

JACKSON HOLE BIOLOGICAL RESEARCH STATION
ANNUAL REPORT
1973

Oscar H. Paris, Director

UNIVERSITY OF WYOMING
Laramie, Wyoming

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ACKNOWLEDGMENTS

It is impractical for me to name all of the many persons who generously assisted me during my first year as Director of the Jackson Hole Biological Research Station. I must, however, acknowledge the very helpful advice, cooperation and assistance provided by a few. University Vice President Elliott Hays and Director of Finance Keith Raitt were outstandingly cooperative in assisting me with financial matters. Mr. William Conway, General Director of the New York Zoological Society, was very patient and cooperative during the transition in administration of the Station. The staff of Grand Teton National Park was extremely cooperative and generous with its assistance. Professor Kenneth Diem and Dr. Aelita Pinter shared their knowledge of the Station, its history, and its operation with me, and made very helpful recommendations with regards to its needs. My two assistants, Mr. Tom Collins and Ms. Hanne Smith, worked long and hard to improve the working and living conditions at the Station; all of us who spent the 1973 summer season there owe them a special debt of gratitude. Mr. Nobel Gregory, Caretaker, taught me much from his vast store of experience and was quick to respond to my many calls for assistance. Finally, I am especially grateful to Ms. Marty Wagner Paris, my colleague, companion, and wife, for her strong interest in and active participation in my endeavors.

O. H. Paris

ADVISORY BOARD

1972-73 Academic Year

Dr. R. O. Asplund, Department of Chemistry
Dr. A. A. Beetle, Division of Plant Science
Dr. R. C. Bergstrom, Division of Microbiology and Veterinary Medicine
Dr. D. J. Crawford, Department of Botany
Dr. K. L. Diem, Department of Zoology and Physiology (Secretary)
Mr. Peter Hayden, Research Aquatic Biologist, Grand Teton National Park
Dean R. J. McColloch, Graduate School
Mr. Charles McCurdy, Chief Naturalist, Grand Teton National Park
Dean E. G. Meyer, College of Arts and Sciences
Dr. O. H. Paris, Department of Zoology and Physiology (Chairman)
Mr. K. K. Raitt, Director of Finance and Budget

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Dean R. J. McColloch, Graduate School
Mr. Charles McCurdy, Chief Naturalist, Grand Teton National Park
Dean E. G. Meyer, College of Arts and Sciences
Mr. Thomas Milligan, Backcountry District Ranger, Grand Teton National Park
Dr. O. H. Paris, Department of Zoology and Physiology (Chairman)
Mr. K. K. Raitt, Director of Finance and Budget
Dr. J. H. Schultz, Department of Recreation and Park Administration

INTRODUCTION

This report on the Jackson Hole Biological Research Station departs from the traditional reports submitted in the past by being an annual report rather than a summer activity report. It is also the first report issued by the Station's new director. The submission of an annual report reflects the use of the Station as a year-round, rather than merely a summer, research facility. The report contains the customary research resumes, lists of seminars and visitors, description of cooperation with other agencies, financial statement, and publication list; in addition there is included, in the INTRODUCTION, an account of activities undertaken during 1973 in order to enhance the value of the scientific contributions of the Station and to improve the research and living facilities at the Station.

Cooperation with Grand Teton National Park

Two of the objectives of the operation of the Jackson Hole Biological Research Station as set forth in the Special Use Permit granted by the U.S. Department of Interior are "to perform research which has local application or research which can best be done at the Jackson Hole Research Station because of some unique feature of this area." The second of these objectives has consistently been met by research activities carried on at the Station in the past. Investigators have often taken advantage of the fact that the Station offers an opportunity for research on a variety of birds and mammals, especially large game species and predators, which is probably unequalled at any other inland biological field station in the United States. It is to the credit of the New York Zoological Society which perceived this circumstance long before Jackson Hole was incorporated into Grand Teton National Park, and which cooperated with the University of Wyoming in establishing the Jackson Hole Biological Research Station. In general, less emphasis has been placed on research "which has local application." By virtue of its location within Grand Teton National Park, however, the Station is in a very unique position to foster very valuable applied research. Like most National Parks, Grand Teton is experiencing significant environmental impact from increased visitor use. Under its new administration, it will be a policy of the Jackson Hole Biological Research Station to encourage and support research aimed at obtaining information that can be applied to the solution of environmental problems in Grand Teton National Park.

With this objective in mind, the Director and Professor Kenneth Diem, former Assistant Director of the Station, met with Park Supervisor Gary Everhardt, Park Naturalist Charles McCurdy, and Park Resources Management Specialist Robert Wood, at Grand Teton National Park Headquarters in January, 1973. These discussions resulted in a general agreement of greater

reciprocal cooperation between the Station and the Park, and more collaboration between scientists at the Station and those on the Park staff. This increased cooperation and collaboration was very significantly realized during the year. Nine of the 18 major projects carried out at the Station during 1973 were directed toward problems of explicit interest to Grand Teton National Park. Several of these projects were supported in part by research contracts with the National Park Service. A number also received support in part from a grant-in-aid to the Station from the New York Zoological Society. All projects received partial support in some form from the University of Wyoming. These projects are described in greater detail in the section, RESEARCH PROJECT REPORTS.

Grand Teton National Park contributed significantly to the operation of the Station in a number of ways during 1973. Certainly one of the most important contributions of the Park Ranger staff was the assistance provided when Station personnel discovered some very old and extremely dangerous containers of ethyl ether and picric acid. This event is described in more detail below. The Park Maintenance Department graded the road on the Station grounds, and applied a dust palliative. The potholes and ruts in the road were thus eliminated and the risk of damage to optical equipment and other delicate instruments by dust reduced. In addition, the Park Service installed a new pit latrine, equipped with a vault which can be pumped out periodically, to replace the original pit latrines which had become unsatisfactory for use. Finally, the Park Service, at the request of the Station Director, installed a sign at the entrance to the Station drive, identifying the Station and indicating its association with the University of Wyoming and the New York Zoological Society.

Cooperation and Support from the New York Zoological Society

The New York Zoological Society continued to generously support research at the Station, in the form of a \$4500 grant-in-aid to investigators. These funds were awarded to seven investigators from five different institutions. This grant from the Zoological Society was even more generous than those made in the past several years and hopefully is indicative of the Society's continued interest in the operation of the Station and its approval of the direction the program of the Station is moving under new administration.

Improvement of Research Facilities

The scientific equipment available at the Biological Research Station at the beginning of 1973 was, to say the least, extremely meager. Consequently the decision was made to initiate a program of purchasing, to the extent that the Station's equipment budget would allow, equipment urgently needed by on-going projects at the Station. A priority of needs was established

by the Director following consultation with investigators working at the Station. The following items were purchased during 1973 using University funds allocated to the Station for equipment: a Zeiss bright-field and phase-contrast compound microscope, a Bausch & Lomb dissecting stereo-microscope, a deep freeze unit, an explosion-proof refrigerator, a 4-place Clay Adams centrifuge, a Coleman Mertrion III pH meter, a Hewlett-Packard 45 electronic calculator, and 200 Longworth small mammal traps.

A major undertaking during 1973 which was designed to facilitate the work of investigators at the Station was the cleaning and organization of the two laboratory buildings. This work was carried out primarily by Mr. Tom Collins, Assistant to the Director, and Ms. Hanne Smith, Station Assistant. A large amount of old and no longer useful equipment and supplies, much of which had been stored in the laboratory building for many years, was removed and discarded. Old equipment and supplies which could be salvaged for possible future use were stored in appropriate locations. Working areas in both laboratories were cleared of stored items and other miscellany, to make work space available to researchers. One of the small rooms and the loft of the main laboratory were designated for storage of equipment and dry-goods, while the second small room was designated the chemical room and darkroom.

Old supplies of chemicals, many of which were in serious states of deterioration, were removed from the shelves and transported to Laramie for disposal. An exception was two very old cans of ethyl ether and a bottle of crystalized picric acid. Oxidized ether and crystalline picric acid are extremely explosive and can be detonated by vibration. The age of the containers could not be determined, but some researchers remembered having seen the containers on the chemical shelves for at least three years, and from the rusty condition of the ether cans, it seemed likely that they had been in the laboratory for a much longer time. The Director consulted with Mr. Eugene Welch, Chief of Law Enforcement for Grand Teton National Park, who in turn consulted the Emergency Ordinance Detail (EOD), 94th Ordinance Division, Fort Carson, Colorado. The following day a 3-man squad from the Ft. Carson EOD arrived at the Station to dispose of the three dangerous containers. The containers were transported in the Ordinance vehicle, under Ranger escort, to the Park dump south of Colter Bay. The three containers were detonated in a remote area of the dump; all three exploded with considerable force. This experience prompted the Director to impose strict regulations governing the use of dangerous chemicals at the Station and to procure an explosion-proof refrigerator in which explosive volatives can be stored.

The shop was also cleaned and organized. Junk was disposed of and usable materials stored for easy access. Tools were located and placed in their proper positions on the tool board. Some additional tools were procured, such as a high speed bit set for the power drill and a heavy duty reciprocating power saw. The tools and other facilities of the shop are available to investigators, who use them for fabricating research equipment, and are also used for maintenance work at the Station.

The library in the Seminar Building was reorganized, inventoried, and catalogued. An honor system of check-out was initiated, to enable Station personnel to keep track of library books and journals being used by investigators. After consulting with investigators, the Director determined that the large collection of Biological Abstracts did not warrant the expanding space which they were occupying. Accordingly, the Station's subscription to the publication was terminated and arrangements made to give the Station's set to the University's Library, which welcomed the acquisition. A typewriter and an automatic calculator were placed in the Seminar Building during the summer for use by investigators. Thus, the Seminar Building was used by investigators for seminars, discussion groups, study, writing, data reduction and occasional relaxation.

The small laboratory building was semi-winterized in late summer of 1973 to provide a warm shelter in which investigators could work during the winter. This building was selected because its small size, propane heater, and solid construction would make it easy and economical to heat. Sections in walls which were not of log construction were filled with fiber glass insulation. Plastic sheeting was placed over the window frames, to form a dead air space in the windows. The crawl space under the cabin was sealed with logs and plastic sheeting. The Director visited the Station in late December, 1973 and found the winterizing measures to have been effective: with temperatures well below zero (Fahrenheit), two investigators were working comfortably in the small laboratory.

Improvements in Living Facilities

Several measures were taken to make living conditions for investigators and their families more comfortable. In the bath house new shower heads were installed, curtains were installed to provide privacy in the commode area of each bathroom, and bath rugs were placed in each bathroom. At the rear of the bathhouse, where a hot-water faucet is located, a sink with a drain line was installed, and rock was spread on the ground in the vicinity of the sink. Thus, a very unsightly and unhealthy area was converted from a mud hole to a pleasant place where personnel could obtain or use hot water.

Leaks were repaired in a number of roofs. Patching was done on the bathhouse, Cabin 15 and on the Director's cottage. A new roof was installed on Cabin 12 (bunkhouse). The reroofing of Cabin 12 was a cooperative undertaking, involving the Director, Nobel Gregory (caretaker), Tom Collins (Assistant to the Director), Jo Ann Camenzind (wife of an investigator), and Marty Paris (wife of the Director).

New cooking utensils were procured from the Federal Surplus warehouse in Cheyenne and were distributed as needed to residence cabins. In particular, pots, pans, buckets, and silverware were in short supply and were augmented during 1973.

Other Maintenance Matters

Repairs of snow and water damage were made to buildings where necessary, and several buildings were painted with a preservative. The broken gate at the entrance to the Station was removed and replaced with a new gate modeled after those used by the Park Service. The delapidated and unsightly wire enclosure around the propane tank was removed and replaced with an attractive log stockade. Dead trees which threatened nearby buildings were felled, cut into logs, and used to demark parking areas adjacent to the road and thus confine vehicles to the road and designated parking areas. The number of garbage cans serving the Station was doubled, and the area around the shop, including the garbage can stand, the woodpile, and an area in which junk had collected were cleaned up. A general cleanup of the entire grounds was undertaken to eliminate trash and junk which had accumulated on the grounds.

At the beginning of the 1973 summer season, it was found that the number and condition of fire extinguishers at the Station were extremely inadequate. There were four soda-acid extinguishers which were charged; two new soda-acid extinguishers found in the loft of the shop had never been charged. There were dry-chemical extinguishers in the large laboratory, the seminar building, and the Director's cottage; the one in the seminar building was not charged. There was no extinguisher in the small laboratory or in the shop. To rectify the situation, all uncharged extinguishers were charged. A dry-chemical extinguisher was procured for the small laboratory, and government surplus CO₂ extinguishers were procured for the large laboratory and the shop. The soda acid extinguishers were distributed about the Station, on the outside of buildings, in such a way that one could be quickly reached from any building on the grounds.

The Station's telephone had but a single extension, located in the Director's cottage. Consequently, if no one was at home in the Director's cottage, it was impossible for personnel at the Station to make or receive calls. Further, if an emergency arose when the Director's cottage was closed, the nearest telephone was at Jackson Lake Lodge, a mile away. To improve this situation, an extension phone, equipped with an outside bell, was installed in the large laboratory. This extension and its bell can be disconnected with a switch located in the Director's cottage. Thus, at any time that the Director's cottage is vacant, the laboratory extension can be switched on. A log book for long-distance calls is kept next to the laboratory telephone, in which investigators record all long distance calls so that they can be recharged later. This honor system has proved very successful. The Station assumes the cost of calls made within Jackson Hole, and 100% of the investigators have cooperated in recording and paying for other long distance calls.

Electrical Wiring

The electrical wiring inside all of the old log structures at the Station (including both laboratories, the shop, bathhouse, seven of the cabins, and

the Director's cottage) is antiquated, inadequate, and dangerous. Consequently, moves were taken during 1973 toward correcting this situation. Three electrical contracting firms inspected the buildings and submitted proposals for renovation of the wiring; their estimated costs ranged from \$1786 to \$3772. Subsequently personnel from the University's Physical Plant visited the Station and inspected the wiring. Physical Plant then prepared plans for the proposed rewiring and will request formal bids from contractors in Jackson. The Office of the Vice President for Finance has allocated \$1800 for the needed electrical work; if the cost of the renovation exceeds this amount, the balance will come from Station funds. The Director proposes to use an appropriate grant-in-aid or gift for this purpose. Plans call for this work to be done as soon as snow melts off in the Spring of 1974.

RESEARCH PROJECT REPORTS

INVESTIGATORS WHO WORKED FOR A SHORT TIME AT THE STATION

Dr. John W. Huckabee
Environmental Sciences Division
Oak Ridge National Laboratory
Oak Ridge, Tennessee

Mercury content of montane mosses

Dr. Philip N. Lehner
Department of Zoology & Entomology
Colorado State University
Fort Collins, Colorado

Coyote ecology

Dr. Robert W. Lichtwardt
Department of Botany
The University of Kansas
Lawrence, Kansas

Intestinal fungi of invertebrates

Ms. Jane Phillips
Department of Zoology
Leeds University
Leeds, England

Isopod ecology

SEMINARS

- June 21, 1973 "Fire Ecology in Grand Teton National Park"
Dr. Lloyd Loope, Research Biologist
Grand Teton National Park
- July 3 "Ecological Thermoregulation in Small Mammals"
Mr. Tom Collins
Department of Zoology and Physiology
The University of Wyoming
- July 10 "The Elk Management Program in Grand Teton National Park"
Mr. Robert Wood, Park Resource Management Specialist
Grand Teton National Park
- July 14 "Trichomycetes: What They Are and Where They Occur"
Dr. Stephen Moss
Department of Botany
The University of Kansas
- July 17 "Fire Ecology in Yellowstone"
Dr. Dale Taylor
Department of Biology
Sterling College
- July 24 "Fisheries Investigations in Grand Teton National Park"
Mr. Peter Hayden, Research Aquatic Biologist
Grand Teton National Park
- July 31 "Archeological Research in Grand Teton National Park"
Dr. Gary Wright
Department of Anthropology
State University of New York at Albany
- August 7 "Ecology and Behavior of Coyotes in Jackson Hole"
Mr. Franz Camenzind
Department of Zoology and Physiology
The University of Wyoming
- August 14 "Ecology of Aspen"
Dr. Alan Beetle
Division of Plant Science
The University of Wyoming
- August 21 "Violent Fluctuations in a Population of Grassland Isopods"
Dr. Oscar Paris, Director
Jackson Hole Biological Research Station

VISITORS TO THE STATION

Dr. Kenneth Diem
Department of Zoology & Physiology
University of Wyoming
Laramie, Wyoming

Mr. John Dobos, Vice President
Wyoming Environmental Institute
Casper, Wyoming

Dr. F. R. Gartner (accompanied by Range Management class)
Agricultural Research Center
South Dakota State University
Rapid City, South Dakota

Dr. Robert W. Gordon
Consulting Geologist
Pueblo, Colorado

Ms. Mary Inman, Member
Environmental Impact Subcommittee
Teton County Planning Committee
Jackson, Wyoming

Dr. Robert Lavigne
Division of Entomology
University of Wyoming
Laramie, Wyoming

Dr. Jack Major
Department of Botany
University of California
Davis, California

Dr. Glenn A. Noble
Biological Sciences Department
California State Polytechnic University
San Luis Obispo, California

Senator Robert Novotny
Wyoming State Legislature
Kinnear, Wyoming

Ms. Leslie Petersen, President
Wyoming Environmental Institute
Dubois, Wyoming

Dr. Patricia Rand
Department of Botany
University of Nebraska
Lincoln, Nebraska

Dr. Carl Rhodes
Department of Biochemistry
Stanford University School of Medicine
Stanford, California

Mr. Fred Scheerer
Group Environmentalist
United States Resource Group
Atlantic Richfield Company
Denver, Colorado

Representative John Turner
Wyoming State Legislature
Moose, Wyoming

Dr. Joseph Wagner
Director of Research, Vegetable Crops Laboratory
U.S.D.A. Western Regional Research Laboratory
Albany, California

COOPERATION WITH OTHER ORGANIZATIONS

Cooperation with Grand Teton National Park has been discussed already, in the INTRODUCTION. It is appropriate to mention here the direct collaboration between several investigators at the Station and Park Research Biologists, Dr. Lloyd Loope and Mr. Peter Hayden, and Park Resource Management Specialist, Mr. Bob Wood. This collaboration included mutual assistance with field work and exchange of data. The Colter Bay Ranger District and Buffalo Subdistrict cooperated well with the Station in a variety of ways.

The National Elk Refuge and the Biological Research Station cooperated in research being carried out on the Refuge by two of the Station's Projects. Investigators from the Station also cooperated with the National Forest Service in research of mutual interest.

Contact was maintained with the Wyoming Game and Fish Department in Jackson, and the Station was able to assist them in several ways.

Students from the Teton Sciences Field Biology School, under the supervision of Mr. Ted Major, attended most of the Station's seminars. In addition, the students from the school spent one day at the Station, during which a number of investigators presented informal research seminars to them.

FINANCIAL REPORT

1972-73

<u>Item</u>	<u>Budgeted</u>	<u>Reappropriated from 1971-72</u>	<u>Total</u>	<u>Expended</u>
Assistants, P/T	\$ 3,000.00	\$	\$ 3,000.00	\$ 3,000.00
Research Project	4,714.00		4,714.00	4,714.00
Clarke Salary	3,550.00		3,550.00	3,550.00
Contractual	948.00	124.00	1,072.00	1,065.09
Travel	374.00	131.40	505.40	505.40
Supplies	1,700.00	1,050.00	2,750.00	2,750.00
Equipment	1,265.00	2,264.00	3,529.00	3,508.50
Fixed Charges	100.00	286.00	386.00	386.00
Contractual/Repairs	<u>154.00</u>		<u>154.00</u>	<u>154.00</u>
Total	\$ 15,805.00	\$ 3,855.40	\$ 19,660.40	\$ 19,631.99

Rent received in the amount of \$620.00 was placed in the General Fund of the University.

Grants-in-aid totaling \$2,700.00 were awarded to investigators by the New York Zoological Society.

1973-74

<u>Item</u>	<u>Budgeted</u>	<u>Reappropriated from 1972-73</u>	<u>Total</u>	<u>Expended*</u>
Assistants, P/T	\$ 2,100.00		\$ 2,100.00	\$ 2,100.00
Research Project	9,100.00		9,100.00	5,192.00
Contractual	1,000.00	23.70	1,023.70	344.60
Travel	300.00		300.00	129.20
Supplies	1,800.00	1,885.58	3,685.58	2,868.30
Equipment	1,300.00	2,609.00	3,909.00	3,472.14
Fixed Charges	<u>100.00</u>	<u>386.00</u>	<u>486.00</u>	<u>386.00</u>
Total	\$ 15,700.00	\$ 4,904.28	\$ 20,604.28	\$ 14,492.24

Rent received in the amount of \$665.75 was placed in the General Fund of the University.

Grants-in-aid totaling \$4500.00 were awarded to investigators by the New York Zoological Society.

*as of January 1, 1974.

