US Army Corps of Engineers®
Engineer Research and Development Center

Threatened and Endangered Species
Research Update Newsletter

November 2006

Introduction

Welcome to the fourth issue of the Threatened and Endangered Species (T&E species) newsletter. The purpose of this newsletter is to communicate ongoing T&E species research conducted by the Engineer Research and Development Center (ERDC) and the potential applications of these various technologies for other T&E species.

The goal of this newsletter is to increase your awareness of new and ongoing research to provide knowledge that may help determine if the methodologies and/or technologies are potentially applicable to your situation. In addition, your particular circumstances may provide insights to researchers on building flexibility and adaptability into their finished products, thereby resulting in more useful end products. It is anticipated that the technologies and methodologies used in conducting this research will have potential cross-applications to other species.

Conservation Research Requirements & Species At Risk

Mohave ground squirrel

Pickering's morning glory

The Army's top two conservation research requirements are: 1) reducing impacts of T&E species on military readiness, and 2) maintaining readiness by improving T&E species monitoring capabilities. The current research approach addresses T&E species only ***after*** a species has been listed. Unfortunately, this can reduce the Army's ability in limiting the effects on military operations from the presence of these species. *Therefore, in a slight departure from previous newsletters, this issue highlights a new research work package – habitat-centric Species At Risk (SAR).*

For purposes of this research, species at risk are defined as: 1) plant and animal species not yet listed as threatened or endangered under the Endangered Species Act, but are designated as candidates for listing or are considered imperiled or critically imperiled throughout their range, and 2) have populations known to occur on or within 2 km of DoD installations.

The overarching goal of the SAR research is to avoid listing these species as threatened or endangered in the future. It is anticipated that this proactive approach will limit the impacts of T&E species on military readiness. In addition, the projected products and results of the SAR research (listed below) will enhance species monitoring capabilities. Therefore, the SAR research is expected to address both of the Army's top two conservation research requirements.

Habitat-centric Species At Risk (SAR) Research

The Problem:

Future listings of species at risk as threatened or endangered could severely affect the ability of the military to conduct its training operations on not only spatial and temporal bases, but also type and intensity of the training. According to the report, *Species at Risk on Department of Defense Installations,* 523 species at risk were present on military installations. Of these species, "47 are federal candidates, 136 are regarded…as critically imperiled, and 340 are imperiled" (NatureServe 2004). The report evaluated nearly 730 DoD installations and found 30% contained one or more species at risk, with 240 SAR inhabiting Army installations, nearly twice as many as Air Force and Navy installations. Without intervention, it is highly likely many of these species will be listed, creating a severe restriction on the military's ability to conduct its mission.

Training restrictions are not the only consequence associated with threatened and endangered species. Per the report, *Installation Summaries from the FY 2004 Survey of Threatened and Endangered Species on Army Lands* (Rubinoff, Sekscienski, Woodson, and Wills 2005), costs for management and recovery efforts of the 177 listed species totaled over $21 million in FY04. The negative consequences associated with restricted training opportunities and increased administration and management costs provide the impetus for a proactive approach to SAR.

The SAR research will focus on two contributing factors for listing species as threatened or endangered: 1) loss of habitat, and 2) human or natural factors (other than disease and predation) that may affect a species' continued existence.

Barriers to Solving the Problem:

Several barriers to solving the SAR problem include:

- Lack of capabilities to efficiently determine basic species biology, taxonomy, abundance, and distribution leads to categorization as SAR
- SAR face a wide range of diverse threats
- Traditional species-by-species empirical field studies to determine risk are inadequate to address the large number of SAR
- SAR metapopulations extend beyond DoD boundaries

Slickspot peppergrass

Overcoming the Barriers:

Several approaches and technologies to overcome the barriers include:

- Improving SAR detection capabilities using hyperspectral imaging technologies
- Using bioinformatic and meta-analysis approaches to develop multi-species risk prediction models for poorly understood SAR
- Developing population viability risk threshold models to relate range-wide habitat availability, condition, and distribution to military training effects on habitats supporting multiple SAR
- Using advanced genetic approaches to evaluate SAR taxonomic affiliations, metapopulation dynamics, and conservation significance

New Army SAR Policy Should Facilitate Success:

According to a 15 September 2006 memo signed by Colonel James B. Balocki, Director, Environmental Programs for ACSIM, the "Army's policy is to manage species at risk (SAR) proactively in order to prevent Endangered Species Act (ESA) listings that could severely degrade military readiness…Implementing proactive measures to prevent the listing of a SAR would be beneficial to both the Army and the species." The memo acknowledges the resources required to successfully manage all SAR are beyond the means of the Army's budget. Therefore, it is imperative the Army concentrate its limited resources on SAR that, if listed, would most adversely affect the Army mission. Starting in FY08, installations will have the flexibility to allocate operational funds to SAR management.


Greater sage grouse

In a related 29 July 2005 ASA (I&E) memo, the "Army policy focuses on preventing the listing of SAR that would possibly impact the mission on Category 1 installations…." The memo defines Category 1 installations as "those that have the highest Army-wide strategic and enduring military training values."


White Sands pupfish

Anticipated Products/Results:

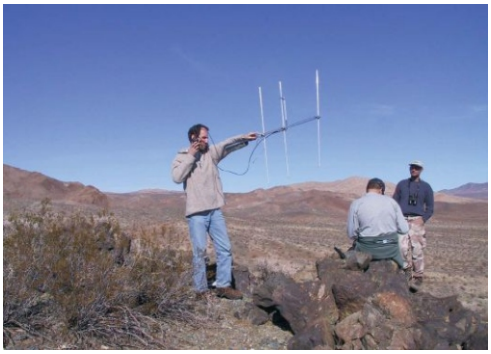
The SAR research will develop technologies, approaches, and new knowledge to minimize factors that may lead to listing these species as threatened or endangered. These products and results will provide installation land managers with the capability to take actions to avoid future listings under the Endangered Species Act. This research, coupled with the ability of installations to allocate operational funds to SAR management, will enable installations to take a proactive approach in addressing SAR.

Anticipated products and results of this research effort include:

- Improved detection of SAR populations
- Multi-species predictive synthesis model of military disturbance effects on SAR
- Integrated military habitat disturbance and population viability models
- Advanced genetic methods for determining taxonomic affiliation and metapopulation dynamics

Leveraging Limited Resources:

The SAR research will take advantage of, to the fullest extent possible, the vast amount of knowledge acquired through prior and ongoing T&E species research. These efforts provide the scientific foundation and initial technology capabilities for extension to species at risk. In addition, current research efforts have established the coordination framework among researchers, installations, and regulators that is necessary for successful accomplishment of the SAR research activities.



In an effort to maximize limited funding opportunities, the DoD SAR research will be conducted in collaboration with the Interdepartmental Endangered Species Science Forum, including partnership efforts with the Interior and Agriculture Departments. This will help ensure duplication of efforts is minimized while maximizing leveraging opportunities.

For additional information abouth the SAR research, contact Dr. Tim Hayden at: (timonthy.j.hayden@erdc.usace.army.mil).

Products Completed Since July 2006 Newsletter

The complete text of any T&E species technical report can be accessed through the ERDC-CERL website http://www.cecer.army.mil/td/tips/browse/publications.cfm?AREA=10).

Mettke-Hofmann, C., T.J. Hayden, K.C. Rowe, and V. Canoine. 2006. *Effects of experience and object complexity on exploration in garden warblers.* Journal of Zoology. 268:405-413.

Sherman, A.R. and C.O. Martin. 2006. *Rediscovery of the gray bat (Myotis Grisescens) in northeastern Mississippi.* Southwest Naturalist. 51(3): 418-420.

Von Stackleberg, K., C. Amos, C. Butler, T. Smith, J. Famely, M. McArdle, B. Southworth, and J. Steevens. 2006. *Screening level ecological risk assessments of some military munitions and obscurant-related compounds for selected threatened and endangered species.* ERDC TR-06-11.

Pending Reports (To Be Released Soon)

- Balbach, H.E. and E.L. Keane. *Profiles for high-priority species: Focus of the Army threatened and endangered species research program.* ERDC/CERL TR-06-XX. (hal.e.balbach@erdc.usace.army.mil)
- Balbach, H.E., D. Pitts, W.D. Meyer, and S.A. Tweddale. *Threatened and endangered species surveillance in inaccessible areas: A feasibility study.* ERDC/CERL TR-06-XX. (hal.e.balbach@erdc.usace.army.mil)
- Cornelius, J.C., T.J. Hayden, and P.J.Guertin. Submitted. *Endangered species management plan for Fort Hood, Texas; 2005-2010.* In public review as INRMP component. (timothy.j.hayden@erdc.usace.army.mil)
- Hayden, T.J. and M. Wilkelski. Accepted. *Human disturbance does not elicit a chronic stress response as measured by corticosterone in white-eyed vireos.* Hormones and Behavior. (timothy.j.hayden@erdc.usace.army.mil)
- Hayden, T.J. and M. Wilkelski. Submitted. *Response and habituation of two passerine species to human intrusion.* The Auk. (timothy.j.hayden@erdc.usace.army.mil)
- Lohr, B., E. F. Brittan-Powell, L.L. Pater and R. J. Dooling. Submitted. *Auditory brainstem responses and auditory sensitivity in woodpeckers.* Journal of Comparative Physiology. (larry.l.pater@erdc.usace.army.mil)
- Lozar, R.C. (ed.) *Habitat fragmentation handbook for installation planners: Status and options.* ERDC/CERL TR-06-XX. (james.d.westervelt@erdc.usace.army.mil)
- Meyer W.D., H.E. Balbach, and J. Berner. *Existing geospatial knowledge of gopher tortoise (Gopherus polyphemus) population and abundance.* ERDC TR-06-XX. (william.d.meyer@erdc.usace.army.mil)
- Pater, L.L., T.G. Grubb, and D.K. Delaney. In press. *Noise impacts on wildlife: Improved assessment techniques.* Journal of Wildlife Management. (larry.l.pater@erdc.usace.army.mil)
- Saif N.Z., R.R. Carthy, M.K. Oli, and W.D. Meyer. *Analysis of abundance estimation methods for gopher tortoises (Gopherus polyphemus).* ERDC TR-06-XX. (william.d.meyer@erdc.usace.army.mil)

- Stoddard, S.T. Submitted. *Extinction thresholds in complex landscapes: The role of perception.* Landscape Ecology. (scott.stoddard@spk01.usace.army.mil)

- Stoddard, S.T. Submitted. *Individual dispersal behavior and spatial heterogeneity: The relative sensitivity of mobile species to habitat loss and fragmentation at landscape scale.* The American Naturalist. (scott.stoddard@spk01.usace.army.mil)

- Tuberville, T.D., K.A. Buhlmann, H.E. Balbach, S.H. Bennett, J.P. Nestor, J.W. Gibbons, and R.R. Sharitz. *Habitat selection by the gopher tortoise (Gopherus polyphemus).* ERDC/CERL TR-06-XX. (hal.e.balbach@erdc.usace.army.mil)

- Walde, A.D., D.K. Delaney, M. Harless, and L.L. Pater. In press. *Osteophagy by the desert tortoise (Gopherus agassizii).* Southwestern Naturalist. (david.delaney@erdc.usace.army.mil)

- Walde, A.D., M.L. Harless, D.K. Delaney, and L.L. Pater. *In press. Anthropogenic threat to the desert tortoise (Gopherus agassizii): Litter in the Mojave Desert.* Western North American Naturalist. (david.delaney@erdc.usace.army.mil)

This newsletter and prior issues are located on the DENIX website:

For DoD Users (password required): https://www.denix.osd.mil/denix/DOD/Library/NCR/endangered_sp.html

For Public Users: https://www.denix.osd.mil/denix/Public/Library/NCR/endangered_sp.html

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