

**Institute for Fisheries Research 1930-1980  
Fifty Years of Fisheries Investigations**

W. C. Latta

**Fisheries Research Report No. 1882  
July 10, 1980**

MICHIGAN DEPARTMENT OF NATURAL RESOURCES  
FISHERIES DIVISION

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INSTITUTE FOR FISHERIES RESEARCH 1930-1980  
FIFTY YEARS OF FISHERIES INVESTIGATIONS

By W. C. Latta

The Institute for Fisheries Research was established on February 7, 1930, by the University of Michigan Board of Regents. In 1973, in celebration of the 100th anniversary of the beginning of fisheries management in Michigan, Gerald P. Cooper, then supervisor of fisheries research in the Michigan Department of Natural Resources, prepared a history of fisheries research. His accounts of people, activities, and accomplishments for the Institute are so complete and recent that I am including them here rather than preparing another report (page 8).

However, in the 7 years since 1973 there have been some changes in fisheries research. In 1974, the Grayling Pathology Laboratory and the Hastings Fisheries Research Station were closed. Fish disease studies were dropped and the staff reassigned outside of research. A pathologist was transferred to the Wolf Lake Hatchery at Mattawan to work with hatchery biologists in control of disease problems. The Hastings staff was also transferred to Wolf Lake Hatchery but continued to work on research projects. In 1976, Gerald P. Cooper retired and I took his place.

Included in this anniversary volume is a list of students (page 15) supported either as employees or fellows while they completed graduate studies in fisheries for a Master's or Doctor's degree. (Cooper explains in the following excerpt the mechanics of the Institute fellowships.) In 50 years the Institute has supported, guided, and benefitted from 42 Master and 39 Doctoral students. Of the 81 graduate students supported, 22 are or were career employees with the Michigan Department of Natural Resources.

The Institute is undoubtedly judged as to its worth on the number and quality of its publications more than any other thing. In 50 years the Institute staff and students have published 476 scientific or popular articles or 9.5 per year. A list of published articles is included here (page 22). Perusal of this list shows that almost every aspect of freshwater fisheries management has been considered sometime in the past. In addition to the published reports, the Institute biologists have prepared 1,877 in-house fisheries research reports for the use of management and from which many of the published articles have evolved.

During the 50 years, there have been four supervisors of fisheries research--Carl L. Hubbs, 1930-35; Albert S. Hazzard, 1935-55; Gerald P. Cooper, 1955-76; and William C. Latta, 1976 to present (Figure 1). Unfortunately both Hubbs and Hazzard died in 1979. The present research staff, grouped by research station, is pictured in Figure 2, and some representative staffs of the past are shown in Figure 3.

Fisheries research in Michigan has thrived. In the early years, the Institute was a unique organization for there were few biological groups in the country who addressed fisheries problems. However, with growth of the fisheries profession, more states and universities developed fisheries research staff. Today the Institute is only one of many fisheries research groups, but it has had an illustrious history and, hopefully, it will have an outstanding future.



Carl L. Hubbs 1930-1935



Albert S. Hazzard 1935-1955



Gerald P. Cooper 1955-1976



William C. Latta 1976-present

Figure 1. --Supervisors of fisheries research.

Figure 2.--Fisheries research personnel 1980.

WOLF LAKE (Research)--Left to right: R. Cobb, G. Beyerle, R. Fitch

HUNT CREEK FISHERIES RESEARCH STATION--Left to right:

G. Alexander, H. Gowing, O. Williams, J. Rodgers

MARQUETTE FISHERIES RESEARCH STATION--Left to right:

P. Hannuksela, D. Greenleaf, T. Stauffer, J. Peck, B. Wagner

INSTITUTE FOR FISHERIES RESEARCH--Left to right:

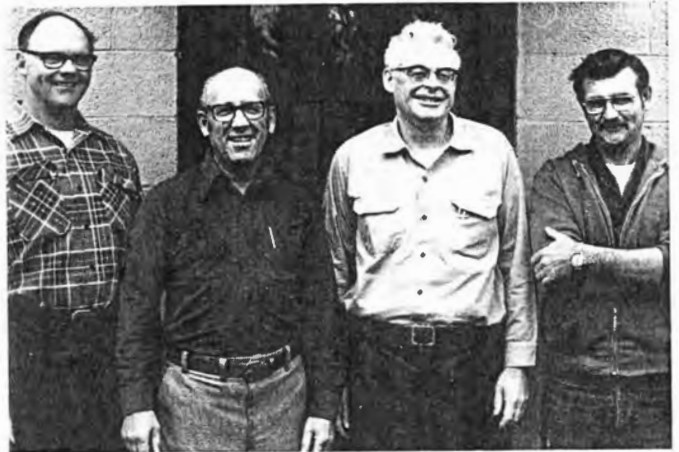
Front row: R. Clark, J. Gapczynski, J. Fenske, J. Baker,  
M. Galbraith, T. DeClercq, M. McClure

Second row: D. Parsons, R. Lockwood, C. Latta, G. Goudy,  
B. Lowell

Back row: F. Simonis, A. Sutton, L. Carl, P. Laarman,  
J. Schneider, J. Ryckman, M. Patriarche, J. Merna



WOLF LAKE



HUNT CREEK



MARQUETTE



INSTITUTE FOR FISHERIES RESEARCH

Figure 3. --Fisheries research personnel of the past.

1942

Front row: C. Brown, B. Howard, H. Staebler, R. Bauch, J. Shafer, M. Manville

Second row: G. Wood, H. VanOosten, S. Lievense, D. Shetter, R. VanDuesen,  
L. Perry

Back row: P. Galvin, L. Krumholz, W. Carbine, R. Ball, A. Hazzard,  
C. Flaten, R. Hile (USBCF)

1945

Front row: W. Cristanelli, K. Fukano, M. Pawlick

Second row: G. Cooper, W. Carbine, G. Washburn, A. Hazzard,  
E. Cooper, H. Predmore

Back row: F. Leonard, V. Andres, G. Wood, E. Livingston, M. Livingston,  
V. Applegate, A. Johnston.

1957

Front row: K. Fukano, R. Barber, R. Schafer

Second row: W. Cristanelli, P. Eschmeyer, L. Graiziger, C. Taube, G. Cooper,  
A. Waterbury, G. Wood, W. Crowe, J. Mial, G. Curry, G. Hubbell,  
M. McClure, A. Hamilton

Back row: R. Ellis, D. Hayne, L. Beatty, C. Steinmetz, W. Latta, R. Anderson,  
K. Christensen, M. Whalls, E. Schultz



1942



1945



1957



History of Fisheries Research  
1930-1973

An excerpt from Fisheries Research by Gerald P. Cooper in Michigan Fisheries Centennial Report 1873-1973, Michigan Department of Natural Resources Fisheries Management Report No. 6, 1974, 200 pp.

We in fisheries research like to believe that the outstanding event in our story was the establishment in 1930 of the Institute for Fisheries Research. This formalized the cooperation between the Department of Conservation and the University of Michigan which had been going on since 1921. This cooperative venture was approved by the University Board of Regents on February 7, 1930, as recorded on page 167 of the printed proceedings by the regents for 1929-1932, as follows:

Present, President Ruthven, Regent Beal, and Regent Sawyer.

With the express approval of the President the committee voted that a research bureau affiliated with the Museum of Zoology should be established to carry on certain scientific work for the Michigan Department of Conservation. The work of the staff is to be under the supervision of the Museum of Zoology and it is understood that the Department of Conservation will transfer to the University \$16,000 for 1930 and at least an equal amount in subsequent years to provide salaries for those employed.

Dr. Carl L. Hubbs selected the Institute's name and was its first director. He worked part-time with the Institute, and received part of his salary from the Department. The University contributed office, laboratory and library facilities for the Institute staff, and still does. The Izaak Walton League of America contributed research funds during the early years of the Institute.

Cooperation by the State Department of Conservation was spelled out in a letter of January 22, 1930, to Carl L. Hubbs by Department Director George R. Hogarth, with a commitment of \$16,000 for the first year. F. A. Westerman, in a Memorandum to the Conservation Commission, February 5, 1931, requested continued Department support of the work to the extent of \$21,000 per year for fiscal 1931-32 and 1932-33. Greatly increased support of fisheries research has been continued ever since.

Fisheries research in our department has always been strongly oriented to solving practical fish-management problems. Director Hogarth, in his organizational letter of January 22, 1930, to Hubbs, stated: "The proposed personnel should permit a continuation of the investigations of a number of the practical problems which confront this Department . . ." and ". . . your investigation should stress practical application." F. A. Westerman, C. L. Hubbs, and A. S. Hazzard all kept faith with this early directive.

The Institute for Fisheries Research, with Hubbs as its organizer and first director, saw many new faces during 1930-31. Wendell H. Krull replaced Langlois as fish pathologist for state hatchery problems. Dr. John R. Greeley came from New York to become assistant director under Hubbs. Eight younger men joined as assistants and fellowship holders. Their assignments illustrate the practical character of the work. L. M. Ashley had a fellowship to work on aquatic plants as related to inland fisheries; S. N. Jones worked on stunted perch populations; R. W. Eschmeyer on lake habitat improvement; C. M. Tarzwell on trout stream improvement; and J. C. Salyer on mergansers and other fish predators. Two to three years later G. P. Cooper started studies on forage fishes. D. S. Shetter began his studies on brook trout growth and migrations; and J. W. Leonard joined the staff full time to work on stream improvement and aquatic insects.

In 1935, Dr. A. S. Hazzard came from the U.S. Bureau of Fisheries to take over as full-time director of the Institute, replacing Carl Hubbs who returned more intensively to his work in ichthyology but never lost interest or contact with fish management problems. In 1936, J. W. Leonard became assistant director of the Institute, the staff was enlarged, and the strong fellowship program was continued. Growth in the organization is fairly well depicted by budget allotments (if, in the process, one makes a major "correction" for inflation), and by number of full-time research biologists involved. Selecting representative years, the fisheries research allotment was \$25,428 for fiscal July 1, 1936 to June 30, 1937; \$70,797 for 1939-40; dropping some during the war years of the early forties, it was \$61,158 in 1944-45; then \$171,763 in 1946-47; \$272,154 in 1951-52; \$313,115 in 1955-56; and approximately \$500,000 during the 1960's.

Two significant happenings affected expenditures for fisheries research. Michigan Legislative Act 337, Public Acts of 1939, earmarked 40¢ of each resident fishing license fee for three activities--public access, habitat improvement, and research; the three shared about equally, and this accounted for one of the substantial increases in the research effort. The second development was the Dingell-Johnson Act of August 9, 1950, by the United States Government, for federal aid to sport fisheries restoration and management. Federal tax on fishing tackle is apportioned back to the states by a formula related to the state's size and its sale of fishing licenses. For fiscal July 1, 1952 to June 30, 1953, Michigan received \$140,520 D-J income,

some of which went to research. This figure was around \$200,000 per year during the fifties, \$300,000 during the early sixties, and with some fluctuation it is now around \$400,000 per year.

Two organizational developments of recent years might be mentioned. The fisheries research section was separated, administratively, from the Fish Division during the last nine years of our centennial period. It started when a special committee studying the Department of Conservation recommended extensive reorganization, including the establishment of a Research and Development Division separate from the parent divisions. Thus, as of April 6, 1964, fish research was taken from fish division, wildlife research from the game division, and along with biometrics and some supporting people, these constituted the new Research and Development Division. Still, fish research related its efforts to fish division problems, and we do not regard the break as a disruption in our part of the fisheries centennial. The Research and Development Division was disbanded and fish research transferred back to Fisheries Division on January 14, 1973.

Having the Institute (the main effort in fisheries research for 30 years) located at the University in Ann Arbor was good from the standpoint of association with fishery scientists in that institution, but it caused some problems in intra-departmental relations. Our critics often accused us of an "ivory tower" attitude and of being non-practical. The latter misconception I have already dispelled (above). For the historical record I would add that most of the critics of research were in fields of fish culture or law enforcement, to which research had appeared on the scene as a new competitor--for money, people, and recognition. By now, major differences have diminished, peck-orders have been re-established, and things are going well.

As indicated earlier, the Institute has been a cooperative enterprise. The University of Michigan at Ann Arbor provides free office and laboratory space in the Museums Annex building, along with heat, lights, and water, and free access to University libraries and other facilities. Starting with the Hazzard era in 1935, all personnel--biologists, fellowship holders, clerical staff, etc.--have been employees of the Conservation Department, with salaries, field expenses and equipment financed by the State and all budget allotments appropriated by the State Legislature. The criticism by some that we have been biologists hiding in an ivory tower, unresponsive to fishermen's interests, is entirely unwarranted.

In early years it was easy to identify the fish research effort with the Institute (in Ann Arbor), because practically all of the research people operated out of Ann Arbor. Later, as a number of field research stations were established in other parts of the state, financed entirely by the Department, it made less sense to identify the whole operation with the Institute, and by the time the Research and Development Division was operating out of Lansing, the Institute had become one of the field stations

of the fisheries research section of the R and D Division. Still, to maintain continuity in a long series of formal reports, and in a catalog of reprints of published papers in scientific journals, we retain the Institute name as a significant part of the system. Furthermore it is an appropriate recognition of continued cooperation with the University.

During the 40-year period of fish research, starting in 1930, thirty-five persons have held Institute fellowships and earned doctoral degrees while working on fish-management problems in Michigan. Another four persons completed their PhD while working full time for fisheries or fisheries research. There have been only four persons who started on a PhD fellowship commitment, but settled for only a Masters degree along the way. Thirty-three persons, while working for our Department, earned a Masters degree on a fish-management problem; mostly these people were fish division employees who took formal course work on their own time, and could use job-related research data as a basis for a masters thesis. During the first ten years, all but one of the fifteen fellowships were at the University in Ann Arbor; since 1941, about half of the fellowships have been at the sister University in East Lansing. The formal doctoral fellowship in fisheries and wildlife research, offered by our Department, has been a financially attractive set-up for the candidate. It has also been a "good deal" for the Department in getting high-quality research done at a very reasonable cost. The cost is relatively low because guidance and consultation are contributed free by scientists on university faculties. At present, the fellowship holders are paid 65% of full pay while completing academic courses and examinations, and then 80% of full pay while working full time on their research project. The fellowship program in fisheries research has made a substantial contribution in the training of fisheries scientists, not only for our own department, but for other Michigan institutions, and for agencies beyond our borders--both national and international. Of the 76 persons who pursued their graduate educations on fellowships, 13 now work in fisheries for our department, and 5 more were recently retired or deceased; another 22 in Michigan are on university faculties, or work for other government agencies; and 36 are out-of-state, working for governments or universities. In short, Michigan, through its Institute for Fisheries Research, has made a substantial contribution to fishery science nationwide.

Much of the growth of our fisheries research section, and the expansion of its philosophy and detail of interest, occurred under the careful guidance of Albert S. Hazzard, who was Director of the Institute for Fisheries Research from September 1, 1935 to November 29, 1955. Successors have been G. P. Cooper, F. F. Hooper, and W. C. Latta. Hazzard, throughout his 20 years here, had full support from F. A. Westerman, chief of the Fisheries Division, and in later years, of J. W. Leonard, the department's research administrator.

In 1931, the initial staff of the fisheries research unit (IFR) was ten people: a part-time director and a part-time assistant director (42 years

later these two men are still active and in good health), a full-time fish pathologist, five fellows (fellowship holders), an assistant, and a stenographer. Seven of the ten had college degrees. By 1933, the staff was down to eight, but included a full-time investigator of beaver-trout relationships. By 1936, there was a full-time director (A. S. Hazzard) with a staff of eight--five of them full time. Then, 12 employees by 1938, 18 by 1939, 25 by 1940, 16 in 1942, 12 in 1944 (but with an additional 13 on military leave), 11 in 1945 (13 on leave), 58 positions in 1947 (including part time, clerical, and service men returned), 73 in 1948, 81 in 1957, 76 in 1964 (when fish research was transferred to R and D), and down to 37 in 1973 (when fish research was transferred back from R and D to Fisheries Division). Since January 1, 1941, all have been employees under the State Civil Service Commission.

Fish research personnel (particularly A. S. Hazzard) took an active role in early experimental fish management, which involved many individual lakes and streams throughout the state. As a natural development, the district fisheries biologists were first under the fish research section. In 1948, there were six district fisheries biologists assigned to six of the 11 fisheries districts, all under research. Within a short time these district men, working in fish management, were transferred to their own administrative unit.

Fish research in our department has dealt mostly with fish populations in their natural environment, as opposed to studies of fish confined in laboratory aquaria. Most management problems dictate this approach. Therefore there was an early interest in the establishment of field research stations and office-laboratories considerably removed from the Institute in Ann Arbor. The Hunt Creek Station was built "from scratch" on a stream watershed which is mostly State-owned. Three other stations were at facilities given up by other administrative units in the Department. One came by State purchase of a large private estate. Station locations and dates of operation are as follows:

Hunt Creek Trout Research Station	Montmorency Co.	1939 to date
Grayling Pathology (at hatchery)	Crawford Co.	1942 to date
Rifle River Area (Jewett estate)	Ogemaw Co.	1945 to 1963
Pigeon River Trout Research Area	Otsego Co.	1949 to date
Marquette Station (at hatchery)	Marquette Co.	1952 to date
Hastings Station (formerly hatchery)	Barry Co.	1955 to date
Saline Station (ponds)	Washtenaw Co.	1966 to date

Administration of the Rifle River Area was turned over to the Parks and Recreation Division after 19 years of fish inventory data on lakes and streams. Grayling is a center for fish pathology, and is now named a Hatchery Biology Service Center. Hastings and Marquette are primarily office headquarters for nearby field research studies. Work has been curtailed at the Pigeon River Station. Saline is a new facility with warm-water ponds. Hunt Creek has outstanding records on brook trout populations, and has excellent potential for further research on trout.

Prior to 1930, fish research was represented by the lake surveys of the 80's, some biology of hatchery fish, and the ichthyological surveys of Hubbs and his associates in the 20's. The outstanding contributions by the Institute in its first decade were in stream and lake improvement, by Tarzwell, Greeley, Eschmeyer, and Hubbs, and the preparation of pioneer bulletins on these two subjects. Later came work on beaver-trout management, trout stream biology and forage fish investigations, to name a few. Soon, efforts were expanded to cover lake and stream biological surveys, lake mapping, creel census of angling quality, life history studies of many of the game species, the sea lamprey problem, aquatic insects as fish food, fish diseases, slow growth in fishes, testing fishing regulations--in effect, the whole array of fish-management problems in the state. Results, conclusions and recommendations from the work are given in some 1,800 formal typewritten reports and 75 graduate theses, and most of the definitive information is published in 410 articles in scientific journals, 5 bulletins and 14 miscellaneous publications.

Over the years our fish research section has cooperated with, or had help from quite a number of institutions and agencies, in addition to the University of Michigan, Michigan State University, and various divisions in the Department of Natural Resources. Central Michigan, Wayne State, and Northern Michigan are among the schools. The Izaak Walton League helped during early years. Other cooperators have been Consumers Power, Detroit Edison, Upjohn, and Dow. Federal Aid under the Dingell-Johnson Act has been most important. Finally, we have had excellent cooperation from the U.S. bureaus of Commercial Fisheries and Sport Fisheries and Wildlife, and their successors, and by their employees in Michigan, stationed mostly in Ann Arbor. Early in this report it is mentioned that the U.S. Fish Commission sent Michigan its first fish eggs, and sent a biologist to help out in the first lake surveys in the 1890's.

About 1930, there was the dual development of the Institute for Fisheries Research and a research office of the United States Bureau of Commercial Fisheries; these two units had adjoining rooms in the fish wing of the Museum of Zoology at the University. Although by gentleman's agreement their two fields of interest were separated rather precisely into sport fisheries (mostly inland waters) and commercial fisheries (confined to the Great Lakes), there was, and still is much cooperation between the two agencies.

A number of research activities have been turned over to other units, as management and field personnel have become oriented more to resource inventory. Lake and stream surveys and lake mapping (after some 3,000 lakes) were turned over to fisheries field staff. Supervision of district fisheries supervisors was relinquished at an early stage. The Rifle River area was turned over to Parks because of its great potential for public recreation.

As field inventories and scientific fish culture have expanded, and been taken over by other units, there has been a substantial decrease in the research staff. The continuous attrition, over the last 15 years, of increased costs in doing business has also been a factor. The research staff still consists of some 15 research biologists and a good supporting team of assistants and clerical staff. We are looking into the first part of the second century with interest, knowing that there are still many problems to be solved.

Fisheries Graduate Students  
1930-1980

Name, and dates of employment <sup>1</sup>	Degree received	School <sup>2</sup>	Subject of research
J. Clark Salyer II 1929-31 (F)	MA 30	UM	Fish predator investigations
Laurence M. Ashley 1930-33 (F)	MA 32	UM	Vegetation planting experiments
Clarence M. Tarzwell 1930-35 (F)	MS 32 PhD 36	UM UM	Environmental improvement in trout streams: A problem in applied ecology
R. W. Eschmeyer 1930-36 (F)	PhD 37	UM	A limnological and fish survey of the lakes in the Pigeon River State Forest, Michigan, with experiments in fish management, and analysis of the fish yield, and a special study of stunted perch populations
Gerald P. Cooper 1933-36 (F)	PhD 38	UM	Studies of the propagation, breeding habits, and growth of certain forage fishes of eastern North America: A contribution to forage fish management
Justin W. Leonard 1934-36 (E)	PhD 37	UM	A revisionary study of the genus <u>Acanthagrion</u> (Odonata: Zygoptera)
David S. Shetter 1934-37 (F)	PhD 37	UM	Contributions to the natural history of some game fishes of Michigan, particularly the brook trout, <u>Salvelinus f. fontinalis</u> (Mitchill) as determined by tagging experiments
James T. Wilkinson 1936-38 (F)		MSU	Trout nutrition
William F. Carbine 1936-41 (F)		UM	Life history studies of the northern pike and Centrarchidae
Karl F. Lagler 1937-39 (F)	PhD 40	UM	Ecological studies of turtles in Michigan with special reference to fish management

<sup>1</sup> F = fellowship; E = employment during which field or laboratory work toward a degree was done.

<sup>2</sup> UM = The University of Michigan, Ann Arbor; MSU = Michigan State University, East Lansing; CMU = Central Michigan University, Mount Pleasant; NMU = Northern Michigan University, Marquette.



Name, and dates of employment <sup>1</sup> ↓	Degree received	School <sup>2</sup> ↓	Subject of research
William C. Beckman 1937-41 (F)	MA 37 PhD 41	UM UM	The time of annulus formation on the scales of certain Michigan game fishes
Walter R. Crowe 1937-41 (F)	MA 37	UM	Analysis of the fish population in Big Bear Lake, Otsego County
John T. Greenbank 1937-41 (F)	PhD 43	UM	Limnological conditions in ice-covered lakes, especially as related to winterkill of fish
Eugene W. Roelofs 1938-41 (F)	PhD 41	MSU	Available plant nutrients in lake soils
Leonard N. Allison 1938-42 (E)	PhD 42	UM	<u>Leucochloridiomorpha constantiae</u> (Gower) Mueller (Brachylaemidae), its life cycle and taxonomic relationships among digenetic trematodes
Robert C. Ball 1939-43 (F)	PhD 43	UM	Relationship of the invertebrate fauna to the fish population in Third Sister Lake, Washtenaw County, Michigan
Paul H. Barrett 1940-42 (E)	PhD 52	MSU	Effects of alkalinity on adsorption and regeneration of phosphorus in natural lakes
Edwin L. Cooper 1945-49 (F)	PhD 49	UM	Age and growth of the brook trout, <u>Salvelinus fontinalis</u> (Mitchill), in Michigan
Vernon C. Applegate 1945-50 (F)	PhD 50	UM	Natural history of the sea lamprey, <u>Petromyzon marinus</u> , in Michigan
Paul H. Eschmeyer 1946-47 (F)	PhD 49	UM	Reproduction and migration of the yellow pike-perch, <u>Stizostedion vitreum vitreum</u> , in Michigan
Dexter B. Reynolds 1946-47 (E)	MS 47	UM	Summary of twenty months investigation on the Platte River and adjacent waters, Benzie County, Michigan, with special reference to the rainbow trout ( <u>Salmo gairdnerii irideus</u> )
Burton P. Hunt 1946-48 (F)	PhD 50	UM	A study of the life history, ecology, and economic importance of a burrowing mayfly, <u>Hexagenia limbata</u> (Serville) in Michigan waters

Name, and dates of employment <sup>1</sup> ✓	Degree received	School <sup>2</sup> ✓	Subject of research
Mercer H. Patriarche 1946-48 (E)	MS 48	MSU	An analysis of the bottom fauna production in fertilized and unfertilized ponds and its utilization by young-of-the-year fish
Arthur K. Adams 1947-54 (F)	PhD 54	UM	Some physico-chemical effects of beaver dams upon Michigan trout streams in the Watersmeet Area
Howard A. Tanner 1947-52 (F)	MS 50 PhD 52	MSU MSU	Experimental fertilization of Michigan trout lakes
Norman O. Levardsen 1947-51 (F)	PhD 51	MSU	Studies on chemical methods of aquatic plant control in freshwater lakes and ponds
Howard D. Tait 1949-53 (F)	MS 51 PhD 53	MSU UM	Production of bass and bluegills in Michigan ponds Sampling problems in the Michigan creel census
Sheldon B. Hedges 1950-51 (E)	MS 51	MSU	Harvesting and production of bait fishes in ponds
George H. Lauff 1950-51 (E)	MS 51	MSU	A survey of live-bait dealers in Michigan
Norman G. Benson 1950-52 (E)	PhD 53	UM	The relationships among certain ecological factors and trout populations in the Pigeon River
John E. Williams 1950-55 (E)	PhD 55	UM	Determination of age from the scales of northern pike ( <u>Esox lucius</u> L.)
Lloyd P. Wilkins 1951-52 (E)	MS 52	MSU	Relationships of a fish population to the invertebrate fauna in two small ponds
Virgil S. Pratt 1951-53 (F)	PhD 53	UM	Populations, ecology, and management of marginal trout streams in southern Michigan
Thomas F. Waters 1951-53 (E)	MS 53	MSU	Experimental use of lime in treating a colored, soft-water lake in Michigan
Robert J. Ellis 1951-57 (F)	MS 55	UM	Effects of stream improvement on insect populations
David L. Shull 1951-57 (F)	MS 52 PhD 63	MSU MSU	Experimental propagation and production of bait fishes in Michigan ponds Limnological characteristics of two Michigan marl-forming waters

Name, and dates of employment <sup>1</sup> ✓	Degree received	School <sup>2</sup> ✓	Subject of research
Truman T. Guard 1952 (E)	MS 53	MSU	Survey of the parasitic lampreys of inland lakes of Michigan
Edward F. Grassl 1952-56 (F)	MS 53 PhD 56	MSU MSU	Production and harvest of farm pond fish Pelleted dry rations versus standard meat rations for trout
Richard O. Anderson 1952-58 (F)	PhD 59	UM	The influence of season and temperature on growth of the bluegill, <u>Lepomis macrochirus</u> Rafinesque
William C. Latta 1953-55 (F)	PhD 57	UM	The ecology of the smallmouth bass, <u>Micropterus d. dolomieu</u> Lacepede, at Waugoshance Point, Lake Michigan
Gaylord R. Alexander 1954-56 (E)	MS 56	MSU	The fertilization of a marl lake
Nickolas Anton 1955-56 (E)	MS 57	MSU	Biological, chemical, physical changes resulting from fertilization of a marl lake
Morris L. Brehmer 1955-58 (F)	MS 56 PhD 58	MSU MSU	The biological effects of pollution on the Red Cedar River
Alfred R. Grzenda 1955 (E)	MS 56	MSU	The biological response of a trout stream to headwater fertilization
Joseph B. Hunn 1956-57 (E)	MS 57	MSU	Methods for the control of stunted panfish populations
Daniel S. Plosila 1956-57 (E)	MS 58	MSU	An evaluation of lake production following artificial enrichment
Marvin J. Whalls 1956-61 (F) 1962 (F)	MS 57 PhD 72	UM UM	Evaluation of brook trout planting in East Fish Lake Interrelationships of rough fish and trout in a Michigan stream
David L. Correll 1957-58 (E)	MS 58	MSU	Alteration of the productivity of a trout stream by the addition of phosphate
Claire L. Schelske 1957-60 (F)	PhD 60	UM	The availability of iron as a factor limiting primary productivity in a marl lake
Walter M. Sebald 1957 (E)	MS 58	UM	Survey of public fishing sites

Name, and dates of employment ↓	Degree received	School <sup>2</sup> ↓	Subject of research
William C. Bryant 1958-59 (E)	MS 60	MSU	Movement of radiophosphorus through the invertebrate community of a trout stream
James D. Hall 1958-62 (F)	MS 60	UM	Preliminary studies on the biology of native Michigan lampreys
	PhD 63	UM	An ecological study of the chestnut lamprey, <u>Ichthyomyzon castaneus</u> Girard, in the Manistee River, Michigan
Robert E. Reinert 1958-62 (E)	MS 62	UM	Sensitivity of fingerling brook trout, <u>Salvelinus fontinalis</u> , and rainbow trout, <u>Salmo gairdneri</u> , to toxaphene with a brief survey of the toxaphene literature
Allen W. Knight 1959-60 (E)	MS 61	MSU	The translocation of radiophosphorus through an aquatic ecosystem
Robin L. Vannote 1959-63 (F)	PhD 63	MSU	Identification of factors which govern or influence reproductive success and growth patterns of smallmouth bass in the Red Cedar River, a typical southern Michigan warmwater stream
John L. Zettelmaier 1960-61 (E)	MS 61	MSU	The translocation of radiophosphorus through a lotic ecosystem
James M. McKim 1960-62 (E)	MS 62	UM	The inshore benthos of Michigan waters of southwestern Lake Huron
Michael E. Bender 1961-62 (E)	MS 62	MSU	The bacterial translocation of radioactive phosphorus through a lotic ecosystem
Walter T. Momot 1961-64 (F)	PhD 64	UM	Population dynamics of the crayfish, <u>Orconectes virilis</u> in relation to predation by the brook trout, <u>Salvelinus fontinalis</u>
Harry Westers 1961-63 (E)	MS 63	UM	An evaluation of population estimate procedures in two ponds, containing only largemouth bass ( <u>Micropterus salmoides</u> )
James C. Schneider 1962 (E)	MS 63	UM	Further studies on the benthic ecology of Sugarloaf Lake, Washtenaw County, Michigan
Percy W. Laarman 1962 (E)	MS 63	UM	Relationships of some environmental factors to growth of three species of fishes in Michigan

Name, and dates of employment <sup>1</sup> ✓	Degree received	School <sup>2</sup> ✓	Subject of research
Thomas A. Wojtalik 1962-63 (E)	MS 63	MSU	The transfer of radiophosphorus within a stream and its relationship to light intensity and insect migration
Wayne H. Tody 1963-64 (E)	PhD 64	MSU	An investigation of the success of rainbow trout populations in ten lakes relative to limiting environmental factors
Barry R. Miller 1963-65 (E)	MS 66	CMU	Age and growth of lake trout and whitefish in Torch Lake, Antrim County, Michigan
Jerry L. Hamelink 1963-69 (F)	PhD 69	MSU	Dynamics of DDT in the lentic environment
Michael D. Clady 1964-70 (F)	MS 66	UM	A study of the population fluctuations of the cisco, <u>Coregonus artedi</u> (Le Sueur) in Bircn Lake, Cass County, Michigan, with special reference to the gill-net sport fishery
	PhD 70	UM	Manipulation of unfished populations of game fish in Sylvania lakes
Jack D. Bails 1964 (E)	MS 68	MSU	Response of a pond metabolism to sodium arsenite
Gerald U. Ulrikson 1965-69 (F & E)	PhD 69	UM	Effects of beta radiation on reproductive organs of the bluegill
Robert C. Haas 1965-66 (E)	MS 70	UM	The effects of lamprey larvicide on the bottom fauna and periphyton of the Chocolay River, Marquette County, Michigan
Thomas M. Stauffer 1965-66 (E)	MS 68	MSU	Migration, age and growth of rainbow trout parr in Black River, Michigan
Randy L. Eshenroder 1966-67 (E)	MS 67	UM	Theoretical growth standards for Michigan bluegills
William T. Shaffer 1966-68 (E)	MS 68	UM	Production of a yellow perch population in a single species situation
Stephen G. Hildebrand 1967 & 1969 (E)	MS 69	UM	Effect of coho spawning activity on the benthic invertebrates of the Platte River, Benzie County, Michigan

Name, and dates of employment <sup>1</sup> ✓	Degree received	School <sup>2</sup> ✓	Subject of research
Manojlo Jovanovic 1969-71 (E)	MS 71	UM	Comparative life histories of the North American and European walleyes
Paul R. Hannuksela 1970-73 (E)	MS 73	UM	Food interrelationships of the mottled sculpin, <u>Cottus bairdi</u> , and juveniles of the rainbow trout, <u>Salmo gairdneri</u> , in a tributary of Lake Superior
John Scott Richards 1971-73 (E)	MS 73	UM	Changes in fish species composition in the Au Sable River, Michigan, from the 1920's to 1972
George E. Burgoyne 1971-73 (F)	PhD(cand)	UM	Model of trout population vs water quality in Au Sable River
Wilbert C. Wagner 1974-75 (E)	MA 75	NMU	Food of larval alewives in a Lake Michigan bay and notes on their distribution, abundance and growth
Leon M. Carl 1975-76 (F) 1976-80 (F)	MS 76 PhD(cand)	UM UM	The sport fishery of the Huron River before and after chemical reclamation Natural reproduction of chinook salmon in Lake Michigan tributaries
Thomas E. Stauffer 1976-77 (E)	MS 77	UM	A comparison of the diet and growth of brown trout ( <u>Salmo trutta</u> ) from the South Branch and the Main Stream, Au Sable River, Michigan
James W. Strogen 1976-77 (E)	MS 79	UM	A comparison of the diet and growth of the trout from the upper Au Sable and upper Manistee rivers, Michigan
James T. Baker 1979-80 (E)	MS(cand)	UM	Life history of sturgeon in Michigan

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Report approved by W. C. Latta

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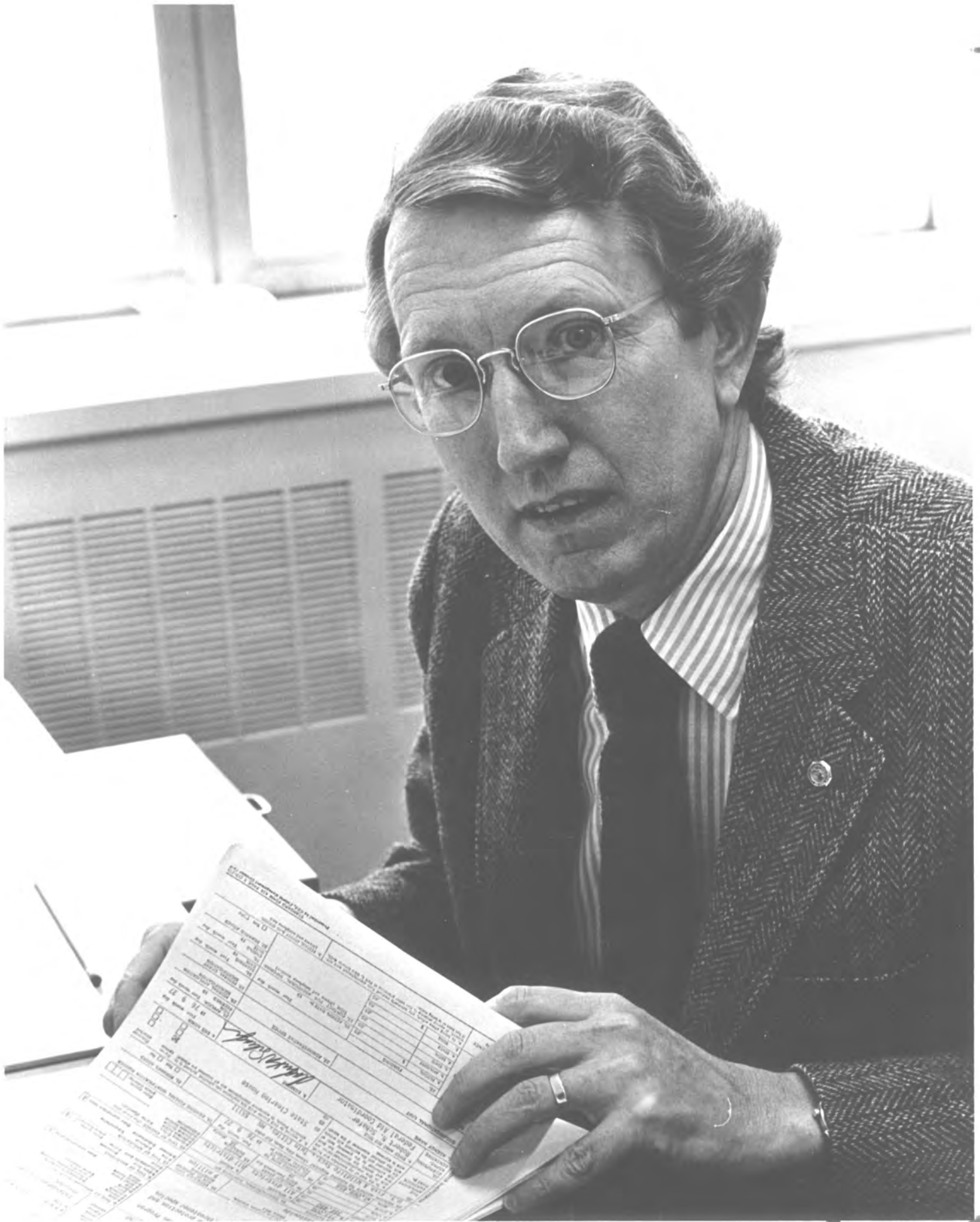




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