



Natural Selections

Legacy Program Update

FY 2011 Full Proposals: The Legacy Resource Management Program received 154 full proposals through the Legacy Tracker by the October 15 deadline. Visit www.dodlegacy.org for details.

New Fact Sheet: DoD's Response to Climate Change

Climate Change Threatens DoD's Lands and Military Mission

The effects of climate change on DoD installations are becoming increasingly significant and have the potential to impact the military mission. Installations across the country require diverse landscapes with healthy ecosystems to successfully contribute to core training missions and ensure military readiness.

DoD is responsible for managing nearly 29 million acres of land and hundreds of square miles of air and sea space to conduct missions vital to national security. The same land, air, and sea space provides habitat for a great diversity of plants and animals, more than 40 of which are found only on DoD lands. In fact, with 420 threatened and endangered species and over 520 species at-risk, DoD harbors more sensitive species per acre than any other federal land managing agency.

Extreme weather events can alter these habitats and the species that depend on them.

Congressmen and women, as well as professionals in industries, governmental agencies, and nongovernmental organizations are working to find



Salt Marsh. Photo: USFWS

[See Climate Change, page 3](#)



In The News

A DoD Biodiversity Conservation Toolbox for Military Natural Resources Manager

By Douglas Ripley

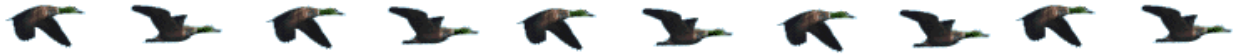
In the spring of 2007, the Department of Defense (DoD) decided to update and revise the very popular 1996 DoD Biodiversity Handbook. DoD had distributed over ten thousand copies of this earlier version. The revised biodiversity publication, entitled *Conserving Biodiversity on Military Lands – A Guide for Natural Resources Managers*, was completed in 2008 by NatureServe and The Nature Conservancy working in collaboration with military natural resources managers and operations personnel throughout the country. DoD published a limited number of the revised biodiversity guide; however, it is primarily intended to be accessed and used in an online version, available at

www.dodbiodiversity.org

[See Biodiversity Conservation, page 5](#)

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Changing of the Season!

Another October in Washington. The red maple and dogwood in our front yard have begun to turn color, the nights are mostly crisp and clear, the days perfect for running – and Congress has left town leaving us with yet another now-expected Continuing Resolution (CR).

Programmatically, the CR affects us in several ways. Fiscally, it means that most FY 2011 Legacy funds probably won't be available until at least mid-January. Policy-wise, Sikes Act amendments that would add 47 Army Guard installations to the Act's provisions and broaden invasive species management provisions for DoD are on hold, and may or may not appear in this year's Defense Authorization Act.

Nonetheless, although we're on hold legislatively, we're moving forward on many other fronts, including –

- ❖ Biodiversity Tools. This issue highlights new tools we've developed in partnership with NatureServe and The Nature Conservancy.
- ❖ New Natural Resources Instruction. We're nearing the finish line! Our Directives Division – gatekeeper for all DoD policy issuances – gave us the go-ahead to proceed with our signature package on October 21st. A companion INRMP Implementation Manual is in final informal review with the Military Services.
- ❖ *TER-S Interagency Research Coordination Manual*. The recently completed Manual is a reference guide on threatened, endangered, and at-risk species (TER-S) research programs for ten federal research and land management agencies. It contains the basic information to direct the user to the appropriate organizational unit and points of contact within these ten agencies that have responsibility for TER-S stewardship.
- ❖ Sustaining Military Readiness (SMR) Conference 2011. The dates and location are set! SMR 2011 will be held in Nashville, TN, July 25-29. The format will again allow for workshops and training courses; invited papers for plenary and technical sessions; and posters and exhibits. Current ideas for workshops and training courses include:
 - ✚ an ecological forestry workshop;
 - ✚ An overview of migratory bird issues for military testers and trainers; and
 - ✚ ESA training for DoD resource managers.

Please let us know if you have any specific suggestions that can make the conference more valuable for you and other participants.

Finally, a personal note. Our *Natural Selections* editor, Pedro Morales, has accepted a position with our sister organization, the SERDP program. He'll be supporting the Resource Conservation and Climate Change pillar. Pedro has been with Legacy for over seven years, and has been instrumental in interfacing with our contracting offices, our Tracker technicians, the CESU network, and many other partners. He's also worked on many elements of our Sustaining Military Readiness conferences – and of course, compiled and organized the content of *Natural Selections* since its inception. He'll be missed. ¡Buena suerte!



ways to reduce greenhouse gas emissions, which may influence climate change. However, several reports indicate that a focus on emissions alone is not enough. Because the planet will experience changes in climate for decades and centuries to come, it is important that we work to mitigate impacts to our water, wildlife, and other natural resources.

DoD is a leader among organizations that are funding projects to assess climate change impacts and determine the best strategies available to respond to climate change. DoD's Legacy Resource Management Program (Legacy) and Strategic Environmental Research and Development Program (SERDP) are two offices funding these types of projects.

DoD Legacy Projects

Guidelines for Assessing the Vulnerability of Species and Habitats to Climate Change (Legacy 09-460)

These guidelines describe ways to assess how vulnerable plants and animals are to anticipated changes in climate. The information is intended to help DoD natural resources managers better manage those species and habitats most likely to need conservation actions as a result of expected changes.

Sea Level Rise Risk Assessment for DoD Coastal Installations (Legacy 08-410)

This project assessed the risk of sea level rise to natural, cultural, and operational resources at five DoD installations on the Dare County peninsula in North Carolina. The assessments were made using the Intergovernmental Panel on Climate Change (IPCC) moderate sea level rise scenario, and showed that major training interruptions could begin as soon as 2050, when forestland converts to wetter marsh transition vegetation. Further, as a result of climate change impacts, all Air Force and Navy testing and training operations in the region may be halted by 2100.

Modeling the Impacts of Climate Change on Birds and Vegetation on Military Lands (Legacy 10-465)

These models predict and map how climate change may alter vegetation and bird distribution on DoD lands in California. Vegetation and bird losses are projected to be much greater on DoD lands than on other public lands in California since birds and vegetation are significantly more abundant and diverse on DoD lands. If regional climate changes result in declines of already sensitive species on military installations, those species could become listed as endangered, which could potentially halt military training.



Red Knot. Photo: USFWS

SERDP Projects

Assisted Migration as a Management Tool in Coastal Ecosystems Threatened by Sea Level Rise (SI-1692) and Use of Multi-Scale Models, Data and Scenario Projections to Reduce Risk of Climate Change Effects and Human Disturbances on the Distribution of Nesting Snowy Plovers and Wintering Piping Plovers on Florida Military Installations (SI-1699)

These projects assessed the impact of sea level rise and associated storm surges on barrier islands and marshes. They developed tools to show how climate change and variability may affect habitat and population dynamics for bird populations in Florida. These tools also can evaluate assisted migration and colonization for plant species subject to increased storm surge levels, and assess whether coastal marsh plants can grow and accumulate sediments fast enough to keep pace with the rate of sea level rise. These significant landscapes provide habitats for species of concern, as well as protection for infrastructure on coastal military installations.



Black-Capped Vireo
Photo: USFWS

Forecasting the Relative and Cumulative Effects of Multiple Stressors on At-Risk Populations (SI-1541)

Researchers evaluated the impacts of climate and vegetation changes, land-use change, training maneuvers, land and pest management, and other stressors to species living on military installations. The project developed a flexible population model with climate change projections and anticipated changes in the dominant vegetation types for three installations. DoD will use this modeling tool to conduct risk assessments for imperiled species on military lands across the country.



Snowy Plover. Photo: USFWS

Southwest FY10 new-start projects

These projects focus on interactions between non-native invasive species, fire regimes, and the impact of climate change on ecological systems. Scientists are developing predictive models to inform land managers of potential future land and resource conditions and to help them modify their management strategies.



Desert Tortoise Hatchling

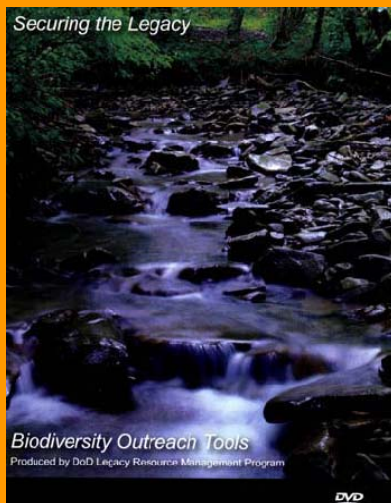
Other SERDP projects are investigating how climate change is degrading intermittent and ephemeral stream systems, which provide important habitats for the region's diverse flora and fauna.

DoD's Commitment to Fighting Climate Change

DoD is committed to providing tools and guidance to help its natural resources personnel manage for anticipated climate change impacts in ways that reduce potential negative consequences. The insights gained from these and other projects will help resource managers maintain healthy habitats, thereby allowing our Servicemen and women to train in the most realistic, natural conditions possible, today and into the future.

This is the latest in a series of fact sheets prepared for the DoD Natural Resources Conservation Program. All may be found at [DoD NaturalResources.net](http://DoDNaturalResources.net)

Did You Know?



The USFWS worked with the DoD Legacy Program and the military services to develop a package of integrated outreach and education tools for use by DoD natural resources managers.

USFWS developed the three related biodiversity presentations and supplemental materials and compiled several hundred copyright free images. The USFWS also coordinated with NatureServe to incorporate products from their Legacy project: *Revision of DoD Biodiversity Conservation Handbook* into the toolkit's two DVDs.

Contact the Legacy Program to request your copy today.

A recently added feature of the 2008 biodiversity guide is the inclusion of a “Biodiversity Conservation Toolbox.” This appendix provides specific references, each with a hyperlink, to individual biodiversity research and management topics. The individual toolbox items are organized and linked to the subjects of the eleven chapters in the guide. Items in each section include a wide array of background information on the specific topic of the chapter, including references for biodiversity conservation, research, training opportunities, DoD policy and guidance documents, and federal laws and Executive Orders. The toolbox will be a “living” reference and thus will be updated and expanded periodically.

Following is a summary of the toolbox’s contents for the individual biodiversity guide chapters.

- **Chapter 1** – Biodiversity and the Military Mission: This section includes links to a wide range of background documents relative to the development of biodiversity conservation within the DoD. Those include the initial 1995 DoD Biodiversity Initiative, the subsequent Keystone Center Policy Dialogue on a DoD Management Strategy, and all of the biodiversity conservation policy and management guidelines and references that were developed as a result of the initiative. It also includes links to the biodiversity policy and management guidelines developed by the individual DoD Components.
- **Chapter 2** – Science: Here are included links to scientific references describing the basic tenets of biodiversity conservation prepared by academic and other scientific institutions such as the American Museum of Natural History, the Conservation Biology Institute, the International Union for the Conservation of Nature (IUCN), and the U.S. Geological Survey’s Biological Resources Division.
- **Chapter 3** – Policy: Since the emergence of biodiversity conservation as a specific and serious natural resources management objective in the early 1990’s, numerous policy memoranda and other guidance documents have been provided by the DoD, the individual DoD Components, and other federal government agencies. This section provides a description of those documents which can then be easily accessed through the hyperlinks.
- **Chapter 4** – Encroachment: Measures to address the negative impacts of encroachment on military lands have included the development of the Army Compatible Use Buffer (ACUB) Program and the DoD Readiness and Environmental Protection Initiative (REPI). These initiatives relate directly to biodiversity conservation, and the toolbox includes numerous references to the details of each of those programs as well as to the enabling legislation through which they were established. Other aspects of biodiversity conservation related to encroachment, such as mitigation banking, are referenced here.
- **Chapter 5** – Multiple Uses: The multiple use of military lands, including commodity production (such as commercial forestry, agricultural outleasing, hunting and fishing programs, and other outdoor recreation activities) have long been important aspects of DoD land management programs. Accommodating those programs within the context of biodiversity conservation requires a careful understanding of the legal basis for such programs and their specific DoD management guidelines. References in this chapter include the statutes regulating DoD forestry programs, agricultural outleases, and appropriate Executive Orders.
- **Chapter 6** – Endangered Species: The management of threatened, endangered, and at risk species (TERS) is a key element of a broader biodiversity conservation program. Numerous links are provided in this section to DoD-developed tools for inventorying, assessing, and TERS on DoD lands. Other links here provide access to TERS management guidance from the U.S. Fish and Wildlife Service, NOAA Fisheries Service, and DoD conservation partners such as The Nature Conservancy and NatureServe.
- **Chapter 7** – Invasive Species: Many of the relevant references relating to invasive species, including Executive Orders, DoD’s and individual Components’ policy directives, and specific management tools, are included in this chapter. Links to guidance provided by the Armed Forces Pest Management Board are complemented with those to public and private organizations such as The Nature Conservancy, the U.S. Fish and Wildlife Service, the National Park Service, and many others.

- **Chapter 8** – Disturbance Regimes: References to the important role of disturbance regimes in biodiversity conservation here include guidelines for the restoration of specific habitat types, background on the Army's Integrated Training Area Management and Land Rehabilitation and Maintenance Programs, and links to disturbance regime guidelines developed by the U.S. Forest Service.
- **Chapter 9** – Funding: Obtaining funding for natural resources conservation is a crucial part of program success. But the funding process can be complicated and frustrating. This chapter of the toolbox helps with funding problems by providing links to most of the DoD's and individual components' funding guidance documents. Also included are links to conservation sources other than traditional Operations and Maintenance funding such as those provided through the Legacy Resource Management Program, Strategic Environmental Research and Development Program, and various non-governmental organizations. Finally, links are provided to the DoD's grant and agreement regulations which outline procedures for establishing cooperative agreements with other government and non-governmental organizations.
- **Chapter 10** – Partnerships: Many important accomplishments of DoD's biodiversity conservation programs have been achieved through partnerships with other government agencies, academic institutions, and private environmental organizations. This section provides links to many of those organizations and provides other guidance for establishing and maintaining partnerships to achieve mutual conservation goals.
- **Chapter 11** – Integrated Natural Resources Management Plans (INRMPs): As the unifying document for the management of DoD natural resources, the development, coordination, and implementation of INRMP's have received tremendous attention in recent years. This chapter provides links to all the legislation requiring INRMPs, all the relevant DoD and individual components' INRMP guidance, and other useful background references ranging from INRMP training opportunities to evaluation techniques.

Innovative Conservation Law Enforcement and Compliance at Marine Corps Base, Camp Pendleton, CA

By Jim Asmus
MCB Camp Pendleton

Marine Corps Base Camp Pendleton's (MCBCP) mission is to operate a training base that promotes the combat readiness of the operating forces and the missions of other tenant commands by providing training opportunities, facilities, services and support responsive to the needs of Marines, sailors and their families. MCBCP is the Marine Corps' premier amphibious training base and its only west coast amphibious assault training center.

MCBCP occupies over 125,000 acres of coastal southern California in the northwest corner of San Diego County. Aside from nearly 10,000 acres, most of the base is largely undeveloped land used for training. MCBCP is situated between two major metropolitan areas: Los Angeles, 82 miles to the north, and San Diego, 38 miles to the south.

The Environmental Security Office (ES) is the lead organization on MCBCP for natural resources compliance and management. Branch departments within ES work in specialized areas, including: wildlife management, spill response, hazardous waste, environmental planning, archaeology, air quality, and waste water compliance.

This comprehensive environmental law enforcement organization has played a key role in maximizing the conservation of natural resources at MCBCP.



Natural Resources

MCBCP possesses a rich assemblage of habitats and natural communities that are fast disappearing to development in the adjacent densely populated portion of southern California. The base's coastal plains, valleys, and rolling mountain foothills support diverse soil types, plant communities and wildlife species. Over 800 plant species, hundreds of invertebrates, more than 50 mammalian, 30 reptilian, 10 amphibian, 300 avian, and 60 fish species have been identified on MCBCP. Sixteen federally listed threatened or endangered species are found on, or transit through, MCBCP.

Public Access and Recreation

The Marine Corps allows access to natural resources to the extent appropriate and consistent with the military mission, safety and security requirements, and the sustainability of natural resources. Further, it is Marine Corps policy that "a program for outdoor recreational developments will be created in consultation with the Department of the Interior and appropriate state agencies."

Conservation Law Enforcement Organization

The Resource Enforcement and Compliance Branch (RECB) is staffed with federal conservation law enforcement officers, a wildlife biologist, and biological technicians. It is responsible for ensuring that fish and wildlife regulations are enforced on MCBCP in accordance with federal and state laws, Marine Corps Orders, annual base bulletins, and other applicable regulations. The RECB has federal conservation law enforcement officers to enforce state and federal fish and game regulations and administer the base's hunting, fishing, camping, and other outdoor recreational programs. Those officers are deputized by the US Fish and Wildlife Service (in accordance with a memorandum of agreement signed in 2003) to enforce federal conservation laws such as the Endangered Species Act (ESA), the Migratory Bird Treaty Act, and the Bald and Golden Eagle Protection Act.

Natural resources related recreation programs managed by the RECB include hunting, fishing, and camping programs.

Examples of Conservation Compliance and Law Enforcement Actions

The MCBCP Integrated Natural Resources Management Plan (INRMP) provides a framework for the integration, implementation, and enforcement of comprehensive natural resources management programs. Several actions outlined in the INRMP have proved to be especially effective in helping MCBCP accomplish its vital military mission while simultaneously ensuring compliance with natural resources laws and DoD, Navy, and USMC environmental policy.

Among these initiatives are:

- Environmental training, education, and awareness programs
 - Monthly briefing to the training (S3) and logistics (S4) representatives from units on base.
 - Annually, a representative from the Wildlife Management Branch gives a slide presentation to units that regularly train near the nesting habitat and colonies of two federally listed species, the western snowy plover and the California least tern.
 - The RECB offers a free monthly basic hunter safety course, which is a pre-requisite for obtaining a hunting license. The branch has three state certified hunter safety instructors.
 - The ES office updates and distributes the environmental operations map book twice a year to help trainers, construction supervisors, and other users on base understand the locations of and requirements for working near sensitive natural resources. The map book includes 24 pages of maps and regulations to help users identify possible environmental conflicts during planning stages.



California least Tern

- Publishing conditions of biological opinions in Base Orders
 - Requirements from biological opinions (BOs) are included in the base's Range and Training Regulations. A typical example of a requirement from a BO that was included in the Range and Training Regulations to help promote compliance for the federally endangered California least tern: "Between 1 March and 15 September, all activities involving smoke, pyrotechnics, loud noises, blowing sand, and large groupings of personnel (14 or more) shall remain at least 300 meters away from fenced or posted nesting areas. All other activities shall be kept at least five meters from these areas."
- Information management and Geographic Information Systems (GIS)
 - The Environmental Incident Reporting System is a database for recording and distributing records of environmental non-compliance aboard the base. The database accepts spatial data as well as photos and text to document the incident. Queries and maps can be created showing the history, type, and location of incidents by category including: National Environmental Policy Act (NEPA) non-compliance, ESA violations, hazardous waste spills, etc. When an incident record is created by a technical specialist, a link to the record can be instantly e-mailed to enforcement and management personnel for proper action.
- Environmental inspection and compliance
 - A NEPA compliance inspector regularly monitors and records the compliance and non-compliance of construction and maintenance crews that are performing work subject to NEPA. The inspector checks to see that site supervisors have copies of the NEPA documents authorizing their activities near sensitive natural and cultural resources and that the supervisors understand their specific requirements to comply with federal natural resources laws.

Examples of Law Enforcement Activities

- Public education and outreach initiatives
 - All hunters must attend a hunter's safety brief annually prior to hunting on base. The brief describes check-in/check-out procedures, hunter safety, legal hunting methods, unauthorized hunting behavior, etc.
- Investigating and reporting incidental takes (e.g., western snowy plover)
 - In 2007, a base game warden investigated the destruction of three eggs in a federally threatened western snowy plover nest. After a thorough investigation, the warden discovered that a contractor had accidentally destroyed the nest. The contractor was riding an ATV while performing an authorized geologic survey, ignored warning markers that were installed to protect the nest, and inadvertently ran over the nest destroying the eggs. Because a programmatic BO was in place, the take was tallied as an incidental take and charged against the base's annual limit of three plovers per year.
- Control of feral animals
 - A base game warden identified and apprehended a person who was maintaining an illicit cat feeding station on base near a nesting colony for endangered California least tern. The warden conducted an investigation and performed a stakeout to catch the person in the act of depositing food for the cats. The feeding station also was visited by wild animals such as skunks, creating wildlife conflicts in an adjacent housing area.
- Recovery of endangered species remains
 - The carcass of a blue whale had washed ashore on the base and decayed. The weathered bones lay undisturbed for several years on Cacklebur Beach. In December of 2007, a game warden on patrol found that the bones had been removed and started an investigation. Soon after, an anonymous caller notified base game wardens that a unit on base had recently collected some very large bones that were on display at their building. All whales are protected under the Marine Mammal Protection Act and blue whales also receive ESA protection because they are federally endangered. Unpermitted persons may not possess the parts of a listed species, so base game wardens confiscated the bones and counseled the unit.

- Preventing recreational off-road drivers

- Base game wardens regularly discover tire tracks and damage caused by unauthorized, recreational off-road drivers. Vernal pools and riparian habitats are sensitive resources that can be easily damaged by off-road drivers. The apprehended drivers receive base citations and letters of offense. On one occasion in 1998, when active duty Marines served as the base game wardens, the wardens coordinated a sting operation with Marine motorcycle scouts. Unauthorized civilian motorcyclists had been seen trespassing in a training area at the edge of the base and riding their motorcycles. Working with the Marine motorcycle scouts, base game wardens apprehended the trespassers when they arrived to ride their bikes on Marine Corps property. The violators were issued a letter of disbarment from the base.



Conclusion

MCBCP has established a comprehensive compliance and enforcement program for natural resources conservation. The base's program is proactive, by necessity, because of the many listed and sensitive natural resources found on base and its very active training program. It demonstrates the critical role that a natural resources law enforcement program can play in ensuring the conservation of biodiversity and critical ecological functions on military lands while allowing for diverse and numerous training operations that fulfill a critical role in national security.

Excerpted from one of the new biodiversity case studies. The full article and nine others are available at www.dodnaturalresources.net/resources.html and www.dodbiodiversity.org.

Habitat Mapping at Camp Atterbury using GPS-based Underwater Video

By Dr. Paul Ayers¹, Ken Swinson¹, Heidi Howard², and Mike Peterkin³

¹ University of Tennessee

² Construction Engineering Research Laboratory (CERL)

³ Camp Atterbury

Established by the U.S. Army just prior to the United States' entry to World War II, Camp Atterbury Joint Maneuver Training Center (CAJMTC) today occupies 33,132 acres of federally-owned property in portions of Johnson, Brown, and Bartholomew Counties, Indiana. It is located approximately 35 miles south of Indianapolis. The installation was closed following World War II but was licensed to the Indiana National Guard (ING) in the early 1950's and today provides training to thousands of regular and reserve forces, particularly in support of the ongoing actions in Afghanistan and Iraq.

The CAJMTC contains approximately 23,000 acres of forested habitat, an estimated 200 acres of wetland and open water, and 170 stream miles of intermittent and perennial streams. Open field and grassland habitat are scattered throughout and account for the remaining land area (with the exception of the cantonment area). The installation is managed at the ecosystem level for forestry, cultural resources, agricultural outlease, water quality, threatened and endangered species management, pest management, spill response, clean air, noise abatement, prescribed burning, and wildfire management. The overarching management goal is to sustain desired military training while maintaining ecosystem viability. Maintaining optimal environmental conditions on training lands is essential for the continued success of the military mission at CAJMTC.





Indiana bat, *Myotis sodalis*.

Numerous floral and faunal surveys indicate CAJMTC is home to 700 species of plants, 28 species of mammals, 89 known or probable breeding bird species, 17 species of reptiles, 19 amphibian species, 41 fish species, 45 species of butterflies, and 22 native species of freshwater mussels. Surveys indicate the presence of 26 sensitive wildlife species on or in the vicinity of CAJMTC and seven state listed plant species on the installation. Of these species only one, the Indiana bat (*Myotis sodalis*), is a federally listed endangered species.

Specific to freshwater mussels, a 1990 survey found shell material of 35 native species of freshwater mussels in the entire Sugar Creek watershed including “fresh dead” shell material of the proposed threatened or endangered rayed bean (RB) (*Villosa*

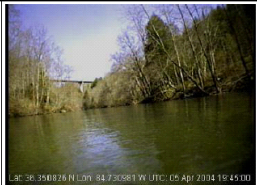


fabalis) in three of the five most downstream sites of the survey. A 1998 survey for freshwater mussels identified 22 native species (and one exotic species) of freshwater mussels via live or “fresh dead” specimens within tributaries, creeks, and rivers of CAJMTC. This included one “fresh dead” specimen of the RB from Sugar Creek.

Given the findings of these surveys it is unlikely that CAJMTC currently supports a reproducing population of the RB. Further investigation into the presence of the RB may be warranted due to the diminutive nature of the species and the proposal for listing as a federally threatened or endangered species. New habitat mapping techniques discussed below may help focus further survey efforts to appropriate stretches of Sugar Creek and Driftwood River allowing funds to be better allocated by permitting more intensive study of potential habitat rather than large-scale surveys of the entire riverine system.

Assessment of the RB, and possible impacts to it by the ING, proved difficult in the past. However, the development of a new technique by the University of Tennessee for habitat mapping using Geographical Positioning System (GPS) based underwater video has greatly enhanced the ability of the ING to ensure adequate monitoring of the species.

Conclusion

Protecting natural resources while maintaining quality military training and testing areas are critical to sustaining military installations. Understanding the impact of military training on unseen aquatic habitat is needed to ensure seldom seen underwater habitat receives the same management considerations as more visible terrestrial environments. Underwater video habitat mapping involves conducting surveys of large river and creek reaches (sections) to develop large scale aquatic habitat maps. Key attributes mapped include river characteristics, depth, substrate, embeddedness, and substrate heterogeneity. This technology provides a valuable tool for the management of the natural resources at Camp Atterbury and could have equally valuable application to other DoD installations requiring the characterization, mapping, and monitoring of underwater habitats.

Flow Characteristics of the River		
habitat parameter	description	example pictures
pool	Areas characterized by smooth undisturbed surface, generally slow current, and deep enough to provide protective cover for fish (75 to 100% deeper than the prevailing stream depth).	 <small>Lat: 36.590176 N Lon: 84.735813 W UTC: 05 Apr 2004 19:44:00</small>
riffle	Area characterized by broken water surface, rocky or firm substrate, moderate or swift current, and relatively shallow depth (usually less than 18 inches). Shallow section in a stream where water is breaking over rocks, wood, or other partly submerged debris and producing agitation.	 <small>Lat: 36.509177 N Lon: 84.634813 W UTC: 14 Jun 2004 19:13:41</small>
run	Fast-moving section of a stream with defined thalweg and little surface agitation. Runs are deeper than a riffle and shallower than a pool.	 <small>Lat: 36.526184 N Lon: 84.731725 W UTC: 05 Apr 2004 16:01:54</small>

DoD Partners Again with National Public Lands Day Sites

By Peter Boice
Deputy Director, Natural Resources

DoD's Natural and Cultural Resources Programs again have partnered with the National Environmental Education Foundation to support National Public Lands Day (NPLD) projects on military installations across the country. As it has each year since 1999, DoD supported the 17th annual NPLD with on-the-ground projects. Many of the 48 projects DoD funded this year took place on September 25, 2010. Others are taking place this fall.

From Pearl Harbor and Pohakuloa Training Area in the Hawaiian islands to Forts Wainright and Richardson, Alaska, and from Naval Air Station Key West, Florida, to Fort Bliss, Texas, and to Malmstrom Air Force Base, Montana, the DoD Legacy Program <https://www.dodlegacy.org> funded 48 NPLD projects in 23 states this year, including 37 that support natural resources, seven that focus on cultural resources, and four that have elements of both. Twenty of these projects focus on pollinators and their habitats.

NPLD 2010 celebrates service and recreation on public lands while educating volunteers about all the benefits of spending time on public lands, including military installations. NPLD inspires a new generation of volunteers committed to service on these lands. The event also encourages volunteers to explore and enjoy America's natural wonders through outdoor recreation.

For a listing of all 48 DoD NPLD projects, please visit <http://www.dodpollinators.org/NPLD-2010.html>. For related stories, check out <http://go.usa.gov/aCP> and <http://go.usa.gov/a4z>.

DoD Animation on Climate Change Activities

By Derrick Golla
Booz Allen Hamilton

Through the [Legacy](#) and [SERDP](#) programs, DoD is implementing several strategies to mitigate and adapt to climate change impacts. Several of these efforts are highlighted in a newly created animation video that describes a handful of DoD-funded projects that address climate change impacts on DoD installations. The video introduces climate change and features projects on sea level rise and threatened and endangered species, as well as an overview of DoD's conservation funding programs. The animation and an accompanying fact sheet are available at <http://dodworkshops.org/CC-Animation.html>.

Both the animation and the fact sheet are designed to engage natural resource managers, civilians living near DoD installations, non-DoD stakeholders, and the public to demonstrate one way in which DoD is working to meet its strategic vision, as articulated in the 2010 Quadrennial Defense Report.

From increasing human and wildlife disease to rising sea levels to regional drought and flooding, climate change is having, and will continue to have, significant repercussions for the military both at home and abroad. On the natural resources front, the DoD Natural Resources Conservation Program is working to address issues such as threats to endangered species, the spread of invasive species, and the loss of coastal areas.

New Online Discussion "Forum" for DoD Natural Resources Managers

By Nancy Benton
NatureServe

The Department of Defense Natural Resource Program and NatureServe have teamed up to develop a new Internet discussion group for Department of Defense natural resources managers. Currently, the forum is under review, with release expected by the end of November 2010. The forum will be accessed at: www.dodbiodiversity.org, which is the website for the online version of the handbook, *Conserving Biodiversity on Military Lands: A Guide for Natural Resources Managers* (NatureServe, 2008).

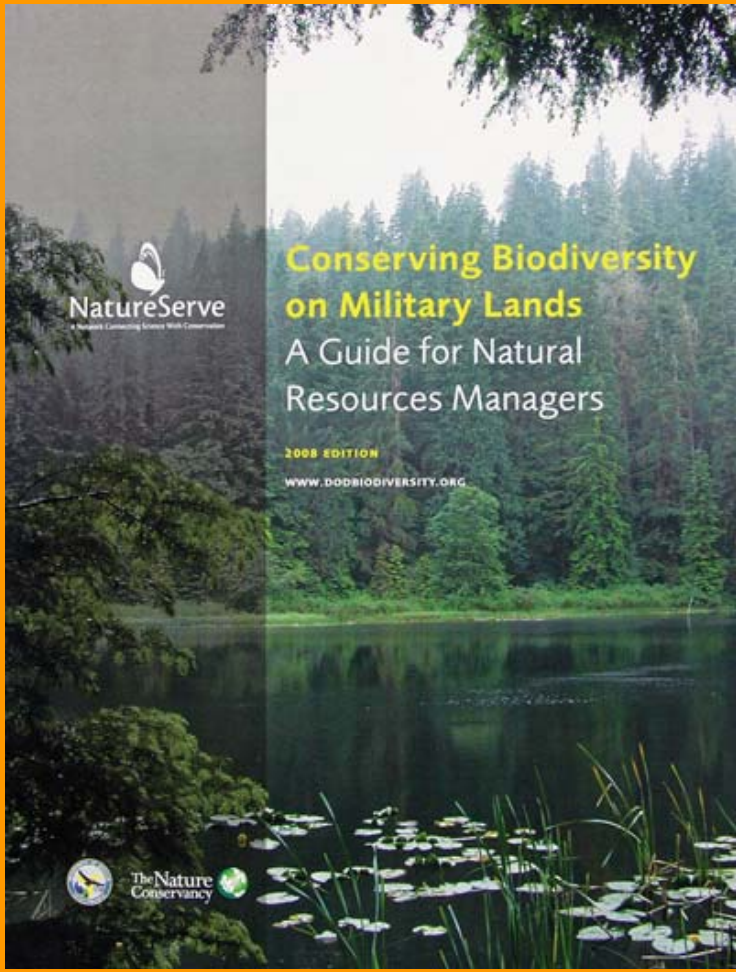
An Internet forum, or message board, is an online discussion site where users can hold conversations in the form of

posted messages. Users will need to register with the forum and log in to post or read messages. Posted messages will be periodically reviewed by a moderator to ensure appropriate content and discussion.

This new forum will have areas for sharing success stories related to biodiversity conservation on DoD lands. Another section of the forum is for general discussion on any topic related to conservation on military lands. Discussion threads may center on topics such as invasive species management, protection of endangered species, managing lands for multiple uses, and so forth.

We hope this forum will be widely used and will provide a way for DoD natural resources managers to share information that will be useful beyond their own installation boundaries and across military lands. We will send a separate reminder email in late November to encourage you to register and participate in this new online forum on www.dodbiodiversity.org.

Did You Know?



The *Conserving Biodiversity on Military Lands: A Guide for Natural Resources Managers* is an updated revision of the 1996 handbook that addresses the changing policy, legislative context, and public perceptions relevant to management of biodiversity and natural resources on DoD lands. The online version of this guidebook can be found at <http://www.dodbiodiversity.org> and highlights new case study examples of successful biodiversity conservation programs on individual military installations. Two of the new case studies can be found in this issue of *Natural Selections*.

Contact the Legacy Program for your copy today!

Training, Announcements & Events of Interest

Workshops, Interagency Training Announcements, and Future Events of Interest to the Conservation Community



Avian Influenza: The Basics: (University of Minnesota online course) This training module is directed toward a variety of professions and backgrounds including but not limited to: physicians specializing in preventive medicine, public health, or infectious disease; nurses focusing on public health, infection control, or infectious disease; veterinarians dealing with swine, poultry, and biosecurity; public health officials; wildlife biologists; and animal health specialists. If you are interested in learning more, please visit www.mceirs.umn.edu/training.

Avian Influenza: Detection in Wild Birds - Field Collection of Samples: (University of Minnesota online course) This training module is directed toward a variety of professions and backgrounds including but not limited to: wildlife professionals, government workers, researchers, veterinarians, students, international workers, and other field professionals working in avian influenza surveillance programs. If you are interested in learning more, please visit www.mceirs.umn.edu/training.

Bat Ecology, White-nose Syndrome Status, and Implications on DoD Mission: November 2-4, 2010, Nashville, Tennessee. This workshop will focus on challenges and opportunities unique to military installations and will provide a Department of Defense perspective on managing for bats and WNS within the context of the military Mission. In this workshop we will discuss bat and cave ecology, landscape management for bats, WNS state of knowledge, federal and state responses to WNS, options for inventory and monitoring for both WNS and bats, and implications for installations trying to manage for both wildlife and their mission. For registration materials please contact Mylea Bayless at Bat Conservation International at mbayless@batcon.org. If you cannot attend, BCI has established a *live feed webinar via WebEx*. For those with IT security restrictions, the workshop will also be recorded for rebroadcast.

5TH National Conference and Expo on Coastal and Estuarine Habitat Restoration: "Preparing for Climate Change: Science, Practice, and Policy": November 13-17, 2010, at the Galveston Island Convention Center, Galveston Island, Texas. This is the only national conference that focuses exclusively on coastal habitat restoration. Healthy coasts and estuaries are essential to the social, economic and ecological well being of everything that depends on them. Successful habitat restoration at all scales is critical to ensuring vibrant coasts. For more information please visit <https://www.estuaries.org/conference/>.

SERDP/ESTCP Annual Technical Symposium & Workshop: The Partners in Environmental Technology Technical Symposium & Workshop: November 30 - December 2, 2010, in Washington, DC. This event is sponsored by the Strategic Environmental Research and Development Program (SERDP), DoD's environmental science and technology program, and the Environmental Security Technology Certification Program (ESTCP), DoD's environmental technology demonstration and validation program. This comprehensive technical symposium and workshop will feature 14 technical sessions and three short courses. Technical sessions will highlight research and innovative technologies that assist the DoD in addressing increasingly complex environmental and mission sustainability challenges. Over the course of the event, short courses will provide training opportunities on select technologies and methods in environmental restoration and munitions response. For the most up-to-date information about the Symposium, visit www.serdp-estcp.org/symposium, send an e-mail to partners@hgl.com or call the Symposium contact line at 703-736-4548.

2011 National Military Fish and Wildlife Agencies Training Workshop: March 14-19, 2011, at the Westin Crown Center Hotel in Kansas City, Missouri. This workshop provides an excellent opportunity for DoD personnel specializing in fish and wildlife management to meet and discuss challenges and solutions to managing these resources. It also affords an opportunity for DoD natural resources managers to meet with counterparts from the U.S. Fish and Wildlife Service and State fish and wildlife agencies who work on Sikes Act issues and many other areas of common concern. For details visit the National Military Fish and Wildlife Agencies announcement at http://www.nmfwa.org/2011_Meeting/index.cfm.

Recent Natural Resources Documents Online

Reports, Fact Sheets, Photos, Videos



This section highlights recently uploaded reports and factsheets on the Legacy Tracker or on the DENIX website. For Legacy-related products, please visit https://www.dodlegacy.org/Legacy/intro/ProductsList_NU.aspx. All Legacy products and many more are available at <https://www.denix.osd.mil/portal/page/portal/denix/environment/NR>. In addition to these two websites, bird-related products are also posted on <http://www.DoDPIF.org>.

Grassland Birds Wintering at US Navy Facilities in Southern Texas- Final Report July 2010: (Legacy 07-189):

Grassland birds have undergone widespread decline throughout North America during the past several decades. A large number of exotic plant species, including grasses, have been introduced in North America, but most research on the effects of these invasions on birds has been limited to breeding birds, primarily those in northern latitudes. Research on the effects of exotic grasses on birds in winter has been extremely limited. This is the first study in southern Texas to examine and compare winter bird responses to native and exotic grasslands. This study was conducted during a period of six years (2003–2009) on United States Navy facilities in southern Texas including Naval Air Station–Corpus Christi, Naval Air Station–Kingsville, Naval Auxiliary Landing Field Waldron, Naval Auxiliary Landing Field Orange Grove, and Escondido Ranch, all of which contained examples of native grasslands, exotic grasslands, or both. For the report or the fact sheet for this project please visit: <https://www.denix.osd.mil/portal/page/portal/NaturalResources/FishandWildlife/Birds>

Intensive Plant Conservation Workshop-Berkeley, CA Final Report- April 2010: (Legacy 09-364): This document details the planning, hosting and response by attendees to the 2009 offering of the Plant Conservation Workshop, funded by Legacy and developed by The Center For Plant Conservation. [https://www.denix.osd.mil/portal/page/portal/NaturalResources/OtherConservationTopics\(I-Z\)/OureachandEducation](https://www.denix.osd.mil/portal/page/portal/NaturalResources/OtherConservationTopics(I-Z)/OureachandEducation)

Avian Response to Grassland Management on Military Airfields in the Mid-Atlantic and Northeast (Interim Report) May 2010: (Legacy 08-381): In this study the relationships among grassland habitat management methods, vegetation characteristics, and avian habitat use during spring migration, breeding, and fall migration periods on three military airfields: Lakehurst Naval Air Engineering Station (LNAES), Westover Air Reserve Base (WARB), and Patuxent River Naval Air Station (PRNAS). This report summarizes combined findings from Year 1 and Year 2 (fall 2008 - summer 2009) of the study. First, data from the most recent year of the study was examined to see if patterns were similar to those observed in the first year. Data were then combined for subsequent analyses, summaries and maps. For the report or the fact sheet for this project please visit: <https://www.denix.osd.mil/portal/page/portal/NaturalResources/FishandWildlife/Birds>

Propagation of Species At Risk Atlantic Pigtoe on Military Installations-Final Report April 2010: (Legacy 09-450): The Department of Army has identified the Atlantic Pigtoe Mussel as a Species at Risk (SAR) with potential for detrimental impact on the military mission if federally listed as either threatened or endangered. The Nottoway River on ARNG-MTC Fort Pickett, VA is home to one of only two known stable populations of the Atlantic Pigtoe Mussel left in Virginia, and perhaps the world. Populations are in precipitous decline throughout the southeast, and expert consensus is that the species currently warrants federal listing. This project details the first year's efforts towards propagating the species and introducing new populations into its habitat. <https://www.denix.osd.mil/portal/page/portal/NaturalResources/FishandWildlife/FreshwaterandMarine>

Establishing American Chestnut Test Orchards on Two TN Army National Guard Installations: (Legacy 08-401) Since 1983, the American Chestnut Foundation has led and managed an intensive breeding program aimed at instilling blight resistance into American chestnut trees. One of the most essential resources needed for this breeding program is land for the seed orchards where the hybrid chestnuts can be grown. Because the Tennessee Army National Guard has small areas on its training sites that are not actively used for military training, they agreed to establish seed orchards at two of its facilities: VTS-Milan and VTS-Catoosa. [https://www.denix.osd.mil/portal/page/portal/NaturalResources/OtherConservationTopics\(A-H\)/HabitatRestoration](https://www.denix.osd.mil/portal/page/portal/NaturalResources/OtherConservationTopics(A-H)/HabitatRestoration)

Proof of Concept of The Range Ignition Probability Tool: (Legacy 07-374) Wildfires resulting from military training pose a significant threat to training realism and land use capabilities, natural and cultural resources, infrastructure, and human/soldier safety. Assessing incendiary munitions wildfire risk and determining best management practices requires accurate information about where fires are likely to start as ignition location can make a dramatic difference in fire outcomes. The RIP Tool is designed to fill the information gap caused by the lack of actual ignition location data. [https://www.denix.osd.mil/portal/page/portal/NaturalResources/OtherConservationTopics\(A-H\)/Disturbance](https://www.denix.osd.mil/portal/page/portal/NaturalResources/OtherConservationTopics(A-H)/Disturbance)

PowerPoint Presentation: Wildlife of Iraq and Afghanistan: How to avoid losing your money, your freedom or your life over wildlife (Legacy 09-444): This presentation describes the wildlife in these two regions (including poisonous species one might encounter), the problem of illicit wildlife trade, important laws pertaining to wildlife trade that must be followed by military personnel, the trade in Afghanistan and Iraq, what military leadership may do, and valuable information sources. Available also as a .PDF file, please visit [https://www.denix.osd.mil/portal/page/portal/NaturalResources/OtherConservationTopics\(I-Z\)/OureachandEducation](https://www.denix.osd.mil/portal/page/portal/NaturalResources/OtherConservationTopics(I-Z)/OureachandEducation)

Developmental Counseling Form DA FORM 4856: Specific to Wildlife Trade (Legacy 09-444): This is a customized DA 4856, pre-loaded with important information and advice regarding illicit wildlife trade, to aid command and troops to be deployed or currently deployed. [https://www.denix.osd.mil/portal/page/portal/NaturalResources/OtherConservationTopics\(I-Z\)/OureachandEducation](https://www.denix.osd.mil/portal/page/portal/NaturalResources/OtherConservationTopics(I-Z)/OureachandEducation)

The Bat Grid Inventory and Monitoring Project: A Regional Approach to Inventorying and Monitoring Bat Populations 2008 Monitoring Report: (Legacy 08-390): The monitoring portion of The Bat Grid project is designed to assess bat species detection and occupancy probabilities across the Pacific Northwest (PNW). Additionally, these probabilities are to be calculated across multiple years to form a baseline against which future changes in PNW bat distributions can be made. This report presents preliminary analyses of 2008 data for three species as a pilot effort to guide final analyses and subsequent field efforts and to provide feedback to the acoustic call identification team (Humboldt State University) currently engaged in processing Bat Grid acoustic data. Report and fact sheet at: <https://www.denix.osd.mil/portal/page/portal/NaturalResources/FishandWildlife/TerrestrialAnimals>

Natural Resources Funding Manual: (Legacy 08-399): The Natural Resources Funding Manual identifies funding resources for which the Department of Defense (DoD) may apply, directly or through partnerships with local, state, or tribal governments; non-governmental organizations (NGOs); commercial organizations; or private landowners. It is intended to facilitate the search for funding sources, but is by no means a comprehensive list of all available resources. The funding sources presented here are associated with land use, endangered species, habitat conservation, environmental quality, and other forms of conservation.

National Military Fish & Wildlife Awards Nominations Open Until November 15

Visit <http://nmfwa.org/awards/> - Nominate Deserving Individuals Now

"A country worth defending is a country worth preserving." - Major General Michael Lehnert, USMC

"You must be the change you wish to see in the world." -Mahatma Gandhi

Real change is brought to us by those who work tirelessly and encourage others, remove obstacles, build bridges, and get things done despite roadblocks and politics. These people inspire us, change the world one plant or animal or brick at a time - and they remind us that it is still possible to accomplish great things.

Please join the National Military Fish & Wildlife Association (NMFWA) in honoring those people among us who support the military mission by preserving the natural heritage of our country on DoD lands in this manner - nominate them for a NMFWA award.

Any individual can make a nomination and awards can go to any individual or group fitting the nomination categories. For more information, please see the NMFWA website and application at <http://nmfwa.org/awards/>. The deadline for submissions is November 15. Awards will be presented at the 2011 Annual Meeting in Kansas City in March 2011.

Photo of the Month

Capturing the beauty of our natural resources



October 2010 Photo of the Month Winner!

Flat-tailed Horned Lizard, Barry M. Goldwater Range-West
(Yuma Desert Management Area), Arizona

Submitted by *Natural Selections* reader: Rich Cerka

Did You Know?

The term "biodiversity" is quite a recent term, that was coined in the USA during the *National Forum on Biodiversity*, which took place in September 1986 under the patronage of the National Academy of Science and the Smithsonian Institute in Washington DC. Originally the term was derived from "biological diversity". The word BIODIVERSITY originates from the Greek word BIOS = LIFE and Latin word DIVERSITAS = VARIETY or DIFFERENCE. The whole word BIO DIVERSITY generally therefore means: VARIETY OF LIFE. Biodiversity should serve as a keyword, which connects impartial scientific realizations and conceptions of moral values, in order to clarify the decrease of biological diversity as central problem of mankind. The contributions from the "Forum on Biodiversity" are found in the book "Biodiversity" written by E.O. Wilson (1988).

Biodiversity in the meantime has attained enormous popularity and significantly stepped into the focus of public interest. During the Earth Summit of Rio 1992, where 150 states signed the Convention on Biological Diversity (United Nations Convention on Biological Diversity, CBD), the term "biodiversity" gained political meaning.

The term biodiversity or biological diversity is not always uniformly used. In a sense the word biodiversity represents the basis of all life on our planet. The earth's biosphere consists of a functional structure of diverse ecosystems, composed by complex partnerships. Each organism from this partnership has individual genetic information. Biodiversity covers the diversity of life on all these levels, the diversity within species (genetic level), between species (species diversity level) and the variability of habitats (ecosystems level).

In nature protection and in a broader public, biodiversity is frequently reduced simply to the "diversity of species." Thus the Convention on Biological Diversity (CBD) is often designated as the "Species Protection Convention". This simplification of the complex term "biodiversity" is unjust, since it considers only the level of species diversity.

Source <http://www.biodiv.de/menue1/encyclopedia/biodiversity.html?L=1>

Did You Know?

Little Did You Know Conservation Could Be So Much Fun!



Backyard Biodiversity—things you can do to attract wildlife to your home or your barracks! Everyone enjoys living in a natural-looking informal landscape that makes greater use of native plants that require little maintenance. With thoughtful plant selection and placement, it's easy to design a low-maintenance yard that still gives the appearance of neatness and care. What's more by incorporating certain plants into the landscape you can improve critical habitat for songbirds butterflies and other wildlife. The most obvious place to begin turning your lawn into a natural landscape is in those areas where grass doesn't thrive in the first place: shaded areas under trees, wet sections of the yard, steep banks and rocky outcroppings. These places are all perfect candidates for alternative plantings. Selecting the appropriate ground cover for your backyard garden can make a big difference.



Rose sedum (*Sedum rosea*).
Photo by USFWS

Groundcover plants, like clovers and sedum, when properly taken care of, provide dense soil cover, retard weed growth, and prevent soil erosion, improving the quality of your backyard garden. Groundcovers range in height from an inch to four feet. They can be woody or herbaceous; clumping or running; evergreen or deciduous.

These plants form a ground-hugging companion for taller plants and protect the soil from erosion as they spread. Plus, when they're mature, they keep weeds and other unwanted plants from gaining a foothold.

For shaded areas, try planting periwinkle (*Vinca minor*) under your trees or incorporate ferns, lily-of-the-valley and pachysandra in shady corners of the yard. For spring color, plant spring-blooming bulbs, Solomon's-seal and old-fashioned bleeding heart (*Dicentra spectabilis*) between the ground cover plants.

For sunny, dry areas, daylilies are one of the easiest fastest-spreading perennial ground covers you can grow. Creeping thyme (*Thymus praecox spp. arcticus*, also sold as *T. serpyllum*) as well as juniper, euonymus and creeping phlox (*Phlox stolonifera*) also make a nice carpet in sunny spots.



Showy Indian clover (*Trifolium amoenum*). Photo by USFWS



Old-fashioned bleeding heart (*Dicentra spectabilis*). Photo by: Univ. of Illinois



Creeping phlox (*Phlox stolonifera*).
Photo by: USFWS

Bird-Friendly Plants

- Oak
- Wild cherry
- White pine Service berry
- Crabapple
- Rhododendron
- Honeysuckle
- Trumpet vine
- Viburnum
- Chokecherry
- Barberry
- Brambles
- Bee Balm
- Speedwell

Plants for Butterfly Gardens

Plants for caterpillars

- Aspen
- Birch
- Butterfly bush
- Cottonwood
- Lilac
- Dogwood
- Poplar

Plants for adult butterflies

- Aster
- Milkweed
- Lavender
- Clover
- Butterfly weed
- Sage
- Fennel
- Hollyhock
- Cosmos
- Zinnia

Excerpts of this month's Did You Know? are from <http://www.gardeners.com/Backyard-Biodiversity/5066.default.pg.html>

Links of Interest on the Web

Useful URLs



DoD Natural Resources Conservation Program: <http://www.DoDNaturalResources.net> The 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.

DoD Legacy Resource Management Program: <https://www.dodlegacy.org> DoD program that provides funding to natural and cultural resources projects that have regional, national, and/or multi-Service benefits. The Legacy Tracker lets you download fact sheets and reports for completed Legacy funded projects.

DoD TER-S Document Repository: http://www.nbio.gov/portal/community/Communities/Ecological_Topics/Threatened_&_Endangered_Species/DoD_TES_Document_Repository/ A compilation of DoD Threatened and Endangered Species documents and data made available online through National Biological Information Infrastructure. The information contained within these documents is considered "gray" literature (i.e., not peer reviewed).

Biodiversity Handbook: <http://www.dodbiodiversity.org> 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. A Commander's Guide to conserving biodiversity on military lands is also available.

DoD Partners in Flight: <http://www.dodpif.org> The DoD PIF Program supports and enhances the military mission while it works to develop cooperative projects to ensure a focused and coordinated approach for the conservation of resident and migratory birds and their habitats.

DoD Pollinator Workshop: <http://www.DoDpollinators.org> Provides an overview of pollinators and the reasons they are important to DoD. This website highlights the 2009 NMFVA workshop on pollinators, and has many useful resources, including factsheets and technical reports, pocket guides to identifying pollinators, and links to other websites on pollinators.

DoD Invasive Species Outreach Toolkit: <http://www.DoDinvasives.org> To help installation natural resources managers protect the natural resources on our nation's military lands, the Legacy Program funded the Invasive Species Outreach Toolkit. The Toolkit is an education and outreach tool 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 is also included.

DENIX: <https://www.denix.osd.mil> DENIX is an electronic environmental bulletin board that provides access to environmental information, such as Executive Orders, policies, guidance, INRMPs, fact sheets, and reports. This website is under reconstruction. We will advise you when it is fully operational. In the meantime, we suggest you visit these other natural resources links.

DISDI Portal: <https://rsgis.crrel.usace.army.mil/disdicac> (DoD only, CAC required) The DISDI Portal offers high-level geospatial data on DoD's installations, providing strategic maps of installations and information on how to access more detailed data. IVT data forms the foundation for the DISDI Portal, which is accessible to DoD staff with a common access card.

Strategic Environmental Research and Development Program (SERDP): <http://www.serdp.org/> SERDP identifies, develops, and transitions environmental technologies that relate directly to defense mission accomplishment.

Environmental Security Technology Certification Program (ESTCP): <http://www.estcp.org/> A DoD program that promotes innovative, cost-effective environmental technologies through demonstration and validation at DoD sites.

Cooperative Ecosystem Studies Unit Network (CESU): <http://www.cesu.psu.edu/> This network of 17 cooperative units provides research, technical assistance, and training to federal resource and environmental managers. DoD is a member of 12 units of the CESUs National Network.

Bat Conservation International: <http://www.batcon.org> BCI, based in Austin, Texas, is devoted to conservation, education, and research to protect bats and their ecosystems around the world.

PARC - Partners in Amphibian and Reptile Conservation: <http://www.parcplace.org/> Partners in Amphibian and Reptile Conservation (PARC) is an inclusive partnership of individuals and entities dedicated to the conservation of amphibians and reptiles (i.e., herpetofauna) and their habitats as integral parts of our ecosystem and culture through proactive and coordinated public/private partnerships.

Contact Us

Who we are and where to find us!



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For additional information about DoD's Natural Resources, please contact the [Deputy Director, Natural Resources](#) or the [DoD Natural Resources Conservation Staff](#).