Spring 2021

Natural Selections

Department of Defense Natural Resources Program

CONTENTS

SPOTLIGHT
HOW TIME FLIES: 30 YEARS OF DOD PARTNERS IN FLIGHT

By Joe Hautzenroder and Chris Eberly, formerly of DoD Partners in Flight

U.S. Department of Defense (DoD) Partners in Flight (PIF) is a broad group composed of DoD biologists and land managers driven to ensure that military commanders have the land, sea, and airspace needed for testing and training to maintain military readiness, while protecting and conserving birds and their diverse habitats. DoD PIF includes a steering committee with members who are vetted and approved to provide input and develop products to address avian issues on military installations.

DoD PIF was initiated in 1991 by Ms. Jacqueline Schafer, the Navy's first Assistant Secretary for Installations and the Environment. As a conservationist and birder, Ms. Schafer recognized the plight of migratory birds and quickly convinced the other Military Services and Office of the Secretary of Defense (OSD) leadership to support the newly formed national PIF that was established and coordinated by the National Fish and Wildlife Foundation (NFWF) in 1990. The progressive NFWF had recognized that the only way to effectively conserve birds and their habitats was to enlist as many state, federal, and non-governmental organization (NGO) conservation entities as possible, along with academia, to reverse the decline of bird populations and destruction of their habitats.

Soon after creating DoD PIF, Ms. Schafer convinced the Deputy Under Secretary of Defense for the Environment to designate Joe Hautzenroder, a young Navy natural resources manager, as the first DoD PIF Coordinator. The designation was presented in writing and distributed throughout DoD. Joe used that letter as his marching orders and displayed it when necessary to enlist the smart, motivated, capable, and well-connected DoD biologists to become DoD PIF regional and technical representatives. Some of the original representatives such as Tim Burr, Kyle Rambo, and Alan Schultz, are still part of DoD PIF today.

Once the initial DoD PIF group was assembled, it became apparent that they needed a strategic plan to effectively advance, publicize, and coordinate bird conservation efforts throughout DoD. With the help of Kyle Rambo, natural resources manager at Naval Air Station (NAS) Patuxent River, Maryland, the group developed the first DoD PIF Strategic Plan in 1993. Tami den Hartog, a graphic artist at NAS Patuxent River, created the very popular DoD PIF logo. Joe also worked closely with Peter Stangel, NFWF, and Alison Dalsimer, former NFWF, to ensure the efforts of DoD PIF were well coordinated with national PIF.

Soon it also became clear, due to the scope of bird conservation needs, that DoD PIF needed a full-time employee to continue to grow this conservation effort. NFWF helped find and hire Chris Eberly, who became the DoD PIF full-time National Coordinator in 1997. Originally, Chris was funded for only three years, but, thankfully, DoD Legacy Program funding was able to keep Chris in this position for the next 17 years. During this time, Chris focused on partnerships, recognizing that effective conservation could not be done in isolation. Through partnerships with the

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MESSAGE FROM THE NATURAL RESOURCES PROGRAM

By Ryan Orndorff, Office of the Assistant Secretary of Defense (Sustainment)/Office of the Deputy Assistant Secretary of Defense (Environment and Energy Resilience); Natural Resources Program Director

Welcome to the Spring 2021 Edition of *Natural Selections*! In honor of DoD PIF's 30th anniversary, this issue of *Natural Selections* celebrates the workings and achievements of one of the most effective initiatives within DoD! Launched in 1991, DoD PIF provides leadership, guidance, and support to conserve and manage birds on and surrounding DoD lands to ensure these lands can continue to support testing, training, and operations.

Birds provide several critical ecosystem services that are sometimes overlooked and taken for granted. For example, birds pollinate plants, spread seeds, control pests, and deter the spread of diseases, such as rabies, by consuming dead animals. These services are worth billions of dollars each year and help to sustain healthy ecosystems all over the world. Birds also provide an aesthetic value to landscapes, contributing to their natural beauty as well as providing symbolic meanings. In addition, birds have been an important species in environmental and biological sciences throughout history. For example, Charles Darwin's finches in the Galápagos Islands were key to developing his theory of evolution through natural selection. Also, the loss of birds has spurred conservation calls to action such as Rachel Carson's *Silent Spring*, which brought to light the environmental dangers of pesticides. Scientists across the world agree that birds are excellent indicators of an ecosystem's health and respond quickly to environmental changes.

Hundreds of bird species depend on DoD lands for food, habitat, and as breeding, wintering, and migration stopover sites. Many DoD lands contain ideal conditions for migratory birds including federally listed, and otherwise sensitive, bird species making these habitats crucial components in maintaining bird populations and diversity all over the world. Since 1970, however, bird populations across the United States have been rapidly declining due to habitat loss, deforestation, climate change, and other threats and stressors, and further declines are expected in the coming years. These rapid declines created the need for global action, leading first to the development of the national PIF and then to the creation of DoD PIF. Read about how these programs began, their goals, and how they work together to support the military mission in "National PIF: Supporting the Military Mission and Bird Conservation" and in the spotlight article "How Time Flies: 30 Years of DoD PIF."

DoD PIF has effectively led many conservation efforts for listed, at-risk, or mission-sensitive species (MSS) on installations while carrying out its military mission. Check out success stories about these species in articles such as "A Regional Conservation Approach for Managing Piñon-Juniper Birds" and "Golden Eagle Monitoring and Management Soars on DoD Lands." These stories are

DoD PIF logo information. Source: DoD PIF

great examples of how DoD PIF teamed with installation personnel and with other programs to improve avian species monitoring and management to protect the species and their habitats while avoiding mission impacts. DoD PIF also helps installations with management strategies. One of these management tools is the MSS List. Read about the parameters for species to make this list and the ways DoD PIF is helping to avoid mission impacts through maintaining this list in "Prioritizing Migratory Birds for Monitoring and Management on DoD Installations through the MSS List."

If you're interested in learning about outreach opportunities that DoD PIF supports year-round, check out "DoD PIF Community Outreach Efforts." Several of these events engage the public while facilitating massive data collection efforts that directly benefit installations. DoD PIF also offers an array of tools to DoD natural resources managers and bird enthusiasts that help collect data, provide guidance, and enable project planning and coordination. To learn more about and access these tools, read "Avian Data and Information Support Tools for DoD Natural Resources Professionals."

I hope you enjoy reading this issue of *Natural Selections* and learning more about DoD PIF and its many accomplishments across three decades. I am excited about these ongoing efforts as they ensure continued access to training and testing lands, preserve DoD's capabilities in mission-critical areas across the United States, and support DoD's natural resources. Look for our next newsletter in Fall 2021. Please contact NaturalSelections@bah.com if you have any good DoD stories to share or would like to contribute an article.

How Time Flies: 30 Years of DoD Partners in Flight (continued from page 1)

proper entities, DoD PIF could do a far greater job protecting birds and their habitat while also facilitating the military mission. Chris helped make DoD PIF a well-respected and recognized initiative among state, federal, NGO, and academic partners. It has been very rewarding and momentous to see the DoD PIF logo alongside other conservation agency logos.

DoD PIF grew significantly thanks to Chris' focus on partnership development and continues to do so from the efforts of the DoD Bird Conservation Program Coordinator, Dr. Richard A. Fischer. Rich is a professional, well-connected, and respected researcher and an on-the-ground conservationist, very well-suited to working and effectively communicating with all levels of the DoD chain of command and partners. With Rich serving as the DoD PIF National Coordinator since 2014, DoD PIF has continued to be in great hands and will surely continue helping to support the military mission while protecting avian species and their habitats for many years to come.

One of the reasons DoD PIF is so successful is the ability to secure and make the most of limited resources. Chris helped craft a methodology to request and justify funds by ensuring that every DoD PIF project supported the DoD PIF Strategic Plan and helped promote the mission of the installation where the project was implemented. All potential projects were prioritized and detailed for decision-makers. This formula still proves effective today for procuring funds that are more limited than ever.

DoD PIF 2014 Strategic Plan Cover. Source: DoD PIF

Some of the most noteworthy DoD PIF projects include:

- The Clemson University Bird Lab/Legacy Program/ Strategic Environmental Research and Development Program (SERDP) radar ornithology project to map bird migration routes and stopover sites for use in Integrated Natural Resources Management Plans (INRMPs). This radar data helps to pinpoint habitat that needs protection on military lands and adjacent properties.

- A collaboration project with the Clemson University Bird Lab to use high-resolution marine radar to monitor bird movements on military airfields to help control Bird/Wildlife Aircraft Strike Hazard (BASH) events.

- A partnership with Cornell University to monitor nocturnal bird migration with acoustic arrays to determine species composition and stopover information for enhanced conservation efforts.

- A collaboration with Cornell University, and subsequent research by the University of Tennessee and the U.S. Army Engineer Research and Development Center (ERDC), using weather balloons equipped with sensitive acoustic monitors to fly over military impact areas and other inaccessible areas to inventory sensitive species abundance and distribution.

Rich Fischer deploys an Autonomous Aerial Acoustic Recording System (AAARS) at Fort Bragg, North Carolina. The AAARS is affixed to a weather balloon tethered from below and flown aloft, to compare avian point count data collected from a stationary ground-based observer with that of the AAARS. Source: Rich Fischer

In addition to its projects, DoD PIF works to create new guidelines and revise existing installation-specific documents to address bird monitoring and management while supporting the military mission. For example, DoD PIF developed bird management guidelines for incorporation into INRMPs to help conserve birds and support the installations' missions. DoD PIF develops species prioritization schemes to help DoD biologists focus attention on the species most in need of conservation on their installations. DoD PIF is also in the process of creating National Environmental Policy Act (NEPA) guidelines to better quantify and mitigate impacts on birds from proposed military actions.

To further provide technical expertise, exchange ideas, support DoD's mission, and share conservation successes, DoD PIF continues to hold annual meetings. These meetings provide a unique opportunity to share technical expertise with local installation natural resource managers, aid in gathering bird information on various DoD installations, propose new ideas for supporting regional and technical PIF efforts, and enable opportunities to manage diverse on-the-ground projects to enhance habitat for birds.

There are too many people and anecdotes to touch on here in highlighting all of the significant accomplishments of the professional DoD biologists and land managers that make up DoD PIF. This initiative has pursued and carried out work that bird conservationists dream about. The conservation successes, technical expertise, and personal connections have made the problem-solving and job satisfaction that come with making military operations and conservation work together unparalleled.

NATIONAL PARTNERS IN FLIGHT: SUPPORTING THE MILITARY MISSION AND BIRD CONSERVATION

By Bob Ford, PIF Coordinator, and Richard A. Fischer, DoD PIF National Coordinator

Starting in the 1980s, concern grew among birders and scientists about a disproportionate decline of birds that migrate long distances compared with short-distance migrants and non-migratory species. Individual observation, independent studies, and results of the Breeding Bird Survey confirmed this pattern. Further galvanizing both citizen scientists and conservation leaders to focus on this group of birds was John Terborgh's 1989 book, *Where Have All the Birds Gone?*, which explored the biology and conservation of birds that migrate to the American tropics.

Against this backdrop of renewed focus on bird conservation, the national PIF organization was launched in 1990 as a broad and multi-faceted initiative. Its priority was to conserve migrating birds across their full migratory routes and cycles using science, landscape-scale conservation planning, habitat management, policy, education, communication, and outreach. Its vision was to keep common birds common and halt population declines before those birds could be listed as threatened or endangered under the Endangered Species Act (ESA).

The Federal Government enabled PIF's success with early support. Amos Eno, the Executive Director of NFWF, spearheaded an effort with other wildlife conservation leaders to establish a coordinated federal response to bird declines. With NFWF's leadership and coordination, multiple federal agencies, including DoD, signed a Memorandum of Understanding (MOU) pledging a partnership to conserve bird populations.

From the start, science and large landscape conservation planning have been foundational elements of national PIF. Among the first conservation products delivered by national PIF was a methodology to count breeding birds off roads. Point counts became the standard inventory and monitoring method that could be applied consistently across different study designs and geographies to provide the groundwork for inventory and monitoring data. National PIF also developed a vegetation sampling scheme to provide biologists and natural resources managers with insights into species-habitat relationships in different areas.

In 1991, DoD, with support from the Navy, launched its own branch of the PIF initiative — DoD PIF. DoD PIF is a robust initiative that continues to provide the full spectrum of bird conservation work ranging from applied, cutting-edge science and management to inventory and monitoring, along with coordination and education. DoD PIF's work is unique in keeping the focus on DoD mission support in combination with the bird conservation goals promoted by national PIF.

Today, with DoD PIF's support, most DoD installations with INRMPs conduct, at a minimum, baseline migratory bird inventories. In addition, DoD's active management of airfield vegetation to reduce BASH incidents often helps support both DoD and national PIF's goals by promoting habitat for less hazardous species, such as small-bodied sparrows.

INTRODUCING THE NEW SENIOR NATURAL RESOURCES PROGRAM MANAGER

By Liz Galli-Noble, Office of the Assistant Secretary of Defense (Sustainment)/Office of the Deputy Assistant Secretary of Defense (Environment and Energy Resilience)

I would like to take this opportunity to introduce myself to the DoD natural resources community and to our many partners and collaborators. I am the new DoD Senior Natural Resources Program Manager (SNRPM). In addition to supporting the Natural Resources Program Director and the Deputy Assistant Secretary of Defense for Environment and Energy Resilience, I am responsible for coordinating the implementation of the DoD Legacy Resource Management Program, ensuring effective organizational coordination among DoD programs and offices, engaging with national conservation partnerships and initiatives, and facilitating collaboration with academic and research institutions.

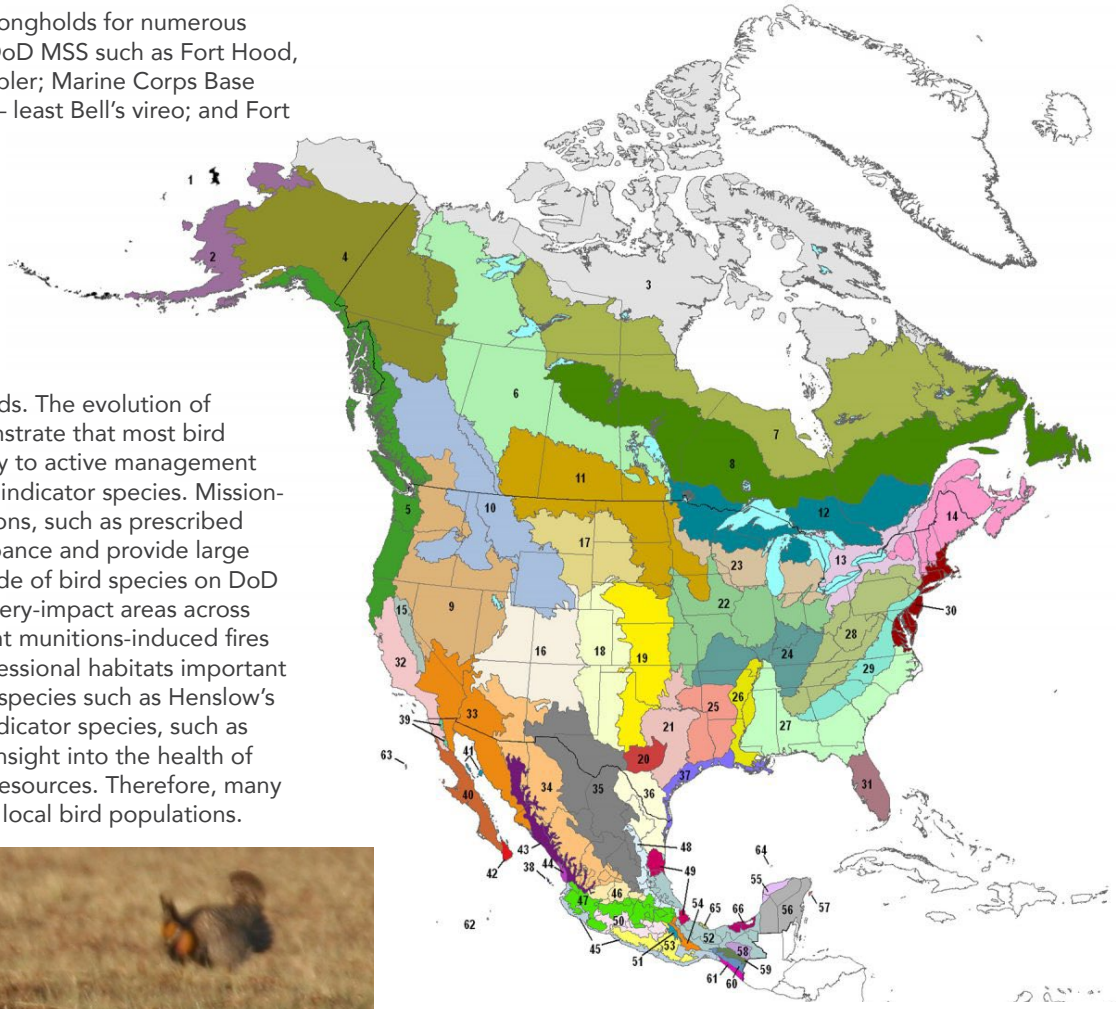
I officially took on this role as an Intergovernmental Personnel Act (IPA) employee on September 1, 2020, after functioning as the Legacy Program Analyst for ~1½ years. As such, I am a member of, and housed within, the Natural Resources Institute at Texas A&M University. My husband and I hail from Bozeman, Montana, and we permanently relocated to the Washington, DC, area in 2020. I completed my undergraduate studies at the University of Montana and earned a Master of Forestry degree from the Yale University School of Forestry and Environmental Studies in 1995.

I bring more than 30 years of national and international program administration, research, and natural resource management experience to the SNRPM position. Prior to my tenure with DoD, I spent 17 years in leadership positions, including watershed association Executive Director, Director of the Center for Invasive Species Management at Montana State University (MSU), Assistant Director of Research at the Montana Water Center at MSU, and Coordinator for the (Montana Governor's Task Force) Upper Yellowstone River Cumulative Effects Investigation. In addition, I have worked as a private consultant, technical editor for the Interior Columbia Basin Ecosystem Management Project, field research team leader, U.S. Forest Service forestry technician and wildland firefighter, and Peace Corps agroforester in Mali, West Africa.

I want to thank the people who have already made me feel welcome in my new position, and I look forward to meeting and working with many more of you in the months and years to come. I am rewarded and inspired by the important conservation and natural resources management work we do in support of DoD's mission. Please reach out to me anytime with news or updates about your projects, questions about our DoD natural resources programs, or if you would like to get more involved in the conservation partnerships and initiatives I coordinate for DoD. My door is always open, and I am only an email (elizabeth.j.galli-noble.civ@mail.mil) or phone call (406-581-8148) away. In closing, please remember: What you/we do matters, and I thank you for your service to your community and your country.

Many installations serve as strongholds for numerous threatened, endangered, or DoD MSS such as Fort Hood, Texas — golden-cheeked warbler; Marine Corps Base Camp Pendleton, California — least Bell's vireo; and Fort Benning, Georgia; Fort Bragg, North Carolina; and Eglin Air Force Base, Florida — red-cockaded woodpecker. Site-specific habitat needs for birds, as well as the large landscape conservation context, often complement the mission objectives of DoD lands. The evolution of DoD PIF has helped to demonstrate that most bird populations respond positively to active management and therefore can serve as an indicator species. Mission-compatible management actions, such as prescribed burning, mimic natural disturbance and provide large blocks of habitat for a multitude of bird species on DoD lands. Furthermore, DoD artillery-impact areas across the nation experience frequent munitions-induced fires that often maintain early-successional habitats important for a wide variety of sensitive species such as Henslow's and grasshopper sparrows. Indicator species, such as migratory birds, can provide insight into the health of an ecosystem and its natural resources. Therefore, many installations regularly monitor local bird populations.

Greater prairie chickens at a breeding site on Fort Riley, Kansas. Fire is used to maintain this habitat. Source: Rich Fischer



Bird Conservation Regions in North America, based on physiographic characteristics and land use patterns, provide the large landscape units for spatially explicit conservation planning. Source: U.S. North American Bird Conservation Initiative

Assessing the vulnerability of species and understanding the importance of the landscape and habitats in which they occur are fundamental for using conservation funds effectively. Population trends alone have proven to be an inadequate decision variable for conservation efforts. Therefore, national PIF developed a unique species assessment tool, the Avian Conservation Assessment Database, to assess and compare species vulnerability. The tool blends six factors based on population size and trend, population distribution, and threats in the breeding and nonbreeding seasons. A combination of the scores from this assessment helps determine the most vulnerable or "Watch List" species. An additional tier of the list includes common birds in steep decline that may move to the Watch List unless conservation actions are taken. National PIF has used this tool to complete an assessment for all species of birds from the Arctic to Panama. Along with many other partners, DoD PIF has adopted the assessment tool, using it as one of several resources to identify and focus on MSS, or those species that, if federally listed, would have the greatest impact to the military mission. These prioritized lists, developed both by DoD PIF and DoD Partners in Amphibian and Reptile Conservation, help installations identify, monitor, and manage species most relevant to protecting the mission.

The 2016 Partners in Flight Landbird Conservation Plan lays the groundwork for Watch List species and for conservation action in large landscapes with Migratory Bird Joint Ventures coordination. Source: PIF

Data management and retrieval is a key component of any natural resources management activity. DoD has a large collection of bird field data as a result of its INRMPs, surveys, and diverse installations. DoD PIF is collaborating with Point Blue Conservation Science and Klamath Bird Observatory to permanently archive DoD bird data in the Avian Knowledge Network (AKN). This database benefits INRMP implementation and helps installations comply with the Migratory Bird Treaty Act (MBTA), ESA, and NEPA.

DoD biologists collect data on bird distribution, abundance, and species habitat relationships on most DoD installations with INRMPs. Source: Rich Fischer

National PIF objectives remain the same as ever — to keep common birds common and keep declining bird species off the threatened and endangered species list. However, the work of the PIF network is not done. In Fall 2019, *Science* published a paper by Ken Rosenberg *et al.* documenting the net loss of three billion breeding birds annually over the last 50 years. The steepest declines were in many species we still consider "common" across our landscapes. Federal Government leadership will be critical to incentivize and execute science, undertake conservation planning, and implement conservation actions domestically and internationally. As a result, the work of DoD PIF, to include installation natural resources managers, remains invaluable. Now more than ever, it's important to revitalize coordination among all avian conservation efforts. DoD PIF, in coordination with national PIF and other bird conservation entities, plans to continue to support and, further, build upon the efforts DoD PIF has helped develop for three decades in working to help recover and conserve bird populations while supporting DoD's mission.

WHO IS THE DOD PARTNERS IN FLIGHT STEERING COMMITTEE?

By Elizabeth S. Neipert, DoD PIF Technical Coordinator

As DoD PIF celebrates its 30th year, we would like to take a step back and highlight those who work tirelessly to implement bird conservation in support of the military mission. What began in 1991 as a small group of DoD natural resources professionals interested in determining how DoD fits within the larger national initiative to conserve birds, has since evolved significantly in size, structure, and focus. Broadly, DoD PIF includes all individuals with an interest in managing bird populations to support DoD testing, training, and safety missions. The DoD PIF Steering Committee is DoD PIF's organizational body, which serves as the focal point for bringing together the collective and technical expertise needed to identify and address bird issues most relevant to DoD. The Steering Committee is composed of OSD program management personnel, the DoD PIF National and Technical Coordinators, designated Military Service and Regional Representatives, and Subject-Matter Experts (SMEs).

DoD PIF Steering Committee 2019 field visit to NAS Kingsville to discuss their BASH program and provide technical support. Source: DoD PIF Steering Committee

Each member of the Steering Committee serves a critical role within DoD PIF to support our mission of "*Providing expertise on the management and conservation of birds and their habitats to sustain and enhance the military mission.*" OSD personnel disseminate policy and provide program guidance. The DoD PIF National and Technical Coordinators develop work plans and coordinate with the Military Services and Regional Representatives. The Military Service Representatives identify mission-specific priorities and policies and act as liaisons between OSD and installations. The Regional Representatives work to incorporate local and regional initiatives with Military Service efforts, provide solutions to installations, and serve on DoD PIF Steering Committee Working Groups (WGs). DoD PIF SMEs are identified by the National and Technical Coordinators and added to the Steering Committee as needed to fill any gaps in expertise or to address specific avian knowledge areas.

DoD PIF Steering Committee Roles and Members

National Coordinator	Rich Fischer	
Technical Coordinator	Elizabeth Neipert	
OSD Natural Resources Program Director	Ryan Orndorff	
Air Force Service Representative	Rebecca Meyer	
Army National Guard Service Representative	Jay Rubinoff	
Army Service Representative	Brian Moyer	
Marine Corps Service Representative	Jacque Rice	
Navy Service Representative	Tammy Conkle	
Eastern Regional Representatives	Jeff Bolsinger	Kyle Rambo
	Emily Gaydos	Alan Schultz
	Dave McNaughton	Michael Wright
Central Regional Representatives	Jacky Ferrer-Perez	Jeff Keating
Western Regional Representatives	Trish Cutler	Bob Schallmann
	Frans Juola	Tiffany Shepherd
	Robbie Knight	Diane Walsh
	Cindi Kunz	Kevin Warner
BASH SME	Paul Block	
Invasive Species SME	Dana Bradshaw	
Representative Emeritus	Tim Burr	
Representative Emeritus	Joe Hautzenroder	

The complete Steering Committee list with contact information and WG details can be found on the DoD PIF website Steering Committee contacts page. The SME list by geographic area, subject, or avian taxa can be found on the DoD PIF website SME contacts page.

DoD PIF WGs complete the bulk of the Steering Committee's tasks and products. WGs comprise members of the Steering Committee, and, if needed, a non-Steering Committee member may be added to a WG to provide additional expertise. The Steering Committee currently has 11 standing WGs that are charged with addressing specific mission-centric issues.

DoD PIF Working Groups and Primary Function

BASH	Works to improve communication and cooperation between Air Operations and Natural Resources programs while disseminating the most up-to-date management techniques
Climate Resilience and Adaptation	Identifies species most vulnerable to threats of changing climate conditions and develops recommendations to mitigate those impacts
Eagle	Acts as a resource on eagles within DoD lands and works collaboratively with installations to provide sound science and assist in streamlining of processes and permitting of eagles on installations
Education and Outreach	Increases awareness of bird conservation issues and conservation initiatives to both internal (i.e., DoD) and external stakeholders; forms subcommittees to handle Annual Report and website content
Energy and Infrastructure	Identifies trends in renewable energy and develops best management practices to minimize effects on species
INRMP Guidance	Develops recommendations on how to sufficiently address migratory birds in INRMPs
Invasive Species	Provides invasive species information and assistance
MSS	Evaluates the list of at-risk species with greatest potential for mission impacts, if federally listed under the ESA, and provides guidance on how to minimize and avoid mission impacts
NEPA Guidance	Develops recommendations to properly address migratory birds in NEPA documents
Research and Monitoring	Identifies research- and monitoring-related issues of importance to DoD; determines appropriate actions and provides technical guidance
Seabirds	Identifies seabird conservation issues and provides technical information to support mission and bird management

Check out the DoD PIF Steering Committee in action at an installation on our Facebook page.

PRIORITIZING MIGRATORY BIRDS FOR MONITORING AND MANAGEMENT ON DOD INSTALLATIONS THROUGH THE MISSION-SENSITIVE SPECIES LIST

By Jeff Bolsinger, Fort Drum, and Richard A. Fischer, U.S. Army Engineer Research and Development Center

Species protected under the federal ESA can place considerable costs and constraints on military installations, including new requirements for surveys and monitoring, habitat management and protection, consultation with the U.S. Fish and Wildlife Service (USFWS), and mission limitations. DoD PIF developed the MSS list to help installations plan for potential future listings and prioritize monitoring and management efforts to help avoid listings. While many other migratory birds are declining, DoD PIF focuses on MSS because these species have high potential to impact military testing, training, and safety missions should they become ESA listed. This list consists of 15 bird species that are present on multiple DoD installations and are at risk of becoming federally protected under the ESA if current population declines continue.

A Henslow's sparrow, one of the current MSS. If the Henslow's sparrow becomes federally listed, training impacts could occur on midwestern and eastern installations with grasslands. Source: Jeff Bolsinger

The first MSS list was created in 2008. DoD PIF and representatives from all Military Services throughout the contiguous United States, Alaska, and the Pacific Islands created a list of 67 species that could impact the military mission if ESA listed. Over the next several years, the team added species based on input from installations with specific mission-impact concerns. In 2017, DoD PIF revised the MSS list by reviewing 93 species based, in part, on their declining populations in several migratory bird regional and national assessment databases, including the Breeding Bird Survey and information from national PIF. This review also considered whether USFWS was conducting a 12-month status review for ESA listing or had otherwise identified a species as "of conservation concern."

DoD PIF recognized the need for an updated, streamlined MSS list. To generate the updated MSS list, the DoD PIF MSS WG ranked each of the 93 species on a 1 to 3 scale, with 1 representing the highest level of concern, based on available assessment criteria. The WG then determined whether each species had sufficient occurrences on military installations to evaluate their potential for mission impacts if federally listed. To aid this effort, the WG reviewed the majority of DoD INRMPs and applied the expertise of DoD PIF representatives and installation natural resources professionals. The result was a list of 16 species reflecting consensus that each would significantly impact the military mission if ESA listed.

As the MSS list was completed in 2020, the eastern black rail, one of the 16 MSS, was listed as federally threatened. This listing confirmed the usefulness of the methods created to identify species likely to be ESA listed. Given that the intent is to raise awareness of species that may become ESA listed, the WG removes a species from the MSS list once it becomes federally threatened or endangered. Removing the eastern black rail brings the current MSS list to 15 species. In addition to these 15 MSS, DoD PIF categorized an additional 37 declining species as "Tier 2." Most of these species are in long-term decline and have potential for future mission impacts if federally listed; however, DoD PIF does not consider them to be MSS based on current review criteria.

A burrowing owl at NAS North Island, California. Source: Tiffany Shepherd

DoD PIF encourages, where and when possible, the monitoring and management of these MSS. Ultimately, DoD's focus on MSS locally, and in concert with broader regional or range-wide efforts, will help increase populations of these species enough to preclude federal listing and reduce the likelihood of potential mission constraints. DoD PIF encourages installations to contact their DoD PIF state or regional representative with any relevant information regarding MSS, to include monitoring data, suggested additions to the list, or information regarding potential mission impacts.

MSS List

Northern bobwhite	Bendire's thrasher
Greater sage-grouse	Bachman's sparrow
Greater prairie chicken	Henslow's sparrow
Mountain plover	Tricolored blackbird
Least tern (Atlantic Coast populations)	Rusty blackbird
Burrowing owl	Golden-winged warbler
Southeastern American kestrel	Cerulean warbler
Pinyon jay	

DoD PIF determined that these species, if federally listed as threatened or endangered, could significantly impact operations on military installations.

FUNDING AVAILABLE FOR ENVIRONMENTAL AND INSTALLATION ENERGY TECHNOLOGY DEMONSTRATIONS

DoD, through the Environmental Security Technology Certification Program (ESTCP), supports the demonstration of technologies that address priority DoD environmental and installation energy requirements. The goal of ESTCP is to promote the transfer of innovative technologies through demonstrations that collect the data needed for regulatory and DoD end-user acceptance. Projects conduct formal demonstrations at DoD facilities and sites in operational settings to document and validate improved performance and cost savings. ESTCP is seeking proposals for demonstrations of innovative environmental and installation energy technologies as candidates for funding beginning in Fiscal Year (FY) 2022. The solicitation requests pre-proposals via Calls for Proposals (CFPs) to federal organizations and via a Broad Agency Announcement (BAA) for private-sector organizations. *Pre-proposals are due March 4, 2021, by 2:00 p.m. Eastern Time.*

Detailed instructions are on the ESTCP website under Funding Opportunities.

DoD organizations (Military Services and Defense Agencies) may submit pre-proposals for demonstrations of innovative technologies in the following topic areas:

- Environmental Restoration
- Munitions Response in Underwater Environments
- Resource Conservation and Resiliency
- Weapons Systems and Platforms
- National Guard Readiness Center Energy Assurance
- Effective Planning for Electric Vehicle Infrastructure and Management
- Improved Energy Resilience
- Moisture Control in DoD Buildings
- Installation Energy and Water Technology Transfer

The BAA and the CFPs for Federal Organizations Outside DoD are seeking pre-proposals for technologies in the following topic areas:

- Innovative Technology Transfer Approaches
- Management of Impacted Groundwater
- Detection, Classification, Localization, and Remediation of Military Munitions in Underwater Environments
- Climate Model Comparative Assessment for DoD Infrastructure Applications
- Improved Threatened, Endangered, and At-Risk Species' Monitoring Tools for Improved Training and Testing Land Utilization
- Demonstration and Validation of Polyfluoroalkyl Substances (PFAS)-Free Fire Suppression Alternatives
- Technology Demonstrations to Accelerate Deployment of Energy Efficiency and Energy Resilience Solutions (BAA Only)
- Improved Energy Resilience
- Moisture Control in DoD Buildings
- Affordable Energy Assurance at National Guard Installations

BIRD CONSERVATION HELPS DOD CONTINUE TO SOAR

By Tiffany M. Shepherd, Luke Air Force Base

It is a common misconception that birds and military readiness have no relationship to one another. However, for 30 years and counting, DoD PIF has proven that effective bird conservation can enable and even enhance our nation's military readiness.

An endangered California least tern below a military helicopter. Source: Rich Fischer

DoD PIF provides direct and indirect support to the mission in a multitude of ways, all of which maintain healthy landscapes and training lands that allow for enhanced readiness. A few ways that DoD PIF supports the Military Services, installations, and ranges include:

- Working to avoid listing additional bird species as federally threatened or endangered, thus avoiding delays and adverse impacts to mission planning.
- Providing local and relevant information on bird conservation to natural resources managers to incorporate into INRMPs.
- Improving bird/wildlife and aviation interactions, which reduces BASH incidents and improves aviation safety.
- Promoting proactive, habitat-based conservation and management strategies in support of DoD's mission.
- Identifying avian research, monitoring priorities, and recommending solutions relevant to specific mission requirements.
- Collaborating with USFWS to ensure that migratory bird legislation and policies consider DoD's testing, training, and operational missions.
- Increasing quality of life for Military Service members and their families through outreach and education.
- Working beyond installation boundaries to facilitate cooperative partnerships.
- Determining the status of bird populations through focused data collection and monitoring.
- Promoting collaboration among installations to quickly address and resolve emerging avian issues.

The essential support DoD PIF provides is varied and wide-ranging. Here are a few examples of how DoD PIF has worked to help installations and their missions:

- At NAS North Island (NASNI) in California, a small colony of federally endangered California least turns was found nesting on the airfield in 2013, adjacent to an active runway and two helicopter pads, literally between cracks in the pavement. NASNI is the largest naval aviation industrial complex on the West Coast, and helicopter pads in this area support over 11,000 operations annually. After collaborating with multiple DoD natural resources professionals through the DoD PIF network and consulting with USFWS, the installation was able to quickly implement solutions to deter the terns from nesting in this busy area. The successful solution, which included setting out k-rails and coyote decoys on the airfield and using tern decoys and playback recordings at established colonies, ensured training operations were not impacted, allowing helicopters to continue to soar.

A least tern chick hiding in a crack on the airfield pavement at NASNI. Source: Emily Rice

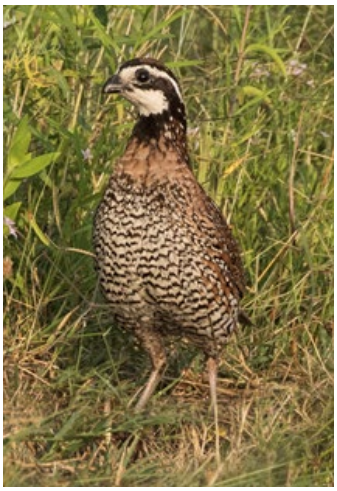
- At NAS Oceana/Dam Neck Annex in Virginia, coastal dune habitat restoration for birds and other wildlife also helps to protect the military mission. The sand dunes, which act as natural barriers to absorb wave energy and prevent erosion, are vital to safeguarding this installation's infrastructure and training mission. Since at least the mid-1990s, active dune restoration has included planting native grasses, adding natural structures to stabilize dunes, and replenishing sand. Bird monitoring in the area, including annual shorebird surveys and a five-year comprehensive inventory, enabled the planning and approval necessary to efficiently carry out large-scale sand replenishment actions and military training exercises. Without ongoing bird monitoring, the essential dune restoration efforts necessary to defend the mission at NAS Oceana/Dam Neck Annex would be hindered.
- At Fort Riley in Kansas, bird conservation partnerships and planning are integral components of mission success. For over two decades, natural resources managers at this Army installation have worked to ensure that the Henslow's sparrow, a DoD PIF MSS, has the habitat it needs to thrive, both on and off the installation. Since Fort Riley began its efforts to manage Henslow's sparrow habitat, the number of birds annually found on the installation has stabilized and contributed to precluding ESA listing petitions, a major win for DoD and bird conservation. Read the full article on this success story on page 19.

These are just a few of the many examples showing how DoD PIF and the bird conservation it fosters help to sustain the military mission at installations across the country. The next time you envision Military Service members conducting ground combat exercises or taking part in aircraft training, think of all the ways bird conservation has played a key role in supporting these activities.

PROACTIVE MANAGEMENT OF DOD MISSION-SENSITIVE SPECIES: ASSESSING THE STATUS OF NORTHERN BOBWHITE POPULATIONS AT FORT HOOD, TEXAS

By Charlie Plimpton, Fort Hood

The northern bobwhite (NOBO) is a ground-dwelling quail species native to the United States, Mexico, and the Caribbean and is found on numerous military installations. The once abundant species, a popular game bird, has experienced steep population declines since the 1960s and, as such, has become the well-studied subject of many different management programs. Due to the frequency of NOBO occurrences on military installations, potential to impact testing and training missions if federally listed, and conservation concerns, it is currently a DoD PIF MSS. If a MSS is listed under the ESA, proactive DoD installation MSS monitoring and management can provide a sound foundation for ESA Section 7 consultations and potentially avoid impacts to essential installation and mission activities, such as construction and training.



NOBO photographed in a Fort Hood, Texas training area. Source: Daniel D. Kelch

NOBO have historically been documented on Fort Hood, but little information is known about the population size, distribution, or status. Existing vegetation data from Fort Hood confirmed that some of the most suitable habitat for the NOBO in central Texas occurs within the boundaries of the installation, primarily in training areas containing both grasslands and shrub cover. So, to gain knowledge about the potential impacts of this MSS on DoD training, the Fort Hood Natural Resources Management Branch Adaptive and Integrative Management (AIM) team, in 2019, initiated focal species research for NOBO populations.

NOBO at Fort Bragg, North Carolina. Source: Alan Schultz

To better understand NOBO presence on Fort Hood, the AIM team conducts spring and fall call counts at randomly selected points across the installation. Spring call counts are performed for two hours after sunrise, during the most active calling period for breeding males. Data from these surveys provides an index of breeding NOBO activity across the installation. Fall inventories occur after the breeding season, when NOBO assemble into groups called "coveys" that remain together throughout the winter. During covey formation, NOBO communicate with other nearby coveys just before sunrise, often resulting in a chorus of covey calls. Counts can only be done once daily because NOBO call only for a short period before dawn. Using a combination of these different survey data will provide AIM biologists with an accurate index of NOBO population size and distribution on Fort Hood and inform wildlife management decisions for the installation.

Charlie Plimpton, Fort Hood AIM biologist, conducts a pre-dawn covey count survey in a training area. Source: Charlie Plimpton

The AIM team works diligently through focused monitoring efforts and proactive conservation management to avoid federal listings of MSS, which could impact Fort Hood's military mission. The team collects and provides data beyond the installation's boundaries, which can inform USFWS and prevent future ESA listing decisions. Backed by sound science and effective monitoring and management, the AIM team achieves its overarching goal to enhance mission resilience by preventing training restrictions that can occur from endangered species listings. The AIM team will continue to balance the Army's needs with environmentally responsible land stewardship to help support unrestricted military training and preserve sensitive habitats for both warfighters and MSS.

To further this goal, DoD PIF is currently partnering with the National Bobwhite Quail Initiative to better understand DoD's role in sustaining secure NOBO populations throughout their habitat range. For more information on how your installation can participate in this emerging initiative, please contact DoD PIF point of contact Jackelyn Ferrer-Perez at jackelyn.ferrer-perez.civ@mail.mil.

A REGIONAL CONSERVATION APPROACH FOR MANAGING PIÑON-JUNIPER BIRDS

By Trish Cutler, U.S. Army Garrison White Sands

Piñon-juniper (PJ) woodlands are unique ecosystems typically found in regions with extreme temperatures and limited water availability. PJ woodlands and the species associated with them have been in decline for decades due to many factors, including woodland management practices and climate change. Many DoD installations in the West contain PJ woodlands that can contribute to broad conservation partnerships. In fact, both national PIF and the Western WG, a regional sub-group of national PIF, already rely extensively on multi-agency partnerships to identify and use the most efficient and effective conservation actions to reverse bird-species declines associated with PJ

woodlands. Participation in conservation partnerships like these provides DoD biologists with opportunities to better manage and conserve natural resources in line with the Sikes Act, and to prevent impacts to the military mission from degraded ranges or increased regulation resulting from future species listings under the ESA.

Two bird species of particular concern to DoD in the PJ ecosystem are the pinyon jay and gray vireo. A DoD PIF MSS, the pinyon jay suffered an estimated 83.5-percent population decline from 1967 to 2015, with an additional 50-percent decline expected by 2035. The gray vireo, a less understood DoD PIF Watch List species, has a restricted range in the Southwest, making this species a conservation priority. Neither species is currently protected under the ESA, presenting an important opportunity for DoD and other stakeholders to take action to help conserve the PJ ecosystem and preclude the need for a future ESA listing that could impact missions at multiple installations.

White Sands Missile Range (WSMR) biologists participate in two of these conservation partnerships: the Pinyon Jay WG and New Mexico Avian Conservation Partners (NMACP). These multi-agency sub-groups of national PIF use the best available science to better understand, conserve, and manage bird species at risk. In 2020, the Pinyon Jay WG completed a detailed Conservation Strategy for the species. Participation by DoD along with multiple federal and state agencies and NGOs ensured that management recommendations were practical for all agencies' natural resources managers and were compatible with the various agencies' missions.

WSMR closely follows DoD guidance to actively avoid and minimize incidental take of migratory birds. PJ woodland management at WSMR consists of thinning vegetation for firebreaks, carrying out prescribed burns, and limiting the use of herbicide treatments that target junipers. DoD biologists recognize the importance of assessing the potential effects of woodland management on DoD priority species, such as the pinyon jay and gray vireo. Measures adopted from the Conservation Strategy for the pinyon jay include buffering nest sites by 500 meters and avoiding disturbance during the nesting season. Due to the DoD Legacy Program and the Army's funding of pinyon jay surveys for over 17 years at WSMR, the installation had the nest data needed to apply these important conservation measures. WSMR's herbicide treatments that target an 80- to 90-percent reduction in juniper were more challenging to mitigate, as 42 gray vireo nests were documented throughout the area proposed for treatment. WSMR personnel worked with USFWS and the New Mexico Department of Game and Fish to facilitate a 115-meter buffer around each nest site and to revise herbicide treatment polygons to exclude these areas. While some breeding habitat will still be lost, the hope is that the highest-quality breeding habitat will be conserved through these mitigation efforts.

Two pinyon jays on WSMR. Source: Nathan Peterson

A gray vireo on WSMR. Source: Lynn Wickersham

In addition, NMACP has spearheaded the collection of standardized data on avian population monitoring and vegetation at treatment sites throughout the state, and WSMR has collected these data at 40 treatment and 40 control plots on the installation, in conjunction with avian point counts, to better understand the effects of herbicide treatments on PJ birds and their habitat. This coordinated data collection allows all agencies in New Mexico to benefit from each other's data to better manage species for a much more effective region-wide conservation effort. Understanding the impacts of these management efforts allows DoD biologists to shape conservation strategies to protect these unique ecosystems and their species while preventing future mission impacts on installations with PJ habitat. National and state partnerships have informed and benefited management of DoD lands, such as WSMR, and helped to avoid mission impacts.

AVIAN DATA AND INFORMATION SUPPORT TOOLS FOR DOD NATURAL RESOURCES PROFESSIONALS

By Elizabeth S. Neipert, DoD PIF Technical Coordinator

DoD PIF helps installation natural resources managers improve inventory and monitoring efforts, research and management, and education involving birds and their habitats on military lands. DoD PIF works to actively provide the most up-to-date information and data on migratory bird occurrence, status, and management actions. DoD PIF connects DoD personnel with the best available resources whether they are authored by military personnel, DoD PIF stakeholders and partners, or publicly accessible sources. A few of the avian data support tools available to DoD natural resources professionals are highlighted below.

Avian Knowledge Network

The AKN is a clearinghouse for migratory bird survey data. These data are used to provide information regarding population status and trends, measure response to specific threats and stressors, and even inform conservation measures and actions. The AKN's mission is to support a network of people, data, and technology to improve bird conservation, management, and research across organizational boundaries at varying spatial scales. The network is a sustainable partnership

based on contributions of data and information, all coalescing into a diversified and cost-shared database. DoD became actively involved in the AKN through the Federal Avian Data Center, a partnership of seven federal agencies, stemming from its membership on the Council for the Conservation of Migratory Birds. The AKN connects partner datasets, uses metadata and data assumptions based on protocol, contains powerful data analysis and decision support tools, and is a permanent archive of all data records.

The AKN consists of a variety of interactive tools, data products, and information. Publicly available tools include:

- Phenology Tool that allows the user to view abundance and relative probability of presence summaries throughout the year for birds in a particular area.
- Data Observation Map that allows the user to visualize, query, and investigate available data at specified locations.

Tools available for use on personally entered data include:

- Data Entry and Sharing Tools that enable individuals and organizations to share their data with the AKN.
- Data and Statistical Analysis Tools that enable data owners to view summaries and analyses of their dataset with powerful statistical packages.

Look for more information on DoD's participation in and opportunities with the AKN in future newsletters and DoD PIF correspondence. An AKN training session will be available on March 12, 2021, during the National Military Fish and Wildlife Association (NMFWA) Annual Meeting and Training Workshop.

Information for Planning and Consultation

The USFWS Information for Planning and Consultation (IPaC) system is a project planning tool that streamlines the environmental review process. This tool allows users to delineate a project site and receive a list of migratory bird species of concern, including general information on the seasonality of occurrence within the project footprint. IPaC also provides information about non-migratory birds, as well as other USFWS-managed non-avian species and resources including threatened, endangered, and candidate species. The system provides conservation measures that can be implemented to avoid or minimize species impacts.

Birds of the World

The Cornell Lab of Ornithology Birds of the World

Birds of the World (BOW) is a powerful research database published by the Cornell Lab of Ornithology that supplies detailed life-history information for more than 10,000 bird species worldwide. This database brings together scholarly content from ornithologists across the globe including observations from eBird and Cornell's multimedia Macaulay Library in a single platform. The robust data available within BOW includes detailed information on appearance, distribution, habitat, movement, diet, behavior, breeding, conservation, and management.

DoD PIF, through funding from the DoD Legacy Program, provides a BOW access code for every military installation with an INRMP. If you do not yet have your access code, please complete the DoD PIF contact form.

DoD PIF Shutterfly Site

Shutterfly

DoD PIF maintains a large, online repository for bird images primarily taken on DoD installations and nearby lands on the continental United States and outside the continental United States. The program has assembled more than 5,000 DoD PIF Shutterfly member-submitted images, sorted taxonomically, as well as geographically, in an easily searchable and downloadable platform. All images are available for free download by DoD PIF Shutterfly members to use in DoD-related presentations and reports with proper photo crediting. We also encourage interested individuals to submit their own images for sharing with other DoD PIF Shutterfly members and archiving on the site. Contact Tim Burr (tburr@san.rr.com) or Paul Block (Paul.Block@navy.mil) for membership and photo submittal details.

DoD PIF Website

The newly revamped DoD PIF website is the one-stop shop for all of your bird conservation needs. The goal of the website is to provide DoD with the most up-to-date technical information to manage and conserve migratory birds and their habitats with a focus on sustaining and enhancing the military mission. The site provides the newest, most relevant information to help DoD comply with the Sikes Act, MBTA, Bald and Golden Eagle Protection Act (BGEPA), ESA, Executive Order 13186, *Responsibilities of Federal Agencies to Protect Migratory Birds*, its associated MOU, and the Final "Readiness" Rule (50 CFR § 21.15) on Take of Migratory Birds by the Armed Forces.

The most recent guidelines and information are pinned to the homepage. The WG page holds links to each individual WG's page. Each page contains products, resources, associated links applicable to mission-centric issues, and contact information for the WG Chair. The website also hosts DoD-specific bird conservation plans as the DoD PIF website strives to connect installation personnel with experts in any field of interest for birds and their habitats. The list of the DoD PIF Steering Committee members with their responsibilities and subject-matter expertise can also be found on the website. If you have questions or need resources pertaining to birds and their habitats, the DoD PIF website can provide solutions.

DoD PIF Listserv

DoD PIF maintains an email distribution list to send out relevant bird conservation information and documents to interested individuals within DoD, as well as agency partners. The program typically sends up to three emails per month. If you would like to join this distribution list, please complete the DoD PIF contact form stating you would like to be included.

DoD PIF Facebook Page

DoD PIF maintains a Facebook page to keep followers updated on hosted events and articles applicable to our members and serves as a venue to hold conversations on migratory bird issues. If you are on Facebook, give us a "Like" or "Follow."

REGIONAL INITIATIVES TO SUPPORT THE MISSION: AVIAN CONSERVATION AT MARINE CORPS BASE HAWAII

By Norma Creps and Dr. Frans Juola, Naval Facilities Engineering Systems Command Pacific

Considered one of the most remote land masses in the world, the Hawaiian Islands host a diverse array of endemic and migratory avian species. Currently, DoD manages over 228,000 acres of land in Hawaii, making it one of the state's largest land managers. Military lands on the island of Oahu include over 20 separate installations and ranges, many with a high concentration of imperiled and listed species. Hawaii's native biodiversity thus greatly relies on sound management and conservation of these lands.

One of the installations on Oahu is Marine Corps Base Hawaii (MCBH), which encompasses over 4,500 acres of land across 8 properties. Strategically, MCBH is positioned to promote military readiness in the Indo-Asia Pacific region. The base provides support functions and facilities for military personnel and families, as well as several tenant commands. Moreover, the facility's acreage contains a variety of unique natural habitats including forests, coastal dunes, and more than 133 acres of valuable coastal wetlands. These habitats support a diverse avifaunal community and are home to over 50 native and migratory bird species, including at least four that are federally endangered.

In partnership with state and federal agencies, academic researchers, NGOs, and DoD PIF, the natural resources staff at MCBH has recently undertaken a variety of initiatives to better understand the biology and ecology of the protected bird species found on their land. These efforts include studying the nesting and reproductive success of the federally endangered Ae'o (Hawaiian stilt), the federally endangered 'Alae 'ula (Hawaiian gallinule), and the federally endangered 'Alae ke'oke'o

A staff biologist reaching into a wedge-tailed shearwater burrow on MCBH. Source: Norma Creps

NON-DOD PARTNERS IN FLIGHT CONSERVATION PARTNERSHIPS WITHIN DOD

DoD participates in and partners with several non-DoD PIF bird conservation efforts. These initiatives and associations highlight DoD's focus on avian issues as a whole. These efforts ultimately support migratory birds and interact with DoD PIF activities and priorities by furthering bird conservation while enabling the military mission.

Council for the Conservation of Migratory Birds

California least tern. Source: Matt Sadowski

The Council for the Conservation of Migratory Birds (Council) was established in 2009 by the Secretary of the Interior to oversee the implementation of Executive Order 13186, *Responsibilities of Federal Agencies to Protect Migratory Birds*, led by USFWS. As a crucial first step in creating a more comprehensive federal conservation strategy for migratory birds, the Executive Order helped the Federal Government fulfill its lead role in protecting this international flagship of natural resources. The Council serves to enhance coordination and communication among federal agencies in fulfilling their responsibilities under the four bilateral treaties on the conservation of migratory birds (Canada, 1916; Mexico, 1936; Japan, 1972; Russia, 1978) and helps build upon the federal agencies' progress on migratory bird conservation.

As a member of the Council, DoD promotes coordination and collaboration of migratory bird conservation among federal agencies, improves opportunities to protect and conserve migratory birds, and ensures DoD implements its MOU with USFWS.

North American Bird Conservation Initiative

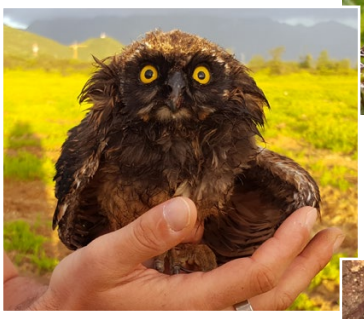
The U.S. North American Bird Conservation Initiative (NABCI) Committee is a coalition of state and federal agencies, private organizations, and bird initiatives in the United States working to ensure the long-term health of North America's native bird populations. As a member of NABCI, DoD works collaboratively with the other partner members to advance biological and scientific priorities for North American bird conservation.

National PIF

The PIF network includes more than 150 partner organizations distributed throughout the Western Hemisphere. They are engaged in all aspects of bird conservation from science, research, planning, and policy development, to land management, monitoring, education, and outreach. National PIF and DoD PIF work in coordination to accomplish mutual goals and objectives in bird conservation.

(Hawaiian coot); tracking movement patterns to better understand habitat use and home range sizes of the Ae'o and the 'A (red-footed booby); and conducting baseline studies on presence, habitat use, and basic biology of the elusive, endemic pueo (Hawaiian short-eared owl), which is MBTA-protected and state-endangered.

Adult red-footed booby ('A) and chick on MCBH. Source: MCBH Environmental Natural Resources Branch



A juvenile pueo at Nuupia Pond Wildlife Management Area. Source: MCBH Environmental Natural Resources Branch

A wedge-tailed shearwater ('Ua'u kani) chick found in a burrow on MCBH. Source: Norma Creps

Natural resources staff at MCBH also conduct long-term monitoring, which includes biannual waterbird surveys, annual breeding surveys of burrowing seabirds including the 'Ua'u kani, or wedge-tailed shearwaters, monitoring of the facility's MBTA-protected red-footed booby colony, and annual Audubon Christmas Bird Counts. These efforts help MCBH natural resources managers better understand the birds' biology and ecology, which in turn promotes more informed management decisions that increase MCBH's ability to protect these species while allowing the base to carry out its primary training missions.

A wedge-tailed shearwater ('Ua'u kani) on MCBH. Source: MCBH Environmental Natural Resources Branch

DoD PIF is a proud cooperator with MCBH on these efforts. DoD PIF participates by providing advice and reviewing projects and management decisions, and in some cases is involved directly in conducting avifaunal studies. Additionally, DoD PIF continues to provide technical guidance on MCBH's current natural resources policy including Sikes Act and INRMP implementation; compliance with the ESA and MBTA; and implementation of Executive Orders and MOUs as they relate to the management of the natural resources and the federal and state protected species found at MCBH. All these efforts help promote partnerships and resilience for the installation while protecting the facility's mission, species, and habitats, creating a win-win at MCBH for birds and the DoD mission.

GOLDEN EAGLE MONITORING AND MANAGEMENT SOARS ON DOD LANDS

By Robert N. Knight, Dugway Proving Ground, and Dr. Steve Slater, HawkWatch International

Golden eagles nest on cliffs or trees in open, remote country landscapes throughout the western United States, including several DoD lands used for military training. These long-lived, but slow-reproducing, birds are protected by federal and state regulations. Recent concerns about habitat loss, declines in rabbit prey, and high levels of human-caused mortality, or "take," have resulted in a specific "no net loss" standard for the species. Accordingly, any human actions that have the potential to cause the loss of an eagle — including military training — must be prevented to the highest degree possible or offset by eagles saved elsewhere. DoD installations that support nesting eagles go to great lengths to monitor eagles and prevent harm to them, including avoiding nest disturbance that is prohibited under the BGEPA.

Golden eagles with one-week-old chick at Dugway Proving Ground. Source: Robbie Knight

The U.S. Army's Dugway Proving Ground (DPG) and Hill Air Force Base's (HAFB) Utah Test and Training Range (UTTR) collectively support approximately 20 eagle nesting territories, plus hundreds of territories in the surrounding Military Operating Area of the UTTR. With the help of DoD Legacy Program funding, Robert Knight (DPG), Russ Lawrence (HAFB), and Dr. Steve Slater from the nonprofit HawkWatch International teamed up with other federal, state, and nonprofit partners in 2010, and over the next four years they gathered data on golden eagle nesting trends, genetics, prey resources, and responses to habitat changes from invasive cheatgrass and fires. Beginning in 2013 and continuing each year since, global

positioning system transmitters were placed on nestling eagles, for a total of 73 deployments through 2020. This eagle research has continued to evolve since its initial funding through the DoD Legacy Program, including placing readable color bands on eagle nestlings, putting cameras in nests to document prey deliveries and nest survival, and conducting in-depth research on nestling health through blood, parasite, and swab sampling. This research effort has become the largest golden eagle study in the western United States.

Rich Fischer holding two golden eagles. Source: Rich Fischer

Understanding both small- and large-scale eagle ecology provides DoD installations in similar landscapes with a wide variety of management options to limit eagle impacts on and from military training. For example, eagle genetic and tracking data gathered in the Utah West Desert and included in a USFWS United States-wide analysis has revealed that eagles are wide ranging and likely represent a single population. This insight has changed the scale at which take permits and offsets are evaluated, which acts to provide greater permit flexibility for DoD.

On a broader scale, extensive coordination and key data contributions from western Utah have also been included in new population assessments revealing that Utah golden eagle populations are likely stable. However, at the national level, there is continued concern regarding take and incidental take as tracking data indicated specific threats (i.e., vehicle collisions, electrocutions) to golden eagles. Through our research and the contributions from DoD installations, take permits are reflecting potential mitigation strategies, such as management of big game roadkill to reduce the probability of eagle-vehicle collisions and eagle electrocutions near roads. Ongoing golden eagle research at DPG and UTTR using cameras in nests and collecting data on nestling health may provide additional options to increase nestling survival. The increase in eagle survival rates can be used to offset nest management or take permits in critical training areas.

Active golden eagle nest photo from a small Unmanned Aerial System at DPG. Source: Robbie Knight

Golden eagles are a symbol of wild and remote landscapes in the West, and military bases are a treasured national asset that support the critical DoD mission. Proactive and well-coordinated efforts in monitoring and management will always be critical in helping DoD maintain its mission while allowing this emblematic species to continue to soar over DoD lands far into the future.

USE OF UNMANNED AERIAL SYSTEMS TO COST-EFFECTIVELY MONITOR EAGLE NESTING

DPG in Utah is home to multiple breeding pairs of golden eagles, which are protected under the BGEPA and MBTA. Due to these protections, military test and training activities that risk disturbing active eagle nests can be restricted. Therefore, it is vital for DPG, and similar military test and training ranges, to fully understand the location and status of eagle nests in the area.

To generate that information, DPG was the host installation for a two-year DoD ESTCP project (RC18-5046) that monitored eagle nests on the installation. The project compared three different methods: an on-the-ground human observer, a military Unmanned Aerial System (UAS), and a small UAS (sUAS) platform. Researchers found the sUAS to be an extremely useful tool, able to quickly identify nests and take photographs to help accurately determine the age of the golden eagles. The data collected directly contributes to ensuring continued mission operations at DPG. The project results will be made available through a final technical report and a guidebook for range managers that focuses on using the sUAS platform for avian monitoring and data collection.

A sUAS used for monitoring efforts at DPG. Source: Robbie Knight

The project was named the 2020 Resource Conservation and Resiliency Project of the Year by ESTCP.

DOD PARTNERS IN FLIGHT COMMUNITY OUTREACH EFFORTS

By Kyle Rambo, NAS Patuxent River

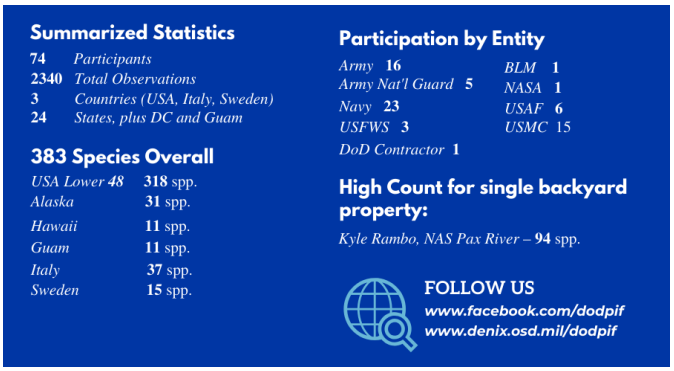
DoD natural resource professionals sponsor and participate in numerous community outreach events on installations throughout the year. These events aim to inform and educate the public about the military's unique resources and challenges, as well as its important stewardship responsibilities and activities. Members of the DoD PIF Steering Committee, along with a network of installation partners in all Military Services, continue to promote and support these outreach events such as World Migratory Bird Day, National Public Lands Day (NPLD), and Earth Day. Some examples of these traditional events include:

- Naval Weapons Station Seal Beach, California, holds an annual NPLD event, where Navy natural resources staff partners with local community volunteers to conduct habitat improvement work for birds and other wildlife.
- Fort Drum, New York, holds an annual public bird tour of the installation for World Migratory Bird Day, highlighting the unique avian resources found there.
- NAS Patuxent River, Maryland, holds an annual Earth Day observance each year that is open to the installation public as well as invited students and teachers from local schools.
- Fort Belvoir, Virginia, holds an annual World Migratory Bird Day observation, leading bird walks and handing out literature promoting Army and DoD bird conservation efforts.

Typically, these traditional outreach events are a one-way flow of information, from staff biologists to an interested public. Recently, however, installations have learned the value of engaging the public in deeper, more hands-on experiences known as "citizen science projects." Through these projects, members of the public actively collect data that is useful for managing the installation's natural resources. Citizen science projects allow the public to become invested in the natural resources, as well as the installation's stewardship of those resources, while the environmental staff receives valuable data at very little to no expense. Recently, more and more installations, with help from the DoD PIF Outreach WG, have expanded their support of citizen science projects.

These citizen science projects include the National Audubon Society Christmas Bird Counts; Cornell University's Great Backyard Bird Count and other mid-winter bird tallies; statewide Breeding Bird Atlases; and specialized bird counts such as gull days, night-bird counts, shorebird inventories, hawk watches, and chimney swift roost surveys. While some events are best suited for an individual effort, others, such as the chimney swift roost surveys, are fun and family-friendly. Data collected can be submitted to DoD partner organizations and shared through applications such as eBird and the AKN. The archived data is then available for installations to use.

In addition, groups of biologists and skilled avocational birders often collaborate to conduct Bird Blitz or Bio Blitz events, taking advantage of strength in numbers. This past year, due to COVID-19, DoD PIF led a virtual Backyard Bird Blitz through Facebook. This event called on DoD members to track the number of bird species spotted in their own backyards. Outreach events also occur during the DoD PIF Steering Committee's Annual Meeting, with participants conducting surveys at that year's host installation. All data reported during these events is then shared with staff biologists.



DoD PIF Backyard Bird Blitz results graphic. Source: DoD PIF

Kyle Rambo directs the planning of a Bird Blitz avian survey at Malmstrom Air Force Base in Great Falls, Montana, conducted by members of the DoD PIF Steering Committee during the annual meeting in August 2017. Source: Rich Fischer

Source: DoD PIF

Examples of excellent avian outreach programs can be found at Fort Hood in Texas and Naval Weapons Station Seal Beach in California. If you are interested in participating in or hosting a future DoD PIF outreach project, contact Jackelyn Ferrer-Perez and Bob Schallman on the DoD PIF Steering Committee for more information or assistance with your programs.

BIRDS AND AIRFIELDS: A NEW APPROACH TO VEGETATION MANAGEMENT

By Richard A. Fischer and Jacob F. Jung, U.S. Army Engineer Research and Development Center; and Paul Block, Naval Facilities Engineering Systems Command Atlantic

BASH prevention on DoD airfields continues to be a major safety concern in terms of potential loss of life as well as the costs of damage to aircraft, despite an extensive array of active and passive management practices currently in use at airfields. The common presence of BASH-hazardous birds on or close to airfields results from complex interactions among their primary needs (i.e., food, cover, presence of water). Large birds that inhabit airfields typically are searching for food while smaller birds, such as grassland passerines (e.g., sparrows, larks) are attracted to food and cover. Wetlands and open water on or near airfields attract flocks of small and large waterfowl. The Air Force, Marine Corps, and Navy have comprehensive BASH programs with extensive expertise to help installations mitigate the risks from the presence of airstrike-hazardous species on airfields. For example, both the Air Force Safety Center and the Navy BASH programs develop policy and guidance and provide other types of support designed to improve flight safety and protect the mission.

A T-45 aircraft involved in a crash with pectoral sandpipers at NAS Meridian, Mississippi. Source: U.S. Navy

Military Service BASH programs actively look to science to seek better tools and techniques for airfield management to reduce wildlife-aircraft collisions. Data on which species pose the highest BASH risk on a regional basis, and in some cases on individual airfields, are required to improve BASH risk management. Therefore, if programs can identify which species are present and why they are attracted to airfields, it will be easier to mitigate those impacts.

An example of this is the Navy and Marine Corps exploring how the height of vegetation on military airfields influences avian communities, and thus bird strikes, on and surrounding those airfields. To begin answering this question, in 2017, the Navy funded the ERDC Environmental Laboratory (EL), to conduct regional assessments and life-history investigations of problematic birds on military airfields. The effort evaluated bird species that pose the highest BASH risks on airfields among Landscape Conservation Cooperative regions by investigating over 200,000 strike records obtained from the Air Force Safety Center (1995-2016), Navy Safety Center (2009-2016), and Federal Aviation Administration (1995-2016) databases. The results suggested that taller vegetation (i.e., greater than 14 inches) is not preferred habitat for most medium- to larger-sized bird species (e.g., hawks, gulls, waterfowl, pigeons/doves, crows/ravens) that are most hazardous to military aviation.

Red-legged partridge at Naval Station Rota, Spain. Source: Paul Block

Golden plovers at Naval Station Rota, Spain. Source: Paul Block

Military airfields have traditionally followed the 7-to-14-inch (or often even shorter) vegetation maintenance protocol, which has been a standard practice for so long that it has seldom been tested for effectiveness. The results of the 2017 study prompted a need to field-test the hypothesis of vegetation heights above the 7-to-14-inch protocol reducing the abundance of hazardous BASH species, and thus the BASH risk. The ERDC-EL, with support from the Navy BASH program, in 2021 will kick off a project to field-test species habitat preferences under varying vegetation height regimes on different airfields. The objective of the study is to assess the abundance of medium- to larger-sized bird species on airfields having both tall and short vegetation.

Cattle egrets in short vegetation at Diego Garcia. Source: Nestor Guzman

If taller vegetation height is shown to be an effective management tool for reducing the abundance of hazardous species, guidance and recommendations may be incorporated into the Navy BASH program to improve flight safety and protect the Navy mission. Other Military Services could also benefit. This new BASH management tool would result in a significant decrease in airfield mowing costs and, although not a goal of the project, it could support Navy Natural Resources program policies by benefiting certain small-bodied grassland bird species. A management tool that benefits Air Operations through improved flight safety, Facilities Maintenance through decreased mowing costs, and Natural Resources by benefiting at-risk species would be a win-win for the Navy and birds.

PREVENTING AVIAN ELECTROCUTIONS AT WHITE SANDS MISSILE RANGE

By Trish Cutler, U.S. Army Garrison White Sands

WSMR encompasses more than 3,000 square miles in the high desert of southern New Mexico, with elevations ranging from 4,000 to nearly 9,000 feet above mean sea level. WSMR contains 31 golden eagle breeding territories and is seasonal or year-round habitat for a diverse population of hawks, owls, vultures, and other electrocution-prone birds. A lengthy network of overhead power lines — originally developed in the 1940s, and since expanded — helps support WSMR's military mission by providing power to the entire installation for direct mission support as well as power supply to homes, restaurants, churches, and healthcare facilities. Over time, electrocution became a common cause of death for WSMR raptors, including golden eagles, and frequently triggered system outages.

Outages disrupt a variety of important activities, and are costly to repair. Additionally, the electrocution of protected species can lead to regulatory restrictions that interfere with the military mission. The recognition that the raptor population and the existing electrical infrastructure were a threat to each other and to the mission helped galvanize WSMR to actively mitigate the problem. In 2014, WSMR worked with EDM International, Inc. (EDM) to complete an Avian Protection Plan (APP), which detailed materials and strategies for remediating hazardous power poles and protecting birds and WSMR's mission.

A pair of golden eagles perch on a power pole at WSMR, New Mexico. The two phases closest to the eagles are de-energized. Source: Debbie Nethers

Outside expertise in raptor behavior and habitat, as well as the electrical system, was fundamental to the development of the APP. The plan includes an Avian Risk Assessment (ARA) of electrocution hazards on thousands of individual poles, with analysis of habitat, design, equipment, and insulation. The pole-specific mitigation recommendations were based on the Avian Power Line Interaction Committee (APLIC) best practices. The APLIC has developed guidance documents to minimize avian electrocutions and collisions as well as worked with USFWS to develop the 2005 APP guidelines. The ARA provided WSMR with a blueprint for facility-wide mitigation, prioritizing the most hazardous poles.

BIRD MORTALITY EVENT IN THE SOUTHWEST

In Fall 2020, biologists at WSMR started receiving alarming reports of large numbers of dead birds at WSMR in New Mexico and Fort Bliss in Texas. By the end of migration season, over 400 carcasses of more than 45 avian species were collected at WSMR alone — thought to be only a small fraction of all mortalities.

Various dead birds collected from WSMR. Source: WSMR

Bird carcasses from throughout New Mexico, including from WSMR and Fort Bliss, were sent to the U.S. Geological Survey National Wildlife Health Center (NWHC) in Madison, Wisconsin, and to the USFWS Forensics Laboratory in Ashland, Oregon.

Results indicated that the single abnormality nearly all the dead birds shared was poor to severely emaciated body condition. The large breast muscles controlling flight were severely shrunken, kidney failure was apparent in many birds, stomachs and intestines were empty of food, many intestines contained small amounts of blood (one effect of starvation), fat deposits were depleted, and lung tissues were irritated. The labs ruled out contagious bacterial or viral disease, or parasites, as the cause of death, and found no evidence of smoke or pesticide poisoning.

State biologists believe the migrant birds entered New Mexico while already in poor body condition. Although an unusual cold front made the birds' situation worse, what likely caused the deaths were larger issues (e.g., drought, climate change, unprecedented and widespread western forest fires, or loss of stopover habitat and food resources). As climatic conditions continue to change, bird mortality events such as this may become more common.

To potentially mitigate possible external factors in these events, WSMR biologists are considering the potential role that unshielded floodlights may have played in attracting nocturnal migrating birds already in poor condition. As detailed in an upcoming factsheet by the DoD PIF Energy and Infrastructure WG, there are many lighting control options to mitigate artificial lighting to avoid attracting birds.

However, risk assessment is just the first step toward a less lethal, more reliable electrical distribution system. Since 2015, WSMR has also budgeted over $1 million for power pole mitigation. WSMR uses strategically placed insulation to provide 60-inch horizontal and 40-inch vertical clearance around energized components. These clearances help protect golden eagles and smaller birds that perch, roost, and sometimes nest on power poles. Today, hundreds of previously high-risk distribution poles are now safe perches for even the largest birds.

Another common mitigation effort taking place on WSMR is the retrofitting of power poles to keep birds from simultaneously touching conductor and ground lines. Several best management practices have emerged during the retrofitting process. In 2018, power pole retrofits provided the compensatory mitigation required by the USFWS to offset permitted eagle take in support of a critical WSMR mission. As a best management practice, WSMR currently develops a retrofitting sheet for each pole's mitigation with pole coordinates, map, photos, and mitigation prescription to ensure the correct fix is applied to each pole. Additionally, a quality assurance/quality control process is vital. It ensures that mitigated poles are completely protected and the insulation is properly installed and does not increase flashover risk that could cause a pole fire. WSMR tracks completed retrofits using a web map, ensuring accurate information about pole remediation.

Electrocution mitigation efforts at WSMR have proven successful in protecting birds. In 2010, there were over 30 reported avian electrocutions at WSMR, but now there are just 3 to 4 each year — an approximately 90-percent reduction. WSMR attributes this improvement to an institutional commitment to identify hazardous poles, create a plan for mitigation, and ensure a significant investment to fund strategic mitigation. Overall, pole mitigation has proven to be well worth the cost, as WSMR continues to deliver smoothly running utilities, significant reduction in avian mortalities, fewer regulatory violations, and far fewer mission impacts.

DID YOU KNOW?

Did you know the DoD Natural Resources (NR) Program supports the military's combat readiness mission by ensuring continued access to nearly 27 million acres of military land, air, and water resources needed to accomplish vital testing, training, and operational activities?

How about the fact that DoD landscapes provide food and habitat to nearly 500 federally listed plant and animal species, as well as over 550 species potentially requiring listing protections, including 74 "at-risk" species that occur only on DoD lands?

These are just a few of the interesting, but very relevant, statistics that help to describe NR Program activities. We want you to help us by submitting more fun facts like these that we can include in a range of DoD NR Program outreach products. These will go on our website, in new outreach materials such as the Conservation Program storymap, in factsheets, and in a number of other locations that make it easy for us to engage with the general public and spread the good news and success stories of conservation at military installations across the country. Even if it is a well-known fact or statistic about DoD's natural resources, send it our way! We will gladly accept any information you send us at DoDNatRes@bah.com.

Later this year, you can look for the fun facts you submitted in our program outreach materials!

MISSION AND MIGRANTS: HOW BIRD CONSERVATION AND MILITARY TRAINING WORK TOGETHER

By Jeff Keating, Fort Riley

DoD installations with significant natural resources are required to write and implement an INRMP. The INRMP must support the military training mission while incorporating principles of ecosystem management. DoD PIF strives to develop landscape-level, ecosystem-based approaches to conservation and provide information and recommendations that benefit INRMPs while supporting the military mission. When INRMPs are developed in cooperation with military planners, bird conservation actions can be designed not just to co-exist with the mission, but to directly enhance readiness.

One example is the ongoing DoD PIF support for the INRMP at Fort Riley, a 100,656-acre Army installation located in the Flint Hills region of Kansas that includes North America's largest remaining tract of tallgrass prairie. Fort Riley's INRMP prominently mentions and addresses as a priority species the Henslow's sparrow, a bird of the tallgrass prairie and a DoD PIF MSS. A 1996 USFWS Status Review showed this species listed as endangered or threatened in 12 states and as a special concern species in another four. In that report, Fort Riley was identified as having one of the most important breeding populations of this species.

Training activities at Fort Riley, Kansas. Source: Fort Riley

As a priority species for the installation, the Henslow's sparrow has helped shape the management objectives of the Fort Riley INRMP. Over time, grassland management that aligns with the mission (e.g., burning, haying, tree removal) has helped to create and preserve ideal Henslow's sparrow nesting habitat (i.e., unburned, undisturbed tallgrass prairie, in fields 60 acres or larger, with tall, dense grasses and forbs, a well-developed litter layer, and sparse woody vegetation) while also supporting the Fort's mission.

To bring readiness and conservation together, Fort Riley's land managers met with military training staff early in the INRMP development process to understand the mission perspective. For example, Fort Riley's flat, open topography lends itself to force-on-force maneuver training, an important component of the installation's mission. Prescribed burning was determined to be the most important method to maintain the open space needed for maneuver training. Burning kills trees, removes the above-ground grassy vegetation, and keeps woody encroachment in check, which all work together to maintain the open vistas trainers favor.

The Henslow's sparrow also benefits from these actions to reduce wildfires. To accommodate the sparrows' nesting, resource managers designated "no-burn" areas in the annual burn plan. These areas should not be intentionally burned, and any wildfires starting there should be aggressively extinguished. Due to the high likelihood that maneuver and gunnery training starts wildfires, frequent prescribed burning (three out of five years) reduces the accumulation of dead vegetation and therefore helps reduce the potential for breakout wildfires.

Henslow's sparrow. Source: Dominic Sherony

Harvesting grasslands for hay is another commonly used tool that Fort Riley personnel use to reduce the danger of wildfires. Eliminating wildfire risk helps protect installation personnel, valuable equipment and infrastructure, and critical Henslow's sparrow habitat.

Fort Riley's INRMP also identifies Bird Conservation Areas (BCAs) designed to protect the Henslow's sparrow from hay-cutting actions. BCAs are fields with the size, grass composition, and spatial characteristics that make them ideal Henslow's sparrow nesting sites. Hay-cutting within BCAs is restricted until July 15 to allow grassland birds to complete their nesting attempts and provide an increased chance for fledging young.

Rotational hay cutting occurs in these areas, with fields cut every other year, to create a better juxtaposition of habitat types important for a variety of grassland bird species. Juxtaposing hayed, burned, and unburned areas additionally provides better alternative vegetation conditions for commanders to choose from for training purposes. Previously burned areas also work to help stop wildfires by providing natural firebreaks.

Another management action in the INRMP is the removal of scattered trees from grasslands. Military trainers stated that the encroaching tree growth can obscure line-of-sight within weapon firing lines and maneuver field events. Henslow's sparrows are ground-nesting birds that will not nest near trees. Removing trees encroaching into grasslands creates higher-quality nesting habitat, provides opportunities to reduce habitat fragmentation, and enhances the ability of soldiers to train during weapons firing, field maneuvers, and force-on-force training.

Monitoring is critical to the success of the Fort Riley INRMP, with its carefully designed actions that help wildlife management and readiness strategies work together seamlessly. The INRMP includes provisions to conduct Henslow's sparrow monitoring to provide additional management data, particularly regarding the response of the population to prescribed burning, haying, tree removal, and military operations, and truly integrate bird conservation actions with the military mission. Management of the Henslow's sparrow at Fort Riley is a key example of how natural resource efforts can collectively benefit the installation and the species that inhabit it.

INVASIVE SPECIES NATIONAL ASSESSMENT REPORT IS NOW PUBLISHED

Invasive Species in Forests and Rangelands of the United States is a broad-ranging scientific assessment of the current state of invasive species science and research in the United States. DoD pest and natural resources managers can benefit from much of the material presented in this rigorous assessment of invasive species. Leading experts (including some from DoD) on invasive pests, climate change, social sciences, and forest and rangeland management contributed to highlighting the science and identifying knowledge gaps on a diverse array of topics related to invasive species.

This comprehensive report is divided into the following chapters that address the most significant aspects and issues related to invasive species:

- Impacts of Invasive Species in Terrestrial and Aquatic Systems
- Impacts of Invasive Species on Forest and Grassland Ecosystem Processes
- Effects of Climate Change on Invasive Species
- Invasive Species Response to Natural and Anthropogenic Disturbance
- Early Intervention Strategies for Invasive Species Management
- Management of Landscapes for Established Invasive Species
- Rehabilitation and Restoration of Landscapes and Habitats Affected by Established Invasive Species
- Sectoral Impacts of Invasive Species and Approaches to Management
- Inventory and Monitoring of Invasive Species
- Tools and Technologies for Quantifying Spread and Impacts of Invasive Species
- Social and Cultural Dynamics of Non-native Invasive Species
- The Role of International Cooperation in Invasive Species Research
- Economics of Invasive Species
- Legislation and Policies Supporting Invasive Species
- Future Invasive Species Research Challenges and Opportunities

Bruce Squires, U.S. Army Corps of Engineers small craft operator, works on clearing waterways from invasive species. Operators use biological, chemical, mechanical, and cultural control methods to keep waterways clear of aquatic invasive species. Source: Brigida Sanchez

This publication can be downloaded here: https://www.fs.fed.us/research/publications/book/invasiveSpecies/invasiveSpeciesFull.pdf.

DOD PROJECT HIGHLIGHTS

In keeping with our issue theme of highlighting DoD PIF and avian issues, the following summaries detail recent bird projects. Find more projects on the Natural Resources page of the DoD Environment, Safety and Occupational Health Network and Information Exchange (DENIX) website or on the SERDP/ESTCP website.

Legacy Project NR-18-843: Addressing Information Needs of DoD for NEPA and to Enhance Migratory Bird Conservation via Customized Tools and Best Available Data

This second-year project built off the accomplishments from the first-year Legacy Project, NR-17-839, which made the AKN available to all DoD users through the Federal Avian Data Center. This open access network provides DoD the capability to upload, archive, access, and use avian monitoring data to help with NEPA environmental reviews and evaluate potential military training and readiness impacts on migratory bird populations. This project included migrating and formatting historical DoD avian data points within the AKN, developing a DoD-specific program within AKN and Military Service-specific subprograms, and completing the first user-training workshops. The AKN database has become a one-stop shop for DoD avian data. Installation personnel now have access to avian data across DoD and can freely share this information with partners to improve data quality, visualize trends, and improve management practices.

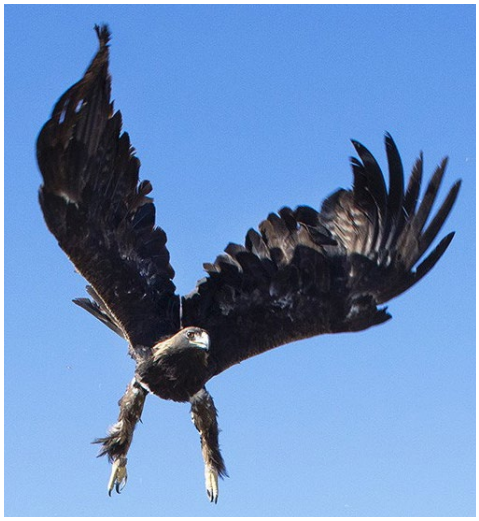
Legacy Project NR-15-800: Meeting Conservation and Compliance Needs Through Improved Greater Sage-Grouse Lek Line-of-Sight Visibility Analysis Using Highest-Hit LiDAR Data

Successful management of greater sage-grouse on DoD lands involves balancing habitat protection with land use by people. Sage-grouse habitat protection typically prevents visible development on sage-grouse breeding grounds, known as "leks." Visibility is typically determined using a bare-earth digital elevation model (DEM). The limited accuracy of these models would over-estimate the size of leks and therefore limit the military's ability to operate in these areas. This project incorporated a laser scanning technique, Light Detection and Ranging (LiDAR), capable of measuring vegetation height, size, and location at three study sites across southern Idaho. The additional data along with the improved accuracy of LiDAR was used to develop a highest-hit DEM. The reduction in structure visibility using LiDAR data from the highest-hit DEM to bare-earth DEM was an average of 50 percent. The primary benefit of this study was demonstrating how to increase the usage area on DoD lands without negatively impacting sage-grouse habitat. This data can potentially reduce natural resource-related encroachment concerns on training and testing areas.

A greater sage-grouse, rear, struts for a female at a lek, near Bridgeport, California. Source: Jeannie Stafford

Legacy Project NR-15-631: Status and Distribution Modeling of Golden Eagles on Southwestern Military Installations and Overflight Areas: Assessing "Take" for This Sensitive Species at Risk

This three-year study focused on three objectives to assess the military's impact on the golden eagle population in the southwest United States to ensure compliance with revisions to the BGEPA. To accomplish the first objective, the team sampled nesting territories along military training routes (MTR) and non-MTR. For the second objective, the team sampled the nest presence or absence along MTR and non-MTR. Results from these two studies determined that MTRs had no detectable impact on golden eagle breeding or nesting. The third objective was to provide management recommendations to allow southwestern military installations to maintain training activities while complying with the revised BGEPA. Estimating the potential breeding phenology for golden eagles provides important data that can be used to develop successful management strategies.



A female golden eagle at DPG. Source: U.S. Army

SERDP RC-2512: Evaluating the Use of Spatially Explicit Population Models to Predict Conservation Reliant Species in Non-Analogue Future Environments on DoD Lands

This project developed and tested an empirical protocol and theoretical framework to determine which target species on military installations will need ongoing management due to changing climate conditions. Time series, space-for-time data, and experimental manipulations were used to predict how future climate scenarios influence the demographic rates for seven species on military installations. Assessing the likelihood of species becoming conservation reliant in the future due to changing climate conditions is valuable for planning and prioritizing natural resource management needs.

UPCOMING EVENTS, CONFERENCES, WORKSHOPS, AND TRAINING

National Military Fish and Wildlife Association Annual Meeting and Training Workshop
March 8-12, Virtual
Held in conjunction with the North American Wildlife and Natural Resources Conference, the NMFWA annual meeting and training workshop is the primary event where installation natural resources managers meet to discuss key concerns and opportunities, policy and legislative changes, ongoing activities and recent accomplishments, and emerging issues and potential new challenges. The virtual workshop will include a DoD NR Program policy update and will feature multiple technical and informational sessions on topics including endangered and at-risk species, invasive species, migratory birds, and natural and cultural resource management partnerships.

North American Wildlife and Natural Resources Conference
March 8-12, Virtual
The 86th North American Wildlife and Natural Resources Conference brings together natural resources professionals from all sectors to exchange knowledge and best practices on issues such as endangered species, migratory birds, and landscape management through workshops and meetings. The event serves as the annual forum to set conservation policy in North America and includes conference sessions, workshops, and more than 150 separate meetings and functions.

Naval Civil Engineer Corps Officers School (CECOS) Natural Resources Management and Compliance Course
April 19-23, Webinar
This course offers instruction in specific natural resources laws, regulations, policies, Executive Orders, DoD Instructions, and other guidance, noting Service-specific requirements. The course addresses stewardship, preservation, and process; fish, game, and wildlife management laws; protection of wetlands, waterways, and other ecological areas; forest and land use management laws; Sikes Act and INRMPs; and inter-service cooperation.

Earth Day
April 22, Global
Since 1970, Earth Day has been the worldwide celebration of saving the planet. Join 22,000 partners in 192 countries working to promote environmental conservation across our planet. Volunteer for the globe. This year on Earth Day, the President will host a Leader's Climate Summit that will outline the future commitment of U.S. foreign policy to climate change.

Northeast Association of Fish & Wildlife Agencies 76th Annual Conference
April 26-28, Virtual
This event attracts over 500 natural resources professionals in the fields of wildlife biology, fisheries and fisheries management, education, and law enforcement. The event provides opportunities for education, discussion, and exchange of ideas. This year's event will be held virtually, providing new opportunities for online collaboration and connection. Highlights include over 50 workshop sessions, keynote speakers, poster displays, and social networking events.

World Migratory Bird Day
May 8, Global
World Migratory Bird Day celebrates the many ways in which birds matter to the Earth, to ecosystems, and to us. Some bird species provide practical solutions to problems, such as the need for insect and rodent control. Others disperse seeds, helping to re-vegetate disturbed areas, or help pollinate flowering plants, trees, and shrubs. This year's theme will focus on stopover sites across the Western Hemisphere and the Caribbean that are important to migratory birds. DoD lands have long served as steppingstones of migration!

National Invasive Species Awareness Week Part II – Outreach and Education
May 15-22, Virtual
Each year during National Invasive Species Awareness Week, state, federal, local, and tribal officials meet with non-governmental organizations, industry, and stakeholder groups. Collectively, they discuss invasive species and examine laws, policies, and creative approaches to prevent and reduce invasive species threats to our health, economy, environment, and natural resources. Access local events on invasive species prevention and removal.

Endangered Species Day
May 21, Global
Recognize the national conservation efforts to protect our nation's endangered species and their habitats. Celebrate and help save the planet one species or habitat at a time. Join the many zoos, aquariums, botanic gardens, wildlife refuges, conservation groups, national parks, museums, and schools throughout the country holding tours, open houses, special presentations, exhibits, milkweed plantings and butterfly garden installations, habitat clean-ups and other restoration events, children's activities, and more. There are also many ways to celebrate at home this year!

Western Association of Fish & Wildlife Agencies Summer Meeting
July 18-23, Virtual
The Western Association represents 19 U.S. states, 3 Canadian provinces, and 1 Canadian territory. This year's virtual conference will feature speakers and workshops that promote sound natural resources management and partnerships at all levels to conserve wildlife for the use and benefit of all citizens.

LINKS OF INTEREST

DoD Natural Resources Program
DoD's NR Program provides policy, guidance, and oversight to manage natural resources on approximately 25 million acres of military land, air, and water resources. Visit the NR Program website for more information on DoD's natural resources initiatives, policy updates, presentations, and links to other conservation and natural resources sites.

DoD Environment, Safety and Occupational Health Network and Information Exchange (DENIX)
The DENIX Natural Resources website is another resource that provides access to natural resources information. Specifically, the website includes DoD Legacy Resource Management Program fact sheets and reports, as well as other natural resources materials.

Armed Forces Pest Management Board (AFPMB)
AFPMB recommends policy, provides guidance, and coordinates the exchange of information on pest management throughout DoD. Its mission is to ensure that environmentally sound and effective programs are in place to prevent pests and disease vectors from adversely affecting natural resources and DoD operations.

Strategic Environmental Research and Development Program (SERDP) and Environmental Security Technology Certification Program (ESTCP)
SERDP and ESTCP are independent DoD research programs that use the latest science and technology to develop innovative solutions to DoD's environmental challenges. They promote partnerships and collaboration among academia, industry, the Military Services, and other federal agencies that support military readiness and mission capabilities, quality of life, compliance with legislation and policy, and natural and cultural resources management.

Readiness and Environmental Protection Integration (REPI)
Under REPI, DoD partners with conservation organizations, and state and local governments to preserve land around military installations to combat encroachment. REPI promotes innovative land conservation, which preserves the military's ability to train and test on its lands now and into the future.

Cooperative Ecosystem Studies Units (CESU) Network
DoD participates in the CESU Network, which is a national consortium of federal agencies, tribes, academia, state and local governments, and non-governmental organizations working together to provide research, technical assistance, and training to federal agencies and their partners. The CESU Network also provides managers with the adaptive management approaches necessary to preserve installation natural and cultural resources.

DoD Partners in Flight (PIF)
DoD PIF consists of natural resources personnel from military installations across the United States and works collaboratively with partners throughout the Americas to conserve migratory and resident birds and their habitats. In addition, DoD PIF supports and enhances the military mission through proactive, habitat-based management strategies that help protect birds on DoD lands and maintain healthy landscapes and training lands. Visit the DoD PIF website for fact sheets, reports, and other materials with information about DoD's migratory bird conservation efforts.

DoD Partners in Amphibian and Reptile Conservation (PARC)
DoD PARC is a partnership dedicated to the conservation and management of herpetofauna (reptiles and amphibians) and their habitats on military lands. DoD PARC membership includes natural resource specialists and wildlife biologists from the Military Services, and individuals from state and federal agencies, museums, universities, and environmental consultants. Visit the DoD PARC website for information about herpetofauna management projects on DoD lands.

DoD Pollinator Initiatives
Visit this website for an overview of pollinators and why they are important to DoD. The website also contains information on how people can help protect pollinators and their habitat, including fact sheets, technical reports, and how-to guides.

DoD Invasive Species Outreach Toolkit
This toolkit has materials to help DoD natural resources managers communicate with agencies, organizations, and the public about invasive species issues on DoD lands. Specifically, the tool kit includes modifiable outreach materials, such as posters, brochures, reference cards, and a PowerPoint presentation.

DoD Biodiversity Handbook
The DoD Biodiversity Handbook contains a thorough introduction to biodiversity and how it is essential to support the military mission. It also details the scientific, legal, policy, and natural resources management contexts for biodiversity conservation on DoD lands, and includes 17 case studies with practical advice from DoD natural resources managers.

DoD PARC Photo Library, DoD PIF Photo Library, and DoD Natural Resources Photo Library
Visit these three websites to share pictures, news, information, and ideas with the DoD Natural Resources, DoD PARC, and DoD PIF communities. Please review the photo policy and photo submission instructions to contribute your images. In addition, account users can download photographs for reports, PowerPoint presentations, and educational materials such as brochures and posters.

DoD Chesapeake Bay Program (CBP)
DoD was one of the first federal departments to be formally involved in the Chesapeake Bay Watershed restoration effort. Military installations in Maryland, Pennsylvania, Virginia, New York, West Virginia, and the District of Columbia play an important role in defending and preserving the Bay. In Fiscal Year 2019, installations funded $65 million in projects to benefit the Bay. These efforts advance the goals and outcomes of the Bay and further the ability for DoD to test, train, and operate in the watershed.

DOD NATURAL RESOURCES PROGRAM

Enabling the Mission, Defending the Resources

www.denix.osd.mil/nr

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