Bibliography of Research Publications of the U.S. Bureau of Sport Fisheries and Wildlife, 1928-72

UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF SPORT FISHERIES AND WILDLIFE
RESOURCE PUBLICATION 120
BIBLIOGRAPHY OF RESEARCH PUBLICATIONS OF THE U.S. BUREAU OF SPORT FISHERIES AND WILDLIFE, 1928-72

Edited by
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Van T. Harris, Division of Wildlife Research

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INTRODUCTION

This bibliography comprises publications in fishery and wildlife research authored or coauthored by research scientists of the Bureau of Sport Fisheries and Wildlife and certain predecessor agencies. Separate lists, arranged alphabetically by author, are given for each of 17 fishery research and 6 wildlife research laboratories, stations, investigations, or centers. Publications coauthored by Bureau scientists from different research units are credited to the facility at which the senior author was stationed at the time of publication.

Although the Federal Government has supported research on fish and wildlife since the late 1800's, the relatively few works published in the early years are not directly identifiable with the existing or recent research units whose bibliographies are included here. Consequently the present lists, with three exceptions, are limited to the contributions of facilities that began operation in or after 1939, the year in which the Department of the Interior was given responsibility for fishery and wildlife research. The exceptions are the Great Lakes Fishery Laboratory (established in 1927), the Tunison Laboratory of Fish Nutrition (1932), and the Western Fish Disease Laboratory (1935).

Fishery and wildlife research were united in the Department of the Interior by the transfer of the Bureau of Fisheries from the Department of Commerce and Labor, and the Bureau of Biological Survey from the Department of Agriculture. In 1940 these Bureaus were merged to form the Fish and Wildlife Service, which in turn was divided in 1956 into the Bureau of Sport Fisheries and Wildlife and the Bureau of Commercial Fisheries. Fishery Research and Wildlife Research were designated as branches or divisions of the Fish and Wildlife Service (1940–56) or the Bureau of Sport Fisheries and Wildlife (1956–72).

The Bureau of Commercial Fisheries was transferred in 1970 to the Department of Commerce, and became the National Marine Fisheries Service of the National Oceanic and Atmospheric Administration. Inasmuch as all marine sport fishery activities were transferred to that agency from the Bureau of Sport Fisheries and Wildlife at the same time, the present bibliography does not include publications of the marine fishery research laboratories at Narragansett, Rhode Island; Highlands, New Jersey; Panama City, Florida; and Tiburon, California.

This series of lists thus constitutes primarily a bibliography of publications that have resulted from freshwater fishery research and wildlife research sponsored wholly or partly by the Department of the Interior in 1939–72. Besides providing a permanent record of that work, the more than 4,500 citations demonstrate the variety, scope, and depth of the research undertaken by the Department in its function of gathering and disseminating information on fish and wildlife. A considerable number of the citations represent the successful culmination of cooperative studies—commonly interdisciplinary—between Bureau scientists and those of other Government agencies, universities, State agencies, and other countries. The bibliography reflects the changing interests over time that have
been dictated by modifications of the environment and growth of the human population; it reflects also the complex research procedures and techniques that have been developed to deal with the increasingly diverse and severe problems that confront biologists everywhere.

Some of the recent publications listed here are available as reprints, by request from the various research units or the authors. Others, in Government publication series, may be purchased from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. Many, however—especially the older works—are out of print and available only in libraries. Fishery and wildlife scientists and others who desire information on subjects of particular interest to them, or on the availability of publications, are invited to communicate directly with the research facilities.
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The Central Office of the Division of Fishery Research supervises the planning, performing, and reporting of research to provide the knowledge needed for effective and efficient management of the Nation's anadromous and freshwater sport fishery resources. During 1972–73, research in fish husbandry, ecosystems, and pest control was divided among 14 laboratories and 14 field stations.

Fish husbandry research has been concerned with the production and use of hatchery fish and has included work in nutrition, pathology, cultural methods, genetics, and environmental requirements. Ecosystem research has been directed toward improving our understanding of the physical, chemical, and biological factors governing the abundance and distribution of sport fishes in the natural environment—primarily in the Great Lakes and large reservoirs. Pest control research has been centered on determining the amounts, kinds, and formulations of pesticides that are lethal or injurious to fish and other aquatic life and on developing chemical, biological, electrical, and mechanical methods of controlling or managing freshwater fish populations.

DIVISION OF FISHERY RESEARCH

THOMPSON, PAUL E.

WALKER, CHARLES R.
WALKER, CHARLES R.


The Eastern Fish Disease Laboratory is in West Virginia's scenic Eastern Panhandle, on the grounds of the Leetown National Fish Hatchery. It began in 1932 as the U.S. Fisheries Experimental Station, a one-man operation housed in the hatchery building. It was later known as the Microbiological Laboratory, and in 1957 was renamed the Eastern Fish Disease Laboratory.

The principal function of the Laboratory is to carry out research in bacteriology, chemotherapy, histopathology, immunology, parasitology, and virology directed toward detection and identification of infectious diseases of fish and development of methods of control. The Laboratory also offers a comprehensive biennial 5-month course that includes lectures and laboratory and field work on the detection, diagnosis, identification, and control of fish diseases. As needed, workshops are held to provide instruction in new methods of disease detection and control. Participants in the training programs are from Federal, State, and private agencies.

A comprehensive collection of literature on the various aspects of fish diseases is housed in the library. Included are more than 250 publications by the staff. "Fish Health News," a quarterly newsletter, was begun in 1972. It lists library accessions with brief annotations, reviews, and news items of interest to hatchery biologists and others interested in fish health research.

Papers published before 1947, which pertained to fish culture or stream investigations, are not included here.


BILLI, JAMES L., AND KEN WOLF.

BOWEN, J. T.

BOWEN, J. T., AND R. E. PUTZ.

BULLOCK, GRAHAM L.


BULLOCK, G. L., AND DIANE COLLIS.

BULLOCK, GRAHAM L., AND JOHN J. A. McLAUGHLIN.
FRIDDLE, S. B., AND S. F. SNIESZKO.


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HERMAN, ROGER LEE, AND ROBERT E. PUTZ.  

HOPFMAN, GLENN L.  


HOPFMAN, GLENN L., HARRY BISHOP, AND C. E. DUNBAR.  

HOPFMAN, GLENN L., AND C. E. DUNBAR.  


HOPFMAN, GLENN L., CLARENCE E. DUNBAR, AND ARTHUR BRADFORD.  

HOPFMAN, G. L., C. E. DUNBAR, K. WOLF, AND L. O. ZWILLENBERG.  

HOPFMAN, G. L., JR., AND G. L. HOPFMAN.  

HOPFMAN, GLENN L., AND JAMES A. HUTCHESON.  

HOPFMAN, GLENN L., AND JIRI LOM.  

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Hunn, Joseph B.

Kinchelor, John W.

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RODGERS, E. O., B. H. HAZEN, S. B. FRIDDLE, AND S. F. SNIESZKO.

1951. The toxicity of pyridylmercuric acetate technical (PMA) to rainbow trout (Salmo gairdnerii). Prog. Fish-Cult. 13(2): 71-73.

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1948. Disinfection of rainbow trout eggs with sulfo-merthiolate: experiment with sodium p-ethyl mercuri thiophenylsulfonate, Lilly. Prog. Fish-Cult. 10(3):143–149.


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SNIESZKO, S. F., and GLENN L. HOFFMAN.


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SNIESZKO, S. F., and G. L. BULLOCK, C. E. DUNBAR, and L. L. PETTIJOHN.

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1965. Use of microhematocrit values to sex large-mouth bass. Prog. Fish-Cult. 27(2):87–90.

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WOLF, KEN.

1965. Infectious pancreatic necrosis: its detection and identification. Prog. Fish-Cult. 27(2):112.
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WOLF, KEN, AND C. E. DUNBAR.


WOLF, KEN, C. E. DUNBAR, AND E. A. PYLE.


WOLF, KEN, C. E. DUNBAR, AND S. F. SNIETZKO.


WOLF, KEN, MANETH GRAVELL, AND RICHARD G. MALSBberger.


WOLF, KEN, ROGER L. HERMAN, AND C. P. CARLSON.


The Western Fish Disease Laboratory was established at Seattle in 1935. Its principal function or objective is to improve salmon and trout culture by providing information on mechanisms of infectious disease transmission, resistance, prevention, and therapy; identifying or diagnosing disease; and prescribing treatment.

The facility comprises five laboratories, equipped for research in bacteriology, virology, pathology, immunology, and biochemistry. Two wet laboratories have aquaria, troughs, and tanks. Supplies of temperature-controlled soft and hard water are available. The Laboratory includes a small museum and a specialized library.

AMEND, DONALD F.

AMEND, DONALD F., AND VELMA C. CHAMBERS.

AMEND, DONALD F., AND JOHN P. PIETSCH.

AMEND, DONALD F., AND AVRON J. ROSS.

AMEND, DONALD F., AND GARY WEDEMEYER.

AMEND, DONALD F., AND JAMES W. WOOD.

ANDERSON, DOUGLAS P.

ANDERSON, DOUGLAS P., AND GEORGE W. KLONTZ.

ANDERSON, DOUGLAS P., AND AYRON J. ROSS.

CONROY, D. A., J. E. VALEZ, AND A. J. ROSS.

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DAVIS, PAUL W., AND GARY A. WEDEMEYER.

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PARISOT, THOMAS J., WILLIAM T. YASUTAKE, AND G. R. WHITE.


PARISOT, THOMAS J., AND JOSEPH E. MARTIN.


PARISOT, THOMAS J., AND JAMES W. WOOD.


PARISOT, THOMAS J., AND GEORGE W. KLONTZ.


ROSS, A. JOHN, AND FRANK P. BRANCATO.


ROSS, A. JOHN, BRIAN J. EARP, AND JAMES W. WOOD.


ROSS, A. J., AND H. E. JOHNSON.


ROSS, A. J., AND G. W. KLONTZ.


ROSS, A. J., J. E. MARTIN, AND V. BRESSLER.


ROSS, A. JOHN, PHYLLIS R. NORDSTROM, JACK E. BAILEY, AND JOHN H. HEATON.


ROSS, A. JOHN, AND THOMAS J. PARISOT.


ROSS, A. J., J. PELNAR, AND R. R. RUCKER.


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ROSS, A. J., AND CATHY A. SMITH.


ROSS, A. JOHN, BRIAN J. EARP, AND JAMES W. WOOD.


ROSS, A. J., AND H. E. JOHNSON.


ROSS, A. J., AND G. W. KLONTZ.


ROSS, A. J., J. E. MARTIN, AND V. BRESSLER.


ROSS, A. JOHN, AND JAMES W. WOOD.


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ROSS, A. J., AND CATHY A. SMITH.

RUCKER, ROBERT R.


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RUCKER, R. R., AND K. HODGEBOOM.


RUCKER, ROBERT R., HARLAN E. JOHNSON, AND GEORGE M. KAYDAS.


RUCKER, ROBERT R., HARLAN E. JOHNSON, AND ERLING J. ORDAL.


RUCKER, ROBERT R., WARNER G. TAYLOR, AND DONALD P. TONEY.


RUCKER, ROBERT R., AND EDWARD M. TUTTLE.


RUCKER, R. R., AND W. J. WHIPPLE.


RUCKER, R. R., W. J. WHIPPLE, J. R. PARVIN, AND C. A. EVANS.


RUCKER, R. R., W. T. YASUTAKE, AND G. WEDEMEYER.


RUCKER, R. R., W. T. YASUTAKE, AND H. WOLF.


UZMANN, JOSEPH R., AND JOHN DOUGLAS.


UZMANN, J. R., AND S. HOBBS HAYDUK.


UZMANN, J. R., AND J. W. JESSE.


UZMANN, J. R., AND M. N. HESSELHOLT.


UZMANN, J. R., AND J. W. JESSE.


UZMANN, J. R., R. A. LANDER, AND M. N. HESSELHOLT.


UZMANN, J. R., G. J. PAULIK, AND D. ROYCE.


UZMANN, J. R., AND H. J. RAYNER.


UZMANN, J. R., JOSPEH A. STERN, DIPTIMAN CHAKRABARTI, AND MARY N. HESSELHOLT.


WATSON, MARGARET E., RAY W. GUENTHER, AND RODNEY D. ROYCE.

VATSON, STANLEY W.

VATSON, STANLEY W., RAYMOND W. GUENTHER, AND ROBERT R. RUCKER.

WEDEMEYER, GARY.

WEDEMEYER, GARY, AND K. CHATTERTON.

WEDEMEYER, GARY, A. J. ROSS, AND LYNNWOOD SMITH.

YASUTAKE, WILLIAM T.

YASUTAKE, WILLIAM T., THOMAS J. PARISOT, AND GEORGE W. KLONTZ.

YASUTAKE, WILLIAM T., AND ROBERT R. RUCKER.

YASUTAKE, W. T., AND HAROLD WOLF.
FISH FARMING EXPERIMENTAL STATION
U.S. Department of the Interior
Bureau of Sport Fisheries and Wildlife
Stuttgart, Arkansas 72160

The Fish Farming Experimental Station was established in 1961 on an 85-acre area 8 miles east of Stuttgart, Arkansas. The Fish Farming Development Center, Rohwer, Arkansas, became a field unit of the Station in 1972, by transfer from the National Marine Fisheries Service. The primary mission of the Station is to study problems associated with the production of fish as related to rice and other field crops.

The Station’s facilities include a modern laboratory, a wet laboratory, a shop, a number of service buildings, 85 experimental ponds, 48 circular fiberglass tanks, and 10 aluminum raceways.

Current research, conducted by specialists in aquatic biology, fish culture, nutrition, pathology, genetics, and water chemistry is concentrated on the development of methods to improve fish production in ponds. Included are studies of catfishes, buffaloes, bait minnows, and black basses, as well as various combinations of species. Field investigations are underway to: (1) determine the species of fish best suited for culture; (2) find methods for efficiently spawning fish and producing fingerlings; (3) develop economical methods for raising fish to desired sizes; (4) develop controls for undesirable species of fish; (5) improve methods for harvesting fish; (6) develop controls for aquatic weeds; and (7) determine the effects of fish production on rice and other crops (in cooperation with the U.S. Department of Agriculture and the University of Arkansas).

Laboratory research includes studies on: (1) parasites and diseases affecting fish, and the development of control measures; (2) the effect of environmental changes on the physiology of fish; (3) the effects of agricultural chemicals on fish; (4) the nutritional requirements of fish; (5) the improvement of strains of fish through hybridization, selective breeding, and mutation; and (6) the improvement of techniques for controlling the spawning of fish through the use of hormones, gynogenesis, or the manipulation of water quality.

ALLEN, KENNETH O.

FRIBOURGH, JAMES H.

FRIBOURGH, JAMES H., DALE E. MCCLENDON, AND BERNARD L. SOLOFF.

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GIUDICE, JOHN J.

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GREENLAND, DONALD C., JAMES E. ELLIS, AND ROBERT L. GILL.

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1972. Operating and design criteria of an adjustable horizontal-bar grader for sorting channel catfish. Prog. Fish-Cult. 34(4):186-190.

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HASTINGS, WALDON H.

HASTINGS, W. H., AND L. M. DICKIE.

HASTINGS, WALDON H., AND HARRY K. DUFOREE.

HASTINGS, W. H., BILL HINSON, DEWEY TACKETT, AND BILL SIMCO.

HORNBECK, RUSSELL, W. A. WHITE, AND FRED P. MEYER.

LETEUX, FRANK, AND FRED P. MEYER.

MARTIN, J. MAYO.

MAYER, FRED P.
MEYER, FRED P.

MEYER, FRED P., AND JERRY COLLAR.
SIMCO, BILL A., W. H. HASTINGS, AND K. B. DAVIS.  

SIMCO, BILL A., AND ROBERT P. STICKNEY.  

SNEED, KERMIT E.  

SNEED, KERMIT E., W. H. HASTINGS, AND HARRY K. DUPREE.  

STEVENSON, JAMES H.  

STICKNEY, ROBERT R., AND BILL A. SIMCO.  

TACKETT, DEWEY L.  

TACKETT, D. L., C. J. BIGGERS, AND B. A. SIMCO.  

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1962. This is the Fish Farming Experimental Station. U.S. Fish Wildl. Serv., Circ. 126. 8 pp.

U.S. Bureau of Sport Fisheries and Wildlife [Warmwater Fish Cultural Laboratories].  

U.S. Fish and Wildlife Service [Warmwater Fish Cultural Laboratories].  
The Southeastern Fish Cultural Laboratory was established in 1959 to develop fish cultural techniques for use by hatcherymen and fish farmers. Research facilities include multiple 5- to 100-liter aquariums, 20 troughs, 22 0.1-acre and 10 0.05-acre earthen ponds, and 53 circular raceways. An additional 30 acres of ponds of various sizes are used to culture experimental fish. Buildings include the main office-laboratory, a service building, a trough and aquarium building, field laboratory, and several temporary fish rearing structures.

During the early 1960's research gradually evolved into studies of basic nutrition and physiology of warmwater fishes, especially the catfishes. Some of the early research was on culture of flathead catfish in troughs, with artificial diets; induction of spawning of channel catfish and other fish species with gonadotropins; freeze preservation of fish sperm; and development of purified diets suitable for nutritional studies. Emphasis now is directed toward basic biological problems concerned with the development of warmwater fish cultural practices, especially those related to production in impounded waters of the Southern States. Significant studies underway include those on the amino acids and vitamins required for the growth of channel catfish; interrelation of utilization of proteins, fats, and carbohydrates; effects of pesticides on fish and fish organisms; chemical and physical properties of immunoglobulins of warmwater fishes; selective breeding and hybridization of catfishes; and the culture and related nutrition and physiology of sport species.


GREEN, O. L.

LEGLER, D. W., R. T. ACTON, P. F. WEINHEIMER, AND H. K. DUPREE.

LEGLER, DONALD W., E. EDWARD EVANS, AND HARRY K. DUPREE.


LINDSAY, RAYMOND H., CYNTHIA ROMINE, FRANK ZACHAREWSIC, HARRY K. DUPREE, AND KERMIT E. SNEED.

SNEED, KERMIT E., AND HOWARD P. CLEMENS.

SNEED, KERMIT E., AND HARRY K. DUPREE.

SNEED, KERMIT E., HARRY K. DUPREE, AND O. L. GREEN.

TARRANT, ROBERT M., JR.
Research at the Salmon-Cultural Laboratory, located on the lower Columbia River, has been directed toward the improvement of methods of artificial propagation of Pacific salmon. The Laboratory's facilities include a full-scale hatchery, rearing ponds, an egg-incubation channel, and chemical and biological laboratories.

Nutrition, physiology, and the development and improvement of hatchery techniques have been the principal subjects of investigation. Extensive feeding trials with various food formulations have led to the development of the Abernathy dry pelleted salmon diet, which is widely used in National and State hatcheries. Physiological work has dealt primarily with the factors affecting the embryonic development and maturation of salmon. In research on hatchery techniques, electrical diversion weirs for trapping adult salmon have been studied; the suitability and efficiency of rearing ponds of different shape and construction have been evaluated; and the quality of fingerling salmon from different stocks or with different rearing histories has been tested in a “stamina tunnel” developed at the Laboratory. Much of the Laboratory’s research has been ultimately evaluated on the basis of the percentage of distinctively marked fingerling salmon that have returned to the hatchery as adults.

The Laboratory was transferred from the Division of Fishery Research to the Division of Fish Hatcheries on July 1, 1972.

ANONYMOUS.
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ELLIOTT, JOSEPH W., LAURIE G. FOWLER, AND ROGER E. BURROWS.

FOWLER, LAURIE G.

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NEWMAN, H. WILLIAM, DAVID D. PALMER, AND ROGER E. BURROWS.

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THOMAS, ALLAN E., AND J. M. SHELTON.  

TODD, W. R., L. E. LAASTUEN, AND L. G. FOWLER.  

TODD, W. R., L. E. LAASTUEN, AND A. E. THOMAS.  
This facility was known as the Convict Creek Experiment Station in 1950-60, when its major functions were to (1) determine experimentally the relative survival of different species of trout in controlled stream habitats, (2) specify factors in the long-term success of hatchery trout, (3) explore regional aquatic productivity through limnological studies, and (4) develop methods and applications for freshwater fishery biology.

After successive additions of laboratory space and equipment in the 1960's, research on ecology, behavior, and adaptive physiology of freshwater salmonids was expanded, with a view to supplying fundamental information needed by fishery managers.

Early publications dealt with studies of trout survival and vitality in experimental waters, limnology of trout waters in the region, formerly unspecified food relations, and the improvement of investigative methods or tools. Publications in 1968–72 concerned research on trout behavior and fish physiology, as well as further work on limnology, trout ecology, and fishery methods.

The Laboratory was closed as a Bureau activity in June 1973.
MACIOLEK, JOHN A.
MACIOLEK, J. A., AND H. D. KENNEDY.
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REIMERS, NORMAN.
REIMERS, NORMAN, AND BOBBY D. COMBS.
REIMERS, NORMAN, JOHN A. MACIOLEK, AND EDWIN P. PISTER.
REIMERS, NORMAN, AND EDWIN P. PISTER.
1953. A machine for sounding and for operating limnological apparatus. Prog. Fish-Cult. 15(1) : 33-34.
Research on the nutrition of salmonids has been conducted at this facility, originally known as the Cortland Experimental Hatchery and later as the Eastern Fish Nutrition Laboratory, since Abram V. Tunison started the first experiments in August 1932. When a new research laboratory was dedicated in May 1971 it was renamed the A.V. Tunison Laboratory of Fish Nutrition. The Laboratory has been operated almost since its inception under a cooperative agreement between the New York Department of Environmental Conservation, the U.S. Fish and Wildlife Service, and Cornell University.

The federally owned Laboratory is on a 105-acre tract of primarily forested land 6 miles south of Cortland. It includes three buildings (more than 15,000 square feet of floor space) that house two experimental hatcheries, an isolation-quarantine area, and laboratory-office space; also on the grounds are 24 outdoor raceways. The Laboratory is completely equipped for studying the physiology and nutritional requirements of trout and Atlantic salmon.

Most of the extensive research of the Laboratory has been published in 39 issues of the Cortland Hatchery Report, which appeared as annual volumes for the years 1932-70.

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PHILLIPS, ARTHUR M., JR., GLEN L. HAMMER, J. P. EDWARDS, AND H. P. HOSKING.


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PHILLIPS, ARTHUR M., JR., HUGH A. POSTON, AND DONALD L. LIVINGSTON.


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PHILLIPS, ARTHUR M., JR., A. V. TUNISON, AND GEORGE C. BALZER.

PHILLIPS, ARTHUR M., JR., A. V. TUNISON, AND DONALD R. BROCKWAY.
PODOLIAK, HENRY A., AND R. C. WILLIAMS.


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PODOLIAK, HENRY A., AND J. HOWARD MCCORMICK.

POSTON, HUGH A.

PODOLIAK, HENRY A., AND HARRY K. HOLDEN, JR.

PODOLIAK, HENRY A., AND J. HOWARD MCCORMICK.

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POSTON, HUGH A.

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PYLE, EARL A.


1940. The protein requirement of trout. Prog. Fish-Cult. No. 50: 29–32.


The Western Fish Nutrition Laboratory was built in 1953 for two purposes: (1) to determine basic nutritional requirements of fish—their needs for vitamins, proteins and amino acids, essential fats, carbohydrate sources, and minerals in the diet and the environment—and (2) to define the specific role of each of these nutrients in fish physiology and metabolism. After qualitative requirements for constituents of these five named classes of nutrients were described, quantitative needs for each were investigated with respect to species, size, and state of development of fish. The comprehensive research program was organized into three major areas of study: (1) basic nutritional requirements; (2) physiological function of nutrients; and (3) diet development, availability, and utilization.

Work at the Laboratory is complemented by research at two field stations—one at Hagerman, Idaho, for large-scale testing of nutrients and diets, and another at Port Townsend, Washington, for the study of conditioning of salmon for conversion from fresh water to salt water.

Research was first focused on test diets and test experimental facilities and conditions that would give scientists positive control over the particular nutrient to be tested. Application of results from extensive testing and development yielded breakthroughs in the fields of vitamin, amino acid, protein, and carbohydrate nutrient requirements for salmon and trout.

Dividends from this research formed the foundation for the modern fish diet industry and revolutionized fish husbandry techniques. Additionally, basic biological understanding of life systems was advanced in such areas as the mechanisms for tissue synthesis and wound repair, respiration and permeability of cell membranes, basic mechanisms in blood clotting and clot lysis, and chemical carcinogenesis and the role of mycotoxins in neoplasia.

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BUHLER, DONALD E.

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CHANCE, E. E., J. E. HALVER, AND E. T. MERTZ.

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GAHIMER, G. D., A. R. ANDERSON, AND C. L. JOHNSON.

HALVER, JOHN E.
HALVER, JOHN E.


HALVER, J. E., L. M. ASHLEY, C. E. SMITH, AND G. N. WOGAN.


SHATTON, JENNIE B., JOHN E. HALVER, and SIDNEY WEINHOUSE.


SMITH, CHARLIE E.


SMITH, CHARLIE E., and JOHN E. HALVER.


SMITH, C. E., L. R. McLAIN, and W. S. ZAUGG.


SMITH, R. R.


SNODGRASS, P. J., and J. E. HALVER.


VON SALLMANN, LUDWIG, JOHN E. HALVER, ELEANOR COLLINS, and PATRICIA GRIMES.


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Woodall, A. N.
Woodall, A. N., L. M. Ashley, John E. Halver, H. S. Oclcott, and John Van Der Veen.
Woodall, A. N., and Gilles LalRocHe.
Yasutake, W. T., D. R. Buhler, and W. E. Shanks.
Yasutake, W. T., and E. M. Wood.

Zaugg, W. S.
Zaugg, W. S., B. L. Adams, and L. R. McLain.
Zaugg, W. S., and R. J. Knox.
Zaugg, W. S., and L. R. McLain.
APPALACHIAN SPORT FISHERY INVESTIGATIONS
U.S. Department of the Interior
Bureau of Sport Fisheries and Wildlife
Leetown, West Virginia

Appalachian Sport Fishery Investigations was established in 1952 with headquarters at Leetown, West Virginia, and a field station at Gatlinburg, Tennessee. The principal purpose was to determine the factors governing the abundance and distribution of game fishes—especially trout—in Great Smoky Mountains National Park and Shenandoah National Park. Secondary purposes were to develop electrofishing apparatus for assessment of fish populations in the extremely soft Appalachian waters and to assist the National Park Service in formulating management plans for the heavily exploited fishery resources.

The investigations were terminated in 1960, after the research objectives had been largely achieved. The staff and the records of the Appalachian Investigations were transferred to the Fish Control Laboratory, La Crosse, Wisconsin. Papers published in 1959–67 that originated from work in Great Smoky Mountains or Shenandoah National Parks are listed in the bibliography for that Laboratory.

LENNON, ROBERT E.
1954. The Pisgah system. Prog. Fish-Cult. 16(2): 91–92.


LENNON, ROBERT E., AND PHILLIP S. PARKER.
This research unit was established in 1948 at the Stanford, California, Laboratory of the U.S. Fish and Wildlife Service. It was moved to Logan, Utah, in 1951, and maintained an association with Utah State University, where library facilities, consultants, and student aids were available. The former U.S. Fish and Wildlife Service egg-collecting station and hatchery at Yellowstone Lake was used as a field station.

The main purpose of Rocky Mountain Sport Fishery Investigations was to study the life history and population dynamics of the cutthroat trout in Yellowstone Lake. Studies were also carried out on stream management in the Madison River system, grayling in Grebe Lake, rainbow trout in Rocky Mountain National Park, and pesticides. All work was conducted on National Park Service waters, except for limited pesticide work in National forests.

Field data collected at Yellowstone Lake included creel census; counts of spawning fish, scales for growth and age analysis, and other life history information on the cutthroat trout; and limnological data. An intensive management plan for Yellowstone Lake was prepared for use by the National Park Service and the Bureau's Division of Fishery Management Services. The work was terminated after the 1961 field season.

BALL, ORVILLE P.

BALL, ORVILLE P., AND OLIVER B. COPE.

BENSON, NORMAN G.

BENSON, NORMAN G., AND ROSS V. BULKLEY.

BENSON, NORMAN G., OLIVER B. COPE, AND ROSS V. BULKLEY.

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COPE, OLIVER B.
COPE, OLIVER B.
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LAAKSO, MARTIN.
LAAKSO, MARTIN, AND OLIVER B. COPE.
MOORE, HARVEY L., OLIVER B. COPE, AND RICHARD E. BECKWITH.
The Fish Control Laboratory was established in 1959 at the site of a former National Fish Hatchery. Remodeling in 1960-61 provided wet and dry laboratories for investigation of new or improved chemical tools needed in fish culture and fishery management—fish toxicants, anesthetics, collecting aids, therapeutants, and disinfectants.

Soon after the Laboratory became operational, new laws were passed by Congress that require registration of aquatic-use chemicals. The registration requirement multiplies severalfold the amount of research necessary to develop a fishery chemical. The Laboratory therefore emphasizes investigations on the toxicity (safety) of candidate chemicals; their effectiveness in controlling target organisms; and their residues in fish, water, and the environment.

Primarily as a consequence of repeated inundation of the laboratory site by floods on the Mississippi River, construction of a new laboratory was begun near La Crosse in 1973.

The Fish Control Laboratories comprise the headquarters at La Crosse; the Southeastern Fish Control Laboratory, Warm Springs, Georgia; and Hammond Bay Biological Station, Millersburg, Michigan, on the north-west shore of Lake Huron. Research at the Southeastern Fish Control Laboratory, which was begun in 1962, supplements the investigations on fishery chemicals at La Crosse, especially as the chemicals affect southern freshwater fishes in very soft waters. Work at Hammond Bay is centered on the development of chemical, physical, and biological means for control of the sea lamprey in the Great Lakes. This Station was established in 1950 and operated by the Bureau of Commercial Fisheries until October 1970, when it was transferred to the Bureau of Sport Fisheries and Wildlife.

Allen, John L.


Allen, John L., and Joe B. Sills.


Berger, Bernard L.

Berger, Bernard L., Robert E. Lennon, and James W. Hogan.

Braem, Robert A., and Everett L. King, Jr.

Burrell, Ralph M.


Cook, R. S., chairman, A. M. Beeton, P. M. Cook, P. H. Derse, A. Hasler, R. E. Lennon, P. Sager, and W. Selbie.


Hanson, Lee H.


Hesselsberg, Robert J., and Ralph M. Burress.


Hogan, James W.


Howland, Robert M.


Hunn, Joseph B.


Hunn, Joseph B., and P. O. Fromm.


Hunn, Joseph B., and Paul F. Robinson.


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LITMAN, G. W., D. FROMMEL, J. FINSTAD, J. HOWELL, B. POLLARA, AND R. A. GOOD.
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MARKING, LEIF L., AND VERDEL K. DAWSON.
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MARKING, LEIF L., AND WAYNE A. WILLFORD.  

SCHOETTGER, RICHARD A., AND GERALD E. SVENDSEN.  

SINDBERG, CARL J., AND DONALD F. MAIRS.  

STEUCKE, ERWIN W., JR., AND RICHARD A. SCHOETTGER.  

SVENDSEN, GERALD E.  

WALKER, CHARLES R.  


WALKER, CHARLES R., ROBERT E. LENNON, AND BERNARD L. BERGES.  

WALKER, CHARLES R., AND RICHARD A. SCHOETTGER.  


WALKER, CHARLES R., ROLAND J. STARKEY, AND LEIF L. MARKING.  

WHITWORTH, WALTER R., AND THOMAS H. LANE.  
WILLFORD, WAYNE A.

WILLFORD, WAYNE A., JOE B. SILLS, AND EVERETT W. WHEALDON.
The Fish-Pesticide Research Laboratory was established in 1959 at Denver, Colorado, to study the effects of pesticides on fish and wildlife. It was moved in 1966 to a 34-acre tract of land adjacent to the University of Missouri’s South Farm, near Columbia, Missouri.

Physical facilities include a 23,000 square-foot laboratory building, 38 ponds, a shop-garage, and a deep well that delivers 1,200 gpm of water at 16 C. Specialized laboratory equipment includes small recirculating streams; a stamina tunnel; light- or temperature-controlled flow-through diluters; a liquid scintillation counter; infrared, atomic absorption, and visible light spectrometers; a fluorometer; an ultracentrifuge; gas chromatographs; a mass spectrometer; and a PDP-12 digital computer.

Field research units are located at the Fish Control Laboratory, La Crosse, Wisconsin; at the National Fish Hatchery, Jackson, Wyoming; and at the Denver Federal Center, Denver, Colorado.

Investigations at the Laboratory are directed toward understanding and predicting the immediate and long-term effects of contaminants such as forest insect sprays, aquatic herbicides, mosquito larvicides, and other resource management chemicals on fishery resources, and toward determining the toxicologic impact of agricultural and industrial chemicals on the management of fisheries. Research is focused primarily on: (1) agents newly developed or registered for use in aquatic ecosystems for protection of natural resources, human health, food, and fiber; (2) old pesticides on which new aquatic registrations are being sought; (3) agents newly developed or registered whose magnitude, mode, or target of application is likely to result in contamination of aquatic ecosystems; and (4) known contaminants of fish and fish foods.


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MAYER, FOSTER L., JR., DAVID L. STALLING, AND JAMES L. JOHNSON.

MCALLISTER, WILLIAM A., JR., WILBUR L. MAUCK, AND MCCRAREN, JOSEPH P., OLIVER B. COPE, AND LAFAYETTE JOHNSON.
VAN VALIN, CHARLES C., AUSTIN K. ANDREWS, AND LAFAYETTE L. ELLER.

VAN VALIN, CHARLES C., AND BURTON J. KALLMAN.

VAN VALIN, C. C., B. J. KALLMAN, AND J. J. O’DONNELL, JR.

WEDEMEYER, GARY.
GREAT LAKES FISHERY LABORATORY
U.S. Department of the Interior
Bureau of Sport Fisheries and Wildlife
Ann Arbor, Michigan 48107

The Great Lakes Fishery Laboratory is on the North Campus of the University of Michigan and continues to maintain a close association with the University that began when a permanent program of Federal fishery and limnological research on the Great Lakes was first established in 1927. The Laboratory was transferred from the Bureau of Commercial Fisheries to the Bureau of Sport Fisheries and Wildlife in 1970, in accordance with Presidential Reorganization Plan No. 4.

Research facilities of the present building (dedicated in May 1966) include specialized equipment for the study of fish physiology, water chemistry, plankton, and benthos; extensive fish holding and rearing equipment; an automatic data processing center; a workshop; and the excellent John Van Oosten Library. Supporting field units are biological stations at Ashland, Wisconsin, and Sandusky, Ohio; vessel bases at Saugatuck and Cheboygan, Michigan; and four 45- to 65-foot research vessels, the Cisco, Kaho, Musky II, and Siscowet.

The mission of the Laboratory is to describe and understand the ecology of the Great Lakes and to develop the knowledge required for the conservation and enhancement of the fishery resources. Major subjects of research have included the life histories of native and introduced fishes; commercial fishery statistics, with special reference to the effects of selective exploitation on the fish stocks; the sea lamprey (its distribution and abundance, effects of its predation on native fish stocks, and the development of methods for its control); the rehabilitation of lake trout in the upper Great Lakes; the alewife (especially its population dynamics and its effects on native fish stocks); and the environment, with particular reference in recent years to the adverse effects of domestic and industrial pollution, contaminants such as insecticides and methyl mercury, and waste heat from power generating plants.

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ALLEN, HERBERT E., AND RICHARD B. HAHN.

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APPLEGATE, VERNON C., AND CLIFFORD L. BRYNILDSON


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DANIELS, S. L., L. L. KEMPE, E. S. GRAHAM, AND A. M. BEETON.  

DEASON, HILARY J.  

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DREYER, WILLIAM R., AND JOSEPH BEIL.  

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EDSALL, THOMAS A., AND PETER J. COLBY.  

EDSALL, THOMAS A., DONALD V. ROTTIERS, AND EDWARD H. BROWN.  

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ERKKILA, LEO F.  

ERKKILA, LEO F., BERNARD R. SMITH, AND ALBERTON L. MCLAINE.  

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ESCHMEYER, PAUL H.

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ESCHMEYER, PAUL H., RUSSELL DALY, AND LEO F. ERKKILA.

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GORDON, WILLIAM G.

GROSSLEIN, MARVIN D., AND LLOYD L. SMITH, JR.

HALL, A. E., JR., AND OLIVER R. ELLIOTT.

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HILE, RALPH, GEORGE F. LUNGER, AND HOWARD J. BUETTNER.

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HOWELL, JOHN H.

HOFFMAN, WALTER J.

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KEMPE, L. L., STAGY DANIELS, AND ALFRED M. BEETON.

KOEHLER, WALTER.

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Merna, James W.

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SAKAGAWA, GARY T., AND RICHARD L. PYCHA.

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STARKEY, ROLAND J., AND JOHN H. HOWELL.

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TORBLAA, RICHARD L.

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WELLS, LARUE.
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WESTERMAN, FRED A., AND JOHN VAN OOSTEN.
WIGLEY, ROLAND L.
WILSFORD, B. R., JR.
WILSFORD, WAYNE A.
WOLPERT, DAVID R.


Wolfert, David R., Vernon C. Applegate, and Leonard N. Allison.

Wolfert, David R., and Jarl K. Hiltunen.

Wood, Leonard E.

Wright, Stillman.


Wright, Stillman, and Wilbur M. Tidd.

Wydoski, Richard S., and David R. Wolfert.

Zimmerman, Jerome W.
The major aims of the National Reservoir Research Program, which was begun in 1963, are to determine the factors that influence sport fish production in major types of large reservoirs and to evaluate fish management methods. In addition, the investigations provide information needed to predict the effects of proposed water development projects, as well as information on environmental requirements of fish needed to establish safe water quality standards.

Activities include (1) studies of the influence of environmental factors on fish standing crop and sport fishing effort and harvest in more than 200 reservoirs; (2) compilation of extensive data on reservoirs; (3) computer analysis of the data, involving relation to the sport fish harvest of such factors as reservoir area, nutrient content, growing season, and reservoir age; (4) estimation of fish standing crops and interspecific competition within reservoirs and prediction of the amount of sport fishing a reservoir will support; and (5) evaluation, in terms of effects on fish production and sport fishery management, of such variables as geographical location, water exchange rate, watershed characteristics, and water level fluctuation and other reservoir operational characteristics as influenced by engineering design.

The National Reservoir Research Program provides leadership and coordination of a fish management evaluation program involving analysis, by automatic data processing methods, of the effects of reservoir environmental variables on the success of stocking striped bass, walleyes, and other predators in southern reservoirs, in cooperation with 15 State and Federal agencies.

JENKINS, ROBERT M.

JENKINS, ROBERT M., AND DAVID I. MORAIS.
North Central Reservoir Investigations was established in Yankton, South Dakota, in 1961. A biological station was begun at Pierre, South Dakota, in 1964, and a station established at Mobridge, South Dakota, in 1963 by the Bureau of Commercial Fisheries was transferred to the Bureau of Sport Fisheries and Wildlife in 1970.

Most research of North Central Reservoir Investigations is conducted on four main stem reservoirs of the Missouri River: Lake Oahe (350,000 acres), Lake Sharpe (56,000 acres), Lake Francis Case (82,000 acres), and Lewis and Clark Lake (27,000 acres). The four principal research objectives are: (1) to determine the relations between the fish populations (reproduction, growth, abundance, mortality) in these reservoirs and such variables as water management programs designed for flood control and power, environmental changes associated with aging, and production of fish food (plankton and benthos); (2) to improve sport fishing by either modifying the environments (changing water management programs) or recommending such fish management measures as stocking or improving fish spawning and nursery areas; (3) to provide information for water resource planning; and (4) to develop prediction models for managing the fishery resources.

The research findings are used in State fish management programs, in Federal-State planning studies with the U.S. Army Corps of Engineers to adjust water management programs for the benefit of fish, and in broad resource assessment studies.

ACKERMAN, G., AND M. S. BOUSSU.

ECKMAN, LANCE G., AND JOSEPH H. ELROD.

BENSON, NORMAN G.

BENSON, NORMAN G., editor.

BENSON, NORMAN G., AND BRUCE C. COWELL.

CLAPLIN, THOMAS O.

COWELL, BRUCE C.

COWELL, BRUCE C., AND PATRICK L. HUDSON.
ELROD, JOSEPH H., AND THOMAS J. HASSLER.


FUCHS, EVERETT H.

GASAWAY, CHARLES R.

GREENWOOD, M. R., AND M. S. BOUSSU.

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HEIMSTRA, NORMAN W., DAVID K. DAMKOT, AND NORMAN G. BENSON.

HUDSON, PATRICK L.


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HUDSON, PATRICK L., AND GEORGE A. SWANSON.

JUNE, FRED C.


McCOMISH, THOMAS S.

MOEN, TOM.

MOEN, TOM, AND DALE HENEGAR.

NELSON, WILLIAM R.


NELSON, W. R., NORMAN R. HINES, AND LANCE G. BECKMAN.

NELSON, W. R., E. E. SIEFERT, AND D. V. SWEDBERG.


South Central Reservoir Investigations was established in 1962, near the White River reservoirs and the University of Arkansas. Research has been concentrated on Beaver and Bull Shoals Reservoirs in the Ozark Mountain region of Arkansas and Missouri, but has also extended to reservoirs in other river systems, primarily in the southern United States.

Research facilities include office and laboratory space shared with the National Reservoir Research Program; a 20 x 63-foot research barge, equipped for rearing larval fish and for other experiments; and the 27-foot midwater trawler, Threadfin II, equipped with a diesel engine, a hydraulic winch system, and a white-line echosounder.

Investigations of the facility include (1) life history studies of the more important fishes; (2) underwater studies of the spawning and early life history of black basses and crappies; (3) development of sampling techniques for use in population dynamics studies (the unit has developed methodology for estimating young-of-the-year forage fish populations, using unique midwater trawls, sampling design, and statistical analyses); (4) estimates of the structure, abundance, and fluctuation of fish populations, especially those of forage fishes; (5) measurement of physical and chemical properties of reservoir waters; and (6) qualitative and quantitative sampling of plankton and bottom fauna. All of the work is directed toward understanding reservoir ecology and developing techniques for reservoir management that will better meet the constantly increasing sport fishing pressure.

The principal research objective is to document the aging processes in a new reservoir ecosystem and compare it simultaneously with an older reservoir on the same river. The ultimate goal is to identify significant factors that may be manipulated by managers to re-create the high abundance of sport fishes typically present during the early history of an impoundment.

Aggus, Larry R.


Applegate, Richard L.

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BAKER, CLAUDE D., DUNCAN W. MARTIN, AND EUGENE H. SCHMITZ.

BAKER, CLAUDE D., AND EUGENE H. SCHMITZ.

BECKER, DAVID A., ROBERT G. HEARD, AND PERRY DON HOLMES.

BOYER, RONALD L., AND LOUIS E. VOGLE.

BRYANT, HORACE E., AND ALFRED HOUSER.

BRYANT, HORACE E., AND DAVID I. MORAIS.

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DENDY, J. S., G. B. PARDUE, AND L. R. AGGUS.

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NETSCH, NORVAL F., ALFRED HOUSER, AND LOUIS E. VOGLE.

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SCHMITZ, EUGENE H., AND CLAUDE D. BAKER.

UNZICKER, JOHN D., LARRY AGGUS, AND L. O. WARREN.

Activities of the Division of Wildlife Research are administered by the Division's Central Office in Washington, D.C. The Division was first established in 1934 by consolidation of the following activities: Food Habits Research, Fur Resources, Disease Control, and Biological Investigations. These activities, however, have changed through the years in response to changes in national needs with respect to wildlife.

Food habits investigations were terminated during World War II, and biological surveys of mammals and birds over extensive areas have been replaced with more intensive ecological studies on public lands. Fur farming studies remained with the Department of Agriculture when the Bureau of Biological Survey was transferred to the Department of the Interior in 1940; wild fur animal investigations have been deemphasized because most fur mammals are resident species in the State and wild furs have become less important than ranched furs in the fur trade.

On the other hand, research on ways of controlling damage and nuisance caused by birds and mammals has become more important as man has reclaimed increasing acreage of wild habitat for his own use. The effects of pesticides and pollutants on wild animals and on their food chains has increased in importance with increased public awareness of the quality of the environment. That awareness has also brought about increased efforts to stem the rate of extinction of species and subspecies of wildlife. Research to provide methods of managing waterfowl has been an involvement of the Division of Wildlife Research, and increased public interest in nongame species of migratory birds has resulted in increased emphasis in the Division's program. Investigations to ameliorate the effects of disease and parasites on wildlife have continued with emphasis on those that affect waterfowl.

The function of the staff of the Washington Office is to plan and implement the wildlife research program of the Bureau, and to establish priorities within the program. The staff exercises general supervision of the conduct and reporting of research projects, which are conducted at five main research installations and 37 field stations subsidiary to these installations. The purpose of the Bureau's research program is to provide the knowledge needed for effective and efficient management of the Nation's wildlife resources.

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BECK, W. B.

BENNETT, LOGAN J.

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BOHL, WAYNE H., AND GARDINER BUMP.

BOHL, WAYNE H., AND LOIS M. COX.

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COTTAM, CLARENCE, JOHN J. LYNCH, AND ARNOLD NELSON.

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COTTAM, CLARENCE, AND F. M. UHLER.

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LEHMANN, VALGENE W.
LEEMANN, V. W.
ROGERS, JOHN P.

SMITH, R. I.

STEVELER, ADOLPH M.

SWANSON, GUSTAV.

SWANSON, GUSTAV, AND LEE E. YEAGER.

U.S. FISH AND WILDLIFE SERVICE.
YEAGER, LEE E.


YEAGER, LEE E., editor.
Although the name of the Bird and Mammal Laboratories (BML) is fairly recent, the history of the unit is long and complex. The functions now performed by the BML have been carried out previously by antecedent organizations and some of the early work of the BML is now assigned to other units of the Division and Bureau.

In 1951, the Section of Distribution and Migration of Birds merged with the Section of Biological Surveys to form the Section of Distribution of Birds and Mammals in the Branch of Wildlife Research. In 1957, in conjunction with sweeping reorganization of the Branch and the establishment of research centers, that Section lost much of its former responsibility relating to bird migration and distribution. At that time, it also absorbed many of the functions of the former Wild Animal Fur Investigations Section. With this reorganization the present name and responsibilities of the BML were established. In 1972 a Herpetology Section was developed in the BML to correspond to the Bird Section and the Mammal Section.

The primary function of the BML is to conduct original research on the systematics, distribution, and life history of terrestrial vertebrate species, particularly those of North America and others of interest to the Bureau. Additionally, the BML performs a wide variety of services related to identification and information that are dependent on the museum-field-systematics approach to biology. These services are for other Federal, State, and non-governmental organizations as well as for the Bureau.

Historically housed in the National Museum of Natural History of the Smithsonian Institution, the BML works in close cooperation with the Museum's Department of Vertebrate Zoology in curating the National collection of research specimens of birds and mammals. More recently reptiles and amphibians, particularly the large proportion of these collections that was amassed by the extensive field operations of the original Bureau of Biological Survey, have come under the curatorial jurisdiction of BML. Field stations are maintained in Seattle, Washington, for research work on marine mammals of the Pacific area, and in Anchorage, Alaska, for polar bear research which is coordinated internationally.

Space for offices, laboratory, and specimen storage amounts to 18,500 square feet provided by the Smithsonian Institution.

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DOZIER, HERBERT L., AND MERTON RADWAY.

DUVALL, ALLEN J., AND CHANDLER S. ROBBINS.

FINDLEY, JAMES S., E. H. STUDIER, AND DON E. WILSON.

FLEMING, T. H., EMMET T. HOOPER, AND DON E. WILSON.

FORBES, THOMAS R.

GARDNER, ALFRED L., AND DON E. WILSON.

GARDNER, MARSHALL C.


GOLDMAN, EDWARD A.


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GREENHALL, ARTHUR M.


HARRIS, VAN T., AND E. H. CHABRECK.

GREENHALL, ARTHUR M., AND GERALD STELL.

HARRIS, VAN T.

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HARRIS, VAN T., AND FRED WEBERT.

HUBBS, CARL L., AND RICHARD C. BANKS.

HUBBARD, JOHN P., AND RICHARD C. BANKS.

HUBBS, CARL L., AND RICHARD C. BANKS.

JACKSON, HARTLEY H. T.


JACKSON, HARTLEY H. T., EMMA M. CHARTERS, A. J. DUVALL, AND S. F. HILDEBRAND.

JEWETT, STANLEY G., WALTER P. TAYLOR, WILLIAM T. SHAW, AND JOHN W. ALDRICH.

JOHNSON, MURRAY L., KARL W. KENYON, AND C. BROSseau.

JONES, CLYDE.


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Jones, Clyde, and J. Sabater Pi.


Jones, Clyde, and Henry W. Setzer.


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Jones, J. Knox, Jr., and Clyde Jones.


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DENVER WILDLIFE RESEARCH CENTER
U.S. Department of the Interior
Bureau of Sport Fisheries and Wildlife
Denver, Colorado 80225

Research at the Denver Wildlife Research Center is focused on the need to better understand both the relationship between wildlife and man's interests and the impact of man's activities on wildlife. Investigations of these relationships are categorized as animal damage control, pesticide-wildlife relationships, wildlife ecology on public lands, and basic biological studies. Most of the laboratory-oriented studies, i.e., chemical, toxicological, physiological, and behavioral, are carried out at the Center, while field studies are conducted at some 20 satellite stations located in many States and several foreign countries.

The Denver facilities occupy more than 20 acres, and include two office buildings, laboratories in six different buildings, nine animal holding facilities, and six storage buildings. The buildings and holding facilities total about 54,000 square feet of space. Many items of specialized laboratory equipment complete the Center's facilities.

The history of the Center reflects a coordination of many earlier U.S. Biological Survey programs. In 1940, the Control Methods Laboratory of the Division of Predator and Rodent Control was combined with the Denver Unit of Food Habits Research to become the Denver Wildlife Research Laboratory, performing research on the food habits of predators and other wildlife, and on the control of troublesome animals. At this time the Biological Survey was transferred from the Department of Agriculture to the Department of the Interior, and became a Bureau of the U.S. Fish and Wildlife Service.

Research continued on control methods and the management of injurious and nuisance species, as well as on wildlife ecology and biology. The areas of investigation were expanded to include wildlife on public lands research in 1953. Later in that decade research in wetland ecology and other migratory bird studies were initiated. These two areas were transferred to other stations in 1963 and 1964. By the mid-1960s, the Laboratory's staff had increased to more than 100 persons. Congressional appropriations under the Pesticide-Wildlife Program added research in pesticides and ecology to the existing programs. As a result of this expanded field of research, the Laboratory was renamed the Denver Wildlife Research Center in 1959. Increases in staff created the necessity for a larger facility, and, in 1965, many of the staff moved into a new building at the Denver Federal Center.

A cooperative international research program on the control of vertebrate pests became a reality in 1967, when an agreement was signed between the Department of the Interior and the Agency for International Development in the Department of State. Studies have been conducted in four foreign countries.


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The Migratory Bird Populations Station was established on October 19, 1961, and was located at the Patuxent Wildlife Research Center near Laurel, Maryland. Its main purpose was to provide the Bureau of Sport Fisheries and Wildlife with a central location for the study of migratory bird population dynamics in North America. Because the seasonal movements of migratory birds cross many political and administrative boundaries, the work of the Station was international in scope, and was conducted in close cooperation with Canada and Mexico, the States, private agencies, and universities.

The Station administered the Bird Banding Laboratory, which is the repository for North American bird banding records, and coordinated banding activities of public and private cooperators. It also analyzed data from breeding and wintering ground surveys of migratory birds, national surveys of hunting activity, and migratory game bird harvests, providing information needed annually to establish hunting regulations for doves, woodcock, waterfowl, and other migratory game birds.

Using banding and survey data, Station biologists investigated population dynamics of the various game bird species, directing their work towards the relationships between various types of hunting regulations, harvests, and populations. The annual breeding bird survey, now conducted throughout much of North America, was developed and directed from the Migratory Bird Population Station.

The Ira N. Gabrielson Laboratory, constructed to house all personnel and facilities of the Station, was dedicated on October 11, 1969. At that time the Station occupied 19,147 square feet of space in office, laboratories, and service buildings. The Station contained the Bureau's major computer unit, used in processing and analyzing millions of records relating to abundance, distribution, and survival of migratory birds.

On July 9, 1973, the functions of the Migratory Bird Populations Station were transferred to the newly organized Office of Migratory Bird Management, attached to the Office of the Director of the Bureau, and to the Migratory Bird and Habitat Research Laboratory, which remained at Patuxent.

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SHARP, BRIAN.


SMITH, ROBERT I., AND A. L. GEIS.


SMART, M. GLEN.


SMITH, ROBERT I., AND A. L. GEIS.


The Northern Prairie Wildlife Research Center, completed in 1965, is the newest of the five research installations of the Division of Wildlife Research. Field stations are located at Woodworth, North Dakota (40 miles northwest of Jamestown); Aberdeen, South Dakota; Brigham City, Utah; Fairbanks, Alaska; and Arcata, California.

The mission of the Center is to gather facts and provide sound information necessary for proper management of designated wildlife species and their habitats in central and western United States and Alaska, with emphasis on the prairie region of the Midwest. The species of primary concern are: (1) migratory birds, especially waterfowl, (2) indigenous wildlife on Federal lands, and (3) certain rare and endangered wildlife.

The specific goals of the Center are to: (1) determine the biology of individual wildlife species or groups of species including their life history, behavior, and physiology, (2) determine the relationships of environmental factors to wildlife species and populations, (3) determine the relationships between human socio-economic factors and wildlife or their habitats, (4) test and evaluate management techniques to help provide practices and guidelines for use of management agencies, (5) develop the specialized equipment and methodology necessary to conduct research investigations, and (6) disseminate research findings by all appropriate means.

The Center at Jamestown comprises about 600 acres of land and 26,000 square feet of space in offices, laboratories, service buildings, propagation facilities, and residences. At Woodworth there are 2,456 acres of land and buildings that provide 7,000 square feet of space.
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COWARDIN, LEWIS M.  

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DUEBBERT, HAROLD F.  

DREWEN, RODERICK C., AND PAUL F. SPRINGER.  


The function of the Patuxent Wildlife Research Center is to apply scientific methodology to practical wildlife problems. Zoologists, wildlife biologists, physiologists, chemists, veterinarians, and biometricians pool their abilities to attack problems with techniques that range from mass spectroscopy and enzyme physiology to making statistically valid surveys of crop damage in the field. Patuxent's reputation has been made by quantitative methods, controlled experiments, and scientific rigor.

Patuxent was established in the 1930's on land acquired by the Resettlement Administration as part of the fight against the Great Depression. By 1973, there were six major laboratories and some 3,400 acres of land. Much of the land, including the rich forest of the Patuxent River floodplain, was kept natural. Other parts were used for the creation of 23 waterfowl impoundments, which provided marsh habitats that were otherwise lacking.

The studies of waterfowl habitat were relinquished to the Migratory Bird and Habitat Research Laboratory in 1973. One of the earliest activities, wildlife disease work, now stresses waterfowl diseases, particularly those of protozoan origin, and pathology problems related to pollution studies. The Section of Wildlife Food Habits, once a large and diversified group, was discontinued during World War II. From its records has come much of our knowledge of the foods and economic status of American animals. Early research on game bird nutrition facilitated experimental studies of pesticides and other pollutants of breeding birds. As a part of pesticide and pollution studies, an excellent chemical laboratory with much specialized equipment was developed for determining persistent pollutants in animal tissues. The control of crop damage and other troubles caused by birds is studied in the Section of Animal Depredations Control Studies, which has field stations in Florida, Ohio, Pennsylvania, and Delaware.

The newest function at Patuxent is research for the preservation of rare and endangered species. Ecologists are stationed at seven localities from Puerto Rico to Hawaii to see what can be done for rare animals in the wild. At Patuxent, the breeding biology of whooping cranes, snail kites, condors, and other animals is studied in an effort to breed rare species for replenishment of wild populations.

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As the Nation’s principal conservation agency, the Department of the Interior has basic responsibilities for water, fish, wildlife, mineral, land, park, and recreational resources. Indian and Territorial affairs are other major concerns of this department of natural resources.

The Department works to assure the wisest choice in managing all our resources so that each shall make its full contribution to a better United States now and in the future.