



Natural Selections

Changes Ahead for Natural Selections! Natural Selections will be expanding to include the entire DoD Natural Resources Program, while continuing to capture updates from supporting programs like Legacy. We will also be moving to quarterly dissemination with increased e-updates between issues. Look for these changes beginning in Spring 2011!

Legacy Program Update

Welcome to Sean Rutherford! Legacy is pleased to introduce Sean as the new Natural and Cultural Resources Support Specialist. His responsibilities will include proposal review, project monitoring, document clearance and posting, general conference support, and last but not least, ongoing efforts to upgrade the Tracker web site.



Legacy Project Highlight

DoD Amphibian Disease Survey: Do Frogs Still Get Their Kicks on Route 66? (Legacy Project 09-426)

By Christopher Petersen¹, Robert E. Lovich², Michael J. Lannoo³, Priya Nanjappa⁴, and Ernesto R. Garcia⁵

¹ Naval Facilities Engineering Command (NAVFAC) Atlantic

² NAVFAC Southwest

³ Indiana University

⁴ Association of Fish and Wildlife Agencies

⁵ Friends of PARC

Despite having survived for the last 300 million years, researchers are observing precipitous declines in amphibian populations worldwide. Extinctions and extirpations are occurring at an unprecedented rate. In fact, one fifth of the world's amphibians may now be facing extinction. The present decline in amphibians is the result of a number of factors, including habitat loss and fragmentation, competition and predation from non-native species, increased ultraviolet radiation, climate change, and diseases and pathogens.

[See Amphibians, page 3](#)

In The News

Defense Department Joins Battle to Save Our Nation's Bats

By Christopher Dobony¹, Eric Britzke², Mark Ford³, and Raymond Rainbolt¹

¹ Fort Drum

² U.S. Army Engineer Research and Development Center Environmental Laboratory

³ USGS Virginia Cooperative Fish and Wildlife Research Unit

White-nose syndrome (WNS) is a wildlife health concern of unprecedented scale that has decimated bat populations in eastern North America. WNS, or its presumptive cause, the cold hardy fungus *Geomyces destructans*, has spread in recent years throughout the eastern United States and Canada and as far south and west as Oklahoma.

Department of Defense (DoD) natural resources managers and biologists are working with their



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The Adverse Consequences of Continuing Resolutions

Funding for federal agencies is again in disarray for FY 2011. Because Congress failed to pass the appropriations bills to fund federal agencies, including DoD, last fall, the government is now operating under another short-term continuing resolution, or CR.

The current CR expires March 4; if Congress does not act soon, agencies could see their spending levels fixed at FY 2010 levels for the entire fiscal year. Although this might not seem like a bad idea to some, the lack of new appropriations bills can have severe consequences at all levels of government.

At the Department level, Secretary of Defense Robert Gates has stated that a yearlong CR would be “a disaster,” “a gigantic problem,” and “the worst of all possible worlds.”

At a more immediate scale, the continuing series of CRs is significantly affecting the planning and execution of spending plans for natural and cultural resources conservation funding at all levels.

For example, at some installations, our natural resources managers are juggling annual work plans. In some cases, time-sensitive monitoring and other field work, including projects driven by biological opinions and other compliance orders, are at immediate risk of a yearlong deferral.

For the Legacy Program, we’re also experiencing significant consequences:

- ✚ Project funds are becoming available only now, and at diminished levels. Unless Congress passes an appropriations bill, we expect only 50% of our projected funding will be available before April.
- ✚ Because many offices will now be submitting paperwork to release funds from their ‘banks,’ we expect there may be additional delays in processing contracting actions. This could mean that some continuing projects may have to weather funding gaps and that we may have to defer funding of some seasonal projects until next fiscal year.
- ✚ Planning and executing an overall spending plan has been challenging. We simply don’t know what our total funding will be for FY 2011. This leads us to ask such questions as which high-priority projects should we fund first? How do we balance funding between different areas of emphasis? Between natural and cultural resources projects? Should we fully fund fewer projects, or provide partial funding to more?
- ✚ For DoD-led initiatives, such as workshops and training courses, which can have a time lag of six to nine months or longer, we also need to determine now whether we can make commitments for next fall, or later.

The inefficiencies, lack of planning, and related consequences that Continuing Resolutions cause create challenges for all of us who work in and for the federal government.





Calling Cope's Gray Treefrog (*Hyla chrysoscelis*); Photo by Dr. Joe Mitchell.

The amphibian disease chytridiomycosis (caused by the fungus *Batrachochytrium dendrobatidis*, or Bd) has been a major factor contributing to many amphibian population declines and extinctions. Bd is now widespread throughout many geographic regions and is known to occur in native amphibian populations on every continent except Antarctica (where there are no amphibians); therefore, this infection may be considered global.

Partners in Amphibian and Reptile Conservation (PARC) and the USFWS Division of the National Fish Hatchery System, along with other partners and sponsors, held an international conference, Amphibian Declines & Chytridiomycosis: Translating Science into Urgent Action, in November 2007 to facilitate the sharing of efforts in research and management related to amphibian declines and specifically chytridiomycosis. As a result of this conference, a worldwide mapping effort began (<http://www.spatialepidemiology.net/bd/>). As this mapping effort progressed, it became apparent that little sampling had occurred on Department of Defense (DoD) installations. DoD lands (nearly 30 million acres) provide an impressive array of herpetofaunal diversity and terrestrial and aquatic habitats. Sampling DoD sites for Bd was identified as an important component to the North America mapping effort and equally important to evaluating the general health of amphibians on DoD lands.



In 2009, the DoD Legacy Resource Management Program funded the authors to conduct a transcontinental transect designed to assess the presence of Bd on DoD lands. Fifteen installations were sampled from west to east along U.S. Highway 66 from California into central Illinois and continuing eastward from there to the Atlantic Seaboard along Route 64 (from Marine Corps Base Camp Pendleton in California to Naval Air Station Oceana in Virginia; Figure 1, page 4). With the completion of this project, answers or insight were anticipated to the following questions:

- ✚ What DoD sites surveyed showed Bd presence?
- ✚ What were the infection rates at the surveyed sites?
- ✚ Is there a temporal pattern to the presence of Bd?
- ✚ Is there a spatial pattern to the presence of Bd?
- ✚ What species showed positive for Bd?
- ✚ Is a particular species more susceptible to Bd fungus?

Three wetland habitats on each of the 15 sites were sampled three times in 2009 during spring/early summer, mid-summer, and late summer/fall. A team of more than 15 people comprised of PARC members, DoD biologists/environmental managers, and volunteers conducted the field work. This study represents the most geographically extensive survey for Bd infection conducted to date.

A non-invasive protocol for capturing and swabbing amphibians was followed to ensure consistency in data collection and to prevent the transfer of Bd, if present, from one amphibian to another and from one installation to another. Field collected swabs were sent to a qualified lab for detection of Bd where modern methods of PCR reactions were used to test for the molecular "signature" of the disease on all samples.



Swabbing a Pine Woods Treefrog (*Hyla femoralis*); Photo by Dr. Joe Mitchell.

The results showed that Bd was detected at 13 of the 15 installations. Bd was not detected at two sites, Camp Navajo in Arizona and Fort Sill in Oklahoma. In total, from all bases, during all visits, 1,306 amphibians were sampled and 217 (16.6%) swabs tested positive for Bd. Half of the species surveyed (15/30) tested positive for Bd. Species infected with Bd covered a wide phylogenetic range including: four species of plethodontid salamanders, three species of toads, five hylid species, and four ranid species. At no point were dead or dying amphibians observed.

There was a strong spatial component to the data set. The ten eastern temperate installations (Camp Gruber, Fort Leonard Wood, Sparta Training Center, NSA Crane, Fort Knox, Radford Army Ammunitions Plant, Fort A.P. Hill, Fort Belvoir, Fort Lee, and NAS Oceana) had higher rates of Bd infection (18.9%) than the five bases (MCB Camp Pendleton, Camp Navajo, Kirtland AFB, Cannon AFB, and Fort Sill) situated in the arid west (4.8%). There was also a strong temporal (seasonal) component to the data set. In total, 78.5% of all positive samples came in the first (spring/early-summer) sampling period. Data suggest that the spatial pattern of Bd presence is due to variations in moisture levels (with moisture promoting infection rates); whereas, temporal (seasonal) patterns may be due to moisture availability, with Bd present at the highest rates during the wettest times of the year. The authors are preparing a manuscript with additional details and discussion on these findings for submission to a scientific journal.



Green Treefrogs (*Hyla cinerea*) resting on cattail (*Typha species*); Photo by Paul Block.

The results of this investigation are important for many reasons. Data will directly support the efforts of DoD natural resource managers and environmental specialists by providing baseline data on the health of amphibian populations, and potentially aid in preventing population declines (thus possibly avoiding new restrictions on current base operations). The results of this investigation will also be incorporated into the ongoing emerging disease mapping project and will help researchers look at national patterns and trends of surveyed sites, die-offs, and spread of this disease. A second transcontinental survey is planned for 2011, which will sample another 15 DoD sites along three north-south transects for the presence of Bd.

Acknowledgements: The authors would like to recognize Dr. Joseph Mitchell and Dr. Christopher Phillips for their extensive field work and dedication on this project. We would also like to recognize Irene Macallister (USACOE) for her laboratory analysis of the field collected data. Lastly this study could not have been conducted without the assistance of the natural resources and environmental managers at the DoD installations or the support of the Legacy Program.

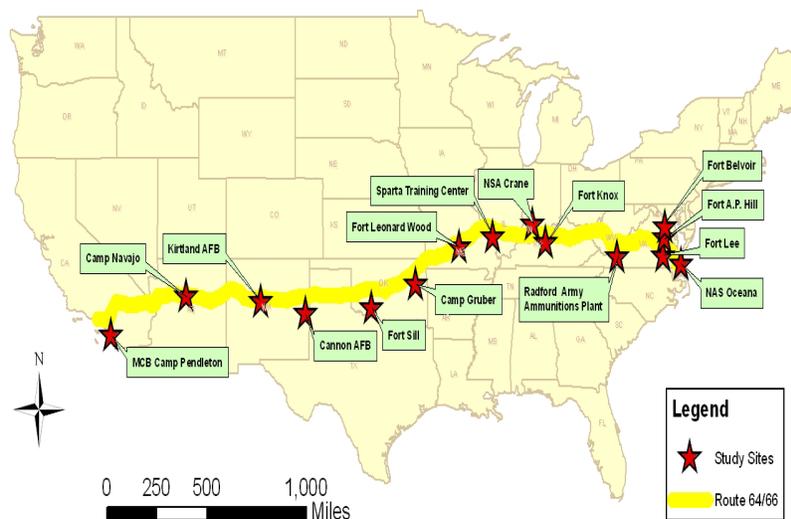


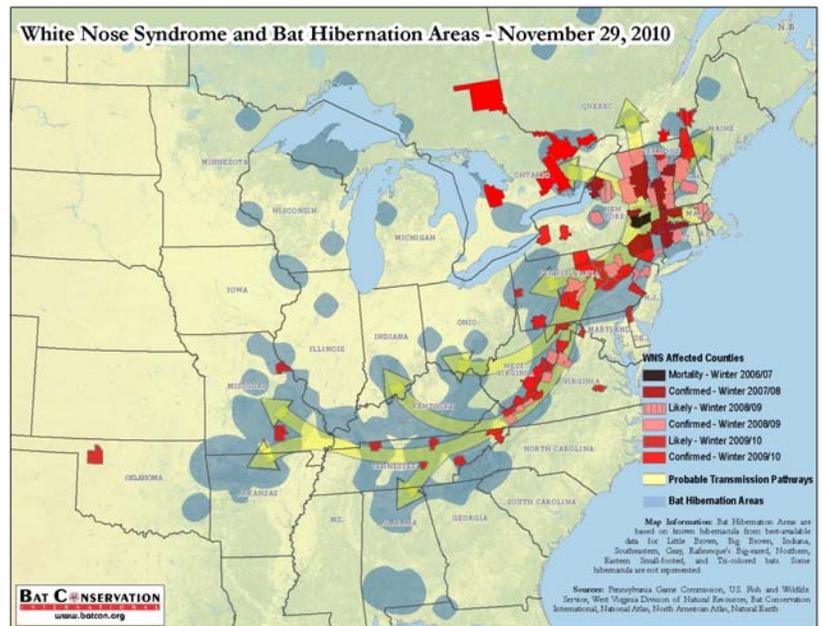
Figure 1. DoD Study Sites

counterparts in other agencies on research to combat the threat of widespread bat extinctions.

The distinctive white fungus often appears on the muzzles, wings, ears, and tails of bats during and just after hibernation. It grows at temperatures from approximately 0-20°C (approximately 32-68°F), which corresponds to the body temperature of hibernating bats. Unfortunately, during normal hibernation, the immune system of bats becomes relatively inactive, leaving bats vulnerable to this fungal infection. Bats with white muzzles, dead bats on cave floors, or emergence of bats from hibernacula during mid-winter months (too early in the year for a reliable food supply) are signs of WNS. It is unknown whether affected bats emerge early in an attempt to forage to restore depleted fat reserves or to escape the increased individual agitation and group disturbance as WNS-infected bats become active. Regardless, bats then die as a result of cold weather exposure.

Although variable among bat species, mortality rates at hibernacula of 70-95% have been reported within 2 years of an initial infection. Bat-to-bat transmission is known to occur, but the roles of humans and other environmental factors in the transmission cycle are unknown but also are believed contributory.

WNS has most severely affected the Northeast's most common "cave" bat species: the big brown bat (*Eptesicus fuscus*), eastern small-footed myotis (*Myotis leibii*), little brown myotis (*Myotis lucifugus*), northern myotis (*Myotis septentrionalis*), tricolored bat (*Perimyotis subflavus*), and the endangered Indiana bat (*Myotis sodalis*). The endangered gray bat (*Myotis grisescens*), the cave myotis (*Myotis velifer*), and southeastern myotis (*Myotis austroriparius*) have recently tested positive for the fungus.



The timing of WNS has postponed considerations for delisting the gray bat, tempered the optimism of increasing Indiana bat populations, and led to a petition to list the eastern small-footed and northern myotis species under the Endangered Species Act. Concern for the viability of the endangered Virginia big-eared bat (*Corynorhinus townsendii*) prompted the U.S. Fish and Wildlife Service, Smithsonian Institution, and West Virginia Division of Natural Resources to develop a captive holding program as an "Ark" in an attempt to prevent outright extinction.

Although understanding of WNS is still limited, researchers at numerous federal and state agencies, universities, and non-governmental organizations are diligently working to answer basic questions about WNS, devise management guidelines, and prepare managers in unaffected areas for its arrival. DoD natural resources specialists have historically collaborated with federal and state biologists to manage endangered species like the Indiana and gray bats, and with the onset of WNS at military installations, DoD has also become involved with WNS research.

Army biologists at Fort Drum have been working with federal and state agencies to collect information at a summer maternity colony of little brown myotis that are known to be infected with WNS. Additionally, although WNS mortality is most prevalent and obvious at hibernacula, research at this U.S. Army installation in northern New York has also documented how those impacts are manifested during non-hibernation months. Numbers of bats captured per net-

survey site at Fort Drum dropped by more than half since the onset of WNS on the installation, with the greatest declines occurring among the northern and little brown myotis.

Unfortunately, with precipitous drops in the numbers of these formerly common bats and declines in already endangered species due to WNS, the complexities of accomplishing the military training mission and managing other uses of DoD lands will multiply.

In collaboration with Bat Conservation International, DoD hosted a workshop in Nashville, Tennessee, and at nearby Fort Campbell in November 2010, to help prepare military installations for the arrival of WNS. Funded by the DoD Legacy Resource Management Program, this workshop focused on challenges and opportunities unique to military installations and provided a framework for DoD to assess risks and to manage for bats and WNS.

It is difficult to predict the role WNS will play in natural resources management in the context of sustaining military mission requirements. However, it is vital that military installations begin communicating with state and federal regulators about potential approaches for dealing with this important issue. If strategies can be developed early, potential military mission impacts may be identified, avoided, and/or mitigated prior to the arrival of WNS.



Training Opportunities for Bat Research and Conservation

Bat Conservation International (BCI) offers comprehensive field training workshops for biologists, land managers, consultants, students, and serious advocates of natural resource conservation. Courses at field locations in Arizona, California, Pennsylvania, and Kentucky have trained more than 1,500 students since 1991. In 2011 BCI will offer four, all-inclusive, field study workshops on topics that include general bat conservation and management, advanced bat capture techniques, and bat detector use for inventory and monitoring. Training will be held this May in Arizona and September in Kentucky at premiere field locations where students will learn hands-on techniques for the study of bats while participating in ongoing bat conservation and management initiatives. Complete details are available on the BCI web site at <http://www.batcon.org> under "Get Involved / Workshops."

Avian Influenza – A Primer and Update

By Chris Eberly¹

¹DoD Partners in Flight

Avian influenza, also referred to as “bird flu”, gained global media attention in 2003. Virologists and epidemiologists warned of a potential pandemic that could kill anywhere from 5 million to 150 million people worldwide. As often happens, media attention of avian influenza has greatly subsided in the past couple years (remember West Nile Virus?). The flu is still out there, and the threat still remains. But what exactly is avian influenza, and how real is the threat to humans and birds?

The term “avian influenza” (AI) is used to describe influenza A subtypes that primarily affect wild waterfowl (ducks and geese) and domestic poultry (chickens and turkeys). The classification of AI viruses is based on two surface proteins, hemagglutinin (H) and neuraminidase (N). Currently there are 16 H and 9 N recognized subtypes that have formed more than 100 strains. Although all of these subtypes have been isolated in wild birds, only three H subtypes and two N subtypes are known to cause disease in people. A bird-adapted strain of H5N1, called HPAI A(H5N1) for “highly pathogenic avian influenza virus of type A of subtype H5N1”, is the causative agent of H5N1 flu. The so-called “bird flu” refers to this one specific strain of AI virus. In contrast, low pathogenic avian influenza (LPAI) H5N1, also known as “North American” H5N1, is common in wild birds. However, LPAI H5N1 is generally nonpathogenic (does not cause disease) in birds and is not known to affect humans at all. The only concern is that it may be possible for it to be transmitted to poultry and mutate in poultry into a highly pathogenic strain.

The current HPAI A(H5N1) outbreak started in Asia in the fall of 2003. It spread in domestic poultry farms at an unprecedented rate and in 2005 began expanding beyond Asia. As of January 5, the World Health Organization has reported human cases of HPAI A(H5N1) in Asia, Africa, the Pacific, Europe and the Near East. Of the 516 humans infected, 306 deaths have resulted—an overall mortality of approximately 60%. The majority of cases have occurred among children and adults aged less than 40 years old. Mortality is highest in those between 10-19 years old. The most significant risk factors for human H5N1 infection appear to be direct contact with sick or dead poultry or wild birds, or visiting a live poultry market. So far, evidence of sustained person-to-person transmission has not been found. This flu is epizootic (an epidemic in nonhumans) and panzootic (affecting animals of many species, especially over a wide area), resulting in the deaths of tens of millions of birds and spurring the culling of hundreds of millions of others—primarily domestic poultry—to stem its spread. To become a pandemic (an epidemic in humans), the virus must mutate or reassort into a strain capable of efficient human-to-human transmission, which has not yet occurred. A repeat of the 1918 Spanish Flu (caused by a subtype of H1N1) pandemic, which killed between 50-100 million people, could be even more lethal in today’s mobile/global society.

The ability to efficiently control the spread of a highly infectious disease depends on its early detection. The United States Interagency Strategic Plan provides guidance to Federal, State, university, and non-governmental organizations for conducting HPAI early detection monitoring and surveillance of migratory birds. The National Biological Information Infrastructure (NBII) web site is a good source with updates and links to other sites.

<http://wildlifedisease.nbio.gov/diseasehome.jsp?disease=Avian%20Influenza&pagemode=submit>



Training, Announcements & Events of Interest

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



Protect U.S. Community Invasive Species Network - Train-the-Trainer Introductory Webinar: February 8, at 3:00 p.m. ET, 2:00 p.m. CT, 1:00 p.m. MT, 12:00 p.m. PT and 9:00 a.m. Hawaii-Aleution. This webinar will provide basic information on the purpose, content, and direction of the Protect U.S. project. Participants will include IPM coordinators, NPDN first detector trainers, and other extension educators from 1862, 1890, and 1994 Land Grant Institutions. The training is also appropriate for other federal and state governmental agency employees involved in invasive species detection and management. This training is offered at no cost; however, interested individuals must register online at <http://www.ncipmc.org/training/>. Questions about the training should be directed to Susan Ratcliffe, Director of the North Central IPM Center, at 217-333-9656 or ipm@illinois.edu.

2011 Green Infrastructure Conference: February 23-25, Shepherdstown, West Virginia. This inaugural event will convene policy makers, practitioners, and on-the-ground implementers of green infrastructure practices and design from around the country. Join us to hear nationally recognized speakers discuss key elements for success and vital lessons learned. Be part of developing the strategy for the future of green infrastructure! Featured topics include public health, social equity, transportation, economic development, and climate change. For more information, visit <http://www.conservationfund.org/GIC2011> or contact Kris Hoellen at 304-876-7462 or khoellen@conservationfund.org.

National Invasive Species Awareness Week 2011: February 28-March 4, Washington, D.C. A week of activities, briefings, and events are planned to highlight what is being done across the nation and around the world to stop and slow the spread of invasive species. The associated State Invasive Species Council and Regional Coordination Workshop will be held March 1. For the complete schedule of events, visit <http://www.nisaw.org/>. Questions may also be directed to Dr. Lee Van Wychen (Lee.VanWychen@wssa.net; 202-746-4686) or Ms. Lori Williams (Lori.Williams@ios.doi.gov; 202 354-1881).

2011 National Military Fish and Wildlife Association Meeting: March 14-19, at the Westin Crown Center Hotel in Kansas City, Missouri. This meeting 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 the agenda and other details, visit http://www.nmfwa.org/2011_Meeting/index.cfm. Note: If you are reserving a room at the conference hotel, please reference the *North American Wildlife and Resources Conference*.

Biodiversity Without Boundaries 2011: May 8-12, in Lied Lodge, Nebraska. This annual training and education event on biodiversity conservation highlights the crucial role that conservation science plays in our global society. In-depth sessions will explore a full spectrum of conservation issues and solutions:

- ✚ the science behind the pressing problems
- ✚ the information and expertise needed to direct decisions
- ✚ the tools and methods for setting priorities, planning and taking action, and monitoring and tracking progress toward goals
- ✚ the lessons learned from conservation success, collaboration, and leadership approaches.

The 2011 location in Nebraska highlights the Midwest, with particular attention to issues prevalent in the region and featuring presentations from regional programs and partners. Co-hosted by NatureServe and the Nebraska Natural Heritage Program, Biodiversity Without Boundaries 2011 brings together an international scope with a local view. For more information, visit <http://www.natureserve.org/visitLocal/conference/BWB2011.jsp>.

2011 Field-Training Workshops on Bat Conservation and Management: May 8-13, Arizona; and September 12-17, Kentucky. Learn the latest bat-research techniques from veteran professionals at Bat Conservation International's 6-day workshops that blend lectures, discussions, and field trips with hands-on experience using mist nets, harp traps, radiotracking gear and bat detectors. In addition, an Advanced Capture Techniques Workshop will be offered May 14-18 in Arizona, and an Acoustic Monitoring Workshop will be held May 19-24 in Arizona. For more details and to register, visit www.batcon.org/workshops or contact Rebecca Patterson at (512) 327-9721 or workshops@batcon.org.

Sustaining Military Readiness Conference: Connecting Missions, Resources, and Communities: July 25-29, Nashville, Tennessee. DoD personnel and stakeholders interested in military training and testing, natural and cultural resources management, and sustainable and compatible land, air, sea, and frequency use are invited to:

- ✚ Explore the interdisciplinary nature of sustaining military readiness
- ✚ Share lessons learned and best practices among colleagues and stakeholders
- ✚ Participate in a broad spectrum of informative training workshops

Additional information including the agenda and lodging details will be available soon at <http://www.smrconference.com/>. Add your e-mail to the mailing list at to be notified when details become available. Organizations interested in exhibiting a poster or booth should e-mail conference@dandp.com.

Sustainable Military Lands Management Certificate: This three-course online certificate from Colorado State University provides training in the breadth and complexity of military land management and knowledge of the rapidly evolving practices, technologies, and analytical tools necessary to support this national defense mission. Visit www.learn.colostate.edu or contact Jenny Hannifin at 970-491-2665 or jhannifin@learn.colostate.edu for details.

Funding Available for Environmental Technology Demonstrations: DoD's Environmental Security Technology Certification Program (ESTCP) is seeking to fund innovative environmental technology demonstrations in the Resource Conservation and Climate Change program area. ESTCP's goal is to transition environmental technology projects through the demonstration phase, thereby enabling promising technologies to receive regulatory and DoD end-user acceptance and to be fielded and commercialized more effectively and more rapidly. The Resource Conservation and Climate Change program area supports the development of the science, technologies, and methods needed to manage DoD's installation infrastructure in a sustainable way.

DoD organizations may submit pre-proposals for demonstrations of innovative tools, technologies, and methodologies that advance DoD's management of its natural and cultural resources (Resource Conservation). The Broad Agency Announcement for private sector organizations and Non-DoD Federal Call for Proposals seek pre-proposals for environmental technologies in the following Resource Conservation topic areas only:

- ✚ Recovery of Threatened and Endangered and Sustainment of At-Risk Plant Species
- ✚ Inventory and Monitoring Technologies for Vertebrate Populations

Pre-proposals from all sectors are due by **March 8, 2011**. Detailed instructions for proposers are available on the ESTCP web site at <http://www.serdp-estcp.org/Funding-Opportunities/ESTCP-Solicitations>.



Recent Natural Resources Documents Online

Reports, Fact Sheets, Photos, Videos



This section highlights recently uploaded reports and fact sheets on the Legacy Tracker or on the DENIX web site. For Legacy-related products, please visit https://www.dodlegacy.org/Legacy/intro/ProductsList_NU.aspx. All Legacy products and many more are available at <http://www.denix.osd.mil/nr>. In addition, bird-related products are also posted on the DoD Partners in Flight web site at <http://www.DoDPIF.org>.

Threatened, Endangered, and At-Risk Species (TER-S) Interagency Research Coordination Manual,

December 2010: (Legacy 09-453): This manual can help federal agencies and the military Services by identifying appropriate POCs and/or offices in other agencies to promote coordination, understand priorities, and identify windows of opportunity to provide inputs into TER-S research program planning. The manual highlights the important distinction between those agencies that are chartered to perform and/or fund TER-S research and those that may have critical research needs but must rely on the research agencies for required resources. The manual also provides insight into internal agency mechanisms for TER-S research priority setting and funding processes. The larger scientific community can use this manual as a resource for TER-S research information across participating federal agencies. To access the manual, visit <http://www.dodnaturalresources.net/Resources.html>.

Legacy Bird Species At Risk Monitoring in and around Camp Navajo and the Naval Observatory Flagstaff Station, Arizona – Fact Sheet and Final Report, October 2010:

(Legacy 07-344): Two Department of Defense installations, Camp Navajo Army Depot and Naval Observatory Flagstaff Station, are located approximately 10 miles west of Flagstaff, Arizona. This study focused on determining the effects of forest thinning on Cordilleran and Olive-sided Flycatchers, and other bird species as to inform proper management to prevent further listing of wildlife residing on DoD properties. The report provides management recommendations to guide the conservation efforts for these priority bird species within the project area, while preserving the military mission for both installations.

<http://www.denix.osd.mil/nr/FishandWildlife/Birds.cfm>

Migratory Linkages of Burrowing Owls on DoD Installation and Adjacent Lands – Fact Sheet, August 2010:

(Legacy 08-283): Burrowing owl (BUOW) (*Athene cunicularia*) populations have declined throughout the Western United States and Canada, and they have been extirpated from the periphery of their breeding range. Despite these declines, BUOWs appear to be increasing in other areas. One possible explanation for this paradox is that BUOWs are becoming less migratory. This project is determining connectivity of BUOW populations on DoD installations in the western United States and determining how far BUOWs nesting on DoD installations and adjacent lands disperse from one year to the next using a combination of stable isotope ratios, DNA samples, and radio telemetry.

<http://www.denix.osd.mil/nr/FishandWildlife/Birds.cfm>

Propagation of Species At Risk Atlantic Pigtoe on Military Installations – Fact Sheet, August 2010:

(Legacy 09-450): The Department of Army has identified the Atlantic pigtoe mussel as a species at risk with potential for detrimental impact on the military mission if federally listed as either threatened or endangered. Intensive sampling conducted by this project in previously abundant areas clearly demonstrates the urgent need for active propagation efforts as historically low numbers of individuals were encountered and none with viable larvae. The lack of viable larvae has delayed identification of host fish species; however, this project filled some of the critical gaps in the life history of the Atlantic pigtoe, gaining greater understanding of the seasonal and environmental conditions required for reproduction and leading to the discovery that the species may not be reproductive every year, much needed information for any recovery effort. <http://www.denix.osd.mil/nr/FishandWildlife/FreshwaterandMarine.cfm>

Pollinators of TER-S Plants on DoD Installations in Western States – Fact Sheet, September 2010:

(Legacy 08-391): The objective of this project was to locate pollinator information on the 226 threatened, endangered, and at-risk species (TER-S) found on DoD facilities in five western states (Arizona, California, Nevada, New Mexico, and Texas) and create a spreadsheet database associating pollinators with their respective host plants. Floral visitor and/or pollinator records were located for 219 of the 226 TER-S. These data were made available to Environmental

Stewardship Divisions, their independent contractors, and other interested environmental agencies and individuals.

<http://www.denix.osd.mil/nr/FishandWildlife/Pollinators.cfm>

A Study of Insect Pollinators Associated with DoD TER-S Flowering Plants, Including Identification of Habitat Types Where They Co-Occur by Military Installation in the Western United States - Final Report, April 2010:

(Legacy 08-391): This Phase 1 Legacy project created an integrated Excel spreadsheet database of pollinator-plant associations (floral visitors and true pollinators) for several hundred DoD threatened, endangered, and at-risk flowering plants (angiosperms) and insect pollinators found on DoD installations in southern California, Arizona, Nevada, and New Mexico. This report summarizes the process and the results.

<http://www.denix.osd.mil/nr/FishandWildlife/Pollinators.cfm>

Photo of the Month

Capturing the beauty of our natural resources

Natural Selections will resume publishing stellar photos of natural resources at DoD installations in our March issue. Until then, please continue submitting your photos to naturalselections@hgl.com.

Note: Ms. Taura Huxley, NAVFAC Atlantic, photographed the Owls at Twentynine Palms, CA, published in the November-December 2010 issue. Our hats off to her for this awesome photo!

Did You Know?

Little Did You Know Conservation Could Be So Much Fun!



Feral and Outdoor Cats Are More Susceptible to Disease

Feral and outdoor cats are susceptible to diseases that rarely affect house cats. The tendency of outdoor and feral cats to encounter wild animals and other traumas puts them at greater risk for exposure to injuries and disease. The spread of diseases in feral and outdoor cats is a problem not only because it limits the lifespan and quality of life for cats, but also because it increases the risk of those diseases being contracted by humans.

What are feral cats?

Feral cats are the offspring of lost or abandoned pet cats or other feral cats who are not spayed or neutered. Unlike stray or outdoor cats, which are accustomed to contact with people and are tame, feral cats are not accustomed to contact with people and are typically too fearful and wild to be handled.

What are the factors that make feral cats more prone to disease?

Unlike outdoor cats, feral cats are more likely to have never been vaccinated and suffer from malnutrition. Malnutrition weakens a cat's ability to fight off infections and illness. Cats that aren't spayed or neutered can also transfer infections and illnesses during breeding, and female cats become run down having multiple litters.



What are the factors that make feral and outdoor cats more prone to disease?

Although outdoor cats may have been vaccinated and have the fall-back food source that their owners supply – thereby preventing malnutrition – the danger of contracting an infectious disease rises for the outdoor cat, and feral cats too, because of exposure to the following risks:

- ✚ disease-carrying organisms--fleas, ticks, tapeworms, roundworms, and mosquitoes
- ✚ wounds from fighting that become infected and abscess
- ✚ exposure to other animals that transmit disease such as mice that carry Toxoplasmosis
- ✚ exposure to sick cats that transmit feline diseases
- ✚ exposure to chemicals, poisons, and tainted water.

What are the diseases that feral and outdoor cats can be exposed to?

Some of the diseases feral and outdoor cats can contract include Feline Immunodeficiency Virus (FIV), Feline Leukemia (FeLV), Feline Infectious Peritonitis (FIP), and rabies. Other diseases they are susceptible to include Panleukopenia (or Feline Distemper), Lyme disease, and Toxoplasmosis.



Links of Interest on the Web

Useful URLs



DoD Natural Resources Conservation Program: <http://www.DoDNaturalResources.net> 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> This DoD program 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://dodtes.nbi.gov> A compilation of DoD Threatened and Endangered Species documents and data made available online through the National Biological Information Infrastructure. Information contained in these documents is considered "gray" literature (i.e., not peer reviewed).

Biodiversity Handbook: <http://www.dodbiodiversity.org> On this web site 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 web site 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 web sites on pollinators.

DoD Invasive Species Outreach Toolkit: <http://www.DoDinvasives.org> 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: <http://www.denix.osd.mil/nr/> DENIX is an electronic environmental bulletin board that provides access to environmental information, such as Executive Orders, policies, guidance, INRMPs, fact sheets, and reports.

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-estcp.org> SERDP is DoD's environmental science and technology program, planned and executed in partnership with DOE and EPA, with participation by numerous other federal and non-federal organizations. SERDP invests across a broad spectrum of basic and applied research, as well as advanced development.

Environmental Security Technology Certification Program (ESTCP): <http://www.serdp-estcp.org> ESTCP is DoD's environmental technology demonstration and validation program. The Program promotes the transfer of innovative technologies that have successfully established proof of concept to field or production use. ESTCP demonstrations collect cost and performance data to overcome the barriers to employ an innovative technology because of concerns regarding technical or programmatic risk.

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 (BCI): <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> PARC is a 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!



For further information about the Legacy Resource Management Program, please contact:

[L. Peter Boice](#)

Deputy Director, Natural Resources

[Jane Mallory](#)

HydroGeoLogic, Inc.

Natural Resource Management Specialist

703-604-1774

[Cecilia Brothers](#)

HydroGeoLogic, Inc.

Cultural Resource Management Specialist

703-604-1724

[Sean Rutherford](#)

HydroGeoLogic, Inc.

Legacy Program Support Specialist

703-604-1933

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

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