Cooperative Research Units

Subactivity	1999 Estimate	Uncontrol. & Related Chgs.	Program Redirect	Program Changes	FY 2000 Budget Request	Change from 1999
Cooperative Research Units	12,497	263	-80	0	12,680	183
Total Requirements $000	12,497	263	-80	0	12,680	183

Note: The Program Redirect column reflects the redirection of funds to the Science Support and Facilities activities.

Current Program Highlights

The Cooperative Research Units program is a unique cooperative partnership among Federal and State Governments and academia, and is one of USGS' strongest links to Federal and State management agencies. The program provides the natural resource management community with scientific information and trained personnel to implement sound resource management. Federal scientists stationed at universities:

- identify, formulate, coordinate, and meet agency information needs through the pooling of resources among agencies for cost-effective delivery of natural resource management;
- provide access to scientific expertise among Unit scientists, university faculty, and other Unit Cooperators, especially where the required expertise is not readily available within Federal resource agencies; and
- provide Federal and other natural resource managers access to a geographically dispersed science organization of Units to meet information needs that transcend State and regional boundaries.

Federal support of the Cooperative Research Units is augmented by State and university Cooperator contributions of expertise, equipment, facilities, and project funding, thereby enhancing the program's cost-effectiveness. Local guidance of individual Units by Unit Cooperators ensures that projects addressed by the Units are of high priority. Through university affiliations, Unit scientists train future natural resource professionals, and provide opportunities through graduate education to diversify the Federal workforce.

Cooperative Research Unit Locations
Cooperative Fish and Wildlife Research Units

Alabama	Auburn University
Alaska	University of Alaska
Arizona	University of Arizona
Arkansas	University of Arkansas, Fayetteville
California	Humboldt State University
Colorado	Colorado State University
Florida	University of Florida
Georgia	University of Georgia
Hawaii	University of Hawaii
Idaho	University of Idaho
Iowa	Iowa State University
Kansas	Kansas State University
Louisiana	Louisiana State University
Maine	University of Maine
Maryland	University of Maryland, Eastern Shore
Massachusetts	University of Massachusetts
Minnesota	University of Minnesota
Mississippi	Mississippi State University
Missouri	University of Missouri
Montana	Montana State University (Fish Unit)
	University of Montana (Wildlife Unit)
New Mexico	New Mexico State University
New York	Cornell University
North Carolina	North Carolina State University
Oklahoma	Oklahoma State University
Oregon	Oregon State University
Pennsylvania	Pennsylvania State University
South Carolina	Clemson University
South Dakota	South Dakota State University
Tennessee	Tennessee Tech University
Texas	Texas Tech University
Utah	Utah State University
Vermont	University of Vermont
Virginia	Virginia Polytechnic University
Washington	University of Washington
West Virginia	West Virginia University
Wisconsin	University of Wisconsin, Stevens Point (Fish Unit)
	University of Wisconsin, Madison (Wildlife Unit)
Wyoming	University of Wyoming

Training Projects with Historically Black Colleges and Universities

Arkansas	University of Arkansas, Pine Bluff
Louisiana	Grambling State University

The Unit program consists of 39 Cooperative Fish and Wildlife Research Units located in 37 States, and two special minority projects at Historically Black Colleges and Universities. The Federal Government is responsible for staffing each Unit with two to four scientists. Over the past two fiscal years, with increased funding, the number of unfunded science vacancies in the Unit Program has dropped from 14 to 6. In FY 1998 and FY 1999, personnel actions were initiated for research positions in Alabama, Alaska, Arkansas, California, Georgia, Hawaii, Maine, Massachusetts, Minnesota, New Mexico, North Carolina, Oklahoma, Pennsylvania, South Carolina, South Dakota, Vermont, Washington, West Virginia, and Wisconsin.

During FY 1998, Unit scientists published more than 400 scientific papers, submitted more than 300 reports to management agencies, and presented more than 750 papers and workshops to natural resource professional societies and agencies. In total, over 1,200 research projects were active in FY 1998, with 215 projects completed and 200+ new projects initiated in response to State and Federal agency needs. Unit projects covered a wide range of disciplines, including biodiversity, instream flow, anadromous fish and migratory bird management, wetland management and restoration, wildlife disease investigations, ecotoxicology, aquaculture and fish propagation, and population genetics.

Through affiliations with host universities, Unit scientists advise and mentor more than 600 graduate students. More than 100 of these students received graduate degrees in FY 1998. Activities also involve Unit sponsorship of undergraduate and graduate education programs for minorities that are underrepresented in the Federal workforce. These efforts focus on minority student recruitment and career training in natural resources and include USGS programs for minority students at Grambling University, University of Arkansas-Pine Bluff, and University of Arizona.

In response to resource management agency needs, Unit researchers will continue to investigate such issues as wildlife biodiversity, ecosystem management, landscape ecology, pollution assessment and control, endangered species management, conservation of animal populations and habitats, management of fisheries and control of exotic species. Unit research will continue to facilitate cooperation and coordination of multiple agencies at the local, State, regional, and national level.

Recent Accomplishments

Environmental Contaminants

The Florida Cooperative Fish and Wildlife Research Unit identified several sites within the Mississippi River system where animals exhibited signs of significant alteration of sex hormones as well as the presence of environmental contaminants known to cause the observed effects. This research is leading to an early warning system for the occurrence of endocrine disrupting chemicals in waters of the nation.

The Montana Unit determined for the U.S. Fish & Wildlife Service (FWS), that wetland burning only slightly increased the loss rate of selenium from wetlands at Benton Lake National Wildlife Refuge. Thus wetland burning does not appear to be as effective as it was hoped in reducing selenium availability to waterfowl and other water birds on the refuge.

The New Mexico Unit characterized for the New Mexico Water Resources Research Institute, seasonal effects of water quality on mercury concentrations in water and sediment in two reservoirs in south central New Mexico. The source, transport, and fate of mercury contamination were determined for these reservoirs. State and federal agencies will use results of this study to better understand and manage mercury contamination in these reservoirs

Non-game species

The Maine Cooperative Fish and Wildlife Research Unit with support from the University of Maine and the Maine Department of Inland Fisheries and Wildlife, determined habitat relationships for selected species of breeding seabirds. This information will help the state and other agencies to manage seabird nesting islands.

The Minnesota Unit evaluated for the National Marine Fisheries Service (NMFS), foraging behavior, survival, and reproduction of California sea lions in southern California. This evaluation provided NMFS with information necessary to more effectively manage this growing population of marine mammals.

The New York Unit combined breeding bird atlas data with public land's GIS coverages from the state Gap Analysis database, to identify areas of high species diversity and occurrences of sensitive bird species (state-listed endangered, threatened, and special concern species) on or near public lands in New York State. The information will be useful for the New York State Department of Environmental Conservation for identifying potential Bird Conservation Areas in compliance with directives of state legislation passed in 1997.

Imperiled species

The Alabama Cooperative Fish and Wildlife Research Unit determined for the FWS, the distribution of several endemic fishes, mussels, and crayfishes in the Tallapoosa River watershed of Alabama and Georgia. Data will be used to evaluate population status of endemics and *Lampsilis altilis* (federally threatened mussel) in relation to water resource allocation in the basin.

The Alabama Unit conducted surveys and identified habitat requirements for International Paper Corporation, and FWS on declining (Category 2) plants species and Henslow's Sparrows in pitcher plant bogs in the Gulf Coastal Plain. Results will be used by the FWS and state agencies to identify management activities for the protection and enhancement of declining plant and bird populations.

The Florida Unit determined for the FWS the host fish required to complete the life cycle of four endangered mussels in the Southeastern U.S. This information is essential to effectively recover the species.

The Florida Unit determined for the FWS reintroduced endangered Schaus swallowtail butterflies into natural habitats in the Florida Keys. This work is in support of the FWS's recovery plan for the species.

The South Carolina Unit evaluated for the FWS, the toxicity of metabolic waste products on shortnose sturgeon. Results of this research will be used to modify culture practices at federal hatcheries in order to improve production of this endangered species for research and management purposes.

Game management

The Colorado Cooperative Fish and Wildlife Research Unit evaluated for the Colorado Division of Wildlife, the impact of Division of Wildlife-sponsored habitat programs on the survival of pheasant broods in eastern Colorado. Results will be used to modify habitat practices of the Division's pheasant management program.

The North Carolina Unit summarized and completed for the U.S. Army, analyses of a 10-year study of vegetation response to prescribed burning practices at Fort Bragg, North Carolina. These studies will be used to improve habitat conditions for northern bobwhite quail at Fort Bragg.

The Oklahoma Unit assessed for the Oklahoma Department of Wildlife Conservation and the FWS, landscape-level temporal changes to breeding habitat of lesser prairie chickens in Oklahoma, Texas, and New Mexico. This information will provide managers with science-based information to address the range-wide declines of the lesser prairie chicken.

The Pennsylvania Unit analyzed for the Pennsylvania Game Commission, land use patterns, human development, and aspects of elk life history to identify areas within the state that would be suitable for translocation of elk from their current range in Pennsylvania. The State will use this information in their restocking program.

The Virginia Unit completed for the Virginia Department of Game and Inland Fisheries, a demographic study of black bears in southwestern Virginia. These data will be used in developing a bear management plan for Virginia.

Fisheries management

The Arizona Cooperative Fish and Wildlife Research Unit evaluated techniques for the University of Arizona, and in cooperation with the Molokai, Hawaii Aquaculture Association and the Agricultural Experiment Station (USDA), to integrate aquaculture with irrigated agriculture. Results provide aquaculturists with a methodology for culturing economically important fish species agricultural irrigation ditches.

The Arizona Unit evaluated factors for the Arizona Game and Fish Department, limiting crappie populations in a series of reservoirs along the Salt River. The findings will be used by the Department to better manage crappie populations for recreational fishing in these reservoirs.

The California Unit, in cooperation with the Bureau of Land Management (BLM), determined the downstream drift of aquatic invertebrates in the Sacramento River, California, and evaluated mortality to juvenile chinook salmon from experimental pumps. This information is helping BLM manage agricultural water uses in the Central Valley of California.

The Louisiana Unit provided for the Federal Emergency Management Agency (FEMA) and Louisiana Department of Wildlife and Fisheries, an analyses of water quality, food web, and fish assemblage variations that occur with cyclic changes in river stages in the Atchafalaya River Basin. Results were used to improve water management strategies for fishes and aquatic resources in this basin.

The Mississippi Unit examined the relationship between striped bass and other recreational fish at Norris Reservoir, Tennessee. This study is expected to settle a long-standing debate among Tennessee anglers, and provide Tennessee Wildlife Resources Agency the information needed to manage fisheries in Norris and similar TVA reservoirs.

The South Carolina Unit evaluated for the South Carolina Department of Natural Resources (SCDNR), the physiological differences of hatchery-produced and wild red drum in response to recreational angling. This study will enable the SCDNR to better evaluate stock enhancement programs for the species.

Ecosystem management

The Alaska Cooperative Fish and Wildlife Research Unit conducted for the FWS, a population viability analysis of the Alexander Archipelago wolf in southeast Alaska. The results indicate that it will be very difficult to simultaneously maintain abundance of both wolf and deer populations in the face of continued losses in habitat carrying capacity. The information will be used by federal and state agencies as part of the Tongass Land Management Plan.

The Colorado Unit found for the FWS, that it is feasible to assess the cost-effectiveness of large-scale prescribed burning projects in Sequoia-Kings Canyon National Park using spatial fire simulations and fuel consumption estimates. Through alternative channels, the prototype is being developed, the feasibility of expanding this approach to other Department of Interior units is being tested, and a computer program for assessing costs of hazard fuel reduction projects is being revised and updated.

The Idaho Unit developed methods to monitor noxious weed infestations in our National Park Service areas in Idaho. A database was developed with details as to frequency of occurrence, area, associated vertebrate species, and management implications for fire management. Information will be used by managers for managing native ecosystems, developing models of post fire succession, and developing fire management strategies.

The Louisiana Unit provided for the U.S. Army Corps of Engineers, information on causes and effects of recurring hypoxia (oxygen defiency) in a swamp management area of the Atchafalaya River Basin. These hypoxic events are associated with the downward limb of the spring flood pulse after water temperatures exceed 20c. The information can be used to manage water flows through specific stagnant regions in the Basin to prevent losses of crawfish and finfish recruits.

Animal biodiversity, surveys and monitoring

The Minnesota Unit evaluated for the Environmental Protection Agency (EPA), the relationship between land use patterns and distribution and abundance of amphibians and

macroinvertebrates in North Dakota. The EPA is using this information to assess the utility of a variety of indicators of wetland quality.

The Oklahoma Unit developed for the FWS and The Trust for Public Land, a GIS model of terrestrial and aquatic vertebrate habitat for long-term management of Tishomingo National Wildlife Refuge in south central Oklahoma. The model is available on CD-ROM and has proven effective in dealing with the effects of multiple-use concerns at this refuge.

The Wisconsin Unit assessed for the U.S. Department of Defense, the biodiversity and ecological integrity of Oak Barrens communities at Fort McCoy, Wisconsin. The project assessed the distribution and abundance of endangered species, evaluated the use of habitat by migratory birds, developed restoration strategies, and resulted in a comprehensive management plan for this area.

The Idaho Unit determined for the U.S. Army Corps of Engineers, the species richness and relative abundance of amphibians and reptiles in riparian and upland habitats along the lower Snake River reservoirs. This information will be used to assess the importance of riparian habitats to amphibians and reptiles. It will also be used to minimize impacts to these species under future operational scenarios of the Snake River dams.

The Montana Unit worked cooperatively with the Blackfeet Nation, the Native American Fish and Wildlife Society, and the FWS, to assess avian species composition and abundance on the Blackfeet Wetland-Grassland, Montana. Habitat quality on this tribal managed site was high, with excellent nesting success by several waterfowl species. Intensive management practices that were previously proposed on the Blackfeet Reservation, were recommended as unnecessary, thus saving the cost of intensive management activities.

Habitat management and restoration ecology

The Colorado Cooperative Fish and Wildlife Research Unit assessed for the FWS Rocky Mountain Arsenal National Wildlife Refuge, the effects of contaminated sediments on macroinvertebrates and fish assemblages in lakes at the refuge. Results are to be used by the FWS to evaluate the success of future remediation activities dealing with lake cleanup and decontamination at this Superfund site.

The Kansas Unit with funding provided by the National Science Foundation, determined the effects of interval burning on Lonestar tick populations. Rangeland treatments that benefit cattle are important to wildlife as well, because they may control wildlife food resources as well as cover. One-year burn intervals effectively reduced Lonestar tick abundance below levels found at sites burned at four or twenty-year intervals. The presence of bison did not have a significant effect on tick populations.

The Montana Unit assessed for the Montana Department of Fish, Wildlife and Parks (MTFWP), fry recruitment of Yellowstone cutthroat trout in response to increased instream flows associated with water leasing in tributaries of the Yellowstone River. Results are being used to evaluate the pilot water leasing program.