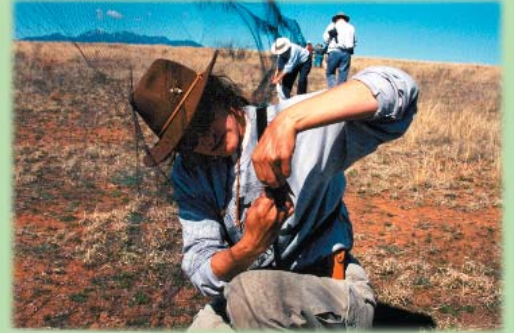


## FORT COLLINS SCIENCE CENTER

### Species and Habitats of Federal Interest

#### Capabilities

Ecosystem changes directly affect a wide variety of plant and animal species, floral and faunal communities, and groups of species such as amphibians and grassland birds. Appropriate management of public lands plays a crucial role in the conservation and recovery of endangered species and can be a key element in preventing a species from being listed under the Endangered Species Act. The Species and Habitats of Federal Interest Branch of the Fort Collins Science Center (FORT) conducts research on the ecology, habitat requirements, distribution and abundance, population dynamics, and genetics and systematics of many species facing threatened or endangered status or of special concern to resource management agencies. FORT scientists develop reintroduction and restoration techniques, technologies for monitoring populations, and novel methods to analyze data on population trends and habitat requirements. FORT expertise encompasses both traditional and specialized natural resource disciplines within wildlife biology, including population dynamics, animal behavior, plant and community ecology, inventory and monitoring, statistics and computer applications, conservation genetics, stable isotope analysis, and curatorial expertise.



#### Selected Projects

##### Ecology of Prairie Dogs and Black-footed Ferrets

Early research in the black-footed ferret recovery program focused on the ecology of a remnant free-ranging population of ferrets in Wyoming, emergency rescue of ferrets for captive breeding, refining methods of captive propagation, and developing the process of reintroducing ferrets back into their native prairie dog habitats. More recently, FORT scientists and collaborators have developed methods to evaluate and compare habitat for reintroductions, assisted in developing a canine distemper vaccine for captive and wild ferrets, and pioneered a new strategy for rearing ferrets that has resulted in a 10-fold increase in post-release survival. Current research emphasizes the ecology and management of plague, a disease that threatens prairie dogs and ferrets. Scientists have found improved methods for controlling fleas on prairie dogs, which should reduce the probability of plague outbreaks. Studies recently initiated on translocations of the threatened Utah prairie dog have resulted in a 50-fold increase in short-term retention of prairie dogs at release sites.



##### Declining Amphibians

Amphibian populations are declining worldwide. Locally, declines in populations of boreal toads in Rocky Mountain National Park have caused concern among park managers. FORT scientists are investigating the habitat use and population dynamics of resident boreal toads as well as measures of amphibian health and possible disease influences. Nationally, FORT represents the Southern Rocky Mountains in the Department of the Interior's (DOI) Amphibian Research and Monitoring Initiative (ARMI), a congressionally funded program. ARMI focuses on long-term monitoring and specific research questions relating to amphibian declines.

FORT scientists work with DOI agencies in designing and implementing monitoring programs to ensure that data collected can be used effectively in management decisions and to provide input into the broader scale, international scope of ARMI.

##### Ecology of Virus Transmissions in Commensal Bat Colonies

In 2001, FORT scientists joined with Colorado State University and the Centers for Disease Control and Prevention to investigate the ecology of rabies virus transmission through bats in an urban environment. This study aims to better understand the population dynamics of bats in an urban/suburban areas, how bats interact with people and human structures, and how they transmit viruses to one another. The study focuses on the big brown bat, a species that commonly roosts in homes, buildings, cracks in trees, and other sites throughout the U.S.

##### Stable Isotopes: Providing Answers to Ecological Questions

Stable isotopes of various chemical elements occur naturally in all ecological systems. The power of stable isotopes in ecological studies hinges on two important traits. First, when an animal ingests water and food, its body tissues take on chemical "signatures" of the geographic area where it resides. Second, the chemical signature of natural environments varies across the surface of the earth. Taking advantage of these traits, FORT scientists are investigating the possibility that isotopic analyses of an animal's tissues (e.g., fur, feathers) may indicate the location of its breeding or non-breeding habitat, tell a more complete story about its migration patterns, and help to establish its feeding ecology and links to other components of the ecosystem.

## Prairie Birds: Declining Populations and Disappearing Habitats



FORT scientists are developing and applying innovative approaches and the latest research technologies to studies of the demography, migratory movements, foraging ecology, behavior, and conservation of avian species in the mountain-prairie region of the U.S. These approaches include stable isotope analysis, genetic tools, radio-telemetry,

and geographic information systems (GIS). For example, FORT scientists are studying population dynamics and causes of decline in two endemic avian species of the shortgrass prairie ecosystem, the Mountain Plover and Lark Bunting. In a study on migratory movements and ecology of shorebirds that traverse the continental interior, FORT staff are helping to develop a hemispheric shorebird monitoring program, developing models for habitat restoration and conservation planning, and evaluating the effects of weather cycles and global climate change on habitat availability and landscape connectivity.

## Rocky Mountain Center for Conservation Genetics and Systematics

The Rocky Mountain Center for Conservation Genetics and Systematics was initiated as the result of a collaborative effort between FORT and the University of Denver. Genetic techniques can be used to augment studies of population dynamics and population viability, refine taxonomic definitions, investigate gene flow, and document genetic diversity. Ongoing studies at the Center include population genetics studies of rare and declining species such as the Greater Sage-Grouse, Gunnison Sage-Grouse, Trumpeter Swan, Mountain Plover, Lesser Prairie-Chicken, Midget Faded Rattlesnake, and the rare plant taxon, *Potentilla rupincola*.

## Curation of the Biological Survey Collection

FORT scientists manage and curate a valuable collection of vertebrates that belongs to USGS and its predecessor agencies. Located in the Museum of Southwestern Biology on the University of New Mexico campus, the collection is particularly rich in specimens of bats and rodents from western federal lands and includes a unique collection of fishes from the Upper Colorado River Basin. The collection supports ongoing research that focuses on the status and distribution of listed species and species of special management concern in the Southwest. All specimen records are fully computerized and the mammal records are searchable online. Future plans include georeferencing of all specimen records.

## Staff

**Branch Chief: Patty Stevens**, M.S. Supervisory Wildlife Biologist: Science program management and administration.

**Baker, Bruce W.**, Ph.D. Research Wildlife Biologist: riparian ecosystems, prairie dog ecosystems, avian ecology, beaver ecology.

**Biggins, Dean**, Ph.D. Research Wildlife Biologist: mustelid ecology, radio-telemetry, steppe ecosystems in North America and China.

**Bogan, Michael**, Ph.D. Research Wildlife Biologist: mammals, vespertilionid bats, systematics, curation.

**Cade, Brian**, Ph.D. Statistician (Biology): computer applications, statistics, regression quantiles, permutation procedures, wildlife-habitat relations, bird migration.

**Child, Ana**, Ph.D. candidate. Student Trainee (Genetics): genetic diversity of rare or threatened plant species, population genetics, plant systematics, plant ecology.

**Cryan, Paul M.**, Ph.D. Research Biologist: mammals, bats, biogeography, migration, physiology, GIS.

**Ellison, Laura**, M.S. Ecologist: bat population ecology, mammals, quantitative biology, modeling, inventory and monitoring.

**Farmer, Adrian**, Ph.D. Supervisory Wildlife Biologist: community ecology, habitat modeling, global change, ornithology, stable isotopes and bird migration, bioenergetics.

**Geluso, Keith**, M.S. Wildlife Biologist: biological surveys, natural history, mammalian behavior and ecology, rodents and bats.

**Iko, William**, M.S. Wildlife Biologist: avian population ecology, wildlife disease, and toxicology; conservation genetics; raptor ecology; stable isotope analysis and food web dynamics.

**Knopf, Fritz**, Ph.D. Research Wildlife Biologist: biological diversity, avian ecology.

**Muths, Erin**, Ph.D. Zoologist: declining amphibians, mammalian ecology, inventory and monitoring.

**Osborn, Ronald**, M.S. Wildlife Biologist: population and community ecology, multimedia and GIS applications, systems development and interface design.

**O'Shea, Thomas**, Ph.D. Research Wildlife Biologist: mammalogy.

**Oyler-McCance, Sara**, Ph.D. Conservation Geneticist: population genetics, avian population ecology, modeling, GIS.

**Ramotnik, Cindy**, M.S. Museum Specialist (Zoology): collection management, mammals, plethodontid salamanders, biological surveys.

**Ruth, Janet M.**, Ph.D. Ecologist: avian ecology, montane riparian birds, grassland birds, bird conservation, Partners In Flight.

**Sedgwick, James A.**, Ph.D. Research Wildlife Biologist: avian ecology, natural history, lifetime reproductive success, costs of cowbird parasitism.

**Skagen, Susan K.**, Ph.D. Research Wildlife Biologist: migration ecology, declining grassland birds, shorebirds, avian ecology.

**Stanley, Thomas**, Ph.D. Research Wildlife Biologist: quantitative population biology, avian and mammalian ecology, statistical modeling.

**Valdez, Ernest**, Ph.D. candidate. Wildlife Biologist: mammals, biological survey, systematic collections.

## Contact Information

**Patty Stevens**, Branch Chief

U.S. Geological Survey, Fort Collins Science Center  
2150 Centre Avenue, Building C  
Fort Collins, Colorado 80526-8118

Tel. 970.226.9499 Fax 970.226.9230 [patty\\_stevens@usgs.gov](mailto:patty_stevens@usgs.gov)

## FORT Online

Find information about FORT science, products, and resources at  
<http://www.fort.usgs.gov>

Learn more about the Species and Habitats of Federal Interest Branch at  
<http://www.fort.usgs.gov/research/300/300.asp>