

## FORT COLLINS SCIENCE CENTER

### Who We Are and What We Do

The U.S. Geological Survey's Fort Collins Science Center (FORT) is one of 17 USGS biological science centers nationwide. FORT conducts research and develops technical applications to assist land managers in understanding and managing biological resources, habitats, and ecosystems. Although the majority of FORT's activities are conducted within the 15-state Central Region of the USGS, many FORT projects are national or international in scope.

FORT serves all Department of the Interior land management bureaus and other natural resource agencies. In addition, FORT scientists partner with DOI and other federal entities such as CDC, DOE, EPA, NASA, NIH, and USDA to share expertise and resources. FORT also partners with several universities and works cooperatively with states and nongovernmental organizations. Products and services include reports and publications, predictive models and software, maps and GIS products, and other technical assistance in the form of meetings, workshops, training, field visits, and needs assessments.



### How We Operate

FORT conducts its science with a staff of more than 110 Federal employees and a support services contract of more than 40 professionals. Most staff are based at the headquarters in Fort Collins. To facilitate collaborative science, FORT scientists are also collocated at the Natural Resource Ecology Laboratory at Colorado State University; the Rocky Mountain Center for Conservation Genetics and Systematics at the University of Denver; the Arid Lands Field Station at the University of New Mexico; the Jemez Mountains Field Station at Bandelier National Monument; and the Bureau of Reclamation's Technical Services Center in Denver.

### How We're Organized

FORT is organized into five major science areas, or Branches. Interdisciplinary project teams integrate research across these five Branches:

#### Aquatic Systems and Technology Applications

FORT scientists develop and adapt technology to address a range of natural resource issues and provide biological information that is relevant and usable. FORT staff have state-of-the-art expertise in Unix- and Windows-based information systems, satellite image processing, satellite telemetry of wildlife, hydraulics, sediment transport, water quality, aquatic habitat modeling, GIS, decision support systems, web-based applications, and basic ecology. Working with natural resource managers, FORT scientists have developed applications for such issues as river



systems management, reservoir operations, constructed wetlands, environmental contaminants, international wildlife policy, endangered species, and economic valuation of natural resources. FORT also leads development of the National Biological Information Infrastructure (NBII) Southwest Information Node to help address that region's complex environmental issues.

#### Ecosystem Dynamics

Many challenging natural resource management issues require consideration of a web of interactions among ecosystem components. The spatial and temporal complexity of these ecosystem problems



demands an interdisciplinary approach that integrates biotic and abiotic processes. FORT provides information for federal resource managers and uses long-term, place-focused research and monitoring on federal lands to advance ecosystem science.

Current studies fall into five general areas. Fire Science focuses on the effects of fire on plant, animal, and human communities at multiple scales, and on the interactions between post-fire vegetation, runoff, and erosion processes. Riparian Ecology is concerned with interactions among streamflow, fluvial geomorphology, and riparian vegetation. Herbivore-Ecosystem Interactions involves quantifying the factors regulating herbivore populations and cascading effects through predator-herbivore-plant-soil linkages. Reference Ecosystems entails long-term, place-based studies of ecosystem biogeochemistry. Integrated Assessments is investigating how to synthesize multiple stressors and response variables over complex landscapes in ways that are useful for management and planning.

## Invasive Species Science

Non-native species of plants, animals, and other organisms negatively affect the ecosystems they enter, with an estimated economic impact in the U.S. of over \$130 billion per year. The goal of this Branch is to provide science and technical assistance relating to invasive species management concerns, from how these species are introduced to identifying areas vulnerable to invasion.



FORT houses the National Institute of Invasive Species Science, a consortium of partnerships established by the USGS and its cooperators. Through FORT, the Institute is developing the Invasive Species Information Node of the NBII, a comprehensive, accessible database of information about invasive plants, animals, and disease agents. From these data, and in partnership with Colorado State University (CSU), the CSU Natural Resource Ecology Laboratory, and NASA, FORT scientists are developing models to understand and predict invasive species distributions for more effective management.



FORT researchers also are testing prevention and intervention techniques for the brown treesnake, which has extirpated many native species on Guam and threatens indigenous species on Hawaii and other Pacific islands.

## Policy Analysis and Science Assistance

Most resource management decisions involve the integrated use of biological, sociological, and economic information. Combining this information provides a more comprehensive basis for making effective land management and conservation decisions. FORT scientists conduct biological, social, and economic research and integrate the findings to inform land and resource managers making these decisions. Examples include identifying policy controversies or questions and areas where biological and social science research is needed to address them; developing approaches to assist researchers in preparing scientific evidence; assessing habitat alteration in a manner consistent with policy needs; and evaluating policy options.



FORT scientists also assist decision makers by helping to resolve resource management conflicts through stakeholder and institutional analyses of conservation policies and management practices. For those involved in natural resource negotiations, FORT scientists offer research-based training courses.

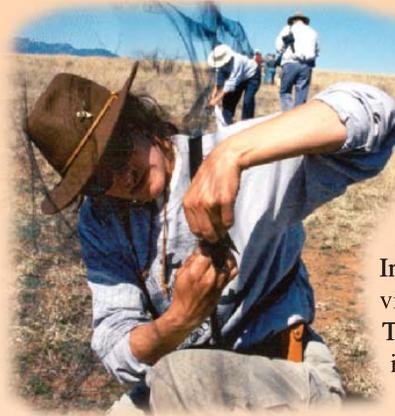
## Species and Habitats of Federal Interest

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. Scientists in the Species and Habitats of Federal Interest Branch conduct 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 also develop reintroduction and restoration techniques, technologies for monitoring populations, and novel methods to analyze data on population trends and habitat requirements.



## Where We're Located

The Fort Collins Science Center headquarters is located on the Natural Resources Research Center (NRRC) campus at Colorado State University. The NRRC was established to support and enhance cooperative research on natural resource issues. It is a partnership of six Federal agencies from the Departments of Agriculture and the Interior, the U.S. General Services Administration, and CSU. The campus consists of six buildings housing more than 1,200 natural resource professionals.



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## FORT Online

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