

Natural Selections

Department of Defense Natural Resources Program



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CELEBRATING 100 YEARS OF MIGRATORY BIRD CONSERVATION

The year 2016 marks the centennial of the Convention between the U.S. and Great Britain (for Canada) for the **Migratory Bird Treaty!** The Migratory Bird Treaty, and three others that followed, form the cornerstones of our efforts to conserve birds that migrate across international borders. Explore this issue of *Natural Selections* as we highlight several policies that came into effect after the issuing of the Migratory Bird Treaty.



JUST RELEASED — LEGACY RFP!



The DoD Legacy Resource Management Program (Legacy) Fiscal Year (FY) 2017 Request for Pre-Proposals (RFP) was released February 2016. To apply by **April 4, 2016**, and for more information, visit <https://www.dodlegacy.org/Legacy/intro/guidelines.aspx>, www.denix.osd.mil, or www.grants.gov.

The FY17 Areas of Emphasis that will receive funding priority are:

- Mission Enhancement and Range Sustainment;
- Planning to Address and Adapt to New and Emerging Threats;
- Efficiencies in Cultural Resources Management;
- Asset Resiliency through Historic Preservation; and
- Training and Communications.

Revisit *Legacy Program Pre-Proposal Frequently Asked Questions* in the *Natural Selections Winter 2014-2015* issue for tips on successfully preparing your Pre-Proposal.

SPOTLIGHT: THE HISTORY OF NAVY'S BASH PROGRAM

By Matthew Klope, Naval BASH Coordinator, Retired

Since the Navy first started flying aircraft, we have been hitting birds and other wildlife. Wildlife strike records found at the Naval Safety Center in Norfolk, VA, go back to World War II to the present day. Over the years, we have made substantial progress in the Bird/Animal Aircraft Strike Hazard (BASH) program by encouraging personnel engaged in flying activities to report all damaging and non-damaging strike events to the BASH database at the Naval Safety Center.



Crashed E2-C Hawkeye aircraft. Source: Matthew Daniels

The Navy program really took hold when we lost an E2-C Hawkeye aircraft at Naval Air Station Point Mugu in Oxnard, CA, in 2000. Because of the Class A Mishap report (a report to record cases of injury), the Navy created a permanent BASH Program biologist position through the Naval Facilities Engineering Command. Once the Navy created this position, they created a **Navy Bird Animal Strike Hazard**

Program Implementation Guidance along with the supporting **Bird/Animal Strike Hazard (BASH) Manual**.

To enhance the program, the Navy contracted with the **Smithsonian Institution's Feather Identification Lab** to identify all Navy and Marine Corps wildlife strike remains. This was a major milestone because one of the most important pieces of information for a facility's BASH program is being able to identify the species of wildlife causing the safety hazard. Once biologists and facility engineers have this information, they can work together to solve the safety issues. This usually includes habitat modification, wildlife species harassment, or depredation.

Following the Smithsonian program, the Navy contracted with the **U.S. Department of Agriculture's Animal and Plant Health Inspection Service Wildlife Services** to assist Navy facility natural resources managers and airfield managers in managing wildlife issues at all the major Naval Air Stations in the United States. This has been a tremendous program and has greatly improved BASH programs. Today's BASH programs are a partnership between the facility air operations and environmental departments and the Wildlife Services. This partnership has proven to be a successful team to support the facility BASH program into the future.

NATURALLY SPEAKING

From the Desk of L. Peter Boice, Deputy Director, DoD Natural Resources Program; Director, Legacy Program



Christina Ramsey and Peter Boice, circa 1990.

This issue provides a retrospective of specific elements of DoD's Natural Resources Program (e.g., biodiversity, endangered species, radar monitoring of bird movements, coral reef management) as well as several closely related programs (e.g., Armed Forces Pest Management Board [AFPMB], Navy Bird Aircraft Strike Hazard).

In this, my last column for *Natural Selections*, I would like to reflect on some of the overall trends that I have witnessed during my 30 years working in the Office of the Secretary of Defense (OSD).

Policy: From 1978 to 1996, natural resources management in DoD was governed by DoD Directive (DoDD) 4700.4, *Natural Resources Management Program*, which my predecessor, Christina Ramsey, completed on January 24, 1989. It may come as a surprise that some of today's key principles were prominent more than 25 years ago – managing natural resources to support the military mission; conserving and managing protected species; and developing integrated natural resources management plans (INRMPs).

Since 1996, all DoD environment, safety and occupational health (ESOH) programs have been authorized by DoDD 4715.1E. The DoD Instruction 4715.03, *Natural Resources Conservation Program*, is one of at least 14 ESOH instructions authorized by this "master directive." This Instruction, issued in 1996 and updated in 2011, added many new responsibilities for DoD natural resources managers, including ecosystem-based management; ecosystem services; biodiversity; self-assessments and metrics; migratory birds; invasive species; partnerships; coastal resources; wildland fire management; pollinators; and climate change. This shift in focus and growth in complexity of natural resources priorities has significantly affected both resource requirements and skills needed.

Christina was responsible for organizing a governing council to provide natural resources policy and program improvements to senior DoD leadership. This group, which began as the Defense Natural Resources Group in 1985, was formally established as the Defense Natural Resources Council (DNRC) in 1989 and was

later renamed the DoD Conservation Committee in 1996. The May 23, 1989 DNRC minutes are a harbinger of several ongoing themes. Jamie Rappaport-Clark, then in her role as Army Guard representative to the DNRC, reported on the first Keystone Foundation-led working group on "biological diversity." DoD contributed to and participated in this precursor to the Keystone Dialogue that Doug Ripley describes in his article.

A second highlight, and an early indication of the value of ongoing coordination between natural resources and pest management professionals, was a presentation by Edward Evans, AFPMB Chair. His top concern – "when does a resource become a pest and how can we best approach the problem?" The specific issue then was pressure by animal rights activists to reduce deer hunting at a time when Lyme disease and Rocky Mountain spotted fever were major health concerns. Also of interest – the impact of pests on endangered species, such as coyotes and the Sandhill crane in Oregon; foxes and the California least tern; goats and hogs on California islands and Hawaii – and the Brown Treesnake in Guam.

Also of note, global warming was first discussed at the DNRC the previous November. An EPA researcher advocated for increased forest productivity and reforestation (i.e., carbon sequestration) and strategic landscape planting as key cost effective tools.

Metrics: Oversight of our military installations' natural resources programs has evolved to reflect changing policies and priorities. Early reporting emphasized absolute numbers – of plans (e.g., forestry, fish and wildlife, land management; outdoor recreation); personnel; and commodity receipts. In the mid-1990s, our office added specific goals for each environmental pillar and required annual status updates to our leadership through the Environmental Management Review (EMR) process. For the Natural Resources Program, we now track percent of INRMPs, percent of wetlands, and complete biological inventories. An immediate finding – installation plans and inventories had surprisingly low completion rates (~45-60%). More recently, we added well-defined "green-yellow-red" metrics for seven "focus areas" including INRMP implementation; federally listed species and critical habitat; and mission support. These metrics, adapted from similar ones first developed by the Navy, were the culmination of a ten-year search for more quantitative and meaningful program measures that former Deputy Under Secretary of Defense (Environmental Security) Sherri Goodman had requested. The Military Services also have the opportunity to discuss specific program challenges and successes at our annual EMRs.

Budget: One of the most noteworthy changes to DoD's Natural Resources Program has been to "Conservation" funding, which combines natural and cultural resources budget lines, as historically these have been difficult to separate. In Fiscal Year (FY) 1993, the total Conservation budget for the Military Departments was about \$90 million, including \$11.7 million for threatened and endangered species. Additionally, DoD Legacy Program funding, which was intended to provide a boost for completing plans and inventories, added an extra \$50 million. Twenty-two years later, those numbers were \$322 million and \$112 million, with the DoD Legacy Program adding just \$4.3 million for DoD-wide and regional initiatives. Several factors have contributed to the relative strength of Conservation funding. The 1997 Sikes Amendments for the first time required installations to develop and implement integrated plans, and

to ensure that these INRMPs provided for no net loss to the military mission. An FY 2004 [National Defense Authorization Act](#) amendment to the Endangered Species Act further reinforced the need for approved and implemented INRMPs by allowing the U.S. Fish and Wildlife Service to preclude Critical Habitat (CH) designation where these INRMPs have been determined to provide a benefit to the species for which CH is being considered. Other factors responsible for these budget increases have included the proliferation of both additional and expanded regulatory requirements (e.g., increased management burden from additional species listings and candidate species proposals; new Executive Orders), and the growing recognition of military testers and trainers that sound natural resources management can enhance long-term sustainability of limited land, sea, and air resources.

Innovative Partnerships: DoD's natural resources managers have long known the value of partnering with other agencies, non-governmental organizations, and universities. Early agreements were predominantly with federal agencies (e.g., U.S. Department of Agriculture, the Department of the Interior) or traditional fish and game groups. In 1988, we completed the first national cooperative agreement with The Nature Conservancy (TNC), a partnership that allowed our installation personnel to contract directly with TNC's Natural Heritage personnel to complete more than 200 biological inventories. With funding from the DoD Legacy Program, our office funded two major initiatives (Mojave Desert Ecomanagement Initiative and Curation of DoD Archaeological Resources) and was a major contributor to two interagency partnerships (National Public Lands Day and Coastal America); The White House recognized our contributions by awarding us with a Reinventing Government "Hammer" award for each. By joining all 17 Cooperative Ecosystem Studies Units, DoD was able to fund more than 850 projects at a net savings through cost avoidance of approximately \$28 million over the past 15 years.

Training: Professionally trained, natural resources managers are essential to meeting the varied and changing demands inherent with working for DoD. Additionally, the Sikes Act requires that each military installation with substantial natural resources have and maintain this expertise. The National Military Fish and Wildlife Association (NMFWA) has provided an enduring source for core training – and the just as important face-to-face information exchanges – for more than 30 years. NMFWA has expanded its training far beyond its original focus on fish and wildlife management to mirror expanding job requirements by adding workshops on pollinators, invasive species, amphibians and reptiles, and bats, among others.

Our office has sponsored DoD-wide and regional conferences and workshops for 25 years, starting with the August 1991 DoD Natural Resources Leadership Conference at the Air Force Academy. These events have morphed to address changing needs, and have integrated other offices and disciplines with our core natural resources constituency, including:

- DoD Legacy Program regional workshops that provided technology transfer to recently completed natural and cultural resources projects;
- Conservation Conferences that addressed all common concerns shared by natural and cultural resources managers;
- Threatened and Endangered Species regional workshops that integrated DoD's policy office with its research and development offices while focusing at an ecosystem level on

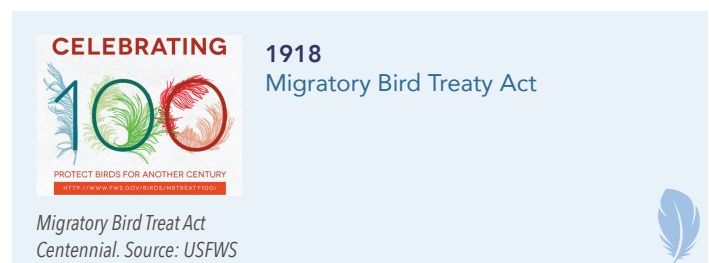
- what is probably the most challenging and important issue now faced by many natural resources managers – species decline;
- INRMP-State Wildlife Action Plan (SWAP) regional workshops that looked to identify common issues addressed by our management plans and SWAPs; and
- Sustaining Military Readiness conferences that integrated non-environmental offices (e.g., testing and training; off-base partnerships) with conservation concerns.

Unfortunately, declining budgets DoD-wide have at least temporarily eliminated these valuable in-person training opportunities. Consequently, our office currently focuses on webinars, on-line training courses (e.g., Endangered Species Act training), expanded web sites, and similar means of providing information and technology transfer. We will continue to provide these expanded opportunities even when in-person training becomes more feasible.

Women in Conservation: I cannot close without mention of a final notable trend – the very noticeable increase in women in natural resources positions across the country, including within DoD. For the first several years that I have worked with natural resources policy issues, the only women I worked with were Christina and Jamie. When I attended my first NMFWA training workshop, that number doubled! Today, women work in all four Military Services' Headquarters and at OSD. Moreover, 6 of the 13 NMFWA Board members listed in the latest newsletter, including both the President and President-Elect, are women. This tapping of our full talent pool is perhaps the most encouraging trend that a father of three girls could hope to see.

Looking Forward: I have been privileged to work directly with many of you, and hopefully to help enable all of you to more effectively perform some of the most interesting, challenging, and rewarding natural resources work possible to provide continued access to our nation's military training lands, and to ensure the long-term sustainability of our irreplaceable natural resources. Those of you who will continue this work will undoubtedly face both familiar challenges and new opportunities. What is unlikely to change are constraints on DoD's resources and the subsequent need for all of you to continue to demonstrate and effectively communicate the inherent value of managing for long-term natural resources sustainability.

What comes next for me? Too many new adventures to more than partially list – travel, grandkids, writing, photography, running, French, mentoring. Catch me in Pittsburgh if you are able to attend. Or in the 'other' Washington when I hope to take advantage of those reduced registration rates.





Delousing operation, 1944. Source: Photo by Jack Rosebush

A BRIEF HISTORY OF THE ARMED FORCES PEST MANAGEMENT BOARD

By Douglas A. Burkett, PhD, DoD Armed Forces Pest Management Board (AFPMB)

World War II was a turning point for military force health protection. As the war raged on, it became clear that disease claimed the lives of more troops than all other non-combat related injuries combined. The African and South Pacific theaters of war saw nearly 60,000 troop deaths due to malaria alone. In the Pacific, for every 1,000 soldiers there were 2,600 cases of malaria, resulting in an incidence rate of 260 percent. In November 1944, the Secretary of War, General George C. Marshall, finally had enough. He established the Army Committee for Insect and Rodent Control (ACIRC). This new committee was commissioned to develop and improve pest and vector-borne disease control equipment and management techniques. The ACIRC was so successful in enhancing operational force health, that it continues its mission to the present day, in the form of the AFPMB under the Office of the Assistant Secretary of Defense, Energy, Installations, and Environment.

During and following World War II, the military funded the U.S. Department of Agriculture (USDA) to conduct research and develop vector control materials to address public health related to militarily important pests and vector-borne diseases. Starting with the USDA Bureau of Entomology and Plant Quarantine Laboratory in Orlando, FL, in the 1940s, and later the research center in Beltsville, MD, numerous scientific advances resulted in profound impacts on military health. These impacts include the use of insecticides for mosquito (malaria, dengue, yellow fever); chigger (scrub typhus), flea (plague), body lice (typhus), bedbug, and filth fly control. Other significant advances still in use today include the development of aerosolized insecticides (1941), DEET insect repellent (1947), sterile male technique for screw worms (1949), development of ultra-low volume insecticide applications (1970), bacterial larvicide (Bti) for mosquito control (1977), insecticide treated fabric / uniforms (1978) and many other more recent advances.

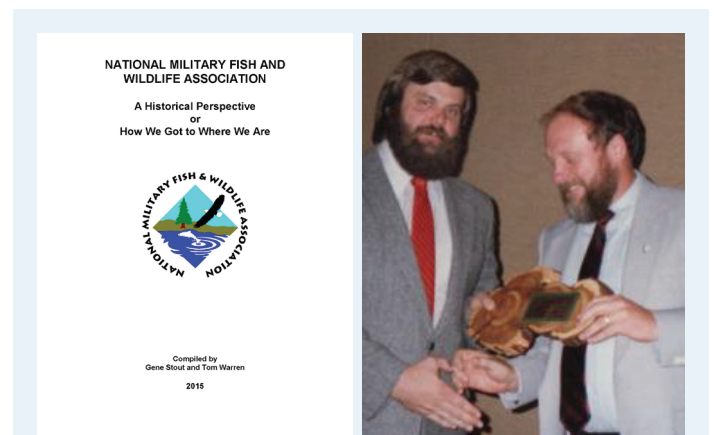
As for the logical expansion into proactive and requirement-driven environmental stewardship under what was then the Deputy Under Secretary of Defense for Environmental Security in the early 1990s, the DoD realized the operational importance of addressing environmental stressors that increasingly impact military testing, training, and readiness (e.g., Safety and Occupational Health, Conservation, Cleanup, Compliance). At this time, the DoD pest management community continues to incorporate integrated pest management (IPM), Endangered Species Act related pesticide use restrictions, and pesticide reduction tenets into DoD policies and practices. The increased importance of IPM implementation in the DoD led to the formation of the AFPMB Natural Resources Committee in 1979, and led to AFPMB hiring its first ever environmental biologist in 1992 to address DoD-wide IPM, invasive species, and other non-vector control pest management issues. Through the AFPMB Directorate, Council, and twelve standing committees, many of which were originally stood up shortly after the ACIRC was formed, AFPMB continues to fulfill its mission to recommend and exercise DoD policy, execute technical oversight, provide scientific advice and enhance coordination among the U.S. Military Services on all matters related to medical entomology and pest management. Visit AFPMB at www.AFPMB.org.



1929
Migratory Bird Conservation Act

Burrowing Owl. Source: DoD Natural Resources Program





The authors and NMFWA's first two presidents: Gene Stout (1983-86) and Tom Warren (left) (1986-88) in 1986.

National Military Fish and Wildlife Association (NMFWA) *A Historical Perspective or How We Got to Where We Are*, compiled by Gene Stout and Tom Warren in 2015, provides a detailed, historical perspective of the organization. Copies of the booklet will be available for sale at the [NMFWA/ North American Wildlife and Natural Resources Conference](#) from March 14-18 in Pittsburgh, PA.



Wolf at the Denali National Park in Alaska.
Source: Gary Kramer, USFWS

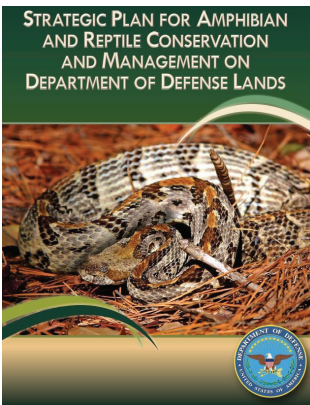
The National Park Service is celebrating its 100th birthday on August 25, 2016! The centennial will kick off a second century of stewardship of America's national parks and engaging communities through recreation, conservation, and historic preservation programs. The National Park Service invites you to find your park and discover the national parks and programs in your own backyard on their website.

WHAT'S HOPPIN' IN DOD PARC: SPRING 2016 UPDATE

By Robert E. Lovich, Ph.D., DoD PARC National Technical Representative and Chris E. Petersen, DoD PARC National Representative



It is a new year and DoD Partners in Amphibian and Reptile Conservation (DoD PARC) is excited about working on our 2016 projects. Spring is heating up in many parts of the United States, and our cold-blooded friends will be active along with DoD PARC. As always, none of our efforts would be possible without the enthusiasm, teamwork, and dedication of our group members and DoD PARC Representatives. Below are a few of the ongoing and new projects planned for 2016.



Source: DoD PARC

DoD PARC worked with senior DoD leadership to finalize the [Strategic Plan for Amphibian and Reptile Conservation and Management on Department of Defense Lands](#) in 2015. The Strategic Plan provides a framework for accomplishing DoD-wide conservation objectives related to the protection of amphibians, reptiles, and their habitats while precluding mission conflicts arising from conservation-based regulatory restrictions. It is the first of its kind for a department of the federal

government, and is an example to our other partner agencies at that level.

The Plan is available in digital format on the [DoD Natural Resources website](#) and we will distribute a limited number of printed copies at the 2016 National Military Fish and Wildlife Association Workshop. If you would like a copy of the Plan, please contact [Chris Petersen](#) or [Rob Lovich](#).

Training is important and helps us stay educated and up to date on the conservation and management of amphibians and reptiles

on military lands. Therefore, in 2016, DoD PARC will develop an online training course on amphibians and reptiles to provide DoD natural resources personnel a general understanding of herpetofauna biology, ecology, survey techniques, and management and conservation practices. Topics will be presented in chapters and will include information presented both in text and video and will include topics such as amphibian and reptile diseases; snake bite prevention and handling techniques; use of standard survey techniques such as drift fence installation, radio-telemetry and automated frog call recorders.



Green Treefrog. Source: DoD PARC

DoD PARC members have started a year-long effort to update the herpetofauna species lists for approximately 140 Army and Army National Guard installations. The updated species lists will identify those species that are confirmed on a particular site and those with the potential to occur. Species lists will be peer-reviewed by DoD PARC group members, and also by a state or local expert. Individual species lists will be combined into a single database that can be sorted by species name, installation name and federal, state and NatureServe status. This effort has already been completed for Navy,

Marine Corps and Air Force installations (Legacy Projects [12-423](#), [13-641](#), [13-642](#)). Once the Army species lists are updated and combined with the other Services' data, **the resulting database will be the most comprehensive and accurate source of information for herpetofauna biodiversity on DoD lands ever to be developed.** The database will help the DoD natural resources community determine what DoD installations' species are confirmed and unconfirmed. This is especially helpful in this era when many species of herpetofauna are imperiled, and could warrant consideration for listing under the Endangered Species Act.

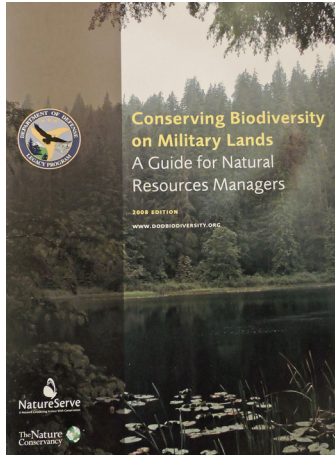
Lastly, this year our group members will focus on developing more educational and outreach materials on herpetofauna. In 2015, group members produced educational snake pamphlets for Naval Air Station Key West, Marine Corps Logistic Base Albany, Fort Stewart, Kansas Training Range, Florence Military Reservation, Naval Support Facility Indian Head, and many more. In addition, group members produced two posters: [Venomous Snakes on United States Air Force Installations](#) and [Amphibians and Reptiles of Naval Magazine Indian Island](#). These products are helping to educate military and civilian personnel about the herpetofauna on the military bases where they work and live. Nearly all of the photographs in these products are from the [DoD PARC Photo Website](#), which contains over 1,300 pictures of amphibians and reptiles on military lands.

If you would like more information on any of the projects listed above, or if you would like to participate in any DoD PARC related projects or activities, please contact [Chris Petersen](#) or [Rob Lovich](#) or visit the [DoD PARC website](#).

THE EVOLUTION OF BIOLOGICAL DIVERSITY CONSERVATION ON DEPARTMENT OF DEFENSE LANDS

By Douglas Ripley, U.S. Air Force, Retired

The guidebook, *Conserving Biodiversity on Military Lands – A Guide for Natural Resources Managers*, published in 2008 by the Department of Defense and NatureServe, describes biological diversity as:



Biodiversity, most simply put, is the variety of life – everything from genes, to species, to entire ecosystems. Shorthand for “biological diversity,” the concept is most frequently applied to the array of plant and animal species that occur in a particular place, or region. The notion, however, captures not only the diversity of species in an area, but also the genetic variation within those species, as well as the organization of these species into biological communities and the variety of

ecosystems across a landscape. Biodiversity conservation must take each of these levels into consideration.

In the past twenty years, management of biological diversity has become a key element of military natural resources programs. The development of this concept on America’s military lands has a rich and interesting history. Starting in the early 19th century, U.S. military officers began contributing to the understanding of the nation’s natural resources through early exploration expeditions, such as those of the Corps of Discovery led by Captain Meriwether Lewis and Lieutenant William Clark. Later 19th century expeditions, such as U. S. Navy Captain Charles Wilkes’ 1838-1842 U.S. Exploring Expedition, and the Army Topographical Corps’ many journeys in the American West, led to the discovery, documentation, and description of numerous species new to science. As the U.S. military expanded in the 20th century and acquired training and testing lands throughout the country, it began programs to manage the natural resources on those lands. Initially, management focused on immediate impacts to the land by military training. Agronomists (professionals experienced in soil management and field crop production) were the earliest military natural resources professionals employed in the 1940s to address these concerns, and entered into cooperative agreements with the Soil Conservation Service and the U.S. Forest Service to provide advice and guidance regarding land management issues. By the 1960s, the U.S. military began to focus on mandates for “multiple use” of federal lands and thereby undertook management programs that incorporated wildlife, outdoor recreation, agricultural out-leasing, and commercial forestry operations into previously more limited programs. The Sikes Act of 1960 specifically mandated and authorized such programs on military lands. The unprecedented passage or strengthening of landmark environmental legislation in the 1970s, such as the Clean Water Act, Marine Mammal Protection Act, and the Endangered Species Act vastly expanded the military’s requirements for managing its natural resources.

The Endangered Species Act of 1973 is an extremely important driver for enhancing biological diversity on military lands. Although the law’s principal goal is to protect individual species in danger of extinction, it also identifies the importance of broad-based conservation measures “to provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved, to provide a program for the conservation of such endangered species and threatened species...”

In the early 1990s, the DoD undertook a concerted effort to inventory its lands for threatened, endangered, and sensitive species using funds from the DoD Legacy Program. Working with installation biologists, environmental consulting firms, and cooperating environmental organizations such as The Nature Conservancy, NatureServe, and State Heritage offices, the DoD completed natural resources inventories on approximately 420 large military installations (greater than 500 acres). Interestingly, those surveys revealed that the approximately 25 million acres of DoD land contain the highest density of threatened, endangered, and sensitive species of any other federal land management agency.



Osprey. Source: USFWS

1936 Convention Treaty with Mexico

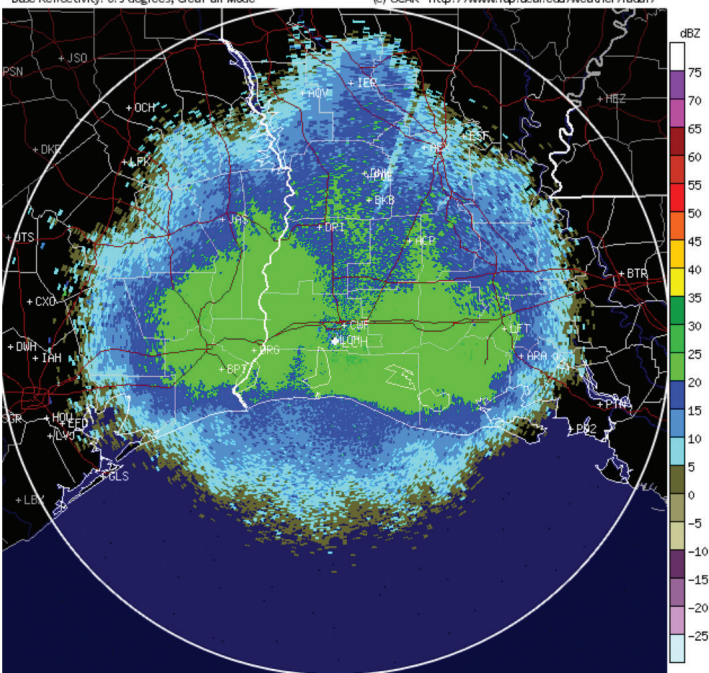


An important milestone in DoD biological diversity management occurred in 1996 with the convening of a Congressionally-mandated (through the DoD Legacy Program) Keystone Center policy dialogue (Keystone Dialogue) to develop a DoD Biodiversity Management Strategy. The Keystone Center assisted the DoD in addressing the issue of biodiversity conservation through a series of dialogues involving the military, the academic community, environmental organizations, and concerned individuals. Using recommendations from the Keystone Dialogue, the DoD formally established a policy for an ecosystem approach to natural resources management and for the conservation of biological diversity in its 1996 [Conservation Instruction](#) (DoDI 4715.3). Revisions and updates to the instruction ([DoDI 4715.03](#)) reinforce that policy, which has been incorporated into the natural resources conservation instructions for each of the military services. That policy now serves as an important element of individual Installation Natural Resources Management Plans.

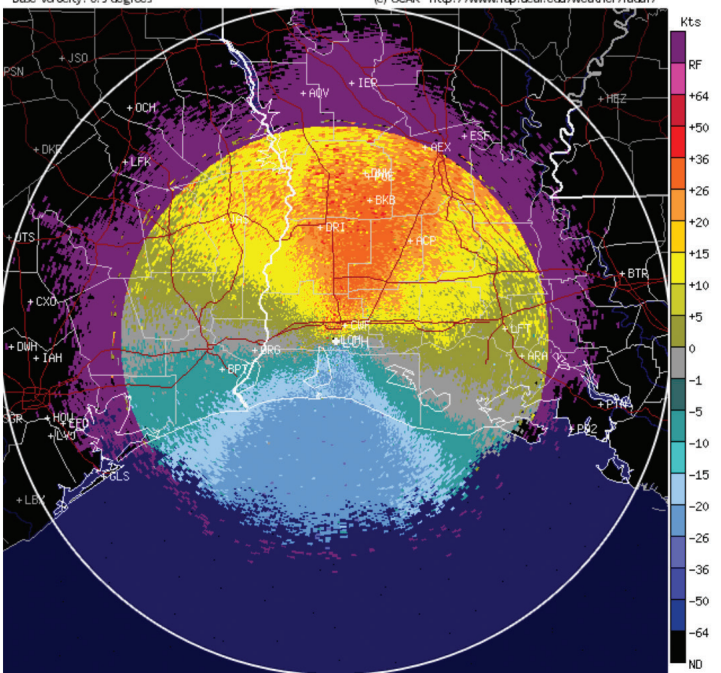
An important product of the Keystone Dialogue was the preparation of a [guidebook](#) for military natural resources managers. Originally published in 1996, the guidebook was updated and expanded in 2008 and provides a wealth of information on many aspects of biological diversity, including specific guidance on how best to implement biodiversity conservation programs on military lands and case studies illustrating successful biological diversity conservation programs. A separate [Commander’s Guide](#) to biodiversity conservation was also prepared at this time.

The conservation of biological diversity continues to be an important element of military natural resources management and planning. As new environmental issues arise (e.g., climate change), their impact on biological diversity will be an important consideration in developing strategies to address them.

KLCH -- Lake Charles, LA
Base Reflectivity: 0.5 degrees, Clear-air Mode
01:58:15 UTC Thu 09 May 2013
(c) UCAR <http://www.rap.ucar.edu/weather/radar/>



KLCH -- Lake Charles, LA
Base Velocity: 0.5 degrees
01:58:15 UTC Thu 09 May 2013
(c) UCAR <http://www.rap.ucar.edu/weather/radar/>



Displays of migrating birds on WSR-88D at Lake Charles, LA on 9 May 2013 at 20:58 CST. Left Image: The pattern of reflected energy from migrating birds arriving on and departing from the NE coast of TX and SW coast of LA. The scale of values increases as the density of birds increases. Right image: Doppler velocity of the same echoes. Cool colors indicate birds moving toward radar, warm colors indicate birds moving away from radar, and purple color indicates ambiguous velocity information. Echoes flying directly toward and away from the radar station show true ground speeds. Source: Sidney Gauthreaux

RADAR MONITORING OF BIRD MOVEMENTS

By Sidney Gauthreaux, P.h.D, Clemson University Professor

In February 1939, a researcher from the Naval Research Laboratory made the first observation of a bird using an experimental radar on a naval vessel off the coast of Puerto Rico. Military personnel continued using surveillance radar to monitor birds during World War II, and recorded unidentified echoes dubbed "angels," "ghosts," and "phantoms." The Army Operational Research Group of Britain was the first to identify large birds and flocks of smaller birds as the source of these echoes, and publish an extensive study in 1945 on their findings.

The first academic studies of bird movements displayed on airport and weather surveillance radar appeared in the 1950s. Once the network of Weather Surveillance Radar, 1957 (WSR-57) was established in the United States, researchers discovered that the radar units readily detected movements of birds of all sizes. In very dense movements, echoes from migrating birds could extend out 100 nautical miles from the radar. During my research, I adapted the meteorological technique of measuring the intensity of rainfall for measuring the intensity of bird echoes displayed on the radarscope. This enabled the WSR-57 to be used as a tool for reducing bird/aircraft collisions—a task of great importance to military aviation because of the number of aircraft operations at low altitudes. Airport surveillance radars were also capable of detecting and monitoring bird movements within 60 miles of an airport, but air traffic controllers did not want echoes from birds obscuring the radarscopes, so settings were changed to reduced sensitivity, which eliminated the weaker echoes from birds without affecting the echoes from aircraft.

In the 1960s, researchers began using smaller, mobile military and marine navigation radars to detect and track birds within

a range of a few nautical miles. These units enabled the gathering of information on intensity, speed, and direction of movement of an echo, and radar could record the modulation of echo intensity attributed to wing-beat pattern. These "avian" radars are still being used to detect, quantify, and monitor bird movements. Scientists use algorithms to automatically track hundreds of echoes at the same time while exporting data on each echo track. These radars are being used at some airports to reduce bird/aircraft collisions and at wind power development sites to reduce bird/turbine collisions.



Bald Eagle. Source: USFWS

1940
Bald and Golden Eagle Protection Act



New Doppler radars (Next Generation Radar or WSR-88D) upgraded the network of WSR-57 radars in the late 1980s; and the new units have stimulated a surge in studies of bird movements in the atmosphere. The Doppler technology provides information on the speeds of the echoes, which can help identify the sources of the echoes. All the WSR-88D units were further upgraded to high-resolution and dual-polarization in 2012-2013, and these developments, particularly the dual-polarization, enable not only the separation of biological and meteorological echoes but the ability to distinguish echoes from birds and insects. This information is used every day to save lives by providing information that helps prevent planes from hitting large birds and large flocks of small birds.



1940
U.S. signs the [Convention for Nature Protection and Wildlife Preservation in the Western Hemisphere](#)

Bicknell's Thrush.
Source: Larry-Master

Ratified in 1941



RESPONSIBLE CORAL REEF MANAGEMENT EQUALS WARFIGHTER FLEXIBILITY

By John Pierson, Director of Marine Resources with the Office of the Deputy Assistant Secretary of the Navy - Environment

DoD's coral policy ([Executive Order 13089, Coral Reef Protection](#)), which was issued more than 18 years ago, is even more applicable today: "It is DoD policy to protect the U.S. and international coral reefs and to avoid impacting coral reefs to the maximum extent feasible. Furthermore, we will responsibly manage and restore coral reef ecosystems in carrying out the terms of all laws, regulations, and policies concerning coastal zone management and coral reef protection." Chiefly due to threats caused by warming oceans, the National Marine Fisheries Service, a line office of National Oceanic and Atmospheric Administration (NOAA), [listed 20 additional coral species](#) under the Endangered Species Act in September 2014. They are currently considering whether to designate critical habitat for those coral species, and whether to expand existing critical habitat for two previously listed coral species. DoD remains committed to protecting these species, but questions how establishing critical habitat will substantially benefit their recovery.



The Blacktip Reef Shark is the most abundant shark inhabiting the tropical coral reef.
Source: John Pierson

Natural resources professionals within DoD have demonstrated that effective stewardship of species produces healthy ecosystems which, in turn, averts the need for additional regulations and/or usage restrictions in areas controlled by DoD, such as designating critical habitat. This active management can ensure both the recovery of the species and operational flexibility for our warfighters.



1972
U.S. signs [Treaty for the Protection of Migratory Birds and Birds in Danger of Extinction and Their Environments with Japan](#)

Eastern Meadowlark.
Source: DoD PIF



The Yellow Tang is one of the most popular aquarium fish and inhabits the shallow coral reef.
Source: John Pierson

To maintain operational flexibility for our warfighters, the Department of the Navy, along with the other services, provided NOAA preliminary assessments of how our Integrated Natural Resources Management Plans provide benefits to the coral species under consideration for critical habitat designation, as well as a preliminary assessment of national security impacts. The assessments reiterated our willingness to continually improve our management plans and work closely with our local partners, including NOAA, to implement those plans.

DoD's proactive coral management stance, established 18 years ago through the DoD coral policy, and amplified by the 2002 DoD [Coral Reef Protection Implementation Plan](#), may be the groundwork that removes the need for the designation of coral critical habitat in areas under DoD management or of national security concern. Being proactive may prove to be the best tool to maintaining operational flexibility for our warfighters in and around coral reefs. Additional information on this topic is available on the [NOAA Fisheries website](#).

STEPPINGSTONES CORNER: VIEW FROM THE EYRIE THE HISTORY OF DOD PARTNERS IN FLIGHT: HOW A FLEDGLING GROUP TOOK OFF

By Richard A. Fischer, PhD, DoD National Bird Program Coordinator, and Joseph E. Hautzenroder, Director, Environmental Planning & Conservation at Naval Facilities Engineering Command



I first met Joe Hautzenroder at a National Military Fish and Wildlife Association (NMFWA) meeting in 1997. I had just been appointed as the U.S. Army Corps of Engineers lead for bird conservation and the Agency representative to the emerging national bird conservation initiatives. Joe had just delivered a very compelling presentation on bird conservation and the role of DoD in a promising initiative called Partners in Flight, and I wanted in. That same year, I met a gentleman named Chris Eberly, who was just finishing up a Master's degree at the University of Georgia. Little did I know the connection Joe and Chris would have would lead to Chris' 17-year reign as the Program Coordinator for what would become known as the DoD Partners in Flight (PIF) Program.

Two years ago, I had the privilege of assuming leadership of the DoD PIF program. Though I have been an active member helping to lead the Research and Monitoring Working Group for nearly two decades, I certainly was not aware of the details and opportunistic ventures that led to formation of DoD PIF. Through the vision of Joe and Chris, substantial support and participation by Peter Boice and Alison Dalsimer, and the grit of a dedicated group of military natural resources representatives, the DoD PIF program developed into an active, unified program unparalleled by any other federal agency. To bring more perspective to our history, I asked Joe to provide his recollection of the genesis of the DoD PIF program.

"I remember first reading about an initiative to protect migratory birds and their habitats from some publication distributed by the National Fish and Wildlife Foundation (NFWF). I had only recently discovered NFWF, as a young natural resources manager for the Navy, in need of a mechanism to spend DoD funds on Navy installations to implement our conservation programs. At that time, in the early 1990s, Navy was flush with funding from the Legacy Resources Management Program and I was a Regional Natural Resources Manager with a contracting officer warrant, which enabled me to execute Sikes Act Cooperative Agreements. Therefore, the partnership with the NFWF was quite effective.



At that same time, the Navy established the first Deputy Assistant Secretary for the Environment position and filled that job with Ms. Jacqueline Schaffer, who was not only a conservationist, but also a birder. Things were falling into place and when Ms. Schaffer heard about the Migratory Bird Conservation Initiative being promoted by NFWF, then being called Partners In Flight, and she wanted in. Ms. Schaffer signed the Navy up as a partner in 1991 and convinced the other Services to collaborate as well, which was done over the next couple of years. Much to my delight, I was in the right place at the right time and Ms. Schaffer convinced the Deputy Under Secretary of Defense for the Environment, to designate me as the DoD PIF Coordinator. They actually put that designation in writing, and I used it as my marching orders to find the smartest, most motivated, and capable DoD biologists throughout North America to be the DoD PIF Regional and Technical Representatives. Some of these individuals are still part of the DoD PIF Program today. I carried the letter around in my wallet as proof to various commanders that I had some authority. Somehow, it worked and the DoD PIF took off.

It then dawned on me that it would be good to have a Strategic Plan and DoD PIF logo. The original Strategic Plan was written by a few of the initial Regional and Technical Representatives, and two very young graphic artists from the Naval Air Station Patuxent River, MD, designed the Strategic Plan. Our logo, which was designed by Tami de Hartog, was also a graphic artist from Naval Air Station Patuxent River, MD. Tami's illustration captured exactly the concept we wanted to promote and led to a decision to create patches and decals depicting our program logo. The logo was so novel and striking that many in the military wanted one of our patches. Since then, many thousands of patches, decals, pins, and maps depicting or including our logo have been distributed both within and outside of DoD. It became one of our goals to ensure that our logo was associated with as many bird conservation efforts as possible. I figured that part of our success could be measured by the prominence of our logo. I wanted to see our logo in conjunction with as many other conservation agency logos as possible, which to me was a good metric to measure our conservation and partnership success. Some of our initial success included:

1. The development of a network of DoD biologists to represent DoD in the various National PIF Work Groups.
2. Incorporation of migratory bird conservation measures into installation natural resources plans.

3. The coordination of conservation measures into our North American Waterfowl Management Plan and Western Hemisphere Shorebird Reserve Network Initiatives.
4. Development of the DoD PIF display.
5. Partnership with the Colorado Bird Observatory for development of a bird conservation prioritization scheme.
6. Establishment of Monitoring Avian Productivity and Survivorship (MAPS) stations on installations throughout North America.
7. Establishment of a partnership with Clemson University to use NEXRAD to monitor and track Neotropical migratory birds.
8. Development of bird brochures to promote the Watchable Wildlife Program.
9. Studies to help determine the impacts of timber harvesting and other land management activities on migratory birds.
10. First DoD PIF Meeting, in conjunction with the NMFWA Meeting, in 1994.

Our first Strategic Plan promulgated our goals and objectives to support each of the National PIF Working Groups. Our DoD PIF Network was very active and involved with this National conservation initiative, and I believe our efforts were beginning to be noticed and appreciated by other conservation agencies and organizations.

Between 1994 and 1996, our DoD PIF International Working Group worked with the NFWF, Smithsonian Tropical Research Institute, the Illinois Natural History Survey, and several Panamanian Conservation Agencies to recommend ways to conserve the military land that DoD was giving back to the country. This effort resulted in the designation of protected natural areas along the Panama Canal from coast to coast, which secured vital bird overwintering grounds.



I cannot remember the precise date, but the most influential conservation experience in my career occurred, thanks to a PIF Meeting, on High Island Texas sometime in the late 1990s, when I met Dr. Sid Gauthreaux and his wife Carroll Belser. I was on the edge of my chair as I listened to Sid explain how the network of [WSR-88D \(Doppler Weather Surveillance Radar\)](#) could be used to map migratory bird stopover areas, as well as the distribution and abundance patterns of bird migration over the entire United States. The light bulb went off. This was data that DoD biologists could use. What better way is there to illustrate the importance of identifying and conserving stopover areas located on DoD installations? And, it seemed to me, that being able to monitor bird activity in the vicinity of DoD airfields could certainly be valuable where bird/wildlife aircraft safety hazard (BASH) was a concern. Dr. Gauthreaux ended his presentation with a prediction, based on weather radar observations, trans-Gulf migrant birds, when nearing High Island would experience a "fallout." I had never experienced a fallout and was very eager to see such a phenomena. It was cloudy outside; a situation Sid and Carroll said would make it difficult for the birds to see High Island and that they may fly further inland. They also pointed

out though, that the clouds were breaking up, and that birds could be seen in the holes between clouds. If we could see the birds, they could see High Island, and fallout they did. It was a very impressive natural spectacle to see 30-40 rose-breasted grosbeaks converge on a mulberry tree, their first terra firma after flying from who knows where, across the Gulf of Mexico. Hundreds of other birds stopped over on High Island that day. It was confirmation to me that the couple from Clemson University was on to something with this radar ornithology business and I wanted to enlist them to help with the DoD PIF Program. The partnership we developed with Clemson, via the DoD Legacy Program, and later in collaboration with Rich Fischer through the Strategic Environmental Research and Development Program, proved to be very prolific, yielding valuable migration data and identification of stopover sites, which is used in our integrated natural resource management plans to help us protect migratory birds and their habitat. We also capitalized on Sid's pioneering work with high-resolution marine surveillance radars to monitor movements of birds near DoD airfields, to help control BASH. I have barely touched on all the innovations and valuable results of radar ornithology, but I like to think that our DoD PIF collaboration with Sid and Carroll set the stage for many more uses of radar in bird conservation, not only by DoD, but with all our partners. One thing is for sure; Sid and Carroll are two of the best people on the planet and continue in retirement to teach people about birds, radar ornithology, and conservation.

I will mention one final technical note on two other technologies that bring us to current day and state-of-the-science for bird monitoring on DoD lands. Dr. Andrew Farnsworth from Cornell has pioneered, through the Legacy Program, our ability to conduct nocturnal migration monitoring with acoustic arrays pointed toward the sky. Andrew has provided important insight into timing, duration, and species composition of migrant flocks that stopover on military lands, and some of his work was correlated with Sid's radar-indicated stopover hotspots. Second, through some pioneering work by Dr. Kirt Frstrup at Cornell University, Drs. David Buehler (University of Tennessee), and Rich Fischer, through funding from the DoD Environmental Securities Technology Certification Program, updated technology and affixed sensitive acoustics to weather balloons. These balloons are being flown above training areas and inaccessibly military "impact" areas as a means to inventory priority birds and estimate densities where we otherwise would be unable to

monitor. Both of these projects had their genesis from the DoD PIF Research and Monitoring Working Group. All of this technology, developed in large part with funding by DoD, has improved not only our agencies ability to monitor and conserve birds in concert with supporting the military mission, but also have provided other agencies, conservation organizations, and researchers an improved ability to monitor and conserve declining bird populations.



Cerulean-Warbler. Source: DoD Natural Resources Program

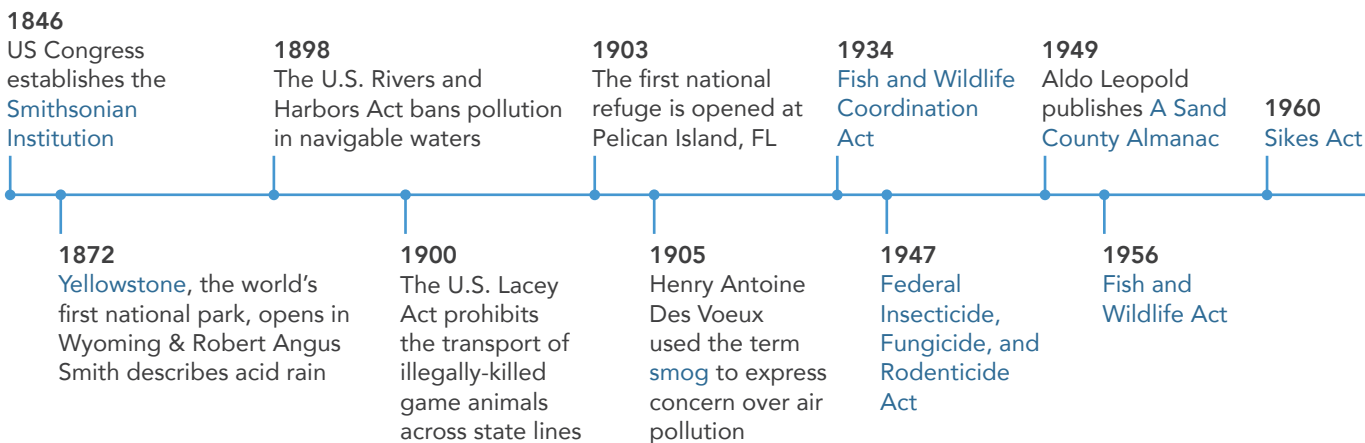
2000 Neotropical Migratory Bird Conservation Act



As much as I would like to have devoted all my efforts to PIF, I did have a great job with the Navy as a natural resources manager in the Chesapeake Bay Area. Fortunately, I had great support from the Office of Secretary of Defense and through the Legacy Program - was able to hire Chris Eberly as our full time DoD PIF Program Coordinator. Chris' efforts over his 17-year tenure were remarkable. It amazes me how well connected and recognized Chris was in the conservation community, by university researchers, DoD contractors, state and local governments, and our federal partners. Chris' work helped all our partners to recognize and respect DoD's conservation efforts. We are now under the helm of Dr. Rich Fischer, who is a very well-known and highly respected biologist, and who continues the DoD PIF legacy in great fashion."

There is so much more to Joe's story that I am sure is not accounted for here, but Alison Dalsimer can attest that in the early days, much work was done on backs of napkins in bars and basements to gain the necessary momentum for the Program. That same persistent effort continues today from those dedicated to DoD PIF, and it is my hope that the Program remains a reputable, science-based organization, committed to supporting DoD's testing and training missions, and the conservation of all birds, for generations to come.

Timeline of Major Natural Resources Activities



EVOLUTION OF THE ENDANGERED SPECIES ACT AND DOD

By Kelly Ebert, Ph.D., Chief of Naval Operations, Energy and Environmental Readiness Division, Operational Environmental Readiness and Planning Branch

The Endangered Species Act (ESA) is an effective law that seeks to bring species back from the brink of extinction, and is rooted in the history of our nation’s consciousness to protect and preserve our natural heritage.

Starting in the early 1900s, various laws were enacted to protect native wildlife. In 1964, the U.S. Department of the Interior (DOI) established the Committee on Rare and Endangered Species, which was charged with publishing the Redbook—the first attempt to establish an endangered species list. In 1966, the [Endangered Species Preservation Act](#) was enacted as a comprehensive federal program to protect endangered species, but its protections were limited to listed species on national wildlife refuges. The law allowed the U.S. Fish and Wildlife Service to purchase habitat for listed species, and directed DOI, Department of Agriculture, and DoD to preserve endangered species’ habitats. Species listed in 1967 that remain on DoD properties include the Indiana bat, Florida manatee, Sonoran pronghorn, and the Hawaiian dark-rumped petrel.

In 1969, the [Endangered Species Conservation Act](#) replaced the Endangered Species Preservation Act, providing additional species protections, including mollusks, crustaceans, and other species in danger of extinction worldwide. Despite these laws, various species of fish and wildlife went extinct or became at risk of extinction from rampant economic growth and development. This led Congress to enact a more robust endangered species law in 1973:

Key provisions of the [ESA](#) include, but are not limited to,

- the definition of “take” (to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect) and instituting broad prohibitions;
- requiring federal agencies to use their authorities to conserve listed species;
- requiring federal agencies to consult on actions that may affect a listed species; and

- prohibiting federal agencies from authorizing, funding, or carrying out any action that would jeopardize the continued existence of an endangered species or destroy or adversely modify designated critical habitat.

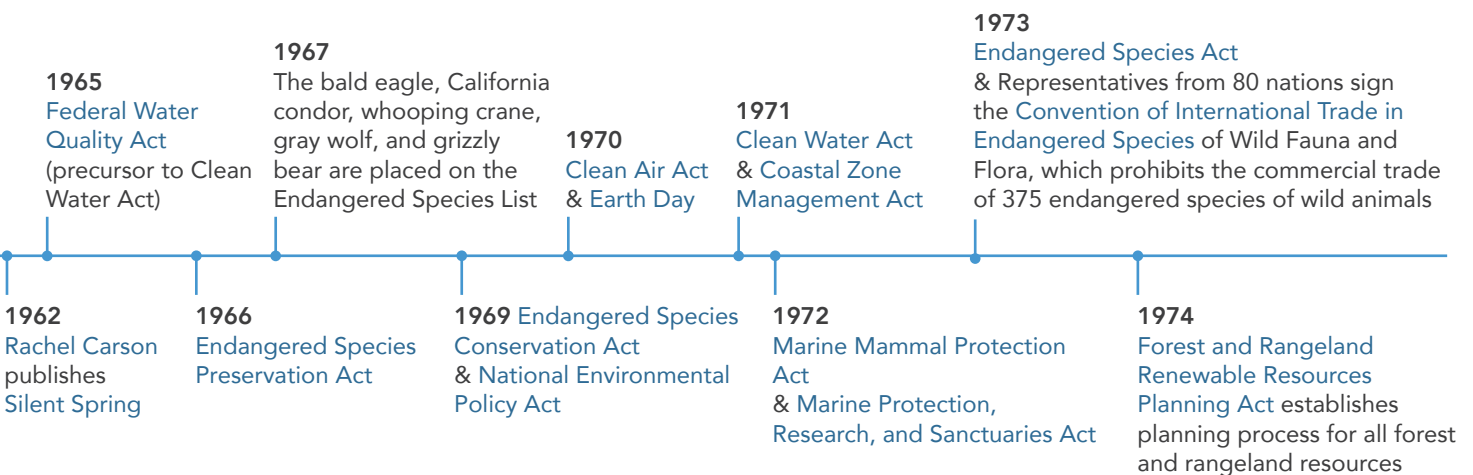
As the 1973 law was applied and tested over time, it became necessary to address major issues; consequently, the ESA was amended in 1978, 1982, 1988, and 2004. A key amendment in 1978 ([Sections 7\(e\) and 7\(j\)](#)), included an exemption that would allow DoD actions to jeopardize the continued existence of an endangered species upon request to the Cabinet-level Endangered Species Committee. DoD has never sought to invoke this exemption. Instead, DoD has sought to strike a balance that meets the requirements of the Act without compromising mission-critical testing and training.

Other key DoD-relevant amendments occurred in 2004 ([Sections 4\(b\)\(2\) and 4\(a\)\(3\)](#)), when Congress recognized that due to the importance of national security, potential impacts to military readiness should be considered before designating critical habitat on military lands. This provision was based on the belief that DoD’s Integrated Natural Resources Management Plans are more effective than the designation of critical habitat in providing for the conservation of listed species on DoD lands.



The Island Night Lizard is a species found on Navy properties and was removed from the ESA list of threatened species in 2014 due to Navy’s stewardship at San Clemente Island and San Nicolas Island, CA. Source: National Park Service

Many lands managed by the DoD have become “islands of biodiversity” and home to over 420 listed species. Promoting the recovery of these species while ensuring our warfighters remain the best trained and equipped fighting force in the world is a challenge—one the DoD has successfully met for more than 40 years. In the words of retired Major General Michael Lehnert (U.S. Marine Corps), “A country worth defending is a country worth preserving.”



The Readiness and Environmental Protection Integration (REPI) program's Webinar Series features best practices, tutorials and knowledge sharing on REPI partnerships that support the military mission and accelerate the pace and rate of land conservation. Unless otherwise noted, all webinars begin at 1pm ET. Visit REPI's [web portal](#) for information on upcoming webinars. The next presentation in the REPI program's webinar series will be held on April 20 at 1pm ET, and discuss changes to the REPI process for FY 2017, highlight successful buffer proposal write-ups, and answer questions about REPI policy guidelines and changes involving REPI's new online proposal system.

The DoD Natural Resources (NR) Program's webinar series aims to share interesting and informative topics and projects related to natural resources with the larger DoD NR community. The webinar series features bimonthly presentations from speakers representing DoD Partners in Amphibian and Reptile Conservation (PARC), DoD Partners in Flight, and Legacy, Strategic Environmental Research and Development Program, and Environmental Security Technology Certification Program projects. Visit the [DoD NR Program](#) and [DoD PARC](#) web portals for information on upcoming webinars. The next presentation in the DoD NR webinar series will feature Robert Lovich and Chris Peterson with DoD PARC. The webinar will be held on March 29 at 1pm ET, and discuss Herpetofauna Biodiversity of Air Force Lands.

in northern South America. It is one of the fastest declining Neotropical migratory warblers due to breeding threats and habitat loss and fragmentation. Cerulean Warblers are now listed as a species of concern in 13 states, threatened in 2 states, and endangered in 1 state. For this project, researchers studied populations and habitat characteristics at three mentor sites: Fort Custer Training Center, Fort Leavenworth, and Naval Support Activity Crane. They used information from these sites to produce case studies and management recommendations that will help facilitate management activities on other installations with similar habitats.



Red-Cockaded Woodpecker.
Source: USFWS

2001
Executive Order 13186,
Responsibilities of Federal Agencies
To Protect Migratory Birds



Herpetofauna Biodiversity on United States Air Force Installations – Report (Legacy 13-642)

This survey updated, compiled, and analyzed herpetofauna species lists for Air Force installations in the continental U.S. with significant natural resources. Installation biologists can use the updated species lists to identify data gaps in the herpetofauna biodiversity of a particular site or as a tool to plan for baseline or species-specific surveys. Air Force leadership can also use the updated survey results to investigate the total herpetofauna biodiversity located on their lands, and as a tool to identify which installations have protected species.

Demonstrating How Vulnerability Assessments Can Support Military Readiness – Fact Sheet, Report, and Installation-Specific Reports (Legacy 14-750)

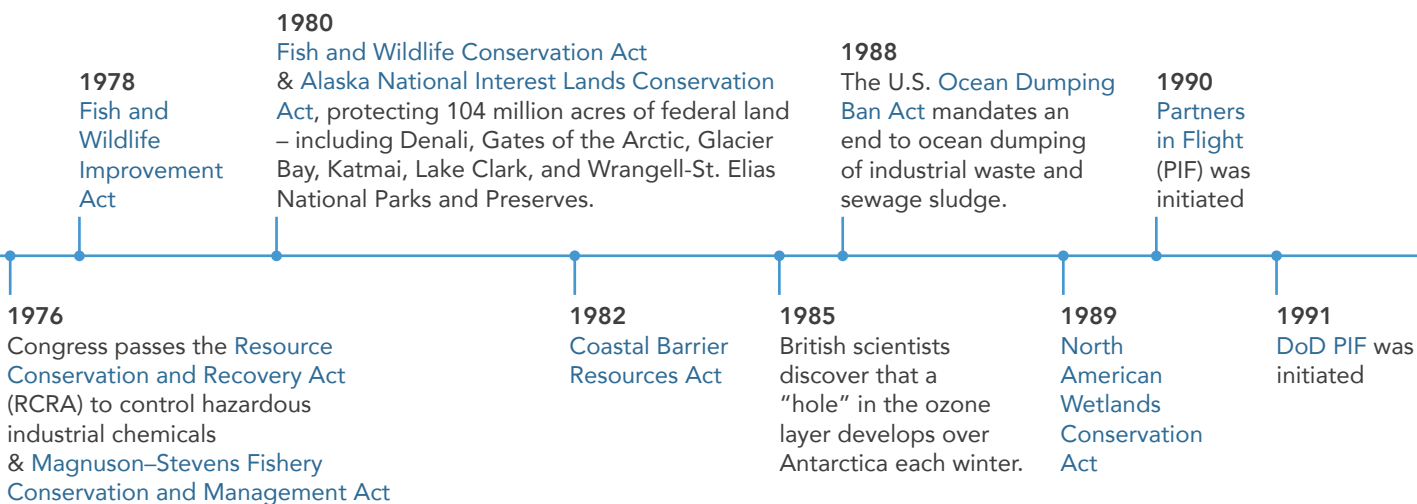
The overall goal of this project was to demonstrate standard methods for identifying known and potential locations of high priority, at-risk species occurring on and around three DoD installations: Eglin Air Force Base, Boardman Naval Weapons Systems Training Facility, and Fort Huachuca Military Reservation. Researchers assessed these areas for potential

NATURAL RESOURCES DOCUMENTS

Highlighted here are reports, fact sheets, spreadsheets, and presentations on the Natural Resources page of the [DENIX site](#). These documents are designed to provide direct benefit to the mission and installation Natural Resource Managers by transferring knowledge and results of high priority natural resources efforts.

Establishing Regional Mentor Sites for the Management of the Cerulean Warbler and other Mature Forest Avifauna– Fact Sheet, Case Studies, and Report (Legacy 13-634)

The Cerulean Warbler is a migratory songbird that breeds in mature deciduous forests of eastern North America and winters



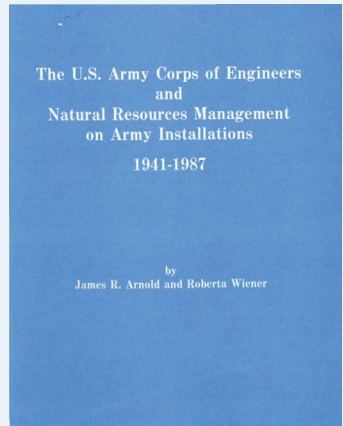
impacts to high priority, at-risk species, and then made recommendations for conservation and mitigation efforts based on these assessments. This study also developed predictive species modeling and assessment methods to help installation managers reduce the decline of at-risk species and prevent some species from being listed under the Endangered Species Act, and reducing the long-term impacts to military installations.

Evaluation of Mechanical mid-Story Removal as a Tool to Restore Endangered Species Habitat – Fact Sheet, Article, and Report (Legacy 14-109)

This project investigates the role of fire as an important disturbance in ephemeral wetlands in the southeastern United States. Researchers focused on the effects of altered fire regimes on the habitat of the federally endangered Reticulated Flatwood Salamander and federally threatened Frosted Flatwoods Salamander. The decline in habitat is contributed to a century of fire suppression, which led to wetlands with high canopy cover and low herbaceous groundcover. Researchers studied how a range of potential vegetation management treatments could influence herbaceous vegetation, hydroperiod (the seasonal pattern of water levels, and use by the amphibian community.

White-nose Syndrome Early Detection and Monitoring for Military Training Facilities – Fact Sheet and Technical Report (Legacy 14-766)

This project investigates early detection protocols through environmental sampling for *Pseudogymnoascus destructans* (Pd), the pathogenic fungus that causes the development of White-Nose Syndrome in affected bat species. White-Nose Syndrome has caused the decline of millions of North American bats since Pd was first discovered in the United States in the winter of 2006. Military personnel conducted research at Fort Hood, a 214,968-acre active training facility in Coryell County, Texas, that hosts several hibernacula and maternity colonies for the migratory tri-colored bat (*Perimyotis subflavus*) and the cave myotis (*Myotis velifer*). Researchers monitored for changes in the fungal community composition to help detect early warning signs of Pd invasion. Military personnel used monitoring results to inform management recommendations for at-risk species to help the DoD Natural Resources Conservation Compliance Program meet its own objective of maintaining unrestricted access to training and testing areas at Fort Hood.



The U.S. Army Corps of Engineers and Natural Resources Management on Army Installations, written by James R. Arnold and Roberta Wiener in 1989, provides a detailed history of the U.S. Army Corps of Engineers' natural resources management from 1941-1987. The top priorities for natural resources management during those 46 years were different from today's

Source: USACE
top priority: conserving threatened and endangered species. Some of the top priorities from 1941-1987 included:

- 1941- 1960: Dust and erosion control, land management (forestry and wildlife management), and entomology (the study of insects) or pest control.
- 1960: Landscaping to include natural features of sites, land management, forest management, and fish and wildlife management plans.
- 1970-1987: Goals mostly remained the same, but erosion became a priority again. U.S. Army Corps of Engineers focused on responding to public interest in conserving the environment by implementing amendments made to the National Environmental Policy Act, the Endangered Species Act, and the Sikes Act.

1994
U.S. Fish and Wildlife Service recommends that strains of American bald eagle be reduced from "endangered" to "threatened" in most of United States & DoD Strategic Plan for Bird Conservation

1997
Congress amended the Sikes Act to require DoD to develop and implement Integrated Natural Resources Management Plans

1999
DoD Partners in Amphibian and Reptile Conservation (DoD PARC) was initiated & The Cooperative Ecosystem Studies Units established.

2001
U.S. rejects the Kyoto Protocol.

2010
After announcing an opening of offshore drilling early in the year, President Barack Obama places a moratorium on deepwater drilling operations in the wake of the Deepwater Horizon Oil Spill, widely viewed as the worst environmental disaster in U.S. history. (A judge blocked the moratorium in June and the Obama administration issued a revised moratorium in July.)

2015
DoD PARC Strategic Plan for Amphibian and Reptile Conservation and Management on Department of Defense Lands

UPCOMING EVENTS CONFERENCES, WORKSHOPS, AND TRAINING

The DoD [Environmental Security Technology Certification Program \(ESTCP\)](#) is requesting proposals for demonstrations of Environmental and Installation Energy and Water technologies to receive Fiscal Year 2017 **funding by 2:00 pm ET on April 5, 2016**. More information about the solicitations, including instructions and deadlines, is available on the [ESTCP website](#) under Funding Opportunities.

NMFWA/North American Wildlife and Natural Resources Conference

March 14-18, Pittsburgh, PA

The National Military Fish and Wildlife Association (NMFWA) will hold its annual training workshop. The training workshop allows natural resources professionals to maintain their professional certification, and is the primary annual event where DoD installation managers meet to discuss key DoD-specific natural resources issues and events, recent policy and legislative changes, ongoing activities and recent accomplishments, and potential new challenges.

24th Annual Environmental Film Festival

March 15-26, Washington, DC

The Environmental Film Festival is the world's premier showcase of environmentally themed films. Over 100 films are screened at museums, embassies, libraries, universities, and local theatres, often combined with thematic discussions and social events.

Biodiversity without Boundaries 2016: The NatureServe & Natural Heritage Conference

April 18-22, San Juan, PR

Biodiversity without Boundaries is where the NatureServe network, their partners, and their friends gather to celebrate successes, collaborate on new initiatives, share innovations, and design the future. The 2016 conference will highlight biodiversity trends that span borders and continents, and provide global context to the most pressing conservation issues. Join industry leaders in discussing how to provide, and how to continue providing, the scientific basis for effective conservation.

Delmarva Birding Weekend

April 21-24, Delmarva Peninsula

The Delmarva Birding Weekend, hosted by Conservation Community Consulting, celebrates the warblers, shorebirds, waterfowl and raptors that visit and live on the Delmarva Peninsula. The weekend event includes boat trips, paddling treks, and hiking trips to search for migrating Neo-tropical warblers that pass through the area. Field trips take place in the land and water that feed into the Chesapeake and Delaware Bays, and the Atlantic coastal bays.

46th Earth Day

April 22, Global

More than 1 billion people now participate in Earth Day activities each year, making it the largest civic observance in the world. Earth Day provides civic engagement opportunities at the local, state, national, and global levels around the world, and encourages all to find opportunities to get involved this Earth Day.

2016 Secretary of Defense Environmental Awards

April 22, Washington, DC

The Secretary of Defense Environmental Awards have honored individuals, teams, and installations for their outstanding achievements to improve the environmental performance of the DoD each year since 1962.

Earth Day at the National Zoo

April 23, Washington, DC

Come celebrate Earth Day with the National Zoo's Sustainability Committee on April 23. Attendees will have the opportunity to learn about the many green achievements and continued efforts across the National Zoo, and will have the opportunity to participate in group tours of the zoo's green features.

International Migratory Bird Day

May 14, Global

Environment For The Americas will host International Migratory Bird Day on May 14, highlighting the importance of international efforts to conserve birds through agreements, laws, treaties, and collaborations. This year also marks the Centennial of the Migratory Bird Treaty, a landmark agreement between the U.S., Canada, and Mexico to protect our shared migratory birds.

11th Annual Endangered Species Day

May 20, National

Join the U.S. Fish and Wildlife Service in recognizing the national conservation effort to protect our nation's endangered species and their habitats. In partnership with the Endangered Species Coalition and the Association of Zoos and Aquariums, events will be scheduled throughout the country.

National Fishing and Boating Week

June 4-12, National

National Fishing and Boating Week is a national celebration of fishing and boating, hosted by the Recreational Boating and Fishing Foundation. Many states will hold events in observation of the week, including how-to clinics, fishing derbies, boat parades, and family festivals.

Pollinator Week

June 20-26, National

Pollinator Week was initiated and is managed by the Pollinator Partnership, and is meant to help address the urgent issue of declining pollinator populations. Pollinator Week has grown to be an international celebration of the valuable ecosystem services provided by bees, birds, butterflies, bats, and beetles.

LINKS OF INTEREST

AFPMB

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

CESU Network

The Cooperative Ecosystem Studies Unit (CESU) Network is a national consortium of federal agencies, tribes, academic institutions, state and local governments, and nongovernmental conservation organizations working together to support research, technical assistance, education, and capacity building. There are 17 CESUs which link DoD and other federal agencies, a host university, and partner institutions. One of the benefits of joining a CESU is a reduced, Network-wide Finance and Administration (i.e., overhead) rate of 17.5% for federal agencies.

DENIX

The DENIX Natural Resources home page is an electronic environmental network and information exchange that provides access to natural resources information, such as Executive Orders, policies, guidance, INRMPS, fact sheets, and reports.

DoD Biodiversity Handbook

On this website you will find a thorough introduction to biodiversity and how it applies to the military mission; the scientific, legal, policy, and natural resources management contexts for biodiversity conservation on DoD lands; and practical advice from DoD natural resources managers through 17 case studies.

DoD Invasive Species Outreach Toolkit

This site provides education and outreach materials to help DoD land managers communicate about invasive species. It contains modifiable outreach materials such as posters, brochures, reference cards, and a PowerPoint presentation. A list of resources to help identify information and funding sources also is included.

DoD Legacy Resource Management Program Tracker

The DoD Natural Resources (NR) Program funds high priority natural and cultural resources projects that have regional, national, and/or multi-Service benefits through the DoD Legacy Program. The Legacy Tracker lets users download fact sheets and reports for completed Legacy-funded projects.

DoD Natural Resources Program

DoD's NR Program provides policy, guidance, and oversight for management of natural resources on all land, air, and water resources owned or operated by DoD. The website offers information on DoD's natural resources initiatives, programs, presentations, and links to other DoD conservation and natural resources sites.

DoD PARC

DoD Partners in Amphibian and Reptile Conservation (PARC) is an inclusive 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.

DoD PARC Group and Photo Site, DoD PIF Photo Library, DoD Natural Resource Photo Library

The three sites are designed to share pictures, news, information, and ideas with the DoD Natural Resources, DoD PARC, and DoD PIF communities. Members may use the websites to download photographs for reports, Power Point Presentations, and educational materials such as brochures and posters. There is also a forum for posting questions to group members, a calendar listing upcoming events, and a library where reports and documents are stored.

DoD Partners in Flight

The DoD Partners in Flight Program supports and enhances the military mission while it works to develop cooperative relationships to ensure a focused and coordinated approach for the conservation of resident and migratory birds and their habitats.

DoD Pollinator Initiatives

This website provides an overview of pollinators and the reasons they are important to DoD. It contains fact sheets and technical reports, how-to guides, resource lists, and more describing some of the simple ways that people can help pollinators and their habitats.

REPI

Under Readiness and Environmental Protection Integration (REPI), DoD partners with conservation organizations and state and local governments to preserve buffer land and habitat around military installations and ranges as a key tool for combating encroachment. By promoting innovative land conservation solutions, REPI supports the military's ability to train and test at its lands now and into the future.

SERDP and ESTCP

Strategic Environmental Research and Development Program (SERDP) and Environmental Security Technology Certification Program (ESTCP) harness the latest science and technology to improve environmental performance, reduce costs, and enhance and sustain mission capabilities. They are independent DoD programs managed from a joint office to coordinate the full spectrum of efforts, from basic and applied research to field demonstration. SERDP and ESTCP, in conjunction with the Legacy Program, support readiness, quality of life, adherence to legal mandates, and responsible environmental stewardship of natural and cultural resources.



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Enabling the Mission, Defending the Resources

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