realize that DoD carries out testing and training not only on its installations but also on other public lands and on private lands. One way this can occur is through a special use permit with the Forest Service, which allows DoD to carry out specific activities covered by a permit. For example, the Coronado National Forest has granted the Air Force permission to operate a ground-to-air transmission facility within the forest.²⁵ Special use permits may be relied on to a greater extent as DoD's training and testing footprint grows in response to the needs of modern warfare. Currently, BLM does not have authority to grant a special use permit to DoD. We recommend that Congress grant the Interior Department the authority to issue special use permits to DoD, perhaps under the condition that DoD perform certain natural resource management activities on the land management agency's lands as a condition of the permit. Why would conservationists care about DoD's use of special use permits? Because if DoD has an interest in using lands for specific purposes, they will also have an interest in maintaining those uses and potentially opposing incompatible uses like mining and logging.
- > In our discussions with DoD, they emphasized that few of their activities on public lands are destructive or even impact the environment. Often, large acres of land are needed to distance the public from military training and testing activities. Further, as part of the west coast sea-to-land training that DoD carries out, the Marine Corps strives to achieve a "net benefit" on BLM lands that it uses by leaving the lands in a better condition than before, such as by removing trash the public leaves on those lands.
- > DoD also engages in land use planning with government and non-government entities. The Desert Renewable Energy Conservation Program is an example of a good planning effort that DoD has engaged in.²⁶ DoD has also participated in land use planning with wind energy developers to minimize interference between aircraft training and wind turbines.
- > The Sentinel Landscape Partnership is an emerging approach that furthers military, conservation, and agricultural interests through a suite of approaches, including acquiring interests in lands covered by the partnership. In the next decade, Sentinel Landscapes may become a primary approach that DoD uses to advance military and conservation goals. We discuss more about Sentinel Landscapes later.

A final piece of the landscape conservation and planning discussion is how on- and off-installation lands are managed for conservation. Our workshop in the southeast underscored the importance of adequately funding management of conservation lands (e.g., by increasing prescribed burns), as the participants lamented that funders often want to invest only in land acquisition but not management. As a result, the acquired lands are not serving their intended conservation purpose.

3

RECOMMENDATIONS: STRENGTHENING MILITARY READINESS AND CONSERVATION

We believe a specific, reasonable scenario of an expanded DoD “footprint” is a useful way to frame opportunities and challenges to advance the military mission and conservation. What might an expanded footprint look like?

DoD currently manages approximately 27 million acres of land. In 10-15 years, we can envision DoD having secured management over or protected from incompatible use another 5 million acres, much of it from land transferred from BLM and the rest from land secured through DoD’s buffering programs. In our scenario, that expansion would include an a) increase in lands withdrawn from other agencies and moved to DoD, b) a significant increase in special use permits, c) an increase in land protected for conservation and that buffers installations, and d) only a very small increase in acquired private lands that were absorbed into installations. This is our speculation, not a reflection of any plan or analysis we reviewed. We expect that most of any increases in DoD’s lands will occur in Western states (Figure 7).

Potential increased mission + conservation footprint

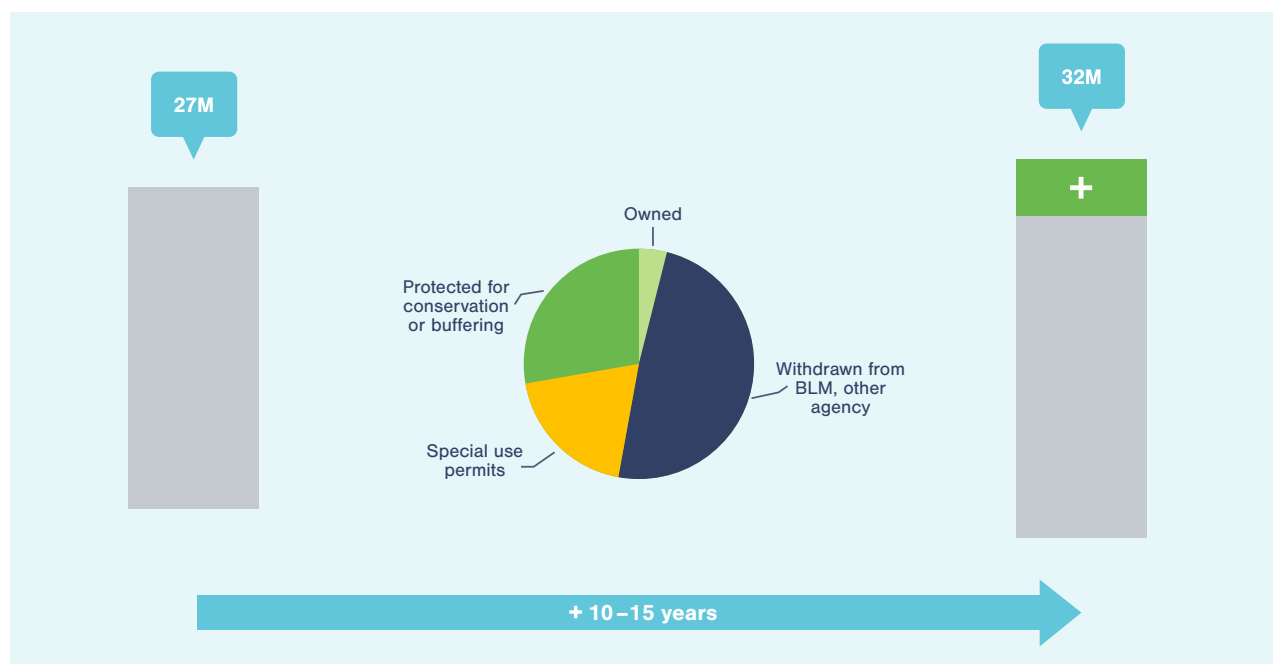


Figure 7: What a 5 million acre increase in DoD’s mission and conservation footprint might look like.

We believe that an expanded footprint for DoD will probably happen with or without conservation partners because of the changing nature of warfare and training and the imperative to prepare for those changes.²⁷ But conservation partners have the ability to influence whether that expansion also enhances conservation.

For context, the REPI buffering program has put over 586,000 acres into a more protected, mission-compatible management in its first 16 years and a current withdrawal proposal (for the Fallon Naval Range) would add 700,000 acres of lands into DoD control.

Evaluating DoD as a Conservation Steward

Why would we encourage conservationists to cooperate to achieve such an outcome instead of fighting it? Our rationale for viewing this scenario as one of possibility rather than threat is that, on the whole, DoD will likely manage its lands better than BLM is able to do given its limited staff and pressures to support multiple land uses other than conservation. Compared to BLM's multiple use mandate, DoD's land management directives and capacity seem more aligned with conservation. The military mission always comes first, but conservation is typically viewed as a compatible and desirable concomitant priority.

The details matter, however, and each proposed land withdrawal or buffer transaction should be evaluated on its merits to ensure that a better conservation outcome is likely. Currently, almost no one in the conservation community focuses on analyzing the benefits and costs of potential DoD land transfers and advocating for beneficial outcomes. The approach is primarily reactive. Nor does anyone systematically insert themselves into DoD land transfers to negotiate better outcomes for conservation. For example, what would happen if DoD wanted 1 million acres of land, but was pressured by conservation groups to acquire another 500k acres for conservation as part of the exchange?²⁸ In many situations, DoD might convince Congress to fund outcomes like that. Although regional conservation groups may currently play this advocacy role in some situations, no national group does so.

A similar opportunity may exist with certain land transfers from National Wildlife Refuges. The benefits of refuge transfers are far less obvious because refuges are already managed primarily for conservation. But we think that in some situations, a transfer of refuge land would result in a net benefit for conservation if it was in exchange for DoD paying the Refuge system to protect and manage more acres of higher quality habitat elsewhere. An example is if portions of a refuge that provide poor habitat for wildlife are transferred to DoD in exchange for DoD acquiring essential areas of important habitat. Right now, the problem is that

no one in the conservation community has done the analysis to identify these beneficial exchanges. As a result, conservationists are missing opportunities to negotiate better outcomes when DoD seeks a land transfer.²⁹

In addition to land protection or management control, DoD also seeks more flexibility to train and test on its installations and less risk from wildfire, drought, and other natural resource challenges. Conservationists could advance both of these DoD objectives in exchange for more conservation on and off installations.

Below, we offer our recommendations for legal, policy, financial, and other measures to promote the overarching goals described above. We have organized our recommendations into five broad categories:

- > The conservation community needs resources to hire expertise that would allow it to partner with DoD on the recommendations in the rest of this report. Without that capacity, we see limited ability for those recommendations to be realized.
- > We then discuss funding, focusing on opportunities to increase DoD funding for conservation by supporting more efficient ways for DoD to combine its funding with other federal agencies.
- > Next we turn to conserving and managing habitat through landscape scale conservation and planning. This broad topic includes Integrated Natural Resource Management Plans and other forms of land use planning.
- > We then discuss the conservation of endangered and at-risk species because they are among the most important units of biodiversity and because they are often the main impetus for DoD to prioritize conservation of certain habitats.
- > We end with the broad topic of resilience, which includes water scarcity, climate change, and wildfire. Building resiliency into DoD installations is as much a benefit for DoD as it is for the environment.

Building Human Capacity to Engage with DoD

Throughout our workshops and other discussions with DoD, a main theme that emerged is the need for dedicated people outside of DoD with the knowledge, experience, and trust to engage with DoD on conservation, especially off-installation. This capacity is vital for several reasons:

- > There is only so much DoD can accomplish on its own without outside help. An example comes from the work of Brigadier General Bob Barnes, USA, retired, who was the national liaison between The Nature Conservancy (TNC) and DoD to pursue collaborations that benefited the environment and the military mission. General Barnes describes his work as a “matchmaker” between TNC and the military, helping each understand the other’s mission and approach. General Barnes’s work and unique relationship with DoD has also allowed him to help DoD get certain legislation enacted, as DoD staff are prohibited from lobbying Congress for increased legislation or appropriations. Ever since General Barnes retired from TNC several years ago, no person has filled the void of developing partnerships at the national level between DoD and a major conservation organization.
- > External capacity is needed to pursue analysis and advocacy on DoD land transfers and other opportunities for land protection and management. As discussed earlier, no conservation organization at the national level is currently analyzing all DoD land transfer opportunities and determining how best to maximize conservation outcomes in each scenario.
- > Capacity is needed to engage and inform conservation organizations about partnerships and other opportunities to advance conservation with DoD. Currently, a number of conservation groups coordinate and advocate on BLM, Forest Service, National Wildlife Refuge, and National Park Service issues. This work includes engaging in rulemakings, legislation and appropriations, and litigation. But no similar coordination exists for DoD issues, despite the importance of DoD lands for biodiversity and ecological integrity. For example, DoD reviews and sometimes updates about 70 land management plans per year, most of which we assume not a single person at a conservation nonprofit reads. Part of the fault lies with the fact that DoD has not gone out of its way to invite public engagement in its planning process. An improved process that engages the public would likely allow DoD to more effectively pursue off-installation conservation.
- > DoD also needs more capacity at other federal agencies because decisions or actions by those agencies are often required for DoD to itself take action.



St. Francis' Satyr butterfly was once thought to only be found in swamps on Fort Bragg, North Carolina.

External, Non-Profit Capacity

To address these gaps, we recommend philanthropic foundations support the capacity of conservation organizations and DoD itself to advance conservation in conjunction with the military mission. First, we recommend the creation of 2-6 new positions within conservation organizations dedicated to DoD issues. The positions should address at least two objectives. One is the opportunity to engage with DoD on establishing buffers around military installations and using off-base mitigation to offset environmental impacts on DoD lands. Given the success of REPI and the DoD's need to increase its land base to address current and future training needs, buffering and mitigation will remain important issues for conservation groups to engage with DoD on. Our workshops and interviews have emphasized the importance of installation staff having external support for easement and other land conservation transactions. When installations are short staffed, they are unlikely to be able to prioritize their own staff to completing those transactions, thus making the role of external conservation partners even more important. We have heard about excellent easement opportunities falling through the cracks because of inadequate installation staff resources. External capacity to help DoD with land conservation is important for the additional reason that convincing Congress to provide DoD with additional resources for land conservation pulls at a military budget baseline not a conservation one (compare this to advocacy around the Farm Bill or Department of the Interior budget, where more funds for one program typically mean less for another).

A second objective is to focus on DoD land withdrawals, land use planning efforts with other agencies, and Base Realignment and Closure (BRAC). As explained earlier, almost no one in the conservation community is focused on these issues at the national level, limiting our ability to influence the outcome of these negotiations.

A different opportunity for capacity building is to support new positions at DoD to serve as liaisons to the public and to other federal agencies with an interest in DoD issues, and vice versa. Several positions of this type already exist and appear to have greatly improved coordination and partnerships between DoD and those agencies. An example is the current REPI Director position, which has offices next to the Deputy Secretary of the Interior and at the Pentagon. In the past, DoD had a full-time Interior liaison, which we understand benefited both departments considerably. Similarly, USFWS has had DoD liaison positions for several years, with the current liaison splitting his time between the Service's Headquarters office and the Pentagon. Institutionalizing these types of inter-departmental positions, such as in statute, could further collaboration between military and conservation interests. In addition to the two positions above, liaison positions with the USDA and National Marine Fisheries Service could result in better coordination with those agencies too. Similarly, Congress could support a position at the White House Council on Environmental Quality focused on prioritization of federal conservation efforts that also enhance the military mission. Although Hewlett would not be funding these positions, we would encourage any DoD-focused campaign to use some funding to advocate for a future administration to fill them.



Kristin Thomasgard, REPI Director, with offices at Pentagon and in Assistant Secretary of Interior's office.

A third opportunity is to establish a partnership with a university to work with DoD on natural resource issues. Several universities already have this type of program, including Texas A&M University's Natural Resources Institute and the Colorado State University's Center for Environmental Management of Military Lands. We could envision a partnership with a west coast university focused on resiliency and the DoD mission, which seem to be especially relevant to many of the west coast installations. We do not have a strong recommendation on whether to pursue this idea but rather flag it as a potential opportunity for a foundation to consider.

Finally, a federal agency could fund grants to conservation organizations that allow them to hire personnel that "sit" in the offices of the agency. For example, the Natural Resources Conservation Service (NRCS) has funded staff positions at the National Turkey Federation, allowing those staff to fully integrate with the NRCS staff. A related opportunity is for a federal agency to assign employees as liaisons that work in the offices of a conservation organization but are still federal employees. Thus, federal agencies and philanthropic foundations could support more partnerships through unconventional but successful staffing arrangements.

Federal Agency Capacity

There are many situations in which one federal agency pays for the time of staff at another agency to process information or decisions or otherwise coordinate. For example, Federal Highways has paid for significant amounts of work by the U.S. Fish and Wildlife Service to review or consult on highway projects that could affect endangered species. We have also noted in this report the limited success of Integrated Natural Resource Management Plans in attracting significant input from the USFWS or state wildlife agencies. We recommend that the military services be given clearer authority that allows them to fund capacity at other federal agencies where doing so is critical to a mission and conservation objective.

Coordinate and Combine Existing Funding Better

Our discussion of funding focuses on several issues. The first is how DoD could be encouraged to invest more funding for conservation. One important way would be to enact authority for DoD to pool its funds with those of other federal agencies to achieve a common conservation objective. Pooling is important because it is often the only way for federal agencies to effectively contribute toward the management of large landscapes, as a federal agency will rarely have the resources to fund this work on its own. What do we mean by pooling? It is the ability to obligate resources that come from multiple agencies or U.S. Treasury accounts through single contracts or agreements without having to track and account separately for each allocation. In contrast to merely aggregating funds among several agencies, pooling removes many of the constraints and reporting requirements for each funding agency. This is why pooling offers the most efficient way for federal agencies to jointly fund land protection or management.

Pooling of funds is also very important for resilience planning such as pre-disaster mitigation and invasive species management. These planning projects are often landscape scale and involve federal, state, local, and private partners. Resilience planning is often a struggle because the costs of the planning (and implementation) end up being borne by one agency, but the benefits are received by many. A similar situation arises for local government where resilience projects might reduce flooding, improve air quality, expand housing, and boost transit but no one agency wants to fund all of those because many outcomes are not related to the agency's own mission. Joint Benefits Authority is a new structure being developed in California to pool funding and coordinate and prioritize the delivery of benefits so that all the payers into the Authority know they are getting value.³⁰ The same kind of structures for resiliency at a federal level could be equally valuable, but would presumably take new legislative authority to implement effectively.

Without new joint benefits authority for resiliency, there are at least four approaches to pooling funds that could be used today. One approach is to use the National Fish and Wildlife Foundation (NFWF) to pool funds for federal agencies. For example, while DoD already contributes \$600,000 annually to NFWF's Longleaf Stewardship Fund, NFWF must still account for these funds separately from USFWS or private money it also holds, which is unnecessarily burdensome for both NFWF and DoD. If there were no such requirement, DoD would likely contribute more to the fund. The NFWF mechanism is also less than ideal because NFWF's mission does not specifically encompass national security and because NFWF already manages a lot of funds including billions in Gulf oil spill restoration funds.



Dr. Benjamin Tuggle of the U.S. Fish and Wildlife Service providing a wildlife conservation award to Colonel Todd Fox, garrison commander of a U.S. Army installation.

A second approach is to legislatively create a chartered foundation to manage funds for off-base conservation that benefits national defense. A foundation of this type could pool funds from multiple entities without the burden of tracking and reporting on each source of funding. An example of this approach is the Congressional authorization to fund ecosystem restoration in the Everglades under the Comprehensive Everglades Restoration Plan, which was enacted into law in the Water Resources Development Act of 2000. This approach would offer the most flexibility for DoD, but also require

the most work to create. We think the approach could be particularly effective if each landscape that benefited from funds had shared outcomes to guide how the funds would be used. DoD is currently figuring out how to develop those types of outcomes through its Sentinel Landscapes Partnership.

A third approach is to use the Council on Environmental Quality's existing "pass the hat" authority, in which CEQ takes funding from multiple agencies but then assigns the responsibility to administer the funds to one agency. There are issues about whether all agencies have the legal authority to affirmatively pass funds to CEQ, but we believe those could be clarified through internal reviews by legal counsel. A committed administration could likely find a way to make this work. Under the Obama and Trump administrations, CEQ has not played that role for DoD because conservation in support of national security has not been a high priority for CEQ. Conservation groups, however, may be able to convince a future administration to make this issue more important to CEQ and create clear pass-the-hat authority for DoD, or create a White House task force on national defense and conservation, vesting the task force with the authority to pool funds from multiple agencies and decide the type of tracking and reporting it will carry out. Wildfire funding where USDA and Interior Department budgets are allocated efficiently across agencies is the best example we know of an efficient government structure to share funding for a specific purpose, but it helps that those two agencies' budgets go through the same budget subcommittees in Congress.³¹

A fourth approach is to create a private foundation that partners with DoD to pool and manage funds. One advantage of this approach is that it faces fewer restrictions than a foundation created by the government. An example of this type of partnership is the work of the U.S. Endowment for Forestry and Communities to support REPI. The Endowment manages funds for Sentinel Landscape Coordinators and the REPI Challenge program, and steers funds to certain Sentinel Landscapes, all in a manner that is likely more efficient than if done under a government foundation.

Among the four approaches discussed above, the second and third are mostly likely to offer a comprehensive, long-term solution because they can be tailored to the unique needs of DoD. Our interviews suggest that DoD would be receptive to the creation of a foundation. Nonetheless, it is worth exploring whether a DoD-specific fund at NFWF could, in the short term, offer an expeditious and efficient path to pooling funds, while DoD and others consider a more comprehensive approach. It is also worth exploring the feasibility of the fourth option, as we encountered limited awareness of this option in our workshops. For all four approaches, the philanthropic community could provide seed money to start a funding program on the condition that Congress takes over future funding for the program.

Expanding Flexibility in the Use of Funding

Besides pooling, we encountered several other opportunities related to funding. First is that DoD would like to provide funds to other federal agencies for them to use in ways that benefit DoD, without having to comply with all the rules governing Economy Act transfers. The underlying issue is that the Economy Act governs interagency transactions when there is no other, more specific, authority. The Act imposes various requirements on those transactions, including making the ordering agency de-obligate the appropriation at the end of the fiscal year if the performing agency has not performed or incurred a valid obligation on behalf of the ordering agency. The Act's requirements, however, do not apply when a federal statute provides specific authority for funds to be transferred between agencies and overrides the Act's requirements. Thus, legislative reform that authorizes DoD to transfer funds to the Interior Department and USDA for use over 2-3 years would likely result in an increased willingness by DoD to transfer funding.

Second, federal and state funds often carry with them requirements or restrictions that hinder efficient use of those funds, especially for conservation measures on private property. For example, we learned that restrictions associated with federal and state funds can make them unappealing to private landowners in Georgia who are considering prescribed burns on their lands. In our southeast workshop, the participants generally agreed that non-governmental funding is the most efficient way to pay for prescribed burns in the state (specifically, participants thought that funding the Georgia Forestry Commission to carry out prescribed burns is the most efficient way to fund that activity because the Commission has figured out how to assist landowners with burns without incurring legal liabilities that prevent federal agencies from participating in burns). There are many other instances where the flexibility of private capital will make the difference between whether or not a conservation action takes place.



Third, DoD and NRCS have different requirements for the terms of easements they will fund. Because the two agencies have not reconciled these differences, combining their funding to support land protection remains difficult or impossible in some situations. As a result, the agencies are losing opportunities to protect large, important parcels, especially in the southeast. Reconciling the differences should be a very high priority and we believe may require a legislative solution to resolve the often unresolvable conflicts between what each department believes the easements must do and possibly to resolve whether easements should be co-held by both or controlled by just one department.

Fourth, a major challenge is how DoD could more effectively finance the protection of buffers around military lands, particularly large amounts of land, at a fair market price and without unduly raising concerns from private landowners. At our workshops, we discussed several potential funding options, ranging from modifications to the tax code to establishment of trust funds similar to those used to provide for safe drinking water. DoD could secure Congressional funding to capitalize a \$1-2 billion revolving loan program with extremely low interest rates and allow those funds to be used by any land trust, state conservation agency, or other similar organization to secure lands within identified DoD buffer and priority areas. The benefit for conservation would be to secure more land quicker (avoiding real estate escalation that is common in all landscapes); to have funding available during cyclical real estate downturns; and to hasten installation buffering progress for DoD. DoD could also attract private financing to support protection of buffer land by making states eligible to receive 20% of the acquisition or easement costs from DoD if lands are protected quickly (e.g., 3 years). DoD could also publicly forecast how much buffer easement and in which areas it is willing to buy each year around certain installations. Doing so would encourage private funders to acquire the land sooner or at lower prices. As long as DoD remains true to its forecast and actually pays for those easements at a future date, it would be clarifying demand in a way that stimulates more land protection by partners.

A second option is to use private funds to secure options to buy or obtain an easement interest in land at specific prices. Each option would describe a price for purchasing the land or an easement interest, and a timeframe over which the transaction must be made. The options would not identify DoD as having an interest in the land, as doing so would likely cause landowners to inflate the purchase price of their lands. After the options are secured, DoD would have a prescribed time (e.g., 5 years) within which to obtain the Congressional appropriations needed to fund the purchase covered by the options. If DoD does not receive enough funding to buy all the properties, the private financing entity could try to extend the options for the unpurchased properties, which would allow DoD more time to secure the remaining funding. This technique is commonly used in the private sector to purchase large tracts of land at a fair market price.

Under this second option, DoD is unlikely to own any acquired land, as it is generally not interested in owning more conservation land. Rather, the most likely scenario is that a third party obtains an easement on the land and provides DoD with the right to enforce the terms of the easement (§ 2684a enables a third party to hold and enforce an easement acquired through DoD funds).

Landscape Scale Conservation and Planning

In our interviews and meetings with military personnel, we heard dozens of recommendations about how better landscape scale planning could benefit national defense and conservation. Below we describe these recommendations in five categories:

- > Land withdrawals
- > Sentinel Landscapes
- > Integrated Natural Resource Management Plans
- > Federal land use planning
- > Readiness and Environmental Protection Integration (REPI) program



The Tomahawk wildfire burns through 6,000 acres of Marine Corps Base Camp Pendleton, Calif., in May 2014. Wildfires are an increasing risk to military training.

Land Withdrawals for Military Use

Land withdrawals is a very controversial issue but one that may present overlooked opportunities for conservation. We provide three main recommendations on this topic:

- 1 The conservation community needs expertise and capacity to evaluate the advantages and drawbacks of proposed withdrawals and to negotiate with DoD for better conservation outcomes.**

As discussed earlier in this report, withdrawing BLM lands for military use could result in a net improvement for conservation by eliminating the threat of oil and gas development and other extractive uses of the land. In some situations, a withdrawal might even be configured in ways that create connectivity for wildlife. For example, if DoD is evaluating three alternatives for a proposed withdrawal, one of those alternatives might unbeknownst to anyone create corridors for wildlife movement. But without a conservation planning expert to identify the overlap between areas needed for connectivity and proposed land withdrawals, no one might realize this opportunity to promote conservation and the military mission. Further, a withdrawal does not always equate to more environmental impacts, as some withdrawals are designed primary to eliminate a public safety concern from existing or future military training.
- 2 Make military land withdrawals permanent, with conditions.**

DoD has tried for four years to pass legislation that would make all military land withdrawals permanent, effectively transferring management responsibility for these lands to DoD. Specifically, the proposal would make the existing withdrawals and reservations for 13 military installations, covering approximately 16 million acres, indefinite (as opposed to subject to periodic renewals),³² in exchange for increasing the transparency of land management decisions for those areas by requiring DoD to issue a public management report every five years and by creating Intergovernmental Executive Committees for the 10 largest installations (similar to the Barry M. Goldwater Range withdrawal, discussed below). Given DoD's inability to get this legislation passed, the department has not offered it in 2019-20 but is likely to reintroduce it in the near future. This creates an opportunity for conservationists because DoD might be more willing to offer additional conservation commitments in exchange for the conservation community's support for the permanent withdrawal proposal. We think that a coalition of conservation groups could engage with DoD on the terms of a new proposal that might offer significant benefits for conservation.
- 3 Replicate the best model of DoD conservation for withdrawn lands.**

The Barry M. Goldwater Range withdrawal—which covers 1.7 million acres, 95 percent of which was BLM-managed until the withdrawal—offers the best model we are aware of for how DoD could carry out other withdrawals.³³ Specifically, the withdrawal provides all stakeholders, including conservation groups, with an opportunity to engage in the natural resource management planning for the Range. Further, the withdrawal requires DoD and the Interior Department to create an Intergovernmental Executive Committee to provide a forum for exchanging information and advice on the management of the natural and cultural resources within the Range. The Committee's meetings are open to the public and provide non-Committee participants with opportunities to present opinions on the Range's management policies.³⁴ DoD conservation funding has then gone to implement the recommendations and priorities set by Committee and identified through stakeholder input. These are just a few examples of how conservationists can shape the management of the Range despite the withdrawal. We think that conservation groups could advocate for DoD to adopt similar opportunities as part of all future withdrawals, particularly because DoD views the Range's public participation process favorably and had incorporated the Barry Goldwater public engagement model into DoD's permanent withdrawal legislation. At minimum, an in-depth analysis of the effectiveness of the Barry M. Goldwater Range withdrawal for conservation is needed.

Sentinel Landscapes Partnership

The Sentinel Landscape Partnership is a coalition of three federal agencies (DoD, USDA, and the Interior Department), state and local governments, and non-governmental organizations that work with private landowners to implement sustainable land management practices around military installations. Thus, the Partnership focuses on simultaneously advancing the military mission, sustainable agriculture, and habitat conservation. Founded in 2013 by the three federal agencies, the Partnership has designated seven areas as “Sentinel Landscapes”: Avon Park Air Force Range (FL), Camp Ripley (MN), Eastern North Carolina, Fort Huachuca (AZ), the state of Georgia, Joint Base Lewis McChord, and the Middle Chesapeake (MD). These areas currently cover 1.6 million acres, with over \$115 million in DoD funds, \$177 million in USDA funds, and \$37 million in Interior Department funds supporting projects in the Sentinel Landscapes through 2018.

In the coming years, Sentinel Landscapes may provide one of the best opportunities for conservation groups to engage with DoD on landscape scale conservation. Already, DoD, the Interior Department, and USDA have demonstrated considerable progress with several Sentinel Landscapes, often using REPI funds. For example, the Camp Ripley Sentinel Landscape has resulted in permanent protection of 30,000 acres and a \$2.8 million Natural Resources Conservation Service Regional Conservation Partnership Program award in 2017 to execute conservation easements on working lands.³⁵ Further, our California workshop discussed the possibility of one or two Sentinel Landscapes for the California coast and adjacent desert areas, both of which encompass some of the most important DoD installations and face some of the most challenging natural resource issues in America.

The three Sentinel Landscapes agencies are now trying to determine what a more robust Sentinel Landscape program could entail. For example, what regulatory, financial, and other incentives could flow to landowners within any of the seven Sentinel Landscapes that would encourage them to maintain their lands consistent with military and conservation goals? As far as we can tell, TNC and Defenders of Wildlife are the only national conservation groups engaged in this effort. We think that if a coalition of national conservation groups with local chapters were to participate in Sentinel Landscapes at both the national and local level, those organizations could help grow the partnership in several ways, including lobbying for appropriations for Sentinel Landscapes activities. One near-term possibility is to convene a forum involving the three Sentinel Landscapes agencies, conservation groups, and states and local agencies to explore collaboration under this program.

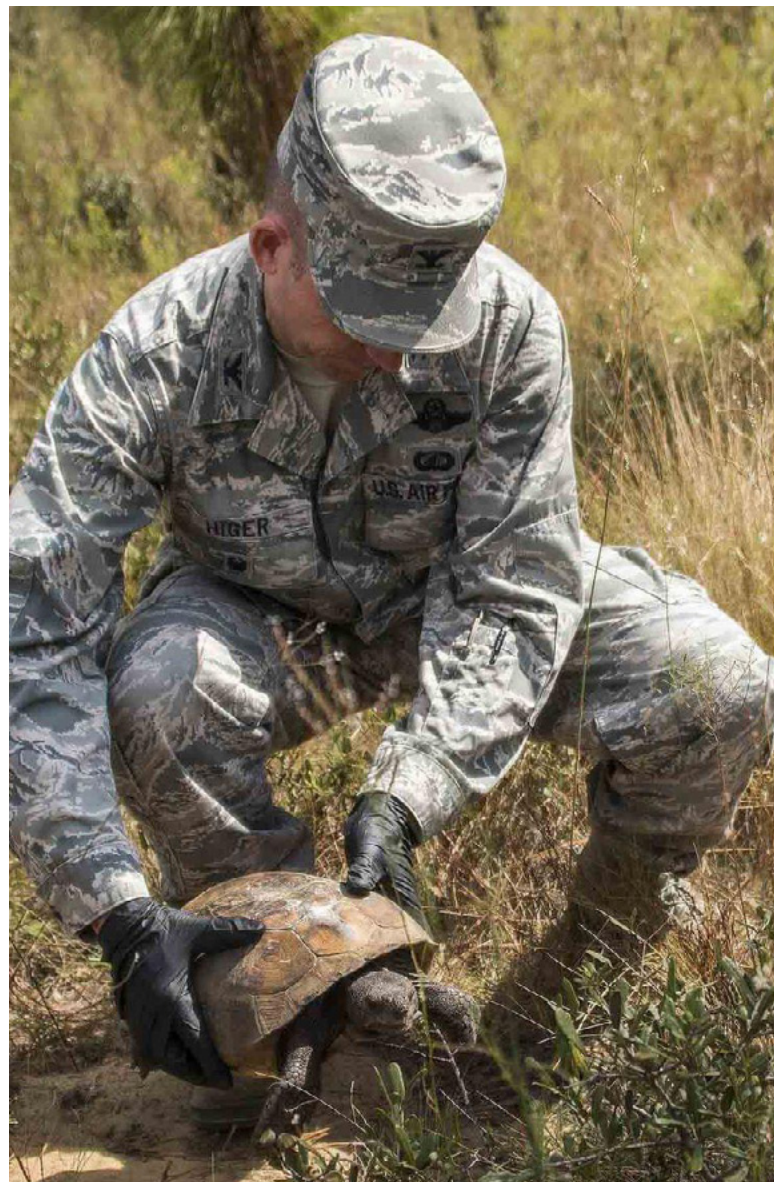
Our view is that the Sentinel Landscapes Partnership has had mixed success depending on the geography. The 2019 accomplishment report for the program lists meaningful accomplishments in some of the landscapes, but other landscapes seem to have fewer accomplishments and some of those accomplishments might have occurred even without the Partnership.³⁶ Some of the landscapes seem to be too large, and the exact outcomes of the partnerships remain unclear. DoD could benefit from outside help to hone this program into one with more focused goals. In particular, the governing structure for the Sentinel Landscapes—its Federal Coordinating Committee—would likely benefit from more involvement from private sector conservation partners, who could play a leadership role on the Committee. If the Committee is interested in this recommendation, it could consider models for successful federal-private sector leadership in other contexts.

Further, we see a crucial role for local conservation organizations to help the federal agencies with landowner outreach, coordination, and other key activities. In the eastern North Carolina Sentinel Landscape, for example, our impression is that the North Carolina Foundation for Soil and Water Conservation is playing the primary role in helping to educate private landowners about that Sentinel Landscape and how it could benefit landowners.³⁷ Although the federal agencies have hired a coordinator for each Sentinel Landscape, those coordinators have almost no capacity to carry out on-the-ground outreach with landowners. Thus, local conservation organizations play a vital role in helping to ensure that each Sentinel Landscape has enough participants to make the effort meaningful.

Integrated Natural Resource Management Plans and the Sikes Act

As discussed earlier, Integrated Natural Resource Management Plans are the most important documents for guiding how DoD installations manage their natural resources. The Sikes Act requires every installation with significant natural resources to prepare one of these plans—this amounts to nearly 380 installations. Many of the plans we have seen are between 100 and 200 pages, although the ones for Fort Benning (1,048 pages), Camp Pendleton (770 pages), and other large installations are considerably longer. Thus, every five years, DoD reviews over 40,000 pages of materials on natural resource management for updates. DoD does not invite public comment on most of those updates. Partly for this reason, few people in the conservation community engage in the process for revising these plans, even when public comment is sought.³⁸

More broadly, our observation is that the management plans have generally not served their goal of being integrated with USFWS and state wildlife agency decisions. One reason for the poor engagement is that the wildlife agencies lack the resources to fully participate in plan development and revisions. Another reason is that some plans are drafted by contractors using a process that has not been designed to maximize engagement and buy-in from other federal agencies and stakeholders, although this process appears to enable efficient drafting of the plans.



Gopher tortoise being released on Eglin Air Force Base.

To improve the planning process, we offer three recommendations:

- 1 **Researchers should study how the plans are developed and what effects they have had on conservation.** All of our knowledge on the plans is anecdotal because no one has performed a comprehensive study of the documents and identified the best opportunities to improve the planning process. A detailed study should generate recommendations on improving the process, perhaps based partly on how other federal land management plans have been developed (e.g., National Wildlife Refuge plans). For example, philanthropic foundations could fund Texas A&M University and a California university to collaborate on such a study. Texas A&M has significant expertise with the military and Integrated Natural Resource Plans, while a California university would bring an understanding of that state's landscapes, ecosystems, and state rules.
- 2 **The conservation community should advocate for funding to enable federal and state wildlife agencies to engage more effectively in plan development.** For example, a missed opportunity was to allocate funding under the Recovering America's Wildlife Act bill for state wildlife agencies to participate in plan development and require them to show that they used the funding to engage with DoD and USFWS and achieve conservation outcomes that are a priority for the military. Further, it became extremely clear to us that no major improvements to the planning process are likely without additional capacity at USFWS to fully participate in the development and revisions of plans. Our research suggests that some USFWS offices engage minimally or not at all in plan revisions because they have no dedicated staff to do so. One DoD expert suggested that philanthropic foundations could consider using the Intergovernment Personnel Act to fund a new position at USFWS dedicated to shoring up the agency's capacity to help develop and revise plans.
- 3 **While USFWS and state fish and wildlife agencies are specifically required to participate in the planning process, nothing prevents USFWS from involving the BLM or state wildlife agencies from involving other state agencies.** All of this is currently possible under the Sikes Act as written. We believe amendments to the Sikes Act are warranted but should be based on the experience of what has or has not worked before. For example, the Sikes Act should be amended to direct stronger efforts to plan for the effects of climate change on installations' natural resources, but not create requirements for state input into that planning unless the Sikes Act also dedicates funding to state agencies for that purpose.

Federal Land Use Planning

If DoD were given a larger role to influence the land use planning decisions of BLM, the result would likely be better conservation. DoD already objects to various land use activities that impact military readiness and the environment, such as certain mining operations and transmission lines. One opportunity to give greater weight to those objections is by amending the Federal Land Policy and Management Act to explicitly incorporate military readiness concerns in land use planning decisions. Another opportunity is to amend BLM policy to require greater coordination with DoD on BLM activities that may impact the military mission.

A third opportunity is for DoD to develop guidance describing the types of land use activities that interfere with the military mission (and mostly likely harm natural resources). Having that list of objectionable activities might make it more likely that an installation oppose those activities when they are proposed on adjacent federal lands, thus indirectly benefiting the environment.

REPI Program

REPI is one of the most important DoD programs that sustain the military mission while also conserving land. For context, REPI's budget has now grown to \$100 million annually, whereas total federal land acquisition and easement funding in 2019 was \$903 million.³⁹ Although REPI funding is not counted toward the \$903 million, we offer this comparison to show the sizeable contribution of REPI toward protecting land from development and other forms of encroachment. A 2007 analysis showed that REPI could make use of \$150 million annually to address encroachment and that accelerated funding now will likely save DoD money later by allowing it to acquire lands when prices are lower.⁴⁰ For this reason, REPI deserves a lot more attention from the environmental community, particularly to lobby for continued growth of REPI funding. REPI should be seen as more of an asset to other federal programs because its funding can count as a non-federal match required by other federal land protection grant programs. For example, the U.S. Endowment for Forestry and Communities crafted an innovative proposal to the USDA Regional Conservation Partnership Program (RCPP) to secure significant funding for the Georgia Sentinel Landscape using REPI funds as match for the extremely high match requirements of RCPP. To date, well over \$20 million of RCPP funding has been used in this way.

REPI itself poses several barriers to its more widespread use for conservation. One is that external partners sometimes find it difficult to apply for REPI funding because DoD has no unified process for reviewing funding proposals. Each Navy installation, for example, has its own REPI process. One solution is to create a new entity that processes and coordinates REPI for all west coast partners, similar to how the Air Force processes all REPI paperwork through its Texas office. Another barrier is that REPI typically requires conservation partners to bring in other funding sources to match REPI funds, but those partners find it difficult to secure matching funds for conservation easements. A third issue is that private forestry companies want to combine funds with REPI but are often unable to do so because of the short timeframe that REPI funds are offered or the slow response from certain installations on easement

opportunities. Funding ways to make REPI funds more flexible would immediately allow DoD to leverage private sector funding for conservation. Although we did not have the time to investigate these three issues in detail, we believe that REPI would benefit from an updated evaluation of how it can help DoD's conservation partners more effectively deploy REPI funds.⁴¹ Indeed, some experts explained to us that now is the right time to rethink how REPI operates in order to take advantage of future opportunities in land conservation.

Biodiversity Conservation

Endangered species and other imperiled wildlife are an important trigger for conservation by DoD, especially the U.S. Army, and sometimes the main driver of its conservation efforts. Particularly in the southeast, we learned that the ESA had often been the main mechanism to force DoD to prioritize conservation of longleaf pine ecosystems. At the same time, the ESA brings regulatory restrictions and costs to DoD, some of which can impede military training. For example, the Rand Corporation found that sprawl and biodiversity loss were the two primary sources of encroachment on DoD lands.⁴² Thus, the key question when it comes to wildlife is how to conserve species without impeding the military mission.

Even though DoD would like to carry out more endangered species conservation, it faces several barriers. One is that it perceives an unfairness in the disproportionately high conservation burden it often bears compared to other federal agencies. For example, land development appears to have extirpated all populations of a Texas cave invertebrate (*Rhadine exilis*) except those on Camp Bullis. Because the species' recovery plan requires multiple populations distributed throughout different landscapes, the species will likely never recover, creating a permanent and sole obligation for DoD to manage the species. Urbanization around other DoD installations has had a similar effect.

Another barrier is that DoD would like to spend more of its time on species stewardship and recovery actions, but is typically busy with work needed to meet the ESA's regulatory requirements. Because DoD has no performance metrics for the amount of recovery actions it needs to complete, nor a good way to measure species recovery progress, this discretionary proactive conservation work often takes a backseat to the mandatory compliance work.

To address these and other barriers, participants at our workshops identified numerous policy and funding recommendations, four of which we summarize below. Unlike most of the other topics in this report, the four recommendations focus on regulatory and policy improvements that federal agencies should pursue, rather than initiatives or staff positions that conservationists could fund. We provide this summary to illustrate the types of ESA reforms that we understand DoD is interested in pursuing, many of which have our support and which we encourage DoD to implement.

One is to continue creating opportunities for DoD to meet its ESA obligations through offsite conservation. This approach has already been demonstrated at Fort Bragg with the red-cockaded woodpecker and Fort Hood with the golden-cheeked warbler. Clearer USFWS policy on off-site mitigation would enable more transactions of this type. Unfortunately, the Trump administration had rescinded the Obama administration's ESA mitigation policy, leaving the public with less guidance on offsite mitigation. In a new administration, promulgating ESA mitigation guidance should be a priority.

Two, DoD remains interested in the use of species "credits" that it can generate to offset the effects of its future impacts on listed species. Crediting helps buffer DoD against unpredictable or lengthy ESA project review by providing a method for DoD to fulfill its ESA permitting obligations for certain species (crediting will not work for all species). DoD has created a crediting system for a few species but finds the processes for expanding the approach to other species time consuming.

The time and cost of species-by-species approaches under the ESA lead to a third opportunity that DoD is pursuing, which is to shift conservation to ecosystem-scale approaches. Perhaps the best example is DoD's work on the longleaf pine ecosystem, which benefits a number of at-risk and endangered species. Although an ecosystem approach is promising, it cannot override the ESA's legal mandate for federal agencies to conserve individual species nor supplant the need for species-specific management that many ESA-listed species require. Figuring out how best to conserve entire ecosystems while meeting the ESA's species-specific duties remains a challenge but one that is worth examining.

In the past, DoD's investments in species and habitat conservation have often exceeded those of other federal agencies, but DoD has not always received training or mission benefits from this work. Yet this type of tradeoff—doing conservation and getting a mission benefit in return—is what DoD cares the most about. Thus, the fourth opportunity is to incentivize DoD to help recover listed species by identifying milestones toward recovery and providing DoD with ESA regulatory relief as each milestone is reached. The Army is the only federal agency to have benefited from this approach. In 2007, FWS approved guidelines for how the Army can manage the endangered red-cockaded woodpecker. Under the guidelines, ESA training restrictions for an Army installation are reduced as more breeding adult woodpeckers occupy an installation, until all restrictions are eliminated once the installation has reached its population goals for the species. Fort Bragg met its goals in 2006, allowing FWS to pronounce the population "recovered" even though the species was still listed as endangered through its range. The Army guidelines encourage voluntary conservation by providing clear population-level target and the promise of regulatory relief that are independent of whether the species has recovered. DoD would like to see this approach expanded to other listed species and is currently investigating opportunities. We think that the approach can hold a lot of promise for species conservation, especially species that are unlikely to ever recover but can be stabilized by rewarding federal land managers for reaching subrecovery milestones (e.g., achieving important milestones toward recovery).

Resilience to Climate Change

Climate change resilience is a very broad and increasingly important issue for DoD, which faces at least seven types of threats related to climate change:⁴³

Type of threat	Consequences of threat
Flooding from storm surges	Increased severity and frequency of flooding caused by storm surges
Flooding from non-storm surges	Increased severity and frequency of flooding caused by non-storm surges
Extreme temperatures	Increased frequency of extremely hot and extremely cold days
Wind	Stronger and more frequent wind
Drought	Increased drought frequency
Wildfire	Increased wildfire frequency
Changes in mean sea level	Increased frequency and severity of coastal flooding

DoD and other organizations have already completed detailed analyses of the military's vulnerability and potential response to these seven threats. In general, studies have found that DoD's current work to address climate change threats is inadequate. For example, the Government Accountability Office recently found that "DoD's preliminary assessment of extreme weather and climate change effects at installations relied on past experience rather than an analysis of future vulnerabilities based on climate projections. Also, DoD's designs for new construction at facilities generally did not consider climate projections, because DoD lacks guidance on how to do so."⁴⁴ Similarly, the Army War College recently

studied the implications of climate change for the Army, observing that "the Army can continue its present trajectories, ignoring the myriad existing and potential threats that result from climate change and environmental concerns more broadly, including alienation of youth, allies and voters on whose largesse it depends, hurtling through the night in the belief that it is as unsinkable as the Titanic."⁴⁵ Rather than analyze and summarize all of those studies, this section of our report focuses on opportunities to enhance DoD's resilience to drought, coastal flooding, and wildfire, which were the main climate change threats discussed at our workshops.



2019 flooding on the Mississippi River left one-third of the headquarters of the US Strategic Command under water.

Drought

At our west coast workshop, drought was the main climate change issue we discussed, as it threatens the operations of many west coast installations. Further, under the Sustainable Groundwater Management Act, groundwater pumping is expected to be reduced by 20-50 percent in the coming years. Aside from the clear need for everyone to conserve water in the arid southwest, the primary opportunity to address drought more broadly is to fallow agricultural lands, as agriculture is the largest consumer of water in the region. DoD is also highly concerned about dust, especially because of the millions of dollars in maintenance costs and fleet groundings that dust imposes on Air Force, Navy, and Army aircraft. For example, a third or more of a service's fleet might be grounded at any time for maintenance or other problems. Dust from droughts is part of that problem.

Below are three types of opportunities for fallowing land that may interest DoD and its partners:

- 1 Passage of state legislation to allow for the buy-out of lands targeted for fallowing, and to combine that funding with REPI funding to maximize the size of acquisitions.
- 2 Designate one or more Sentinel Landscapes in the southwest that include a goal of fallowing land to conserve water. REPI funding could help with easement acquisitions, especially because the most recent amendment to the REPI authority allows the program to fund climate resiliency projects.
- 3 The Sikes Act allows DoD to fund cooperative agreements for external partners to manage non-DoD lands in ways that benefit the military mission, including by managing fallowed lands for dust, invasive species, and other issues. Unlike under REPI, the Sikes Act process does not require DoD to have a fee or easement interest in the targeted lands. Our workshops suggest that a better process to administer cooperative agreements could result in greater use of this approach, which could benefit a wide variety of natural resource management programs beyond fallowing.

A final consideration is that, unlike agricultural water users, DoD might not exhaust all of the water rights it secures. From this standpoint, the environmental impact of shifting water supplies to DoD might be far less than an equivalent shift to agriculture. From that perspective, an important legal development is DoD's ability to claim a national defense and security right to water. In 1995, the State Engineer of Nevada began a water adjudication process for the Las Vegas Artesian Basin, which included the Nellis Air Force Base. In the final settlement, the State Engineer recognized a new national defense and security water right. This new right would be available after the Air Force had exhausted its other existing water rights, and provided the Base with a stable water supply that may be used "to support all operations and activities" there. The settlement also requires the Air Force to "utilize reasonable efforts to develop water conservation and well management plans," implying that this new type of water right might be limited. DoD has thus worked with communities to conserve water through REPI and other programs.⁴⁶ Other military bases and installations might raise the national defense claim in their water adjudications too.

Another similar opportunity comes from New Mexico, where the Office of the State Engineer recently agreed with several conservation organizations including Audubon and Trout Unlimited that using existing water rights for nature (e.g., to increase stream flows, rather than requiring them to be used solely for agriculture) is a legally allowable use.⁴⁷ This ruling might allow DoD to acquire existing water rights in New Mexico and make some portion of the water available for conservation while using the rest to support military operations.

Coastal Resiliency

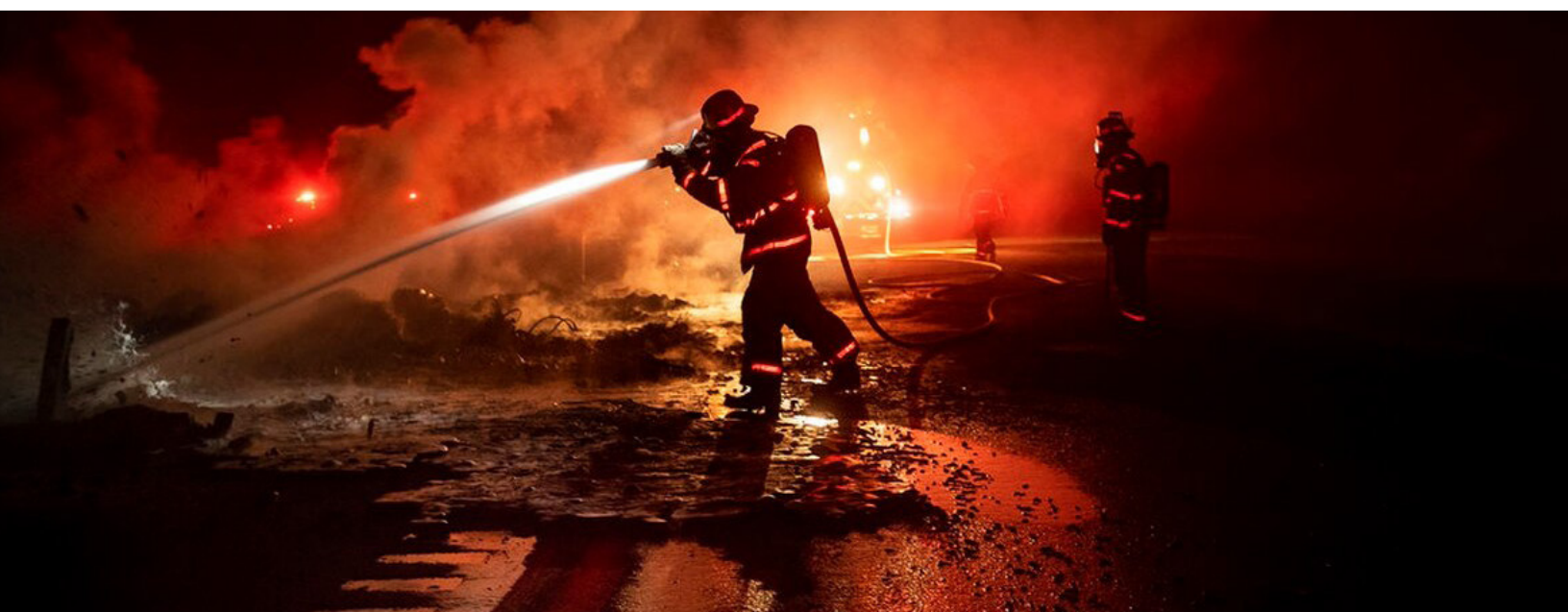
Sea level rise, beach loss, and other coastal resiliency issues are a growing problem for DoD installations along coasts. For example, Naval Base Ventura County has seen 40-60 feet of beach loss over the last 50 years, while the Navy's Mid-Atlantic installations are among the most vulnerable to sea level rise, land subsidence, and changing ocean currents. Many installations have already begun to respond to those threats, including by integrating weather and climate considerations into their existing plans and processes, by studying the impact of future floods on an installation, and by partnering with external groups to mitigate the effects of climate change.⁴⁸

At our California workshop, we identified several opportunities for DoD to continue addressing coastal resiliency issues in ways that also benefit the environment. For example, the Navy partners with the California Coastal Commission to evaluate options for manmade and natural infrastructure to address vulnerabilities from sea level rise. We also discussed new opportunities, like the idea of an insurance fund for green infrastructure, in which coastal communities pay into a fund for resiliency work, which in turn provides insurance against certain losses. There are likely many other ideas related to coastal resiliency for the conservation community to work on with DoD.

Wildfire

Wildfire is an existing risk on many DoD installations because of routine training and testing activities that can ignite vegetation. Climate change, however, is exacerbating that problem and causing fires that are unrelated to training and testing activities. The 2018 Woolsey Fire in southern California was the first that resulted in a wildfire-caused evacuation of a DoD installation on the west coast.⁴⁹ Because an increasing number of fires originate outside of the DoD fence line, DoD tries to partner with external groups to reduce wildfire risk. This is an opportunity that is worth further consideration if philanthropic foundations were to fund greater capacity within environmental groups to engage with DoD.

Foundations could also support the creation of a new western initiative for DoD, similar to the southeastern Longleaf Stewardship Fund. This new initiative, which we will call the Desert Readiness Operations and Conservation Initiative (DesertROC), could allow DoD to pool its funds with those of other agencies and conservation partners to address the growing suite of climate resiliency and related issues in the west. Our impression is that the scale and pace at which drought, wildfire, and other resiliency issues are growing require a coordinated and comprehensive response. The Longleaf Steward Fund appears to have successfully conserved and managed a lot of longleaf pine habitat. A similar initiative in the western desert and coastal regions could help carry out many of the recommendations identified throughout this report.



4

CLOSING THOUGHTS

There are many opportunities to expand conservation through partnerships driven by national security. The key theme is that DoD will prioritize those initiatives that directly advance military training, testing, and operations and ignore those that don't. Thus, it is vital for conservationists to frame their proposals in ways that honestly speak to DoD's primary mission.

Deeper engagement with DoD is a worthwhile effort for conservationists because DoD has several unique and often underappreciated advantages.

- 1 DoD lands are among the most important in the U.S. for biodiversity conservation, with more types of ecological systems than Forest Service or BLM lands. No national biodiversity strategy should overlook the value of those managed lands.
- 2 Military readiness and conservation often go hand-in-hand. This is not the case with certain other uses of our federal lands, such as energy development.
- 3 DoD is far more successful at securing needed legislative authority and funding to advance its conservation objectives than is any other federal agency.
- 4 DoD is emphatically interested in partnering with the public on conservation that furthers the military mission. Examples of this include the Sentinel Landscapes Partnership, REPI program, and other external funding initiatives.
- 5 DoD already understands that climate change is real and that it needs to respond with climate adaptation and mitigation measures. Conservationists can use this momentum as a springboard to achieve broader climate resilience goals in partnership with DoD. And finally, the broader goal of national security creates many untapped opportunities for other federal agencies to promote conservation and the military mission through their work. For example, future Farm Bill discussions could include programs designed to advance working lands and military readiness.

The Department of Defense's advantages as a conservation partner are significant. It is one of most important federal agencies for advancing our nation's conservation goals.

Sources

- For an overview of the ecological value of DoD lands, see Benton, N., J.D. Ripley, and F. Powlledge, eds. *Conserving Biodiversity on Military Lands: A Guide for Natural Resources Managers*. 2008 edition.
- Department of Defense, *Base Structure Report – Fiscal Year 2018 Baseline* (2018), <https://www.acq.osd.mil/eie/Downloads/BSI/Base%20Structure%20Report%20FY18.pdf>
- Aycrigg, J.L., Belote, R.T., Dietz, M.S., Aplet, G.H., Fischer, R.A., 2015. Bombing for biodiversity in the United States: Response to Zentilis and Lindenmayer 2015. *Conserv. Lett.* 8, 306–307, http://www.dodnaturalresources.net/Aycrigg_et_al_FINAL.pdf
- Department of Defense, *Base Structure Report – Fiscal Year 2018 Baseline* (2018). *DoD Natural Resources, Threatened and Endangered Species on DoD Lands*, <https://www.denix.osd.mil/nr/archive/archived-documents/threatened-and-endangered-species-on-dod-lands/>
- Aycrigg, J.L., Belote, R.T., Dietz, M.S., Aplet, G.H., Fischer, R.A., 2015. Bombing for biodiversity in the United States: Response to Zentilis and Lindenmayer 2015. *Conserv. Lett.* 8, 306–307.
- Kristin Thomasgard, *The REPI Program: Preserving Test, Training, and TES*, 2018 SERDP Symposium.
- For every 100,000 hectares of DoD lands, an average of 2.9 ESA species and 3.8 other imperiled species are present. Kristin Thomasgard, *The REPI Program: Preserving Test, Training, and TES*, 2018 SERDP Symposium.
- Petersen, C.E., et al. *Amphibians and Reptiles of United States Department of Defense Installations*. 2018. *Herpetological Conservation and Biology* 13(3):652–661, http://www.herpconbio.org/Volume_13/Issue_3/Petersen_et_al_2018.pdf
- There are many definitions of encroachment. Here is one we used: <http://www.cpeo.org/encroachment.html>
- DoD Chesapeake Bay Program, *Fiscal Year 2016 Annual Progress Report* (2016), <https://www.fedcenter.gov/admin/itemattachment.cfm?attachmentid=1093>
- The only time the ESA was amended in the last 25 years was for DoD.
- Critical habitat has had little to no effect on public land management decisions for several reasons, including the ESA's limited legal protections for critical habitat and the USFWS's de-emphasis of critical habitat as a conservation tool.
- Stein, B. A., D. M. Lawson, P. Glick, C. M. Wolf, and C. Enquist. 2019. *Climate Adaptation for DoD Natural Resource Managers: A Guide to Incorporating Climate Considerations into Integrated Natural Resource Management Plans*. Washington, D.C.: National Wildlife Federation. <https://www.nwf.org/-/media/Documents/PDFs/NWF-Reports/2019/DoD-Adaptation-Guide.ashx>
- Department of Defense Instruction 4715.03.
- Department of Defense, *Readiness and Environmental Protection Integration*, 2019 Report to Congress, https://www.repi.mil/Portals/44/2019%20General%20Fact%20Sheets/2019_REPI_Report_to_Congress_FINAL_5FEB.pdf?ver=2019-03-05-095918-767
- Data aggregated by Chesapeake Bay Foundation, *Marking Milestones* (2019), http://www.chesapeakeconservation.org/wp-content/uploads/2019/08/CCP_publication_SD_FD-R-FINAL.pdf
- DoD Partners in Flight Programs Bird Conservation Programs in the Military, *Fact Sheet*, http://www.dodnaturalresources.net/fs_DoD_PIF_Programs_Dec2016.pdf
- DoD Partners in Amphibian and Reptile Conservation, *Fact Sheet* (2019), <https://www.denix.osd.mil/dodparc/home/files/dod-parc-fact-sheet/>
- Service, Department of Defense adopt credit strategy for Southeast installations benefiting gopher tortoise and other species (March 24, 2017), <https://www.fws.gov/southeast/news/2017/03/fws-dod-adopt-credit-strategy-for-southeast-installations-benefiting-gopher-tortoise-and-other-species/>
- National Fish and Wildlife Federation, *Longleaf Stewardship Fund*, <https://www.nfwf.org/longleaf/Pages/home.aspx>
- Department of Defense, *Report on Effects of a Changing Climate to the Department of Defense* (Jan. 2019), <https://media.defense.gov/2019/Jan/29/2002084200/-1/-1/1/CLIMATE-CHANGE-REPORT-2019.PDF>
- Id.
- Department of Defense, *DDd Directive 4715.21, Climate Change Adaptation and Resilience*, <https://dod.defense.gov/Portals/1/Documents/pubs/471521p.pdf>
- Stein, B. A., D. M. Lawson, P. Glick, C. M. Wolf, and C. Enquist. 2019. *Climate Adaptation for DoD Natural Resource Managers: A Guide to Incorporating Climate Considerations into Integrated Natural Resource Management Plans*. Washington, D.C.: National Wildlife Federation.
- U.S Forest Service, Santa Catalina Ranger District, *Special-Use Permit*, U.S. Air Force Civil Defense Communication Site, <https://www.fs.usda.gov/project/?project=32669>
- Desert Renewable Energy Conservation Plan*, Department of Defense Engagement Memorandum of Understanding (Dec. 2011), https://www.drecp.org/documents/docs/Renewable_Energy_Action_Team_and_Dept_of_Defense_MOU_Dec_2011.pdf
- Department of Defense, *Summary of the 2018 National Defense Strategy of the United States of America*, <https://dod.defense.gov/Portals/1/Documents/pubs/2018-National-Defense-Strategy-Summary.pdf>
- While DoD might advocate for a conservation set-aside as part of a larger withdrawal proposal, DoD is unlikely to accept responsibility for managing conservation lands that do not have a mission-support component. Another federal agency or conservation organization would need funding to manage those lands.
- This could, or should, include a GIS/spatial analysis team from a conservation group, working under a security clearance with DoD on promising win-win land deals.
- <https://sfwater.org/Modules/ShowDocument.aspx?documentid=14821>
- To learn more about the wildland fire program, visit <https://www.doi.gov/wildlandfire>.
- E&E Daily, *Prospects for sage grouse rider's survival improve* (May 21, 2018), <https://www.eenews.net/stories/1060082171>
- Bureau of Land Management, *Legal description of the Barry M. Goldwater Range withdrawal in Arizona* (Nov. 30, 2001), <https://www.federalregister.gov/documents/2001/11/30/01-29730/legal-description-of-barry-m-goldwater-range-withdrawal-az>
- Barry M. Goldwater Integrated Natural Resource Management Plan, *Public Report 2018*, https://www.luke.af.mil/Portals/58/Draft%20BMGR%20Public%20Report_NA.pdf
- 2019 Sentinel Landscapes Accomplishment Report, https://sentinellandscapes.org/resources/pdfs/accomplishments_report_2019.pdf
- Id.
- North Carolina Foundation for Soil and Water Conservation, *ENC Sentinel Landscapes - Managing Your Land and Legacy*, <http://ncsoilwater.org/active-programs/encsl-landowner-outreach-meetings/>
- According to DoD policy, if substantial revisions to an INRMP are required, and the revisions are expected to result in biophysical consequences materially different from those anticipated in the existing INRMP and analyzed in an existing NEPA document, then a new or supplemental NEPA analysis must be prepared and the public provided a reasonable opportunity to comment on the revised INRMP.
- Chesapeake Bay Foundation, *Marking Milestones* (2019), http://www.chesapeakeconservation.org/wp-content/uploads/2019/08/CCP_publication_SD_FD-R-FINAL.pdf
- Beth Lachman et al., *The Thin Green Line: An Assessment of DoD's Readiness and Environmental Protection Initiative to Buffer Installation Encroachment*, Santa Monica, CA: RAND, 2007.
- Id. In 2007, RAND had published a report on the REPI program but no similar analysis has been completed since then.
- Id.
- U.S. Government Accountability Office, *DoD Needs to Assess Risk and Provide Guidance on Use of Climate Projections in Installation Master Plans and Facilities Designs* (June 2019), <https://www.gao.gov/products/GAO-19-453>
- Id.
- U.S. Army War College, *Implications of Climate Change for the U.S. Army* (2019), <https://www.documentcloud.org/documents/6546169-War-College-2019-1.html>
- Marriel Murray, *NatSec H2O: A federal right to groundwater?* (Feb. 6, 2019), <http://policyinnovation.org/natsec-h2o-a-federal-right-to-groundwater/>
- The NM Political Report, *New Mexico grants water rights to keep water in a river* (Dec. 13, 2019), <https://nmpoliticalreport.com/2019/12/13/new-mexico-grants-water-rights-to-keep-water-in-a-river/>
- Examples of recent projects can be found at Department of Defense, *Report on Effects of a Changing Climate the Department of Defense* (Jan. 2019), <https://www.documentcloud.org/documents/5689153-DoD-Final-Climate-Report.html>
- Woolsey Fire more than doubles in size in 24 hours; 2 dead in Southern California, ABCNews (Nov. 12, 2018), <https://abc11.com/woolsey-fire-more-than-doubles-in-size-in-24-hours-2-dead-in-southern-california/4653180/>



ENVIRONMENTAL POLICY
INNOVATION
CENTER

EMAIL: tmale@policyinnovation.org

CALL: 240.274.0341

VISIT: policyinnovation.org