



## FORT COLLINS SCIENCE CENTER

### Who we are and what we do

The U.S. Geological Survey, Fort Collins Science Center (FORT), is one of 17 USGS biological science centers.



The Center conducts research and develops technical applications to assist land managers in understanding and managing biological resources, habitats, and ecosystems. The majority of FORT's activities are conducted within the 15-state Central Region of the USGS. However, many FORT projects are national or international in scope.

FORT serves all Department of the Interior (DOI) land management agencies 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.

FORT scientists produce 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 Resources Ecology

Laboratory at Colorado State University; the new 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 around six major science programs. Interdisciplinary project teams integrate research across these six *Science Program Areas*:

#### **Invasive Species Science**

Non-native species of plants, animals, and other organisms negatively affect the ecosystems they enter, sometimes permanently, with an estimated economic impact in the U.S. of over \$130 billion per year. The Institute's goal 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.

For example, FORT is leading development of the Invasive Species Information Node of the National Biological Information Infrastructure (NBII), a comprehensive, accessible database of information about invasive plants, animals, and disease agents. From these data, and in partnership with Colorado State University and NASA, FORT scientists are developing models to understand and predict



invasive species distributions for more effective management. FORT researchers are also testing prevention and intervention techniques for the brown treesnake, which is responsible for the extirpation of many native species on Guam and poses a significant threat to indigenous species on other Pacific islands.

#### **Ecosystem Dynamics**

Many challenging natural resource management issues require consideration of a web of interactions among ecosystem components. Essentially ecosystem problems, their spatial and temporal complexity demands an interdisciplinary approach integrating biotic and abiotic processes. FORT provides information for federal resource management decisions 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 and animal com-



munities 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 comprises long-term, place-based studies of ecosystem biogeochemistry. Finally, Integrated Assessments is investigating how to synthesize multiple stressors and response variables over complex landscapes in ways that are useful for management and planning.

### **Species and Habitats of Federal Interest**

Ecosystem changes directly impact a wide variety of individual plant and animal species, native floral and faunal communities, and groups of species such as amphibians and grassland birds. Many species are dependent on suitable management of public lands to prevent listing under the Endangered Species Act or for recovery from endangered status.

FORT conducts research on the ecology, habitat requirements, distribution and abundance, and genetics of many such species, including black-footed ferrets, migratory and grassland birds, bats, boreal toads, and prairie dogs. Scientists also develop reintroduction and restoration techniques as well as technologies for monitoring populations and analyzing data.



### **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. Toward this

end, FORT scientists contribute expert knowledge by conducting biological, social, economic, and institutional analyses of conservation policies and management practices. This information helps land managers and other decision makers in their efforts to meet competing resource demands in water resources projects, site-specific land management plans, and regional ecosystem management programs. These integrated science activities have included evaluating national conservation policies, regional economic trends, and wildlife management policies. FORT scientists also assist decision makers by helping to resolve resource management conflicts through stakeholder and institutional analyses.

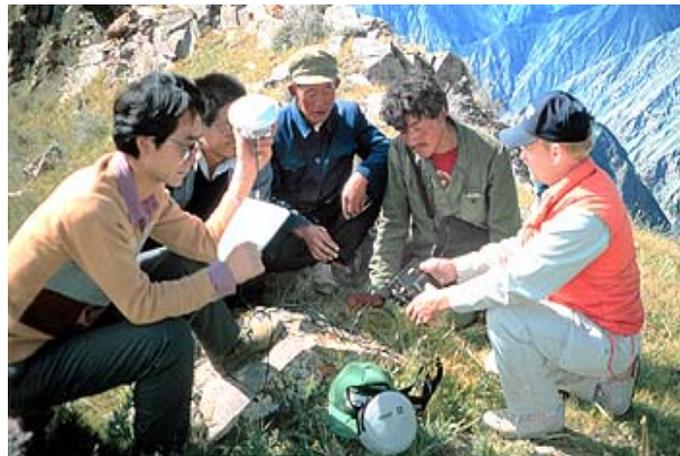
### **Aquatic Systems and Technology Applications**

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 NBII Southwest Information Node to help address that region's complex environmental issues.

### **International Center for Applied Ecology**

Restoring and preserving natural systems globally depends increasingly on exchanging knowledge and expertise across nations. FORT brings scientists



from other countries to the USGS to build experience, share expertise, and generate a Federal scientist network for use in this country and by countries of guest scientists. FORT scientists also offer technical assistance and training in cooperating countries. Projects have involved neotropical migratory birds and bats in the Western Hemisphere, sustainable economic development and conservation in China, snow leopard and red-crowned crane conservation in Asia, and several comparative ecology studies involving invasive plants, plague, and the endangered black-footed ferret. FORT is also testing ways of sharing information and methodologies remotely.

### **Where we're located**

The Fort Collins Science Center headquarters is located on the *Natural Resources Research Center* (NRRC) campus. 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 Colorado State University. When finished in 2004, the campus will consist of six buildings housing more than 1200 natural resource professionals.

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