

SUMMARY OF RESEARCH ACTIVITIES WITHIN THE NATIONAL PARK SERVICE AREAS
COOPERATING WITH THE U.W.-N.P.S. RESEARCH CENTER, 1987.

Big Hole National Battlefield

- I. Studies Conducted By Park Personnel.
 - A. Plant community changes since the Battle in 1877.
Park Staff.
Initiated 1977.
Ongoing.
- II. Studies Supported With National Park Service Funds.
 - A. Vertebrate inventory for Big Hole National Battlefield.
Frederick Lindzey, University of Wyoming.
Initiated 1987.
Completion 1988.

Bighorn Canyon National Recreation Area

- III. Studies Supported By University And Allied Funding Sources.
 - A. Distribution and habitat analysis of Bighorn Sheep in Bighorn Canyon National Recreation Area.
Sanford Schemnitz, New Mexico State.
Source of Support: University of Wyoming/NPS Research Center and other sources.
Initiated 1985.
Ongoing.
- IV. Studies Supported By Funds From Other Sources.
 - A. Bighorn Cave research project.
Source of Support: Volunteers from various grottos.
Initiated 1985.
Ongoing.

Bryce Canyon National Park

- I. Studies Conducted By Park Personnel.
 - A. Inventory of conflicts with wilderness management.
Park resource manager and ranger staff.
Initiated 1987.
Ongoing.
 - B. Inventory of backcountry campsite conditions. Initiation of monitoring program to track impacts to biological resources from backcountry campsite use.
Park resource manager and ranger staff.

- Initiated 1987.
Ongoing.
- C. Inventory and monitoring of Peregrine Falcon aeries.
Park resource manager and SCA volunteer.
Initiated 1986.
Ongoing.
- II. Studies Supported With National Park Service Funds.
 - A. Evaluation of the study of mining noise/Alton Coal fields.
WASO Energy, Mining and Minerals; Jim Foch, private contractor. Original study contracted and paid for by Utah International, Inc.; BBN, private contractor.
Initiated 1986.
Ongoing.
 - B. Effects of mining operations on night skies (modeling).
WASO Air Quality; Systems Applications, Inc., private contractor; Utah International, Inc.
Initiated 1987.
Ongoing.
 - C. Plant community distribution and dynamics.
Dave Roberts, Linda Gottschalk, Greg Hallsten, Utah State University, University of Wyoming and Park resource manager.
Initiated 1986.
Ongoing.
 - D. Fire effects.
RFP's through University of Wyoming-National Park Service Research Center.
Initiated 1986.
Ongoing.
 - E. Inventory and evaluation of Bryce Canyon water resources.
WASP Water Resources; Will Mast, researcher, Park staff.
Initiated 1987.
Ongoing.
- III. Studies Supported By Universities and Allied Funding Sources.
 - A. Geologic investigation of the Paunsaugunt Fault.
Eric Lundin, University of Arizona.
Source of Support: University of Arizona and personal.
Initiated 1986.
Completion 1987.

Canyonlands National Park

- I. Studies Conducted By Park Personnel.
 - A. Biotic succession following the 1982 Bulter Wash Fire and Salt Creek Fire.
Kate Kitchell and Jeff Connor, Natural Resource Specialist.
Initiated 1982.
Ongoing.
 - B. Campsite assessment in the backcountry of Canyonlands National Park.
Kate Kitchell, Natural Resource Specialist.
Initiated 1978.
Ongoing.
- II. Studies Supported With National Park Service Funds.
 - A. Water resources assessment in the Needles District and adjacent BLM lands.
Ecosystem Research Institute.
Initiated 1985.
Ongoing.
 - B. Determine the sulfur content of different-age annual whorls of pinyon trees.
Roger W. Ferenbaugh.
Initiated 1985.
Ongoing.
- III. Studies Supported By Universities and Allied Funding Sources.
 - A. Evolutionary significance of a particular DNA sequence from the Kangaroo Rat, D. ordii.
Karl C. Lark, University of Utah.
Source of Support: National Institute of Health.
Initiated 1983.
Ongoing.
 - B. Eriogonum inflatum, the allocation of limiting resources between reproduction and survival in life history variants of Eriogonum inflatum.
Nona R. Chiariedllo, University of Utah.
Source of Support: ?
Initiated 1983.
Ongoing.
 - C. Research on the endangered Colorado Squawfish in Canyonlands National Park.
Bob Williams, Bureau of Reclamation.
Source of Support: Bureau of Reclamation.
Initiated 1984.
Ongoing.

- D. Research project on the interactions between yucca, its pollinator and its seed predator.
John F. Addicott, University of Alberta.
Source of Support: Natural Sciences and Engineering Research, Council of Canada.
Initiated 1981.
Ongoing.
- E. An analysis of pothole water in Canyonlands National Park.
Stanley I. Dodson, University of Wisconsin.
Source of Support: ?
Initiated 1984.
Ongoing.

Capitol Reef National Park

- I. Studies Conducted By Park Personnel
 - A. Impact of livestock on Capitol Reef National Park ecosystems: vegetation changes on upland riparian benches in lower Hall's Creek.
Norman R. Henderson, Resource Management Specialist.
Initiated 1987.
Ongoing.
 - B. Impact of livestock on a population of Sclerocactus wrightiae.
Norman R. Henderson, Resource Management Specialist.
Initiated 1986.
Ongoing.
 - C. Coliform bacteria in tinajas of the Waterpocket Fold: changes correlated with the presence of cattle in Capitol Reef National Park.
 - D. Grazing effects on the grasslands of Capitol Reef National Park.
Norman R. Henderson, Resource Management Specialist.
Initiated 1984.
Ongoing.
- II. Studies Supported With National Park Service Funds.
 - A. Presettlement grassland composition of Capitol Reef National Park.
Richard Fisher, Utah State University.
Initiated 1987.
Ongoing.
 - B. Abundance and distribution of Tamarisk along the Fremont River within Capitol Reef National Park.

- Mark Pistrang, Duke University, School of Forestry and Environmental Studies.
Initiated 1986.
Completion 1988.
- C. Vegetation communities of Capitol Reef National Park.
Ken Heil, San Juan College, Farmington, New Mexico.
Initiated 1986.
Ongoing.
- D. Ecological characterization/biological assessment of the tinaja ecosystems of the Waterpocket Fold.
James Haefner, Utah State University.
Initiated 1986.
Ongoing.
- E. Livestock grazing impacts on riparian areas within Capitol Reef National Park.
Richard C. Barth, Soil-Plant Systems.
Initiated 1984.
Completion 1988.
- F. Domestic livestock grazing and range evaluation within Capitol Reef National Park.
Mike Davis, Production Ecology.
Initiated 1984.
Completion 1989.
- G. Ecology and distribution of newly introduced Bighorn Sheep within Capitol Reef National Park.
Gar Workman, Utah State University.
Initiated 1984.
Ongoing.
- III. Studies Supported By Universities And Allied Funding Sources.
- A. Some responses of soil microphytic crusts to livestock trampling.
Neil West, Utah State University.
Source of Support: USDA Coop. States Research Service.
Initiated 1986.
Ongoing.
- B. A biogeographical analysis of the grasshoppers of the Great Basin.
James MacMahon, Utah State University.
Source of Support: Utah State University.
Initiated 1984.
Completion 1988.

- C. Analysis of the upper Permian and Triassic Strata.
Diane Kamola, University of Utah.
Source of Support: University of Utah.
Initiated 1984.
Ongoing.

- IV. Studies Supported By Funds From Other Sources.
 - A. Habitat assessment and criteria for the Peregrine Falcon in Southeastern Utah.
Dr. Clayton White, Brigham Young University.
Source of Support: Utah Division of Wildlife Resources.
Initiated 1987.
Ongoing.

 - B. Basalt Dikes.
Anne Gartner, U.S. Geological Survey.
Source of Support: U.S. Geological Survey.
Initiated 1984.
Completion 1988.

 - C. Phylinae (Hemiptera: Miridae) of North America and Mexico.
Randall Schuh, American Museum of Natural History.
Source of Support: National Science Foundation.
Initiated 1983.
Ongoing

 - D. Analysis of the Jurassic system on the Colorado Plateau.
Fred Peterson, U.S. Geological Survey.
Source of Support: U.S. Geology Survey.
Initiated 1980.
Ongoing.

 - E. Sedimentology of the Upper Triassic Chinle Formation, Southeastern Utah.
Russell Dubiel, U.S. Geological Survey.
Source of Support: U.S. Geological Survey.
Initiated 1980.
Ongoing.

 - F. Macroinvertebrate (Benthos) Monitoring Program.
Michael Reichert, Bureau of Water Pollution Control, Utah Department of Health.
Source of Support: State Water Pollution Control and Fed. EPA 106 grant.
Initiated 1977.
Ongoing.

Custer Battlefield National Monument

- II. Studies Supported With National Park Service Funds.
- A. Archeological examination and inventory of cultural resources Custer Battlefield National Monument.
Douglas D. Scott, Midwest Archeological Center, Lincoln, Nebraska.
Source of Support: Custer Battlefield Historical and Museum Association.
Initiated 1983.
Ongoing.
 - B. Geomorphologist study of deep ravine.
C. Vance Haynes, University of Arizona.
Source of Support: Custer Battlefield Historical and Museum Association.
Initiated 1985.
Ongoing.
 - C. Forensic analysis of human bones found on Custer Battlefield as a result of 1984 and 1985 archeological survey.
Source of Support: Custer Battlefield Historical and Museum Association.
Initiated 1984.
Ongoing.

Dinosaur National Park

- I. Studies Conducted By Park Personnel.
- A. Peregrin Falcon recovery program.
Resource Management Specialist and other staff, Colorado Division of Wildlife.
Initiated 1977.
Ongoing.
 - B. Baseline vertebrate survey.
Resource Management Specialist and other park staff, National Ecology Center.
Initiated 1987.
Ongoing.
 - C. Bighorn Sheep movement and habitat selection.
Resource Management Specialist and other staff.
Initiated 1984.
Ongoing.
 - D. Fire effects studies (vegetation, breeding birds, small mammals).
Resource Management Specialist and other staff.

- Initiated 1984.
Ongoing.
- E. Baseline vegetation studies.
Resource Management Specialist and other staff.
Initiated 1983.
Ongoing.
- F. River campground impact monitoring.
River Ranger and other staff.
Initiated 1979.
Ongoing.
- G. Mormon Cricket population monitoring.
Resource Management Specialist and other staff.
Initiated 1982.
Ongoing.
- H. Apatosaurus excavation.
Paleontologist and staff.
Initiated 1985.
Ongoing.
- I. Quarry cliff face excavations.
Paleontologist and staff.
Initiated 1952.
Ongoing.
- J. Morrison microvertebrates excavation.
Paleontologist and staff.
Initiated 1985.
Ongoing.
- K. Mowry fish excavation.
Paleontologist and staff.
Initiated 1987.
Ongoing.
- II. Studies Supported With National Park Service Funds.
 - A. Ecology and management of Mormon Cricket, Anabrus simplex Haldeman.
John Capinera and Charles MacVean, Colorado State University.
Initiated 1985.
Completion 1987.
 - B. Air quality monitoring (visibility).
Air Resource Specialists, Fort Collins, CO and park staff.
Initiated 1978.
Ongoing.

- C. Inventory of plant species of special concern and the general flora of Dinosaur National Monument.
David Kuntz, Colorado Natural Areas Inventory.
Initiated 1987.
Ongoing.
- III. Studies Supported By Universities And Allied Funding Sources.
 - A. Morrison microvertebrates.
George Engelmann, University of Nebraska, Omaha.
Source of Support: University of Nebraska, Earthwatch.
Initiated 1985.
Ongoing.
- IV. Studies Supported By Funds From Other Sources.
 - A. Colorado River fishes monitoring project.
Harold Tyus, Research Biologist, USFWS.
Source of Support: U.S. Fish and Wildlife Service.
Initiated 1981.
Ongoing.
 - B. Determination of economic impact and economic threshold levels for brush and insect pests in the sagebrush ecosystem.
John Capinera, C. D. Bonham, E. T. Bartlett and Richard Redak, Colorado State University.
Source of Support: Colorado State University, Western Regional Integrated Pest Management Competitive Grants Program (C.S.R.S., U.S.D.A.).
Initiated 1985.
Completion 1987.
 - C. Population monitoring of endangered fish, Utah .
Stephen Cranney, Utah Div. of Wildlife Resources.
Source of Support: Utah Div. Wildlife Resources.
Initiated 1985.
Ongoing.
 - D. Winter habitat study of endangered fish, Green River.
Richard Valdez, BIO/WEST, Inc., Logan, Utah.
Source of Support: U.S. Bureau of Reclamation, U.S. Fish and Wildlife Service.
Initiated 1986.
Ongoing.
 - E. Winter habitat study of endangered fish, Yampa River.
Ed Wick, John Hawkins, Colorado State University.
Source of Support: U.S. Bureau of Reclamation, U.S. Fish and Wildlife Service.
Initiated 1986.
Ongoing.

- F. Colorado Squawfish-Humpback Chub studies, endangered fishes investigations.
Thomas Nesler, Colorado Division of Wildlife.
Source of Support: Colorado Nongame Checkoff Funds, U.S. Fish and Wildlife Service.
Initiated 1987.
Ongoing.
- G. Vertebrate baseline study.
Michael Bogan, National Ecology Center, USFWS.
Source of Support: U.S. Fish and Wildlife Service.
Initiated 1987.
Ongoing.
- H. Baseline analysis of Jurassic rocks on the Colorado Plateau.
Fred Peterson, U.S. Geologic Survey.
Source of Support: U.S. Geological Survey.
Initiated 1982.
Ongoing.
- I. Effects of chemicals used for control of Mormon crickets on kestrels.
Lowell McEwen, Brett Peterson, Colorado State University.
Source of Support: ?
Initiated 1987.
Ongoing.
- J. Habitat studies on the Green River for endangered fishes.
Keith Rose, U.S. Fish and Wildlife Service.
Source of Support: U.S. Fish and Wildlife Service.
Initiated 1986.
Completion 1987.
- K. Taxonomic re-evaluation of the genus Ameletus (mayflies).
Thomas Fink, University of Utah.
Source of Support: University of Utah.
Initiated 1987.
Ongoing.
- L. Food habits and predator-prey relationships of Colorado squawfish.
Steven Hiebert, Stephen Grabowski, U.S. Bureau of Reclamation.
Source of Support: U.S. Bureau of Reclamation.
Initiated 1987.
Ongoing.
- M. Range and cytogenetics of the taxon Gutierrezia sarothrae and its octoploid cytotype (Gutierrezia pomariensis sensu Welsh).

Robyn Tierney, University of Colorado.
Source of Support: ?
Initiated 1987.
Ongoing.

V. Publications

- A. Capinera, J. and C. MacVean. 1987. Ecology and Management of Mormon cricket, Anabrus simplex Haldeman. Final Report to the National Park Service. 63 pp.
- B. Douglas, M. E., W. L. Minckley, and H. M. Tyus. 1987. Qualitative characters, identification of Colorado River Chubs (Cyprinidae, Genus Gila), and the art of seeing well. Department of Zoology, Arizona State University, Tempe, AZ. Unpublished manuscript. 24 pp.
- C. MacVean, C. M. 1987. Ecology and management of Mormon cricket, Anabrus simplex Haldeman. P. 116-136. In J. L. Capinera, ed. Integrated Pest Management on Rangeland: A Shortgrass Prairie Perspective. Westview Press, Boulder, Colorado.
- D. Nesler, T. P. 1987. Squawfish-Humpback Studies. Colorado Division of Wildlife Job Progress Report, Project No.: 02-01-035.

also includes:

- Larval Fish Laboratory (Colorado State University). 1986. Development of Marking and Otolith-Ageing Techniques for Colorado Squawfish. 18 pp.
- Wasowicz, A. F. and R. T. Muth. 1987. Selected References on Fish Otoliths and Marking Young Fish. Larval Fish Laboratory, Colorado State University. 16 pp.
- E. Nesler, T. P., R. T. Muth and A. F. Wasowicz. In press. Evidence of Baseline Flow Spikes as Spawning Cues for Colorado Squawfish in the Yampa River, Colorado. American Fisheries Society Symposium, 11th Annual Larval Fish Conference.
- F. Tyus, H. M. 1986. Life Strategies in the evolution of the Colorado squawfish (Ptychocheilus lucius). Great Basin Naturalist 46 (4):656-661.
- G. Tyus, H. M. 1987. Distribution, reproduction, and habitat use of the razorback sucker in the Green River, Utah, 1979-1986. Transaction of the American Fisheries Society 116:111-116.

- H. Tyus, H. M. and W. L. Minckley. 1988. Migrating Mormon crickets Anabrus simplex (Orthoptera:Tettigoniidae), as food for stream fishes. Great Basin Naturalist 48 (1): in press.
- I. Tyus, H. M., C. A. Karp and K. A. Paulin. 1987. An Assessment of Instream Flow Needs of Rare and Endangered Fishes in the Yampa River, Colorado. Colorado River Fishes Project, U.S. Fish and Wildlife Service. Unpublished draft report. 37 pp.
- J. Tyus, H. M., R. L. Jones and L. A. Trinca. 1987. Green River Rare and Endangered Fish Studies, 1982-1985. Final Report, Colorado River Fishes Monitoring Project. U.S. Fish and Wildlife Service and U.S. Bureau of Reclamation. 117 pp.

Fort Laramie National Historic Site

- II. Studies Supported By University And Allied Funding Sources.
 - A. Vertebrate inventory and analysis.
David M. Armstrong, University of Colorado.
Source of Support: University of Wyoming-National Park Service Research Center.
Initiated: 1987.
Ongoing.

Glacier National Park

- I. Studies Conducted By Park Personnel.
 - A. Glacier National Park landsat based resource information system.
Carl H. Key.
Initiated 1981.
Ongoing.
- II. Studies Supported By National Park Service Funds.
 - A. Grizzly bear population studies.
Cliff Martinka.
Initiated 1967.
Ongoing.
 - B. Aquatic ecosystem inventory.
Leo F. Marnell.
Initiated 1979.
Ongoing.
 - C. Grizzly bear food ecology studies.
Kate Kendall.
Initiated 1982.

Ongoing.

- D. Lake McDonald ecosystem investigations.
Leo F. Marnell.
Initiated 1986.
Ongoing.
 - E. Upper Kintla Lake charr studies.
Leo F. Marnell.
Initiated 1983.
Ongoing.
 - F. Local and long-range movements of Bald Eagles.
Riley McClelland and Leonard Young.
Initiated 1977.
Ongoing.
 - G. Nesting ecology of Bald Eagles.
Riley McClelland and Rick Yates.
Initiated 1985.
Completion 1989.
 - H. Bighorn Sheep insular ecology.
Kim Keating.
Initiated 1985.
Ongoing.
- III. Studies Supported By University And Allied Funding Sources.
- A. Spotted knapweed.
Rob Tyser, University of Wisconsin-La Crosse.
Initiated 1984.
Ongoing.
- IV. Studies Supported By Funds From Other Sources.
- A. Wolf ecology.
Robert Ream.
Source of Support: NPS, USFS, USF&WS.
Initiated 1978.
Ongoing.
 - B. Geology of Glacier National Park.
James Whipple.
Source of Support: U.S. Geological Survey.
Initiated 1979.
Ongoing.
 - C. Border station water chemistry.
Jack Stanford, Yellow Bay Biological Station, Bigfork,
Montana.
Source of Support: University of Montana.
Initiated 1983.

Ongoing.

V. Publication.

- A. Keating, K. A. 1986. Historical grizzly bear trends in Glacier National Park, Montana. Wildl. Soc. Bull. In press.
- B. Keiter, Robert B. 1986 Legal considerations in challenging external threats to Glacier National Park. Envir. Manage., 11(1):121-126.

Glen Canyon National Recreation Area

I. Studies Conducted By Park Personnel.

- A. Monitoring lakeshore tamarisk invasion. Charles W. Wood, Biologist. Initiated 1985. Ongoing.

II. Studies Supported With National Park Service Funds.

- A. A survey of bacterial indicators of fecal pollution in Lake Powell, Glen Canyon National Recreation Area. Jacquelyn A. Fitzgerald, et. al., Department of Biological Sciences, Northern Arizona University, Flagstaff. Initiated 1985. Ongoing.
- B. Reclamation investigations on disturbed lands at Glen Canyon National Recreation Area. Jeff Meyer and Robert Comer, Thorne Ecological Institute, and Jim Holland, Glen Canyon National Recreation Area. Initiated 1984. Completion 1994.
- C. Inventory and evaluation of campsites and subsequent development of a recreation model for the San Juan River from Sand Island to Clayhills Crossing. Larry Agenbroad and Dale Nations, Northern Arizona University, Flagstaff. Initiated 1985. Ongoing.
- D. Survey of Peregrine Falcons at Zion and Canyonlands National Parks and Glen Canyon National Recreation Area. James H. Enderson, The Peregrine Fund, Boise, Idaho. Initiated 1984. Ongoing.
- E. Cultural resources inventory. Richard Ambler, Northern Arizona University, Flagstaff. Initiated 1984. Ongoing.

- F. Ruins stabilization.
Paul Nickens, Nickens and Associates, Montrose, Colorado.
Initiated 1983.

Ongoing.
 - G. Paleontological studies.
Larry Agenbroad, Northern Arizona University, Flagstaff.
Initiated 1984.
Ongoing.
- IV. Studies Supported By Funds From Other Sources.
- A. Glen Canyon environmental studies: A series of studies evaluating the impact of Glen Canyon Dam on the Colorado River through Glen and Grand Canyons.
Dave Wegner, Bureau of Reclamation.
Source of Support: Bureau of Reclamation, Salt Lake City.
Initiated 1982
Completion 1987.

Grand Teton National Park

- I. Studies Conducted By Park Personnel.
 - A. Ecological effects and biotic succession following the 1974 Waterfalls Canyon fire.
William J. Barmore, Jr., Research Biologist.
Initiated 1974.
Ongoing. Measured in 1975. 1976. 1977. and 1983.
 - B. Snake River cutthroat trout investigations.
Pete Hayden, Aquatic Biologist.
Initiated 1964.
Ongoing.
- II. Studies Supported With National Park Service Funds.
 - A. Bald Eagle nesting and banding study.
Robert Eng, Montana State University, Bozeman.
Initiated 1979.
Ongoing.
 - B. Cumulative effects model for human intervention on Bald Eagle habitat.
Donald A. Anderson, University of Wyoming.
Initiated 1987.
Completion 1988.
- III. Studies Supported By Universities And Allied Funding Sources.
 - A. Mushrooms of Grand Teton and Yellowstone National Parks.

Kent H. McKnight, Agricultural Research Service,
Beltsville, Maryland.
Initiated 1967.
Ongoing.

IV. Studies Supported By Funds From Other Sources.

- A. Effects of environmental variables on some physiological responses in Microtus montanus under natural conditions.
Aelita Pinter, University of New Orleans, LA.
Source of Support: Private funds.
Initiated 1969.
Ongoing.
- B. Winter ecology and migration of the Gros Ventre Buttes mule deer herd, Jackson Hole, Wyoming.
T. Campbell, Biota Research and Consulting, Inc., and T. Clark, Idaho State University, Pocatello.
Source of Support: Boone and Crockett Club, Idaho State University, Spring Creek Ranch, and Biota Research and Consulting, Inc.
Initiated 1979.
Ongoing.
- C. Summer distribution and migration of elk that winter on the National Elk Refuge.
Bruce Smith, Management Biologist, National Elk Refuge.
Source of Support: U.S. Fish and Wildlife Service.
Initiated 1978.
Ongoing.
- D. Life history strategies of the Montane vole, Microtus montanus.
Frederick J. Jannett, Jr., Science Museum of Minnesota, St. Paul.
Initiated 1978.
Ongoing.
- E. Late-glacial and postglacial vegetation and climate of Jackson Hole and the Pinyon Peak Highlands, Wyoming.
Cathy W. Barnosky, Carnegie Museum of Natural History.
Source of Support: University of Wyoming.
Initiated 1986.
Completion 1987.

Grant-Kohrs Ranch National Historic Site

- III. Studies Supported By Universities And Allied Funding Sources.
- A. Heavy metal concentrations in Clark Fork River.
Vicki Watson, University of Montana.
Initiated 1985.
Ongoing.

- IV. Studies Supported By Funds From Other Sources.
 - A. Ground water movement and heavy metal concentration levels relative to water levels in the Clark Fork River.
Tom Brooks, U.S. Geologic Survey.
Initiated 1986.
Ongoing.

Jewel Cave National Monument

- I. Studies Conducted By Park Personnel.
 - A. Breeding bird survey and inventory.
Tim Schantz, Park Intern.
Initiated 1987.
Ongoing.
- II. Studies Supported With National Park Service Funds.
 - A. Hydrologic study of Jewel Cave and Wind Cave.
E. Calvin Alexander, Jr., and Marsha Davis, University of Minnesota.
Initiated 1985.
Completion 1988.
- III. Studies Supported By Universities And Allied Funding Sources.
 - A. Hibernating bat population census.
David Mora, Bowling Green University.
Source of Support: Bowling Green University and Wind Cave/Jewel Cave Natural History Association.
Initiated 1987.
Completion 1987.
- IV. Studies Supported By Funds From Other Sources.
 - A. Scenic trail area cave microclimate.
Mike Wiles.
Source of Support: Wind Cave/Jewel Cave Natural History Association.
Initiated 1986.
Completion 1987.

Knife River Indian Villages National Historic Site

- II. Studies Supported With National Park Service Funds.
 - A. Phase I archeological data base research for KNRI.
Stanley A. Ahler, University of North Dakota, Grand Forks.
Midwest Archeological Center, Lincoln, Nebraska.
Initiated 1976.
Ongoing.
- IV. Studies Supported By Funds From Other Sources.
 - A. Phytolith analysis of plant and sediment samples from Big

Hidatsa.
Susan Mulholland, University of Minnesota-Duluth.
Source of Support: Private.
Initiated 1985.
Ongoing.

Theodore Roosevelt National Park

- I. Studies Conducted By Park Personnel.
 - A. Photographic study of the vegetative recovery of a rehabilitated roadway in Theodore Roosevelt National Park. District Naturalist, South Unit, and Jeff Bradybaugh, Resource Management Specialist.
Initiated 1981.
Ongoing.
 - B. Distribution mapping of common and air pollution sensitive lichens.
Ray W. Snow, District Naturalist, North Unit.
Initiated 1982.
Ongoing.
 - C. Update and correction of taxonomy and synonymy for the Park's vascular flora.
Micki Hellickson, Chief Naturalist.
Initiated 1982.
Completion 1987.
 - D. Affects of various herbicides and application rates on leafy spurge.
Jeff Bradybaugh, Resource Management Specialist.
Initiated 1983.
Ongoing.
 - E. Moth communities of the North Unit of Theodore Roosevelt National Park, North Dakota.
Ray W. Snow, North Unit District Naturalist.
Initiated 1984.
Ongoing.
 - F. The ecological role of lichens in Theodore Roosevelt National Park.
Ray W. Snow, North Unit District Naturalist.
Initiated 1984.
Ongoing.
 - G. Isotopis (S) analysis of precipitation of the North Unit of Theodore Roosevelt National Park.
Ray W. Snow, North Unit District Naturalist.
Initiated 1985.

Ongoing.

- H. Breeding bird atlas of the North Unit of Theodore Roosevelt National Park and neighboring townships.
Ray W. Snow and others, NPS.
Initiated 1985.
Ongoing.
- I. Range forage utilization and range condition trends in relation to large ungulate use at Theodore Roosevelt National Park.
Jeff Bradybaugh, Resource Management Specialist.
Initiated 1982.
Ongoing.
- J. Distribution, extinction and establishment of prairie dog colonies over time in Theodore Roosevelt National Park.
Jeff Bradybaugh, Resource Management Specialist and NPS staff.
Initiated 1952.
Ongoing.
- K. Nesting establishment, territoriality, and nesting success of raptor species of special concern.
Jeff Bradybaugh, Resource Management Specialist and NPS staff.
Initiated 1984.
Ongoing.

II. Studies Supported By National Park Service Funds.

- A. Distribution, movements, habitat use, food habits, and associated behavior of reintroduced elk in Theodore Roosevelt National Park.
Lynn Irby and others, Montana State University.
Initiated 1985.
Ongoing.
- B. Baseline survey of bryophytes in Theodore Roosevelt National Park and their sensitivity to air pollution.
David Bilderback, University of Montana.
Initiated 1986.
Completion 1987.
- C. Survey of rare flora within Theodore Roosevelt National Park.
Alexis Duxbury and Carolyn Godfread, North Dakota Natural Heritage Program.
Initiated 1987.
Ongoing.

- III. Studies Supported By Universities.
- A. Lichens of the Killdeer Mountains, North Dakota.
Ray W. Snow, North Unit District Naturalist.
Source of Support: North Dakota State University.
Initiated 1983.
Ongoing.
- IV. Studies Supported By Funds From Other Sources.
- A. Inventory of the rare plants of North Dakota.
Richard Warner, North Dakota Natural Heritage Program.
Source of Support: Natural Heritage Program.
Initiated 1982.
Ongoing.
- B. Aerial survey of deer, bighorn, elk and pronghorn for Theodore Roosevelt National Park.
North Dakota Game and Fish Department Personnel.
Source of Support: Theodore Roosevelt Nature and History Association.
Initiated 1982.
Ongoing.
- C. Historical origins and management history of feral horses in Theodore Roosevelt National Park.
I. Castle McLaughlin.
Source of Support: Theodore Roosevelt Nature and History Association.
Initiated 1987.
Ongoing.
- D. Affects of cattle grazing on understory production and seedling establishment in wooded draws in western North Dakota.
Rocky Mountain Forest and Range Experiment Station personnel.
Source of Support: U.S. Forest Service.
Initiated 1982.
Ongoing.
- E. Formation of columnar jointing in rock overlying burning coal veins.
Donald Coates, U.S. Geological Survey.
Source of Support: U.S. Geological Survey.
Initiated 1986.
Ongoing.
- F. The effects of air contaminants on the vegetation of Theodore Roosevelt National Park and adjoining areas.
David Bilderback, University of Montana.
Source of Support: North Dakota Air Quality Trust.
Initiated 1986.
Ongoing.

Wind Cave National Park

- I. Studies Conducted By Park Personnel.
 - A. Natural mortality of elk and bison in Wind Cave National Park.
Park Research Biologist and other members of Park staff.

Initiated 1977.
Ongoing.
 - B. The effect of ungulates on abundance and distribution of trees and shrubs.
Park Research Biologist and other members of Park staff.
Initiated 1977.
Ongoing.
 - C. Predator activities on black-tailed prairie dog towns.
Park Research Biologist.
Initiated 1981.
Ongoing.
 - D. The effect of grazing by bison and elk on prairie plant communities.
Park Research Biologist.
Initiated 1981.
Completion 1988.
 - E. Canada thistle colony dynamics on prairie dog towns.
Park Research Biologist.
Initiated 1984.
Completion 1988.
 - F. Fire's effect on cacti.
Park Research Biologist.
Initiated 1985.
Completion 1988.
- II. Studies Supported With National Park Service Funds.
 - A. Coyote food habits in Wind Cave National Park.
William Franklin, Iowa State University and Park Research Biologist.
Initiated 1983.
Completion 1988.
 - B. Dietary analysis of sympatric herbivores at Wind Cave National Park.
Larry L. Tieszen, Augustana College, South Dakota and Park Research Biologist.
Initiated 1984.

Completion 1988.

- C. A geneological evaluation of air pollution tolerances in hardwood trees.
David F. Karnosky and Paul Berrang, Michigan Tech University.
Initiated 1986.
Completion 1987.
- D. Vertebrate paleontology in Wind Cave National Park.
James E. Martin, South Dakota School of Mines and Technology.
Initiated 1985.
Completion 1988.
- E. Hydrologic study of Jewel and Wind Caves.
E. Calvin Alexander, University of Minnesota.
Initiated 1985.
Completion 1988.

III. Studies Supported By Universities And Allied Funding Sources.

- A. Riparian habitats in Wind Cave National Park.
Theodore L. Maguder, University of Hartford.
Source of Support: University of Hartford and personal funds of researcher.
Initiated 1981.
Ongoing.
- B. Archeological Neotaphonomy: Understanding the formation processes of faunal assemblages, the Wind Cave Taphonomy Project.
Galen R. Burgett, University of New Mexico and University of Wyoming.
Initiated 1984.
Completion 1988.
- C. Hydrology and hydrochemistry of the Pahasapa Limestone.
John Rohde, Washington State University.
Source of Support: Washington State University.
Initiated 1984.
Completion 1988.
- D. Genetic variability versus colony size in Black-tailed Prairie Dogs.
James G. Daley, University of Maryland.
Source of Support: University of Maryland, NSF and personal funds.
Initiated 1987.
Completion 1989.

- E. Repopulation of Black-tailed Prairie Dog towns after artificial reduction.
Matthew C. Radcliffe, University of Maryland.
Source of Support: University of Maryland, NSF and personal funds.
Initiated 1987.
Completion 1989.
 - F. Relationship of female distributions and vegetation to mate access and mating tactics of males in a low density population of Pronghorns.
Peter M. McDonald, University of SW Louisiana.
Source of Support: University of SW Louisiana and personal funds.
Initiated 1986.
Completion 1987.
- IV. Studies Supported By Funds From Other Sources.
- A. Social behavior of prairie dogs.
John L. Hoogland, University of Maryland.
Source of Support: National Science Foundation and the Harry Frank Guggenheim Foundation.
Initiated 1975.
Ongoing.
 - B. Social development in American bison.
Wendy Green and Aron Rothstein, City College of the City University of New York.
Source of Support: National Institute of Health.
Initiated 1982.
Completion 1988.
 - C. Intensification of biological activity and control of ecosystem change by native herbivores in North American grasslands.
James K. Detling and April Wicker, Colorado State University.
Source of Support: National Science Foundation.
Initiated 1984.
Completion 1988.
 - D. Prairie dog grazing: Its potential effects on vegetation attributes and soil nitrogen.
Miguel Angel Brizuela, Colorado State University.
Source of Support: National Science Foundation.
Initiated 1985.
Completion 1987.
 - E. Individual and interactive grazing effects of prairie dogs and bison upon vegetation and soil attributes.
M. S. Cid de Brizuela, Colorado State University.

- Source of Support: National Science Foundation.
Initiated 1985.
Completion 1987.
- F. Investigations of structural stability in the Wind Cave Ecosystem.
Kirsten Krueger, Colorado State University.
Source of Support: National Science Foundation.
Initiated 1985.
Completion 1988.
- G. The role of prairie dogs and bison in determining the abundance and species composition of grasshoppers in Wind Cave National Park.
Richard A. Redak, Colorado State University.
Source of Support: National Science Foundation.
Initiated 1985.
Completion 1988.
- H. Grazing patterns of American bison in the mixed-grass prairie ecosystem.
Ron Green, Colorado State University.
Source of Support: National Science Foundation.
Initiated 1985.
Completion 1988.
- I. Plant-animal interactions: The role of native herbivores in selection of grazing adapted plant.
Elizabeth Painter and J. L. Detling, Colorado State University.
Source of Support: National Science Foundation.
Initiated 1981.
Completion 1987.
- J. Marked individuals in range plant studies.
Kirsten Krueger and E. L. Painter, Colorado State University.
Source of Support: Personal Resources of Investigators.
Initiated 1985.
Completion 1988.
- V. Publications
- A. Bruzuela, Miguel A. 1987. Prairie dog feeding behavior: response to colonization history and fire. PhD. Dissertation, 113 pp. Colorado State University.
- B. Carlson, Daniel C. 1986. Effects of prairie dogs on mound soils. Masters Thesis, 116 pp. South Dakota State University, Brookings.

- C. Cid, Maria S. 1987. Mother-daughter interactions in American bison (Bison bison): Factors associated with individual variation. PhD. Dissertation, 202 pp. City University of New York, NY.
- D. Hoogland, John L. and Janice M. Hutter. 1987. Using molar attrition to age live prairie dogs. J. Wildl. Manage., 51(2):393-394.
- E. McDonald, Peter M. 1987. Relationships of female distributions and vegetation to mate access and mating tactics of males in a low density population of pronghorns (Antilocapra americana). Masters Thesis, 94 pp. University of Southwestern Louisiana, Lafayette.
- F. Painter, Elizabeth E. 1987. Grazing and interspecific variation in four North American grass species. PhD. Dissertation, 250 pp., Colorado State University.

Yellowstone National Park

- I. Studies Conducted By Park Personnel.
 - A. Plant ecology studies.
Don G. Despain.
Initiated 1968.
Ongoing.
 - B. Bison ecology studies.
Mary Meagher.
Initiated 1969.
Ongoing.
 - C. Animal ecology studies.
Mary Meagher.
Initiated 1980.
Ongoing.
 - D. Study of thermal features in Yellowstone National Park.
Roderick A. Hutchinson.
Initiated 1974.
Ongoing.
 - E. Gypsy Moth detection.
J. Sweaney, National Park Service.
Initiated 1983.
Completion ?
 - F. Elk studies.
Francis J. Singer, National Park Service.
Initiated 1985.

Ongoing.

- G. Pleistocene events in the Yellowstone area.
John Good, National Park Service.
Initiated 1981.
Ongoing.

- H. Quaternary-present deformation, Yellowstone Lake Basin.
Wayne L. Hamilton, National Park Service.
Initiated 1983.
Ongoing.

III. Studies Supported By Universities And Allied Funding Sources.

- A. White Pelican reproduction in the Molly Islands breeding colony.
Kenneth L. Diem, University of Wyoming, Laramie.
Source of Support: University of Wyoming.
Initiated 1949.
Ongoing.

- B. Ecological studies on parasites of the Gibbon elk herd.
David E. Worley, Montana State University, Bozeman.
Source of Support: Montana State University.
Initiated 1978.
Ongoing.

- C. Diatoms in hot springs and thermal streams in Yellowstone.
Samuel R. Rushforth, Brigham Young University.
Source of Support: Brigham Young University.
Initiated 1982.
Ongoing.

- D. Distribution of shore bugs and brine flies at Sylvan Springs, Yellowstone National Park.
V. Resh and M. Barnby, University of Washington.
Source of Support: University of California.
Initiated 1983.
Ongoing.

- E. Aquatic invertebrates of Yellowstone National Park.
G. Roemhild, Montana State University.
Source of Support: Montana State University.
Initiated 1983.
Ongoing.

- F. Cellobiase production in thermophilic bacteria and fungi.
J. Von Ashlefeldt, J. Mattoon and K. Andrews, University of Colorado.
Source of Support: University of Colorado.
Initiated 1982.
Ongoing.

- G. Ecology of hot springs microbial mats.
D. Ward, N. Revsbech, T. Tayne, K. Anderson and M. Bateson, Montana State University.
Source of Support: National Science Foundation and Montana State University.
Initiated 1977.
Ongoing.
- H. Ecology and characterization of bacterial nitrogen fixation in thermal springs.
C. Wickstrom, Kent State University.
Source of Support: National Science Foundation and Kent State University.
Initiated 1982.
Ongoing.
- I. Primary productivity of thermal algal mats in Yellowstone National Park.
R. Wiegert, University of Georgia.
Source of Support: National Science Foundation and University of Georgia.
Initiated 1982.
Ongoing.
- J. U.S. - Japan seminar on terrestrial noble gases.
J. H. Reynolds, University of California.
Source of Support: ?
Initiated 1986.
Ongoing.
- K. Precambrian geology of southwestern Beartooth Mountains.
Clarence Casella, Northern Illinois University.
Source of Support: ?
Initiated 1975.
Ongoing.
- L. Thermophilic diatoms from hot springs and geysers in Yellowstone National Park.
Ken J. Andrews, Colorado College.
Source of Support: Colorado College.
Initiated 1983.
Ongoing.
- M. Thermophilic DNA polymerases.
Michael Kriegler, University of California and Cetus Corporation.
Source of Support: ?
Initiated 1985.
Ongoing.

- N. Visitor perception of bear behavior in Yellowstone National Park.
Daniel Ropek, Eastern Michigan University.
Source of Support: E. Michigan Grad School.
Initiated 1986.
Ongoing.
- O. Public attitudes and behavior in relation to grizzly bears in National Parks.
Richard Trahan, University of N. Colorado.
Source of Support: University of N. Colorado.
Initiated 1985.
Ongoing.
- P. Role of arsenic in Yellowstone waters.
Jane M. Humphress, Arizona State University.
Source of Support: Arizona State University.
Initiated 1984.
Ongoing.
- Q. Alluvial fan development and sedimentation in the Mount Everts area.
James Schmitt, Montana State University.
Source of Support: Montana State University.
Initiated 1986.
Ongoing.
- R. Topographic survey of meandering rivers.
J. Dungan Smith, University of Washington.
Source of Support: University of Washington.
Initiated 1986.
Ongoing.
- S. Characterization of soils in Yellowstone National Park.
Carl C. Trettin, Michigan Technological University.
Source of Support: Michigan Tech University.
Initiated 1980.
Ongoing.
- T. The relationship of climate to sedimentation rates in lakes and ponds.
H. E. Wright, University of Minnesota.
Source of Support: University of Wyoming.
Initiated 1986.
Ongoing.
- U. Late-Glacial and postglacial vegetation and climate of Jackson Hole and the Pinyon Peak Highlands, Wyoming.
Cathy Barnosky, Carnegie Museum of Natural History, Pittsburgh, Pennsylvania.
Source of Support: University of Wyoming.

Initiated 1985.
Ongoing.

IV. Studies Supported By Funds From Other Sources.

- A. Yellowstone Lake: an evaluation of patterns in productivity.
W. H. Romme, Fort Lewis College.
Source of Support: University of Wyoming
Initiated 1982.
Ongoing.
- B. Yellowstone secondary science teacher workshop.
Randy Brown, The Chattanooga Nature Center.
Source of Support: ?
Initiated ?
Completion ?
- C. Isotopic studies of rare gases in terrestrial samples and in natural nucleosynthesis.
John H. Reynolds, University of California.
Source of Support: NSF.
Initiated 1981.
Completion ?
- D. Environmental assessment of heavy metal contamination in Yellowstone National Park.
Joann Silverstein, University of Colorado.
Source of Support: Personal.
Initiated 1985.
Completion ?
- E. National Surface water survey - Western lakes study.
C. E. Runas, U.S. Environmental Prot. Agency.
Source of Support: EPA.
Initiated 1985.
Completion ?
- F. Substrate characterization of retrogressive oligotrophy in Yellowstone Lake, Yellowstone National Park.
Jerry L. Kaster, University of Wisconsin.
Source of Support: Center Great Lakes Studies.
Initiated 1983.
Completion ?
- G. Remote sensing imagery of turbid lake and sour creek resurging dome.
Steven C. Hansen, Ricks College.
Source of Support: ?
Initiated 1986.
Completion ?

- H. Life history of lake trout in Yellowstone National Park.
Fred P. Binkowski, University of Wisconsin, Milwaukee.
Source of Support: Center Great Lakes Studies.
Initiated 1986.
Completion ?
- I. Common Loon nesting status in Wyoming and Idaho.
Thomas P. Fitch, Idaho State University.
Source of Support: N. Amer. Loon Fund.
Initiated 1985.
Completion ?
- J. The isolation of microorganisms for biomining and related biotech. goals.
Jim H. Wolfram, Idaho Nat. Engineering Lab.
Source of Support: Bureau of Mines.
Initiated 1985.
Completion ?
- K. Film documentation of life history of Yellowstone Grizzly Bear and its present research.
Steven P. French, Yellowstone Grizzly Foundation.
Source of Support: Yellowstone Grizzly Foundation.
Initiated 1986.
Ongoing.
- L. The factors that limit elk populations in the Greater Yellowstone Ecosystem.
Charles Kay, Utah State University.
Source of Support: Welder Wildlife Found.
Initiated 1986.
Ongoing.
- M. Migratory waterfowl survey.
Dave Lockman, Wyoming Game and Fish Department.
Source of Support: Wyoming Game and Fish Department.
Initiated 1971.
Ongoing.
- N. The comparative ethology of digger wasps in northern Wyoming.
Kevin M. O'Neill, Montana State University.
Source of Support: Personal.
Initiated 1986.
Ongoing.
- O. Bull elk habitat research.
Dr. James Peek, University of Idaho.
Source of Support: ?
Initiated 1987.
Completion ?

- P. Northern Yellowstone elk study.
Harold Picton, Montana State University.
Source of Support: Gamboni Found, Rocky Mountain Elk Found.
Initiated 1984.
Completion: 1987.
- Q. Applications of aversive conditioning techniques to Yellowstone Ecosystem Grizzly Bears.
Forrest Hammond, Wyoming Game and Fish Department.
Source of Support: U.S. Fish & Wildlife Service.
Initiated 1986.
Completion ?
- R. The genetics and biogeography of Western North American fishes.
Mark J. Rosenfeld, University of Utah.
Source of Support: ?
Initiated 1986.
Completion ?
- S. Genetic-taxonomic positions of native trout.
Dennis K. Shiozawa, Brigham Young University.
Source of Support: ?
Initiated 1987.
Completion ?
- T. Research of fluoride effects in wildlife and vegetation.
James L. Shupe, Utah State University.
Source of Support: Utah Agr. Expt. Station.
Initiated 1956.
Ongoing.
- U. Observe historic Peregrine eyries.
Jay S. Sumner, Contract with Peregrine Fund.
Source of Support: ?
Initiated 1985.
Completion ?
- V. Radiotelemetry study of the Northern Yellowstone elk herd.
Jon Swenson, Montana Department of Fish, Wildlife and Parks.
Source of Support: Mt. Dept. of F.W.P., Gamboni Foundation, Rocky Mountain Elk Foundation.
Initiated 1984.
Completion ?
- W. Ecology of Gallatin elk herd and range relationships.
Graham Taylor, Montana Department of Fish, Wildlife and Parks.
Source of Support: Mt Dept. of F.W.P.

- Initiated 1959.
Ongoing.
- X. Relative roles of food abundance and cover in determining habitat distribution of cutthroat trout.
Margaret A. Wilzbach, University of Maryland.
Source of Support: NSF, DOE, USGS.
Initiated 1986.
Completion ?
- Y. Systematics of the green algal family zygnetaceae.
Robert W. Hoshaw, University of Arizona.
Source of Support: NSF.
Initiated 1982.
Completion ?
- Z. Fossil flora of the specimen ridge fossil forest.
Steven R. Manchester, Indiana University.
Source of Support: NSF.
Initiated 1984.
Completion ?
- A¹. Fire and landscape dynamics in Yellowstone National Park.
W. H. Romme, Fort Lewis College.
Source of Support: NSF.
Initiated 1984.
Completion ?
- B¹. Montana pine beetle infestation: cycling and succession in lodgepole pine forest.
W. H. Romme, Fort Lewis College.
Source of Support: University of Wyoming
Initiated 1980.
Completion ?
- C¹. U-series geochronology of thermal activity in YNP and behavior of U-series nuclides in YNP hydrothermal systems.
Neil C. Sturchio, Argonne National Laboratory.
Source of Support: USDOE Off Ener Sci.
Initiated 1984.
Completion ?
- D¹. Active and fossil geothermal systems. (Major Norris report with Rick Nutchinson).
Donald E. White, U.S. Geological Survey.
Source of Support: U.S. Geological Survey.
Initiated 1956.
Completion ?
- E¹. Use of germanium/silicon ratios as tracer of the biogeochemical silica cycle.

- M. O. Andreae, National Center for Atmospheric Research.
Source of Support: NSF.
Initiated 1984.
Completion ?
- F¹. Heat flow in Yellowstone Lake.
David D. Blackwell, Southern Methodist University.
Source of Support: NSF.
Initiated 1985.
Completion ?
- G¹. Arsenic in thermal spring ecosystems distribution and cycling.
Alice G. Chalmers, University of Georgia Marine Institute.
Source of Support: NSF.
Initiated 1986.
Completion ?
- H¹. Chemical investigation of high temperature petroleum from calcite spring thermal area, Yellowstone National Park.
Charles Clifton, Oregon State University.
Source of Support: Petr. Migrat. Consor.
Initiated 1985.
Completion ?
- I¹. Investigations of the Gardner river rhyolite/basalt complex Yellowstone National Park, Wyoming.
Arnold G. Doden, Iowa State University.
Source of Support: Personal.
Initiated 1986.
Completion ?
- J¹. Stream gaging to monitor heat and mass flux of hot-spring systems.
R. O. Fournier, USGS.
Source of Support: ?
Initiated 1983.
Ongoing.
- K¹. Fluid inclusions in hydrothermal, minerals from drill holes in Yellowstone National Park.
Robert Fournier, USGS.
Source of Support: USGS.
Initiated 1983.
Completion ?
- L¹. Hydrothermal activity in Yellowstone Park.
Robert Fournier, USGS.
Source of Support: USGS.
Initiated 1960.
Ongoing.

- M¹. Surface chemistry of obsidian cliff glasses.
David W. Mock, Montana State University.
Source of Support: MT NSF Epescor Proj.
Initiated 1986.
Completion ?
- N¹. Quarternary glacial geology in Yellowstone National Park.
Gerald M. Richmond, USGS.
Source of Support: USGS.
Initiated 1967.
Completion ?
- O¹. Welding features of the hulckleberry ridge tuff.
J. K. Russell, University of British Columbia.
Source of Support: NSERC - Canada.
Initiated 1985.
Completion ?
- P¹. Monitoring of seismicity & contemporary deformation in the
Yellowstone region: Yellowstone seismic network &
precision gravity observation.
Robert E. Smith, University of Utah.
Source of Support: USGS.
Initiated 1981.
Ongoing.
- Q¹. Studies of photosynthetic carbon metabolism in the
thermophilic purple bacterium.
Michael T. Madigan, Southern Illinois University.
Source of Support: NSF.
Initiated 1986.
Completion ?
- R¹. Pathogenic naegleria from thermal springs.
William D. O'Dell, University of Nebraska.
Source of Support: NIH.
Initiated 1984.
Completion ?
- S¹. Isolation of microorganisms that produce extracellular
proteases, amylases, lipases under highly alkaline
conditions.
Bernie D. Steele, University of Tennessee.
Source of Support: Eastman Kodak Research.
Initiated 1986.
Completion ?
- T¹. Mushrooms of Grand Teton and Yellowstone National Parks.
Kent McKnight, U.S. Department of Agriculture, Beltsville,
MD.
Source of Support: USDA and University of Wyoming,

Brigham Young University.
Initiated 1980.
Ongoing.

Zion National Park

- I. Studies Conducted By Park Personnel.
 - A. Tunnel stress monitoring.
Larry L. Hays, Resource Management Specialist.
Initiated 1978.
Ongoing.
 - B. Peregrine Falcon monitoring; nesting and fledging success.
Larry L. Hays, Resource Management Specialist.
Initiated 1978.
Ongoing.
- II. Studies Supported With Park Service Funds.
 - A. Peregrine Falcon survey and eggshell recovery.
James Enderson, Colorado College with the Peregrine Fund.
Initiated 1984.
Completion 1987.
 - B. Habitat requirements of the Virgin River Spinedace.
James E. Deacon, University of Nevada.
Initiated 1987.
Completion 1989.
 - C. Vegetation communities of Zion National Park.
Kimball T. Harper, Brigham Young University.
Initiated 1987.
Completion 1990.
- IV. Studies Supported By Funds From Other Sources.
 - A. Utah State ambient benthological monitoring.
Michael K. Reichert, Bureau of Water Pollution Control.
Source of Support: State funds.
Initiated 1979.
Ongoing.
 - B. Utah flora project.
Stanley L. Welsh, Brigham Young University.
Source of Support: Private funds.
Initiated 1960.
Completion ?
 - C. Erg margin process and products; intertonguing of the Kayenta and Navajo Formations.
Marlene F. Tuesink, Northern Arizona University.
Source of Support: Chevron, Sigma Xi, and Friday Lunch

Club.
Initiated 1984.
Completion ?

- D. A stratigraphic and petrographic study of the Moenave Formation, Zion National Park.
Elizabeth Queen, Stephen F. Austin State University.
Source of Support: Private funds.
Initiated 1984.
Completion ?
- E. Yucca-Yucca moth interactions.
John F. Addicott, University of Alberta.
Source of Support: National Science and Engineering Council of Canada; National Geographic Society.
Initiated 1980.
Completion ?
- F. Search for Microcaddis Fly Ochrotichia zioni.
Milton W. Sanderson, Northern Arizona University.
Source of Support: Private funds.
Initiated 1985.
Completion ?