PROJECT NAME: North Central Regional Aquaculture Center Extension Program

FUNDING LEVEL: Year 1 - Grant 1: $63,500
Year 2 - Grant 2: $68,100

DURATION: 2 Years

ADMINISTRATIVE ADVISOR: Dr. Steven B. Laursen, Program Leader, Natural Resources, Minnesota Extension Service, St. Paul, MN 55108

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PROJECT NAME: North Central Regional Aquaculture Center Extension Program

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SITUATION

Interest in aquaculture has grown dramatically with an increased awareness of the health benefits from regular fish consumption, the rising demand and prices of fish products, the desire to stock fishes to improve the recreational potential of public and private waters, and the search for economic development and alternative agricultural opportunities.

Fish and seafood consumption in the U.S. reached a record high of 14.5 pounds per capita in 1985. Regular fish consumption appears to reduce the potential of developing cardiovascular diseases and may even reverse atherosclerosis. Current production by fish culturists in the North Central Region (NCR) can not meet current demand for fresh food fish, fish used for stocking and bait minnows. Opportunities for expansion and establishment of fee-fishing operations exist in many areas across the region.

Extension Service personnel in aquaculture serve as liaison between research personnel and several clientele groups. The largest group of clientele are individuals interested in starting an aquaculture operation who lack basic knowledge of aquaculture technologies and opportunities. A second group of clientele have some basic knowledge of aquaculture and sites with potential for aquaculture development. These individuals need more specific information to develop plans for establishing a commercial operation. The third clientele group is comprised of established fish culturists who need information to solve specific problems. A fourth clientele group includes industries involved in production of inputs for aquaculture or in the processing and marketing sectors.

The demand for aquaculture extension education programs cannot be met by the few specialists in the North Central region. Networking of specialists will maximize efficiency of education programs and minimize duplication. Printed materials will be an important component of the extension education effort in aquaculture and county agents and Sea Grant agents will be educated to serve as initial information sources. The North Central Regional Aquaculture Center (NCRAC) Extension Project is designed to assess and meet the information needs of the various clientele groups through cooperative and coordinated regional educational programming.

OBJECTIVES

1. Establish linkages between North Central Regional Aquaculture Center research and extension work groups.

2. Establish a North Central Region (NCR) aquaculture extension network for aquaculture information transfer.

3. Provide in-service training for Cooperative Extension Service and Sea Grant personnel and other landowner assistance personnel.

4. Develop aquaculture education programs for the North Central Region including:

    a. Educational materials for individuals who lack basic knowledge about aquaculture.

    b. Conduct regional workshops for individuals with potential to develop commercial aquaculture operations.

c. Plan and implement educational programs for aquaculturists and industries involved in production of inputs for aquaculture or in the processing and marketing sectors.

5. Coordinate publications resulting from activities of NCRAC's programs.

ACTION

1. Establish linkages between NCRAC research and extension work groups.

   Assign one extension working group member to work with each funded NCRAC research project to identify results useful in extension programs, provide ongoing needs assessment, and provide input for design and prioritization of future research projects.

2. Establish a North Central Region (NCR) aquaculture extension network for aquaculture information transfer.

   Designate at least one contact person for each NCR state, develop a directory, and establish a mechanism for sharing materials produced by states in the NCR. Conduct a workshop for CES and Sea Grant personnel on how to develop a strong interdisciplinary effort, enhance information sharing, establish priorities for development of educational materials, plan workshops, etc. Establish liaisons with state and federal agencies, and with state aquaculture organizations to identify industry needs.

3. Provide in-service training for Cooperative Extension Service and Sea Grant personnel and other landowner assistance personnel.

   Conduct two or more regional aquaculture in-service training workshops as model programs. Use materials developed for objectives 4 as the basis for the programs.

4. Develop aquaculture education programs for the North Central Region including:

   a. Educational materials for individuals who lack basic knowledge about aquaculture.

      Develop a bulletin containing basic information describing aquaculture potential and the planning process for the general public and individuals interested in aquaculture. Develop fact sheets that describe basic information for the culture of species with demonstrated culture potential in the NCR.

   b. Conduct regional workshops for individuals with potential to develop commercial aquaculture operations.

      Assemble an aquaculture information packet that addresses appropriate basic aquaculture considerations and aquaculture planning. Assemble/develop training materials for specific aquaculture technologies. Conduct two to three regional workshops as model programs for individuals with demonstrated potential to develop commercial aquaculture. Each workshop will focus on a different technical subject.

   c. Plan and implement educational programs for aquaculturists and industries involved in production of inputs for aquaculture or in the processing and marketing sectors.

      Provide continuing educational programs for aquaculturists and industries involved in production of inputs for aquaculture or in the processing and marketing sectors that need information to solve specific problems. Provide information to meet specific industry needs. Provide demonstrations at existing aquaculture facilities. Work with industry clientele to provide researchers with updated needs assessments.

5. Coordinate publications resulting from activities of NCRAC's programs.

Assign one extension work group member to coordinate publications resulting from NCRAC programs.

EVALUATION

Ask selected aquaculturists, extension specialists, state and federal fish culturists within and outside the region to evaluate extension program materials. Survey workshop participants on perceptions of knowledge gained, usefulness of materials, ability to apply ideas, and for suggestions for improvement. Survey individuals receiving extension materials/assistance to quantify the number, type, and size of new fish culture operations started and the economic impact on existing industries.

SCOPE

Number of States in Region: 12
Number of States In the Program: 4
Cooperating Program Areas:

Sea Grant, landowner assistance personnel, Aquaculture Industries and industry associations.

KEYWORDS

aquaculture, fish, water quality, agriculture, North Central Regional Aquaculture Center, natural resources, fisheries, alternative agriculture

ESTIMATED RESULTS/IMPACTS

Knowledge gained and attitudes changed	1000	individuals
New or expanded fish culture	50	farms
	250	acres of ponds
	100	linear feet of raceways
	$1,000,000	economic impact
Improved fish culture management	75	farms
	300	acres of ponds
	250	linear feet of raceways
	20	reduced disease
	25	improved product
	$500,000	economic impact
New or expanded associated industries	15	new
	15	expanded
	$300,000	economic impact

ESTIMATED FTEs

Year	Professional	Paraprofessional	Volunteer
1989	1.0	1.9	.55
1990	1.5	2.5	.75

REPORTING SCHEDULE

Year	Accomplishment
1989	X
1990	X

CONTACTS

Program Chairman
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PROJECT LEADERS

EXTENSION SPECIALISTS/AGENTS

State	Name	Institution
Illinois	Robert D. Espeseth	University of Illinois
Iowa	Joseph E. Morris	Iowa State University
Michigan	Donald L. Garling	Michigan State University
	Ronald E. Kinnunen	Michigan State University - Marquette
Minnesota	Anne R.D. Kapuscinski	University of Minnesota
	David J. Landkamer	University of Minnesota

EXTENSION PROGRAM MAJOR ACTIONS AND BUDGET
FOR UNIVERSITY OF ILLINOIS

(Espeseth)

MAJOR ACTIONS

Participate in the following objectives of the Extension Work Group of the NCARC Extension Work Plan:

2. Provide information of NCR aquaculture extension directory.

3. Explore potential for a joint aquaculture specialist with Indiana CES (Purdue University).

4b. Participate in NCR aquaculture extension workshops.

4c. Work with Illinois Aquaculture Industries Association and Illinois Departments of Agriculture and Conservation on educational workshops for the NCR.

PROPOSED EXTENSION BUDGET SHEET FOR UNIVERSITY OF ILLINOIS

(Espeseth)

	Yr 1 No.	Yr 1 FTEs	Yr 2 No.	Yr 2 FTEs	Year 1	Year 2
A. Salaries and Wages						
1. No. of Senior Personnel & FTEs[1]						
a. (Co)-PI(s)	1	0.05	1	0.05	$0	$0
b. Senior Associates						
2. No. of Other Personnel (Non-Faculty) & FTEs						
a. Research Assoc./Postdoc						
b. Other Professionals						
c. Graduate Students						
d. Prebaccalaureate Students						
e. Secretarial-Clerical						
f. Technical, Shop, and Other						
Total Salaries and Wages					$0	$0
B. Fringe Benefits					$0	$0
C. **Total Salaries, Wages and Fringe Benefits**					$0	$0
D. Nonexpendable Equipment					$0	$0
E. Materials and Supplies					$500	$500
F. Travel - Domestic (*Including Canada*)					$400	$600
G. Other Direct Costs					$0	$0
TOTAL PROJECT COSTS (*C through G*)					$900	$1,100

[1] FTEs = Full Time Equivalents based on 12 months.

EXTENSION PROGRAM MAJOR ACTIONS AND BUDGET
FOR IOWA STATE UNIVERSITY

(Morris)

MAJOR ACTIONS

Participate in the following objectives of the Extension Work Group of the NCARC Extension Work Plan:

1. Serve as liaison to the NCRAC Hybrid Striped Bass research project.

2. Work with NCRAC regional materials project in determining methods for sharing of materials.

3. Conduct water quality workshop for regional in service training.

4a. Participate in preparing bulletin on basic information and develop two fact sheets with potential for culture in the NCR.

4b. Conduct regional workshop on water quality (year 2).

PROPOSED EXTENSION BUDGET SHEET FOR IOWA STATE UNIVERSITY

(Morris)

	Yr 1 No.	Yr 1 FTEs	Yr 2 No.	Yr 2 FTEs	Year 1	Year 2
A. Salaries and Wages						
1. No. of Senior Personnel & FTEs[1]						
a. (Co)-PI(s)	1	0.10	1	0.10	$0	$0
b. Senior Associates						
2. No. of Other Personnel (Non-Faculty) & FTEs						
a. Research Assoc./Postdoc						
b. Other Professionals						
c. Graduate Students						
d. Prebaccalaureate Students	1	0.36	1	0.36	$1,100	$1,200
e. Secretarial-Clerical						
f. Technical, Shop, and Other						
Total Salaries and Wages					$1,100	$1,200
B. Fringe Benefits					$0	$0
C. **Total Salaries, Wages and Fringe Benefits**					$1,100	$1,200
D. Nonexpendable Equipment					$0	$0
E. Materials and Supplies					$500	$500
F. Travel - Domestic (*Including Canada*)					$1,000	$1,000
G. Other Direct Costs					$1,500	$1,500
TOTAL PROJECT COSTS (*C through G*)					$4,100	$4,200

[1] FTEs = Full Time Equivalents based on 12 months.

EXTENSION PROGRAM MAJOR ACTIONS AND BUDGET
FOR MICHIGAN STATE UNIVERSITY

(Garling)

MAJOR ACTIONS

Coordinate North Central Region Aquaculture Center Extension Program as Work Plan chairperson and participate in the following objectives:

1. Serve as liaison with the NCRAC Yellow Perch research project and extension work group.

2a. Develop directory of NCRAC aquaculture extension contact persons.

2b. Participate in NCR aquaculture extension network workshops, organize and host a NCR Aquaculture Conference in 1990.

4a. Lead development of bulletin containing basic information describing aquaculture potential and planning process.

4a. Develop one fact sheet for culture of species with demonstrated culture potential in the NCR.

4c. Conduct a regional workshop on culture and economics of salmonids for aquaculturists and associated industries.

5. Coordinate publications resulting from activities of NCRAC's programs.

PROPOSED EXTENSION BUDGET SHEET FOR MICHIGAN STATE UNIVERSITY

(Garling)

	Yr 1 No.	Yr 1 FTEs	Yr 2 No.	Yr 2 FTEs	Year 1	Year 2
A. Salaries and Wages						
1. No. of Senior Personnel & FTEs[1]						
a. (Co)-PI(s)	1	0.10	1	0.10	$0	$0
b. Senior Associates						
2. No. of Other Personnel (Non-Faculty) & FTEs						
a. Research Assoc./Postdoc						
b. Other Professionals						
c. Graduate Students	1	0.50	1	0.50	$11,400	$12,500
d. Prebaccalaureate Students						
e. Secretarial-Clerical	1	0.08	1	0.08	$1,600	$1,680
f. Technical, Shop, and Other						
Total Salaries and Wages					$13,000	$14,180
B. Fringe Benefits (25% of 2e)					$400	$420
C. **Total Salaries, Wages and Fringe Benefits**					$13,400	$14,600
D. Nonexpendable Equipment					$0	$0
E. Materials and Supplies					$500	$500
F. Travel - Domestic (*Including Canada*)					$1,000	$1,000
G. Publication Costs (NCRAC newsletter, research and extension publications					$24,000	$24,000
H. Other Direct Costs					$1,000	$1,500
TOTAL PROJECT COSTS (*C through H*)					$39,900	$41,600

[1] FTEs = Full Time Equivalents based on 12 months.

EXTENSION PROGRAM MAJOR ACTIONS AND BUDGET
FOR MICHIGAN STATE UNIVERSITY

(Kinnunen)

MAJOR ACTIONS

Participate in the following objectives of the Extension Work Group of the NCARC Extension Work Plan:

2. Participate in the NCR aquaculture extension network for aquaculture information transfer.

3. Provide in-service training for CES and Sea Grant personnel and other landowner assistance personnel.

PROPOSED EXTENSION BUDGET SHEET FOR MICHIGAN STATE UNIVERSITY

(Kinnunen)

	Yr 1 No.	Yr 1 FTEs	Yr 2 No.	Yr 2 FTEs	Year 1	Year 2
A. Salaries and Wages						
1. No. of Senior Personnel & FTEs[1]						
a. (Co)-PI(s)	1	0.10	1	0.10	$0	$0
b. Senior Associates						
2. No. of Other Personnel (Non-Faculty) & FTEs						
a. Research Assoc./Postdoc						
b. Other Professionals						
c. Graduate Students						
d. Prebaccalaureate Students						
e. Secretarial-Clerical						
f. Technical, Shop, and Other						
Total Salaries and Wages					$0	$0
B. Fringe Benefits					$0	$0
C. **Total Salaries, Wages and Fringe Benefits**					$0	$0
D. Nonexpendable Equipment					$0	$0
E. Materials and Supplies					$300	$300
F. Travel - Domestic (*Including Canada*)					$1,200	$1,300
G. Other Direct Costs					$0	$0
TOTAL PROJECT COSTS (*C through G*)					$1,500	$1,600

[1] FTEs = Full Time Equivalents based on 12 months.

EXTENSION PROGRAM MAJOR ACTIONS AND BUDGET
FOR UNIVERSITY OF MINNESOTA

(Kapuscinski and Landkamer)

MAJOR ACTIONS

Participate in the following objectives of the Extension Work Group of the NCARC Extension Work Plan:

1. Kapuscinski will serve as liaison to the NCRAC Walleye research project and Landkamer will serve as liaison to the NCRAC Economics/Marketing research project.

2. Participate in the NCR Aquaculture Extension Network for aquaculture information transfer.

3. Provide in-service training for CES and Sea Grant personnel and other landowner assistance personnel.

4a. Participate in development of basic planning bulletin and develop on fact sheet for cultural practices of a species with potential in the NCR.

4b. Conduct regional baitfish culture workshops for individuals with potential to develop commercial aquaculture operations.

4c. Plan and implement educational programs on fish health, aeration, and fish spawning for aquaculturists.

PROPOSED EXTENSION BUDGET SHEET FOR UNIVERSITY OF MINNESOTA

(Kapuscinski and Landkamer)

	Yr 1 No.	Yr 1 FTEs	Yr 2 No.	Yr 2 FTEs	Year 1	Year 2
A. Salaries and Wages						
1. No. of Senior Personnel & FTEs[1]						
a. (Co)-PI(s)	2	0.15	2	0.15	$0	$0
b. Senior Associates						
2. No. of Other Personnel (Non-Faculty) & FTEs						
a. Research Assoc./Postdoc						
b. Other Professionals						
c. Graduate Students	1	0.50	1	0.50	$10,400	$11,400
d. Prebaccalaureate Students						
e. Secretarial-Clerical	1					
f. Technical, Shop, and Other						
Total Salaries and Wages					$10,400	$11,400
B. Fringe Benefits					$0	$0
C. **Total Salaries, Wages and Fringe Benefits**					$10,400	$11,400
D. Nonexpendable Equipment					$0	$0
E. Materials and Supplies					$1,500	$1,500
F. Travel - Domestic (*Including Canada*)					$2,000	$2,500
G. Other Direct Costs					$3,200	$4,200
TOTAL PROJECT COSTS (*C through G*)					$17,100	$19,600

[1] FTEs = Full Time Equivalents based on 12 months.

AQUACULTURE EXTENSION

Budget Summary for Each Participating Institution at 63.5K for Year 1

	UI	ISU	MSU (Garling)	MSU (Kinnunen)	UM	TOTALS
Salaries and Wages	$0	$1,100	$13,000	$0	$10,400	$24,500
Fringe Benefits	$0	$0	$400	$0	$0	$400
Total Salaries, Wages and Benefits	$0	$1,100	$13,400	$0	$10,400	$24,900
Nonexpendable Equipment	$0	$0	$0	$0	$0	$0
Materials and Supplies	$500	$500	$500	$300	$1,500	$3,300
Travel	$400	$1,000	$1,000	$1,200	$2,000	$5,600
Publication Costs[1]	$0	$0	$24,000	$0	$0	$24,000
Other Direct Costs	$0	$1,500	$1,000	$0	$3,200	$5,700
TOTAL PROJECT COSTS	$900	$4,100	$39,900	$1,500	$17,100	**$63,500**

[1]Publication costs resulting from NCRAC programs including newsletter and research activities.

AQUACULTURE EXTENSION

Budget Summary for Each Participating Institution at 68.1K for Year 2

	UI	ISU	MSU (Garling)	MSU (Kinnunen)	UM	TOTALS
Salaries and Wages	$0	$1,200	$14,180	$0	$11,400	$26,780
Fringe Benefits	$0	$0	$420	$0	$0	$420
Total Salaries, Wages and Benefits	$0	$1,200	$14,600	$0	$11,400	$27,200
Nonexpendable Equipment	$0	$0	$0	$0	$0	$0
Materials and Supplies	$500	$500	$500	$300	$1,500	$3,300
Travel	$600	$1,000	$1,000	$1,300	$2,500	$6,400
Publication Costs[1]	$0	$0	$24,000	$0	$0	$24,000
Other Direct Costs	$0	$1,500	$1,500	$0	$4,200	$7,200
TOTAL PROJECT COSTS	$1,100	$4,200	$41,600	$1,600	$19,600	**$68,100**

[1]Publication costs resulting from NCRAC programs including newsletter and research activities.

RESOURCE COMMITMENT FROM INSTITUTIONS[1]

(Salaries, Supplies, Expenses and Equipment)

Institution/Item		Year 1	Year 2
Iowa State University			
Salaries and Benefits: EY @ 0.1 FTE		$3,828	$4,020
Supplies, Expenses and Equipment		$1,558	$1,638
	TOTAL PER YEAR	**$5,386**	**$5,658**
Michigan State University			
Salaries and Benefits: SY @ 0.02 FTE TY @ 0.08 FTE		$10,467 $2,000	$10,990 $2,100
Supplies, Expenses and Equipment		$14,922	$15,392
	TOTAL PER YEAR	**$27,389**	**$28,482**
University of Illinois			
Salaries and Benefits: EY @ 0.06 FTE TY @ 0.05 FTE		$2,466 $1,923	$2,589 $2,019
Supplies, Expenses and Equipment:		$1,450	$1,522
	TOTAL PER YEAR	**$5,839**	**$6,130**
University of Minnesota			
Salaries and Benefits: EY @ 0.30 FTE TY @ 0.15 FTE		$12,228 $3,650	$12,840 $3,830
Supplies, Expenses and Equipment:		$12,500	$13,125
	TOTAL PER YEAR	**$28,378**	**$29,795**
	GRAND TOTAL	**$66,992**	**$70,065**

[1]Since cost sharing is not a legal requirement and due to the difficulty in accounting for small items, documentation will not be maintained.

LIST OF PRINCIPAL INVESTIGATORS

Robert D. Espeseth, University of Illinois

Donald L. Garling, Jr., Michigan State University

Anne R.D. Kapuscinski, University of Minnesota

Ronald E. Kinnunen, Michigan State University

David J. Landkamer, University of Minnesota

Joseph E. Morris, Iowa State University

VITA

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EDUCATION

B.S. University of Wisconsin-Madison 1952
M.S. University of Wisconsin-Madison 1956

POSITIONS

Associate Professor and Extension Specialist, University of Illinois (1973-present)
Chief of Park and Recreation Resources Planning, Ellis, Arndt & Truesdell, Inc., Flint, MI (1971-1973)
Assistant Director and Chief of Park and Recreation Planner, Genesee County Parks and Recreation Commission, Flint, MI (1967-1971)
Wisconsin Department of Natural Resources (1955-1967)
Officer, United States Navy (1952-1954)

SCIENTIFIC AND PROFESSIONAL ORGANIZATIONS

National Recreation and Park Association: National Society for Park Resources (Board of Directors, 1975-1979; President, 1983-1984) and National Registration Board (1978-1981; President, 1980)
Illinois Parks and Recreation Association
National Marine Education Association
Environmental Education Association of Illinois
Marine Technology Society Council for National Cooperation in Aquatics

SELECTED PUBLICATIONS

Kistler, B., and R.D. Espeseth. 1986. Waterskiing–a rapidly growing aquatic activity. National Aquatics Journal 2(4).

McKinney, W., R.D. Espeseth, and C. Burger. 1986. Long range park and recreation planning: a case study. Journal of Park and Recreation Administration 4(4).

Espeseth, R.D. 1985. Risk management for recreation enterprises. National Aquatics Journal 1(3).

Espeseth, R.D., A Kaha, and D.F. Hoffmeister. 1978. Lake Shelbyville Visitor Center. Research Report and Plan, U.S. Army Corps of Engineers Project 10-77-431. University of Illinois at Urbana-Champaign.

Espeseth R.D. 1977. County level systems for outdoor recreation services. Office of Recreation and Park Resources, ORPR-35. University of Illinois at Urbana-Champaign.

Espeseth, R.D., and J.F. Dwyer. 1977. Improved local planning for reservoir oriented recreation opportunities. UILU-WRC-77-013 Research Report. Water Resources Center, University of Illinois at Urbana-Champaign.

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EDUCATION

B.S. University of Dayton 1970
M.S. Eastern Kentucky University 1972
Ph.D. Mississippi State University 1975

POSITIONS

Associate Professor, Department of Fisheries and Wildlife, Michigan State University (1985-present)
Aquaculture and Fisheries Extension Specialist, Department of Fisheries and Wildlife, Michigan State University (1985-present)
Assistant Professor, Department of Fisheries and Wildlife, Michigan State University (1980-1985)
Assistant Professor of Fisheries Science, Department of Fisheries and Wildlife Sciences, Virginia Polytechnic Institute and State University (1976-1980)

SCIENTIFIC AND PROFESSIONAL ORGANIZATIONS

American Fisheries Society: Fish Culture and Fisheries Educators Sections
Beta Beta Beta
Sigma Xi
Gamma Sigma Delta

SELECTED PUBLICATIONS

Machado, J.P., T.G. Bell, D.L. Garling, Jr., N.R. Kevern, and A.L. Trapp. (In Press). Effect of carbon monoxide and exposure on gas-bubble trauma in rainbow trout (*Salmo gairdneri*). Canadian Journal of Fisheries and Aquatic Sciences.

Westerhoff, R., D.L. Garling, and H.A. Tanner. 1988. Development of techniques to produce triploid chinook salmon for stocking the Great Lakes. Presented at the Annual Meeting of the World Aquaculture Society, January 4-9, Honolulu, Hawaii. Abstract 19:80 (#320).

Masterson, M.F., and D.L. Garling. 1986. Effect of feed color on feed acceptance and growth of walleye (*Stizostedion vitreum v.*) fingerlings. Progressive Fish-Culturist 48:306-309.

Ostrowski, A.O., and D.L. Garling. 1986. Dietary androgen-estrogen combinations in growth promotion in fingerling rainbow trout. Progressive Fish-Culturist 48:268-272.

Garling, D.L., and L.A. Helferich. 1984. Making plans for commercial fish culture in Michigan. Michigan Cooperative Extension Service Bulletin No. E-1775. 8pp.

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EDUCATION

B.A. Swathmore College 1976
M.S. Oregon State University 1980
Ph.D. Oregon State University 1984

POSITIONS

Assistant Professor/Extension Specialist (Aquaculture), University of Minnesota (1984-present)
Instructor/Project Leader/Research Assistant, Oregon State University (1980-1984)
Research Assistant, Oregon State University (1977-1980)
Aquaculture Research Technician, Weyerhaeuser Company (1976-1977)

SCIENTIFIC AND PROFESSIONAL MEMBERSHIPS

American Fisheries Society: Fish Culture Section, Genetics Section, NCD Fish Genetics Technical Committee
Genetics Society of America
International Association of Genetics in Aquaculture (Charter Member)
Society for the Study of Evolution
World Aquaculture Society
Sigma Xi, Phi Kappa Phi, Gamma Sigma Delta

SELECTED PUBLICATIONS

Kapuscinski, A.R. (In Press). Integration of transgenic fish into aquaculture. Food Reviews International.

Phillips, R.B., and A.R. Kapuscinski. (In press). High frequency of translocation heterozygotes in odd year populations of pink salmon (*Oncorhynchus gorbuscha*). Cytogenetics and Cell Genetics.

Yoon, S.J., E.M. Hallerman, M.L. Gross, Z. Liu, J.F. Schneider, A.J. Faras, P.B. Hackett, A.R. Kapuscinski, and K.S. Guise. (In Press). Transfer of the gene for neomycin resistance into goldfish, *Carrassius auratus*. Aquaculture.

Kapuscinski, A.R., and L.D. Jacobson. 1987. Genetic guidelines for fisheries management. Minnesota Sea Grant, St. Paul, Minnesota.

Kapuscinski, A.R.D., and J.E. Lannan. 1986. A conceptual genetic fitness model for fisheries management. Canadian Journal of Fisheries and Aquatic Sciences 43:1606-1616.

Lannan, J.E, and A.R.D. Kapuscinski. 1986. Application of a genetic fitness model to extensive aquaculture. Aquaculture 57:81-87.

VITA

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EDUCATION

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M.S. Michigan State University 1979

POSITIONS

District Agent, Michigan Sea Grant Extension Service, Michigan State University (1982-present)
Fish Pathologist, Rangen Laboratory, Hagerman, Idaho (1980-1981)
Fisheries Biologist, U.S. Fish and Wildlife Service, Leetown, West Virginia (1979-1980)
Environmental Consultant, Michigan Consolidated Gas Company, Detroit, MI (1978)
Graduate Research Assistant, Michigan State University (1977-1979)

SCIENTIFIC AND PROFESSIONAL ORGANIZATIONS

American Fisheries Society, Fish Health Section
National Association of Extension Agents
Michigan Association of Extension Agents
Sea Grant Advisory Service Association
Michigan Association of Marine Agents

SELECTED PUBLICATIONS

Kinnunen, R.E., and H.E. Johnson. 1986. Pathology of sea lamprey inflicted wounds on rainbow trout. Great Lakes Fishery Commission Technical Report No. 48, Ann Arbor, Michigan.

Kinnunen, R.E., and H.E. Johnson. 1985. Impact of sea lamprey parasitism on the blood features and hemopoietic tissue of rainbow trout. Great Lakes Fishery Commission Technical Report No. 46, Ann Arbor, Michigan.

Kinnunen, R.E., editor. Commercial Fisheries Newsline (quarterly newsletter for Great Lakes commercial fishermen published by the Michigan Sea Grant Advisory Service Program).

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Kinnunen, R.E., J. Peterson, and S. Stewart. 1984. Underwater preserves: a definite future in Michigan. Michigan Planner 4:14-16.

Kinnunen, R.E. 1984. Fish disease diagnostic needs survey results. Michigan Sea Grant Advisory Service Program Publication.

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EDUCATION

B.S. Utah State University 1977
M.Ag. Oregon State University 1986

POSITIONS

Assistant Aquaculture Extension Specialist, Department of Fisheries and Wildlife, University of Minnesota (1987-present)
Interpretive Ranger, Tuzigoot National Monument, U.S. Department of Interior, National Park Service (1987)
Instructor/Naturalist, Everglades Center Outdoors, Homestead, Florida (1986-1987)
Master Gardener/Master Food Preserver, Oregon Extension Service (1986)
Graduate Assistant, Department of Agriculture and Resource Economics, Oregon State University (1985)
Research Assistant, Swanson Aquaculture Laboratory, Oregon State University (1984-1985)

SCIENTIFIC AND PROFESSIONAL ORGANIZATIONS

American Fisheries Society
World Aquaculture Society
Canadian Aquaculture Association
Minnesota Fish Farmers Association

SELECTED PUBLICATIONS

Landkamer, D.J. 1988. Fish farming. Minnesota Extension Service.

Landkamer, D.J. 1988. Aquaculture in Minnesota. Minnesota Extension Service.

Landkamer, D.J., editor. 1988-present. The Catch. Minnesota Fish Farmers Association Newsletter (published quarterly).

Landkamer, D.J., and M.L. Gross. 1988. Regulations that apply to aquaculture in Minnesota. Minnesota Extension Service and Sea Grant Extension Program.

Gross, M.L., A.R. Kapuscinski, and D.J. Landkamer. 1988. Introduction to aquaculture in Minnesota. Minnesota Sea Grant Extension Program.

Aquaculture Advisory Committee. 1988. Interagency responsibilities for aquaculture development in Minnesota.

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EDUCATION

B.S. Iowa State University 1979
M.S. Texas A&M University 1982
Ph.D. Mississippi State University 1988

POSITIONS

Graduate Research Assistant, Mississippi State University (1986-1988)
Aquaculture Manager, Stiles Farm Foundation (1982-1986)
Graduate Research Assistant, Texas A&M University (1981-1982)
Research Technician I, Texas A&M University (1980-1981)
Fisheries Biologist Aide, Indiana Dept. Natural Resources (1979)

SCIENTIFIC AND PROFESSIONAL ORGANIZATIONS

Sigma Xi, Mississippi State University Chapter
American Fisheries Society, Mississippi Chapter
Mississippi Academy of Sciences
Fish Farmers of Texas (1983-1985)
Texas Chapter American Fisheries Society (1980-1985)

SELECTED PUBLICATIONS

Morris, J.E., L.R. D'Abramo, and R.J. Muncy. 1988. An inexpensive marking technique to assess ingestion of artificial feeds by larval fish. Submitted to Progressive Fish-Culturist.

Morris, J.E. 1988. Influence of artificil feeds upon striped bass (*Morone saxatilis*) X white bass (*M. chrysops*) hybrid fry survival. Doctoral dissertation. Mississippi State University, Starkville.

Morris, J.E. 1988. Effect of artificial feeds upon hybrid striped bass fry survival and growth. Mississippi Chapter American Fisheries Society Annual Meeting, Vicksburg.

Morris, J.E., P.V. Zimba, and R.J. Muncy. 1988. Chlorophyll α determination in aquaculture ponds. Mississippi Academy of Sciences 52nd Annual Meeting, Biloxi.

Morris, J.E., W.M. Wingo, and R. J. Muncy. 1987. Zooplankton population dynamics in hybrid striped bass culture ponds. Mississippi Chapter American Fisheries Society Annual Meeting, Oxford.

Champbell, J.M., J.E. Morris, and R.L. Noble. 1983. Spatial variability and community structure of littoral microcrustacea in Lake Conroe, Texas. 86th Annual Meeting Texas Academy of Science, Stephen F. Austin University, Nacodoches.