

Historic, Archive Document

Do not assume content reflects current scientific knowledge, policies, or practices.

QZ5076
AIUS4

C



United States
Department of
Agriculture

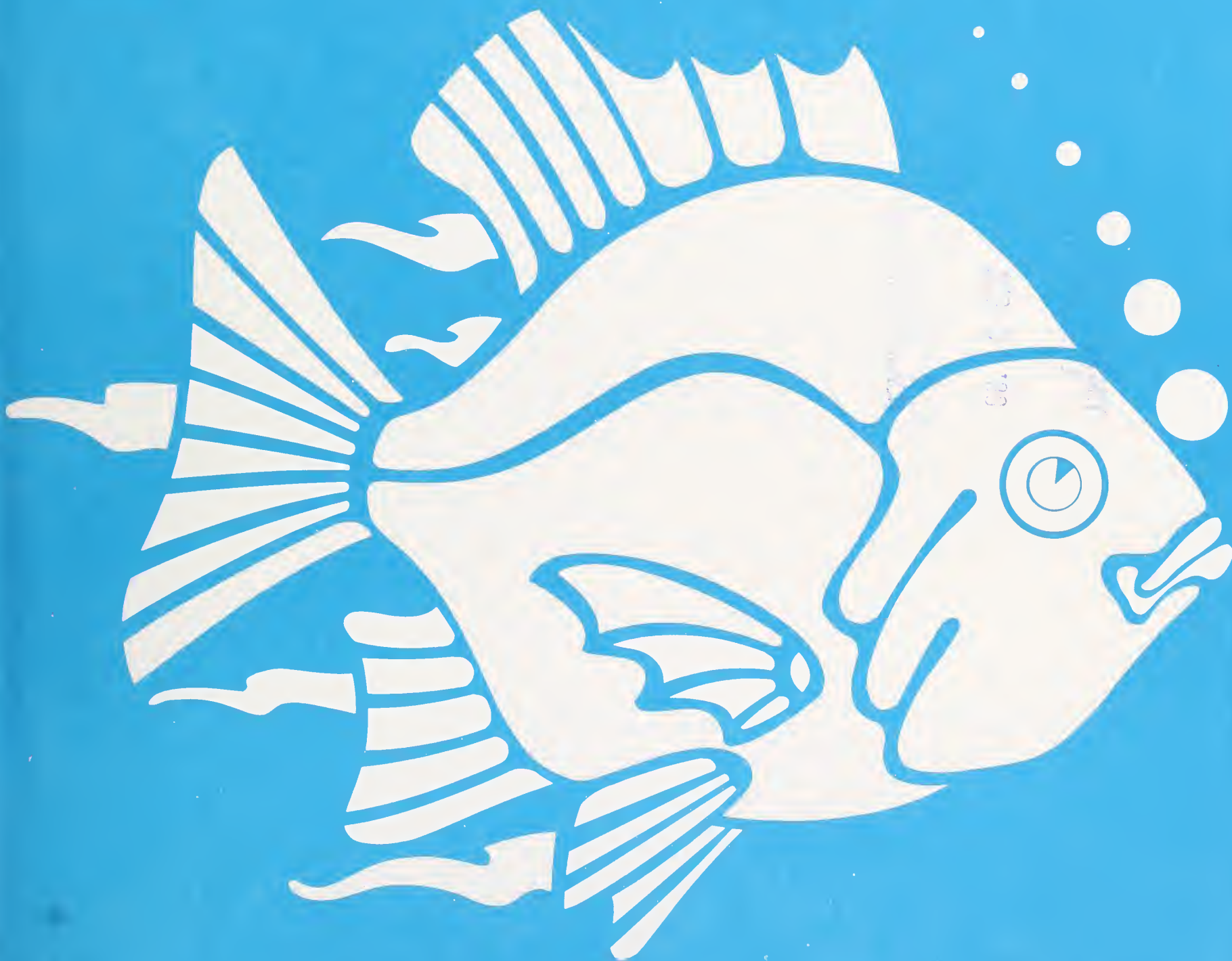
National
Agricultural
Library

Bibliographies
and Literature
of Agriculture
Number 75



Practical Aquaculture Literature II

A Bibliography



930505

United States
Department of
Agriculture

National
Agricultural
Library

Bibliography
and Literature
of Agriculture
Number 75



Practical Aquaculture Literature II

A Bibliography

Compiled and Edited by:
Eileen M. McVey
Deborah T. Hanfman
Mona F. Smith
Ann Townsend Young

U.S. Department of Agriculture
National Agricultural Library
Aquaculture Information Center

**In Cooperation With Joint Subcommittee
on Aquaculture
Information Task Force**
(Representing 17 Federal agencies
and organizations)

Meryl Broussard,
Extension Service,
U.S. Department of Agriculture

James P. McVey,
National Sea Grant College Program,
U.S. Department of Commerce

Joyce A. Mann,
Fish and Wildlife Service,
U.S. Department of the Interior

Tony Mazzaccaro,
Office of Aquaculture
Cooperative State Research Service,
U.S. Department of Agriculture

National Agricultural Library
Beltsville, Maryland 20705

June 1989

Preface

This bibliography updates Bibliographies and Literature of Agriculture Number 35 issued August 1985. Most of this update is new material. The purpose of the bibliography is to provide sources of information on practical aquaculture literature. The intended audience includes fish farmers, aquaculture specialists, educators, librarians, information professionals, students, Federal and State personnel, and the private sector.

Topics cover aquaculture species and subjects; selected periodicals, newsletters, books, bibliographies, directories, and State publications; State extension specialists in aquaculture and fish and wildlife; associations; and the Regional Aquaculture Centers. These topics are separated in the bibliography as follows:

- PART I: SPECIES
- PART II: SUBJECTS
- PART III: OTHER TYPES OF PUBLICATIONS
- PART IV: CONTACTS IN AQUACULTURE
- PART V: ADDRESSES FOR PUBLICATIONS

(Refer to the "Contents" page to locate specific types of information.)

The majority of documents cited within this bibliography are "how-to" publications. They represent selected materials dated from 1970 to 1989 that were collected over an 18-month period. Most of these reflect U.S. noncopyrighted materials provided by State and Federal contacts.

Each bibliographic citation is annotated to provide the user with a summary of the publication content, followed by a short address regarding publication availability.

Where can documents be obtained?

Complete addresses for obtaining publications cited in this bibliography are listed in PART V: ADDRESSES FOR PUBLICATIONS, beginning on page 161. The abbreviated address given after each citation should be used as a cross-reference to the complete address listed in PART V.

Since costs for a publication may vary according to the requesting location, exact fees are not provided in this bibliography. Many of the materials are free of charge. Users should contact the source given in PART V for information regarding publication availability and cost.

In addition, many documents may be obtained through interlibrary loan from a local public or university library.

Where can one seek additional help?

Some valuable references may be available but were excluded from this publication if they were not readily accessible to the user. Users are encouraged to contact their local public or university library for additional resources on a topic of interest.

The authors of this bibliography believe the basis of knowledge in the field of aquaculture begins with printed publications, audiovisuals, and computer programs. These types of materials represent a wealth of expertise based on research activities conducted over many years. However, in addition to these materials, each State offers technical expertise representative of the species and management techniques effectively used within its region.

County Agents and State specialists in aquaculture and fish and wildlife offer technical expertise. For location of the specialist in your area, refer to the County Agents Directory (cited in PART III under Directories) or to an expert listed under "State Aquaculture and Fish and Wildlife Specialists" (see PART IV).

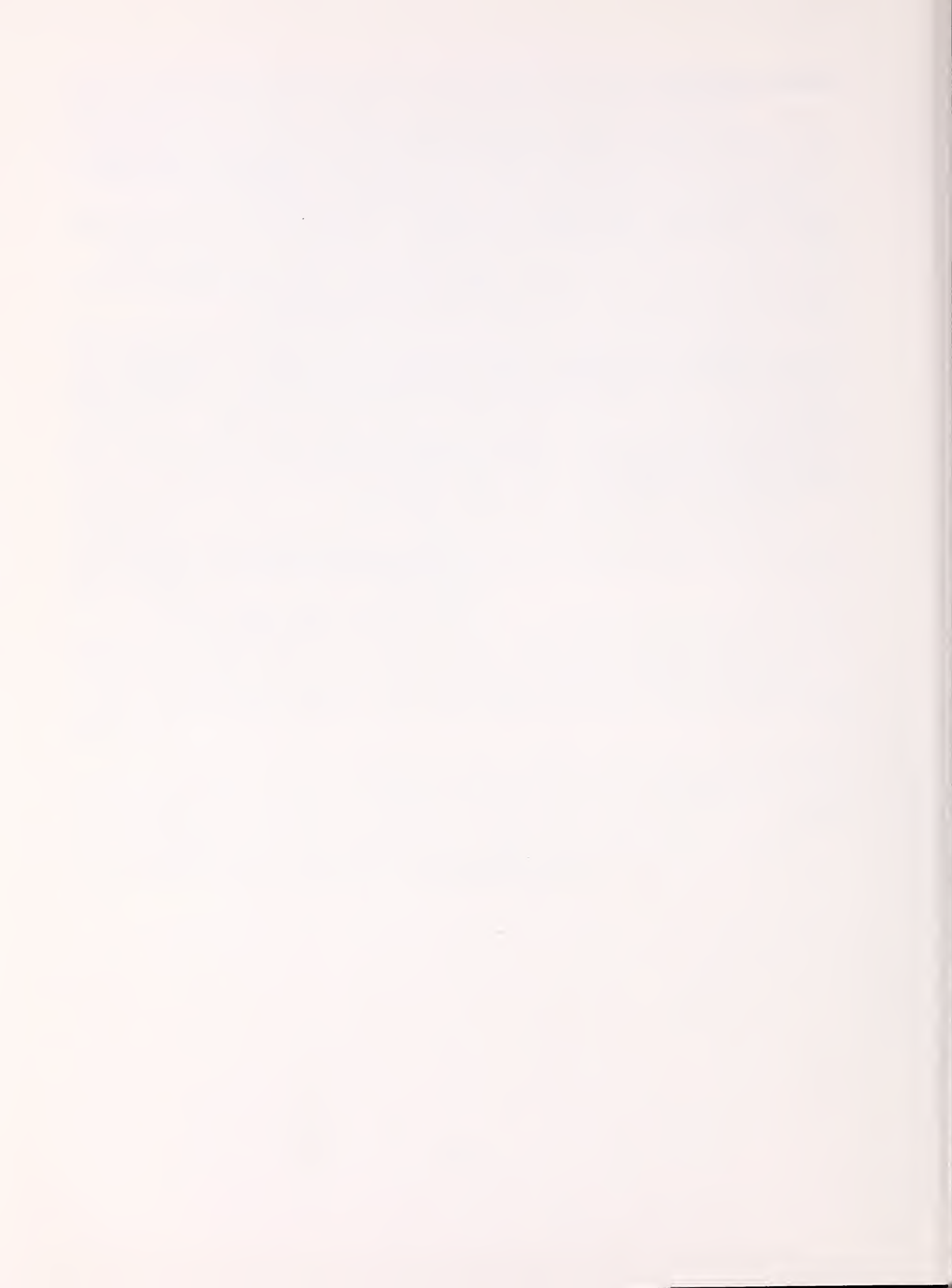
National and State associations can offer additional assistance in aquaculture. Many of these groups provide informative newsletters to members. Refer to sections under "United States and Canadian National Aquaculture Associations" and "United States Regional and State Aquaculture Associations" (see PART IV) for listings of associations.

Acknowledgments

This bibliography represents a cooperative effort between the National Agricultural Library (NAL) and the Joint Subcommittee on Aquaculture (JSA) as a means to improve information dissemination in aquaculture. The JSA is represented by 17 Federal agencies and organizations for the purpose of increasing the overall effectiveness of Federal programs in aquaculture. Members of the JSA and its supporting "Information Task Force" are acknowledged for their assistance in identifying and annotating documents for this major bibliography.

Special appreciation is expressed to the Extension Service, State agricultural publication offices, libraries, and other information facilities that provided NAL complimentary copies of aquaculture publications to use in this bibliography. Their agreement to serve as a distribution source for cited documents in this bibliography ensures the availability of practical aquaculture literature. Without their assistance, this bibliography could not have been produced.

AQUACULTURE INFORMATION CENTER
NATIONAL AGRICULTURAL LIBRARY
ROOM 304
BELTSVILLE, MARYLAND 20705



CONTENTS

	Page
PART I: SPECIES	
General Species.....	1
Aquatic Plants and Vegetation Control.....	4
Baitfish.....	9
Brine Shrimp.....	13
Catfish.....	13
Clams.....	19
Crabs.....	21
Crawfish.....	25
Daphnia.....	28
Oysters.....	29
Salmon.....	33
Shrimp, Freshwater.....	34
Shrimp, Marine.....	37
Sportfish.....	41
Striped Bass.....	43
Tilapia.....	44
Trout.....	45
Miscellaneous Species	
- Aquarium Fish.....	50
- Forage Species.....	51
- Frogs.....	52
- Milkfish.....	52
- Molluscs.....	53
- Perch.....	54
- Red Drum.....	54
- Shad.....	54
PART II: SUBJECTS	
Aquaculture Conversion Tables.....	55
Aquaculture Planning and Economics.....	55
Chemicals in Aquaculture.....	60
Computer Applications.....	63
Culturing Systems	
- Cage Culture.....	65
- Materials.....	69
- Raceways.....	69
- Recirculating Systems.....	70
- Tanks.....	71

PART II: SUBJECTS (Continued)

Diseases and Infections

- General.....	72
- Bacteria.....	77
- Fungus.....	81
- Parasites.....	82
- Virus.....	84
Feeds, Feeding and Nutrition.....	87
Legislation.....	93
Ponds	
- Construction.....	95
- General.....	96
- Management.....	98
- Water Quality.....	102
Transportation.....	106

PART III: OTHER TYPES OF PUBLICATIONS

Bibliographies.....	109
Directories.....	114
Selected Books.....	116
Selected Periodicals and Newsletters.....	122
State and Regional Publications.....	127

PART IV: CONTACTS IN AQUACULTURE

State Aquaculture and Fish and Wildlife Specialists.....	131
United States and Canadian	
National Aquaculture Associations.....	151
United States Regional and State	
Aquaculture Associations.....	153
United States Regional Aquaculture Centers.....	160

PART V: ADDRESSES FOR PUBLICATIONS.....161

PART I: SPECIES

GENERAL SPECIES

AQUACULTURE

Terry, Orville W. MESA New York Bight Atlas Monograph 17, New York Sea Grant Institute, June 1977, 36 pp.

This monograph discusses potential of aquaculture in the various inshore waters adjoining New York Bight with relation to pollution control and high-technology systems for offshore and open sea mariculture.

(Copies available from New York Sea Grant Institute)

THE ARTIFICIAL PROPAGATION OF WARM-WATER FINFISHES: A MANUAL FOR EXTENSION

Woynarovich, E. and Horvath, L. FAO Fisheries Technical Paper 201, 1980, 183 pp.

Manual is for use by extension workers and aquaculture training institutions. Includes artificial propagation techniques for some commercially important warmwater fishes. Contains many illustrations.

(For information on availability contact your local public or university library)

A FIRST LOOK AT FLORIDA AQUACULTURE

Shireman, Jerome V. and Lindberg, William J. Florida Cooperative Extension Service, Circular 702, [n.d.], 19 pp.

Discusses aquaculture development in Florida and Florida aquaculture species.

(Copies available from University of Florida)

FISH CULTURE IN MARYLAND: WEIGHING THE PROS AND CONS

Harrell, R. University of Maryland, UM-SG-MAP-88-05, 1988, 3 pp.

Provides checklists to assess the potential success of a fish farming venture.

(Copies available from University of Maryland, Sea Grant College)

FISH FARMING?

Beem, Marley. South Dakota Cooperative Extension Service, Extension Extra 12001, May 1987, 3 pp.

Briefly discusses types of fish farming, water quality, marketing economics, and legal considerations.

(Copies available from South Dakota State University)

FISH FARMING TECHNIQUES

Belusz, Larry. University of Missouri-Columbia, 1987, 84 pp.

An introductory guide emphasizing environmental factors. Includes helpful conversion tables and a list of equipment supplies.

(Copies available from University of Missouri)

FRESHWATER FISH FARMING IN VIRGINIA: SELECTING THE RIGHT FISH TO RAISE

Helfrich, Louis W.; Orth, D. J.; and Neves, R. J. Virginia Cooperative Extension Service, Publication 420-010, Reprinted September 1988, 34 pp.

Covers warmwater, coolwater and coldwater species, as well as bait minnows, crayfish, frogs, clams, salamanders, hellgrammites, and some aquatic plants.

(Copies available from Virginia Polytechnic Institute)

GETTING STARTED IN SHELLFISH MARICULTURE

Smith, Christopher F. and Malouf, Robert E. Sea Grant Cooperative Extension, Coastal Resources Shellfish Mariculture Fact Sheet, 300:20, November, 1984, 4 pp.

Discusses mariculture for six naturally occurring species of shellfish in New York State: hard clam (*Mercenaria mercenaria*), Eastern oyster (*Crassostrea virginica*), blue mussel (*Mytilus edulis*), bay scallop (*Argopecten irradians*), soft-shell clam (*Mya arenaria*), and surf clam (*Spisula solidissima*).

(Copies available from Cornell Cooperative Extension)

INLAND AQUACULTURE HANDBOOK

Texas Aquaculture Association, December 1988, [unpaginated], Originally prepared by Texas Agricultural Extension Service.

Includes 90 assorted factsheets on catfish, crawfish, sport and forage fish, tilapia, pond design and construction, pond management, water quality, water use and conservation, parasites and diseases, food and nutrition, pest management, transport and handling.

(Copies available from Texas Aquaculture Association)

WEST COAST MOLLUSC CULTURE: A PRESENT AND FUTURE PERSPECTIVE

Amidei, Rosemary, Ed. California Sea Grant College Program, Report No. T-CSGCP-017, 1988, 87 pp.

Presents overview of mollusc culture in California and implications of environmental quality, public policy, as well as discussions of broodstock management and stock improvement.

(Copies available from University of California)

AQUATIC PLANTS AND VEGETATION CONTROL

ALGAE AND WATER POLLUTION

Palmer, C. Mervin. U.S. Environmental Protection Agency, Municipal Environmental Research Laboratory, Office of Research and Development, Report No. EPA-600/9-77-036, December 1977, 124 pp.

Contains color plates and descriptions of fresh water algae, as well as identification keys. Discusses control and use of algal species. Includes information on algal species in polluted water. Contains an extensive bibliography and glossary.

(For information on availability contact your local public or university library)

AQUATIC PLANT IDENTIFICATION AND HERBICIDE USE GUIDE

Westerdahl, Howard E. and Getsinger, Kurt D., Eds. U.S. Army Corps of Engineers, Aquatic Plant Control Research Program, Technical Report No. A-88-9, November 1988, v. I, 146 pp. plus appendices; v. II, 104 pp.

Volume I. Aquatic Herbicides and Application Equipment. Provides information on the use of registered herbicides. Includes factors that affect herbicide selection, environmental effects, and application equipment.

Volume II. Aquatic Plants and Susceptibility to Herbicides. Contains plant descriptions, habitats and distribution. Includes glossary, color photographs, and line drawings. Correlates aquatic species and herbicide susceptibility.

(Copies available from U.S. Army Corps of Engineers, Waterways Experiment Station, CEWES-EV-I)

AQUATIC PLANTS FOR FOOD, MISCELLANEOUS USES

In Making Aquatic Weeds Useful: Some Perspectives for Developing Countries. Commission on International Relations, National Academy of Sciences, National Research Council, 1976, pp. 127-147.

Discusses utilization of selected aquatic plants (e.g., floating rice, wild rice, lotus, matai, water spinach, watercress, taro, arrowhead Azolla and Spirulina). Includes information on habitat and harvesting. Scientific names are also provided.

(For information on availability contact your local public or university library)

AQUATIC VEGETATION CONTROL

Harrell, Reginal M. and Hochheimer, John N. University of Maryland Cooperative Extension Service Fact Sheet No. 415, 1985-86, 4 pp.

Provides information on the biological, chemical, and mechanical control of weeds. Includes safety tips for herbicide usage. Contains a list of suggested herbicides.

(Copies available from Maryland Cooperative Extension Service)

BARRIERS TO RESTRICT MOVEMENT OF GRASS CARP FOR MANAGEMENT OF AQUATIC WEEDS

Vandiver, Vernon V., Jr.; Bagnall, Larry O.; Sutton, David L.; [et al.]. University of Florida at Gainesville, Weeds in the Sunshine #A-85-13, December 1985, 4 pp.

Details are given for the design and use of a fish barrier, which is introduced to contain the herbivorous triploid grass carp.

(Copies available from University of Florida)

BIOLOGY AND CHEMICAL CONTROL OF DUCKWEED

Haller, W. T. University of Florida at Gainesville, Weeds in the Sunshine #A-86-10, January 1986, 8 pp.

A description of the Lemnaceae family (duckweed). Contains list of recommended herbicides.

(Copies available from University of Florida)

CONTROLLING WEEDS IN LAKES AND FARM PONDS

Everest, John W.; Jensen, John; and Bayne, David R. Alabama Cooperative Extension Service, Publication No. ANR-48, [n.d.], 6 pp.

Provides information on practical systems of aquatic plant management in Alabama ponds and lakes.

(Copies available from Alabama Cooperative Extension Service)

THE CULTURE OF MACROSCOPIC ALGAE

Stickney, Robert. In World Aquaculture, September 1988, v. 19 (3), pp. 54-58.

Lists and discusses the species of macroalgae cultured in the world. Includes information on the products and uses of algae and their extracts.

(For information on availability contact your local public or university library)

ESTABLISHING A SEAWEED INDUSTRY IN HAWAII: AN INITIAL ASSESSMENT

Moss, J. R. and Doty, M. S. Hawaii State Department of Land and Natural Resources, Aquaculture Development Program, January 1987, 73 pp.

Discusses the economic feasibility of growing and processing seaweeds. Provides information on extracts and extraction plants. Includes techniques for growing, harvesting, and processing. Legality of seaweed harvesting is also discussed.

(Copies available from Hawaii Aquaculture Development Program)

FOOD POTENTIAL OF AQUATIC MACROPHYTES

Edwards, Peter. International Center for Living Aquatic Resources Management, Asian Institute of Technology, 1980, 51 pp.

Reviews utilization of aquatic macrophytes. Includes topics on human food, fodder, and fertilizers. Provides comprehensive information on plant taxa and their culture.

(For information on availability contact your local public or university library)

GRASS CARP: A FISH FOR BIOLOGICAL MANAGEMENT OF HYDRILLA AND OTHER AQUATIC WEEDS IN FLORIDA

Sutton, David L. and Vandiver, Vernon V. University of Florida at Gainesville, Technical Bulletin No. 867, December 1986, 10 pp.

Includes details on the description and management of grass carp as a biological weed control.

(Copies available from University of Florida)

HYDRILLA: A NEW AND RAPIDLY SPREADING WEED PROBLEM

Haller, William T. University of Florida at Gainesville, Circular S-245, June 1978, 13 pp.

Includes detailed information on hydrilla and on control measures. Contains color photographs of propagules. Tells how to distinguish Hydrilla from Elodea.

(Copies available from University of Florida)

IMPORTANCE OF MARINE PLANTS

In *Marine Botany*, edited by Clinton J. Dawes, 1981, Wiley, New York, pp. 23-55.

Discusses the economic importance of marine plants and the utilization of seaweed by genera. Includes information on products by country. Economic data are also included.

(For information on availability contact your local public or university library)

SEAWEED CULTIVATION IN MINAMIKAYABE, HOKKIDO, JAPAN: POTENTIAL FOR SIMILAR MARICULTURE IN SOUTHEASTERN ALASKA

Olson, Wallace M. Alaska Sea Grant College Program, Marine Advisory Bulletin No. 27, 1987, 23 pp.

Discusses the cultural impact on seaweed cultivation. Provides techniques for growing, harvesting, and processing seaweed. Includes economic and marketing analysis.

(Copies available from University of Alaska)

SPIRULINA, THE EDIBLE MICROORGANISM

Ciferri, Orio. In *Microbiological Reviews*, December 1983, pp. 551-578.

Includes sections on several aspects of the use of Spirulina from its isolation, chemical composition, and production to the prospects of its use as a food source.

(For information on availability contact your local public or university library)

WATER WEEDS

Florida Department of Natural Resources, Bureau of Aquatic Plant Management, April 1987, 6 pp.

Serves as a brief introduction to aquatic weeds. Discusses their advantages and disadvantages. Sources of regional biologists are given.

(Copies available from University of Florida)

WEED CONTROL IN AQUACULTURE AND FARM PONDS

Thayer, D. D.; Haller, W. T.,; and Joyce, J. C. University of Florida at Gainesville, Circular No. 707, 24 pp.

Includes pond selection and construction, methods of weed control. Contains useful appendices with herbicide details. Photographs of weed harvesting and plant species are also included.

(Copies available from University of Florida)

BAITFISH

BACTERIAL INFECTION IN GOLDEN SHINERS OF TEXAS RETAILING ESTABLISHMENTS

Reproduced from the Proceedings of the 1974 Fish Farming Conference, Texas A & M University, FDDL-F3, November 1974, 6 pp.

Using fish collected from 48 minnow retailers, 8 bacteria species were identified in 32 bacterial isolates. Methods of control were discussed.

(Copies available from Texas A & M University)

BAIT MINNOW PRODUCTION REVIEW

McGee, Mike. Florida Cooperative Extension Service, [n.d.], 2 pp.

Briefly discusses marketing, labor, capital, production, and management.

(Copies available from University of Florida)

BAITFISH

Gray, D. Leroy. Southern Regional Aquaculture Center, [n.d.], 2 pp.

Provides a brief description of the golden shiner, fathead minnow, goldfish, blue tilapia, and rudd.

(For information on availability contact your County Extension Office, State Cooperative Extension Service, or the U.S. Department of Agriculture, National Agricultural Library)

BAITFISH: FEEDS AND FEEDING PRACTICES

Gray, D. Leroy. Southern Regional Aquaculture Center, [n.d.], 3 pp.

Discusses natural food and grower feed in feeding golden shiners, fathead minnows, and goldfish.

(For information on availability contact your County Extension Office, State Cooperative Extension Service, or the U.S. Department of Agriculture, National Agricultural Library)

BAITFISH PRODUCTION: ENTERPRISE BUDGET

Engle, Carole R.; Dorman, Larry W.; and Gray, D. Leroy. Southern Regional Aquaculture Center, November 1988, 4 pp.

Provides annual cost and return information and capital investment requirements for baitfish. Prototypes for 20-acre and 100-acre baitfish farms are used.

(For information on availability contact your County Extension Office, State Cooperative Extension Service, or the U.S. Department of Agriculture, National Agricultural Library)

MAINTAINING MINNOWS - A GUIDE FOR RETAILERS

Johnson, S. K. Texas Agricultural Extension Service, 2M-6-81, 1981, 19 pp.

A how-to guide for holding minnows for sale to the public.

(Copies available from Texas A & M University)

MANUAL FOR BAIT FISH CULTURE IN THE SOUTH

Giudice, John J.; Gray, D. Leroy; and Martin, J. Mayo.
University of Arkansas Cooperative Extension Service, EC550-5M-
8-82R, Reprinted 1982, 50 pp.

Includes marketing, construction, production, harvesting,
aquatic vegetation control, predators, diseases and
management.

(Copies available from U.S. Fish and Wildlife Service at
Stuttgart and University of Arkansas at Little Rock)

PARASITE INFESTATION IN GOLDEN SHINERS OF TEXAS RETAILING ESTABLISHMENTS

Johnson, S. K. Texas Agricultural Extension Service, Fish
Disease Diagnostic Laboratory Report No. FDDL-F7, July 1975,
5 pp.

Presents results of parasitological examination of minnows
while being held by the retailer and management techniques
that could prevent losses.

(Copies available from S. K. Johnson, Texas Agricultural
Extension Service)

PRODUCTION OF BULL MINNOWS (FUNDULUS GRANDIS) FOR THE LIVE BAIT MARKET IN COASTAL ALABAMA

Tatum, W. M. Alabama Department of Conservation and Natural
Resources, Alabama Marine Resources Bulletin No. 13, 1982,
35 pp.

Includes biology, culture methods, water quality, and disease
prevention.

(Copies available from Alabama Department of Conservation and
Natural Resources)

RAISING MUDMINNONS

Strawn, Kirk; Perschbacher, Peter W.; Nailon, Robert; [et al.].
Texas A & M University Sea Grant College Program Report No.
TAMU-SG-86-506, [1986], 6 pp.

This paper covers general characteristics, recommended culture technique, ponds, feeding and fertilization, harvesting, management, farm size and location, and marketing.

(Copies available from Texas A & M University, Sea Grant College Program)

TEMPERATURE CHANGE AS A CAUSE OF RETAIL MINNOW DEATH

Johnson, S. K. Texas Agricultural Extension Service, Fish Disease Diagnostic Laboratory, FDDL-F2, November 1974, 3 pp.

This paper discusses testing of the effect of temperature change on golden shiners and provides recommendations to avoid minnow loss from temperature shock during hot weather.

(Copies available from S. K. Johnson)

WATER CHEMISTRY OF RETAIL MINNOW VATS

Johnson, S. K. Texas Agricultural Extension Service, Fish Disease Diagnostic Laboratory, FDDL-F5, November 1974, 3 pp.

Discusses water chemistry and its affect on the health of retail minnows. Areas covered are oxygen, carbon dioxide, ammonia, chlorine, and hydrogen sulfide.

(Copies available from S. K. Johnson)

BRINE SHRIMP

CONTROLLED LARGE-SCALE HATCHING OF BRINE SHRIMP, ARTEMIA SALINA

Meade, J. W.; Haines, P. B.; and Howey, R. G. [et al.]. Lamar Fish Cultural Development Center, Lamar Information Leaflet No. 80-03, [n.d.], 9 pp.

Discusses method for incubating artemia cysts to nauplii stage for use as a larval fish food.

(Copies available from U.S. Fish and Wildlife Service, Lamar)

DECAPSULATION OF BRINE SHRIMP (ARTEMIA SALINA) CYSTS

Haines, P. B.; Howey R. G.; and Theis G. L. Lamar Fish Cultural Development Center, Lamar Information Leaflet No. 80-06, [n.d.], 8 pp.

Discusses method for removing the outer shell of brine shrimp for improved digestibility when fed to larval fish.

(Copies available from U.S. Fish and Wildlife Service, Lamar)

CATFISH

ANCESTRY AND BREEDING OF CATFISH IN THE UNITED STATES

Dunham, Rex A. and Smitherman, R. Oneal. Alabama Agricultural Experiment Station, Circular 273, September 1984, 93 pp.

Covers information on channel, blue, white, flathead, and bullhead catfish using information from 192 farms, 58 State and Federal hatcheries, and 10 research institutions.

(Copies available from Auburn University, Swingle Hall)

THE BIOLOGY OF CHANNEL CATFISH PRODUCTION

Gray, D. Leroy. Arkansas Cooperative Extension Service, EC 535, [n.d.], 19 pp.

Provides information on pond construction, fingerling production, spawning, stocking and feeding, and disease symptoms.

(Copies available from University of Arkansas at Pine Bluff)

CATFISH FARMERS HANDBOOK

Wellborn, Dr. Thomas H., Jr. Cooperative Extension Service, Mississippi State University, Publication 1549, [1987], 35 pp.

Basic information for new catfish farmers. Primarily channel catfish is discussed, but information can be applied to other catfish species.

(Copies available from Mississippi State University)

CATFISH FARMING IN FLORIDA

Walsh, S. J. and Lindburg, W. J. Florida Cooperative Extension Service, IFAS Circular 710, July 1986, 17 pp.

A general guide for raising catfish in Florida on a commercial basis.

(Copies available from University of Florida)

CATFISH FARMING RISKS IN ALABAMA

Cacho, Oscar; Kinnucan, Henry; and Sindelar, Scott. Alabama Agricultural Experiment Station, Circular 287, December 1986, 19 pp.

Lists sources of risks and discusses how to manage those risks. Lists most common diseases in order of importance to farmers. Also discusses oxygen depletion and off-flavor problems.

(Copies available from Auburn University, Swingle Hall)

CATFISH IN FARM PONDS FOR FOOD AND RECREATION

Lock, Joe and Steinbach, Don. Texas Agricultural Extension Service, B-1319, 10-M-9-85, Reprint, [1985], 5 pp.

Comprehensive publication which provides specifics for construction of a catfish farm pond. Also discusses stocking, fertilizing the pond, feeding catfish, and harvesting.

(Copies available from Texas A & M University)

CHANNEL CATFISH BROOD STOCK - SELECTION AND MANAGEMENT

Dorman, Larry W. and Torrans, Les. Arkansas Cooperative Extension Service, Fact Sheet 9009, [n.d.], 2 pp.

Provides information on selection of broodfish, sex determination, and brood stock management with tips for successful spawning.

(Copies available from University of Arkansas at Pine Bluff)

CHANNEL CATFISH FINGERLING PRODUCTION

Wellborn, Thomas L.; Schwedler, Thomas; and Macmillan, Randy. Adapted from "Producing Channel Catfish Fingerlings" by John Jensen. Mississippi Cooperative Extension Service, Mississippi State University, Publication 1460, [1986], 15 pp.

Covers brood stock selection, management, spawning management, and hatchery management. Also discusses growing fingerlings, harvesting and handling, and selective breeding.

(Copies available from Mississippi State University)

CHANNEL CATFISH: LIFE HISTORY AND BIOLOGY

Wellborn, Thomas L. Southern Regional Aquaculture Center, November 1988, 4 pp.

Covers distribution, physical characteristics, habitat, feeding, age and growth, water quality, respiration and spawning of *Ictalurus punctatus*.

(For information on availability contact your County Extension Office, State Cooperative Extension Service, or the U.S. Department of Agriculture, National Agricultural Library)

CHANNEL CATFISH PRODUCTION IN TENNESSEE

Hill, Thomas K. Agricultural Extension Service, University of Tennessee Publication PB1287, [1988], 8 pp.

Covers culturing methods, water management, stocking, feeding, harvesting, marketing, problems and treatment, and costs.

(Copies available from Dr. T. K. Hill)

DETERMINING THE ECONOMIC EFFECTS OF OFF-FLAVOR IN FARM-RAISED CATFISH

Sindelar, Scott; Kinnucan, Henry; and Hatch, Upton. Alabama Agricultural Experiment Station, Bulletin 583, March 1987, 26 pp.

Discusses effect of off-flavor problems on short-run aggregate farm revenues.

(Copies available from Auburn University)

ECONOMIC ANALYSIS OF FARM-RAISED CATFISH PRODUCTION IN MISSISSIPPI

Keenum, Mark E. and Waldrop, John E. Mississippi Agricultural and Forestry Experiment Station, Technical Bulletin 155, July 1988, 27 pp.

Discusses advanced technology currently used and estimates investment requirements and annual costs for three synthesized catfish farms. Summarizes total annual production costs per pound.

(Copies available from Mississippi State University)

GUIDE FOR PROSPECTIVE FISH FARMERS

Wellborn, Dr. Thomas L., Jr. Mississippi Cooperative Extension Service, Publication 1465, [1987], 11 pp.

Provides helpful checklist in making a decision to enter catfish farming. Also provides criteria for site selection, investment costs, production data, diseases and harvesting.

(Copies available from Mississippi State University)

IMPROVED GROWTH RATE, REPRODUCTIVE PERFORMANCE, AND DISEASE RESISTANCE OF CROSSBRED AND SELECTED CATFISH FROM AU-M AND AU-K LINES

Dunham, Rex A. and Smitherman, R. O. Alabama Agricultural Experiment Station, Circular 279, June 1985, 7 pp.

Discusses origin and traits, mass selection, crossbreeding, and maintenance of stock of these strains.

(Copies available from Auburn University, Swingle Hall)

MORTALITY IN TEXAS FARM-REARED CATFISH CAUSED BY NATURAL TOXINS

Johnson, S. K. Texas Agricultural Extension Service, Fish Disease Diagnostic Laboratory Report No. FDDL-F6, February 1975, 3 pp.

Discussion of catfish kills by natural toxins such as those excreted by algae, and products of decomposition such as ammonia and hydrogen sulfide, and preventive measures.

(Copies available from S. K. Johnson)

PRODUCING CHANNEL CATFISH FINGERLINGS

Jensen, John; Dunham, Rex; and Flynn, John. Alabama Cooperative Extension Service, Circular ANR-327, [n.d.], 22 pp.

Discusses the technical skill and management needed for brood stock selection, brood stock management, hatchery system and harvesting and handling of fingerlings.

(Copies available from Alabama Cooperative Extension Service)

THIRD REPORT TO THE FISH FARMERS

Dupree, Harry K. and Huner, Jay V., Eds. U.S. Fish and Wildlife Service, Washington, D.C., 1984, 279 pp.

Provides the essentials of warmwater fish farming with an emphasis on channel catfish. Topics covered include polyculture, nutrition and feeding, harvesting, holding, transport, parasites and diseases.

(Limited free copies available from U.S. Fish and Wildlife Service, Stuttgart; copies available at cost from National Technical Information Service, #PB85-116341/XAB; and partial reprint of 200 pages available at cost from Catfish Farmers of Oklahoma)

CLAMS

BIOLOGICAL AND TECHNOLOGICAL STUDIES ON THE AQUACULTURE OF YEARLING SURF CLAMS. PART I: AQUACULTURE PRODUCTION

Goldberg, Ronald. National Marine Fisheries Service, Milford Laboratory, Proceedings of the National Shellfisheries Association, v. 70, 1980, pp. 55-60.

Growth of surf clams, *Spisula solidissima*, was monitored in a raceway system with data indicating a strong correlation between available phytoplankton and growth.

(Copies available from University of Connecticut)

A GUIDE TO MANILA CLAM AQUACULTURE IN PUGET SOUND

Anderson, Gregory J.; Miller, Mark B.; and Chew, Kenneth K. Washington Sea Grant Program, University of Washington, Technical Report WSG-82-4, 1982, 45 pp.

This manual contains sections on factors influencing Manila clam survival and growth in the Pacific Northwest, site selection, methods for planting and growout, economic prospects for clam aquaculture in Washington State. Appendices on tide level determination, necessary supplies and materials, planting schedules, sampling procedures, and length-weight approximations complete the volume.

(Copies available on loan from National Sea Grant Depository)

INCREASING CLAM HARVESTS IN MAINE

Maine/New Hampshire Sea Grant College Program, University of Maine, Orono, Maine, Report No. MEU-T-83-002, 1983, 59 pp.

This publication discusses the implications of better clam bed management for coastal towns in the northeast. Sections on clam management, clam biology, predation and protection, clam mariculture and legal issues provide a broad overview of present clam management practices. The clam mariculture section considers all aspects of aquacultural production of clams including hatchery and growout.

(Copies available on loan from National Sea Grant Depository)

INTENSIVE HARD CLAM MARICULTURE: A PRIMER FOR SOUTH CAROLINA WATERMEN

Manzi, John J. and Whetstone, Jack M. South Carolina Sea Grant Consortium, Marine Advisory Publication 81-01, 1981, 20 pp.

Provides a summary of procedures for a commercial scale demonstration in South Carolina in 1975. Includes contact agencies and field unit designs.

(Copies available from South Carolina Sea Grant Consortium)

MANUAL FOR GROWING THE HARD CLAM MERCENARIA

Catagna, Michael and Kraeuter, John N. Virginia Institute of Marine Science, Special Report in Applied Marine Science and Ocean Engineering 249, 2nd Printing 1984, 110 pp.

Clear, comprehensive manual designed for low-tech approach. Places emphasis on easy learning and inexpensive implementation. Includes a list of suppliers.

(Copies available from Virginia Institute of Marine Science)

SMALL-SCALE FARMING OF THE HARD CLAM ON LONG ISLAND, NEW YORK

Malinowski, Steve. The Clam Farm, Inc. prepared for The New York State Urban Development Corporation, 1986, 60 pp.

Describes techniques to produce seed clams for strengthening natural beds, market-sized clams for selling as seafood, and brood stock clams for spawning. Includes site selection criteria, upwelling system construction, field growout, legal requirements and expenses.

(Copies available from New York State Urban Development Corporation)

CRABS

BLUE CRAB SHEDDING SYSTEMS: DETERMINING WATER VOLUME AND PREPARING ARTIFICIAL SEAWATER

Perry, Harriet M. and Wallace, Richard. Louisiana Sea Grant College Program and Mississippi-Alabama Sea Grant Consortium, MASGP-83-007, [n.d.], folder, 3 pp.

Provides a table for adding salt to water to obtain desired salinity.

(Copies available from Mississippi-Alabama Sea Grant Consortium)

BLUE CRAB SHEDDING SYSTEMS: WATER QUALITY CONCERNS

Perry, Harriet M. and Richard Wallace. Louisiana Sea Grant College Program and Mississippi-Alabama Sea Grant Consortium, MASGP-83-007, [n.d.], folder, 3 pp.

Discusses managing oxygen levels, temperature, salinity, ammonia, and nitrite.

(Copies available from Mississippi-Alabama Sea Grant Consortium)

DILUTING WATER QUALITY SAMPLES FOR SOFT CRAB SHEDDING

Hochheimer, John. Maryland Sea Grant Extension Program, Crab Shedders Workbook Series, No. 3, 3 pp.

Provides instructions for diluting test samples to work within the range of a test kit and then converting this test value to the correct value for undiluted sample.

(Copies available from University of Maryland, Sea Grant College)

THE EFFECT OF AMMONIA ACCUMULATION ON BLUE CRAB SHEDDING SUCCESS

Lakshmi, G. J.; Trigg, Christine, M.; Perry, Harriet M.; [et al.]. Mississippi-Alabama Sea Grant Consortium, MASGP-83-023, August 1984, 51 pp.

Sublethal, lethal, and incipient lethal ranges of un-ionized and total ammonia were determined with its effects on shedding (molting) success in the blue crab in a closed recirculating system.

(Copies available from Mississippi-Alabama Sea Grant Consortium)

HOW TO IDENTIFY A SOFTSHELL CRAB

Spears, Carol J. Oregon State University Extension Service, SG76, June 1983, 2 pp.

Using photographs explains how to identify soft-shelled crabs for conservation purposes as well as explaining the molting process of the Dungeness crab.

(Copies available from Oregon State University, Sea Grant Communications)

INTERIM DESIGN RECOMMENDATIONS FOR CLOSED-RECIRCULATING BLUE CRAB SHEDDING SYSTEMS

Malone, Ronald F. and Manthe, Don P. Louisiana State University, May 10, 1984, 13 pp.

Report of ongoing research into recirculating shedding systems and development of specific design criteria for closed shedding systems.

(Copies available from Louisiana State University)

LOUISIANA BLUE CRAB PRODUCTION, PROCESSING, AND MARKETS

Keithly, Walter R., Jr.; Roberts, Kenneth J.; and Liebzeit, Andrea W. Louisiana Sea Grant College Program, September 1988, 33 pp.

Provides an economic analysis of the Louisiana blue crab wholesaling, processing, and distribution network. Reviews historical trends in the Louisiana harvesting and processing sectors and compares these trends with statistics at the Gulf regional and national levels.

(Copies available from Louisiana Sea Grant College Program)

MANUAL FOR HANDLING AND SHEDDING BLUE CRABS (CALLINECTES SAPIDUS)

Oesterling, Michael J. Virginia Institute of Marine Science, No. SRAMSOE 271, Revised 1988, 100 pp.

A practical approach to constructing and operating a crab shedding facility. Includes information on in-water float systems, shore-based tank systems, and closed recirculating systems. Also includes information on rock crabs (*Cancer irroratus*).

(Copies available from Virginia Institute of Marine Science)

PROCEEDINGS OF THE NATIONAL SYMPOSIUM ON THE SOFT-SHELLED BLUE CRAB FISHERY

Perry, Harriet M. and Malone, Roland F., Eds. Mississippi-Alabama Sea Grant Consortium, MASGP-86-017, February 12-13, 1985, 128 pp.

Subjects covered include viruses, diseases, molt cycles and hormonal regulation, fishery management, system design, and water quality concerns.

(Copies available from Mississippi-Alabama Sea Grant Consortium)

SOFT-SHELLED CRABS: ONBOARD SHEDDING FOR EXTRA INCOME

Supan, John; Horst, Jerald; and Bankston, David. Louisiana Cooperative Extension Service LSU Center for Wetland Resources, August 1986, 8 pp.

Includes peeler identification and design and use of flowthrough tanks.

(Copies available from Louisiana Sea Grant College Program)

USING WATER QUALITY CONVERSION TABLES FOR SOFT CRABBING

Hochheimer, John. Maryland Sea Grant Extension Program, Crab Shedders Workbook Series, No. 1, UM-SG-MAP-85-03, 7 pp.

This publication is a user's guide to "Water Quality Conversion Tables for Soft Crabbing" (UM-SG-MAP-85-01) published by Maryland Sea Grant Extension.

(Copies available from University of Maryland, Sea Grant College)

WATER QUALITY CONVERSION TABLES FOR SOFT CRABBING

Maryland Sea Grant Extension Program, UM-SG-MAP-85-01, 2 pp.

Includes five tables which aid in determining solubility of oxygen in water, specific gravity and salinities, temperature conversion from centigrade to Fahrenheit and Fahrenheit to centigrade, and hydrometer reading conversions at any temperature. Plastic coated for field use.

(Copies available from University of Maryland, Sea Grant College)

WATER QUALITY IN SOFT CRAB SHEDDING

Hochheimer, John. Maryland Sea Grant Extension Program, Crab Shedders Workbook Series, No. 2, UM-SG-MAP-88-01, 5 pp.

Discusses properties of water: physical, chemical, and biological; and six parameters of shedding water quality: dissolved oxygen, temperature, pH, ammonia, nitrite, and salinity.

(Copies available from University of Maryland, Sea Grant College)

CRAWFISH

AN ANALYSIS OF THE LOUISIANA CRAWFISH PROCESSING INDUSTRY AND POTENTIAL MARKET OUTLETS

Dellenbarger, L. E.; Roberts, Kenneth J.; Kelly, Steve S.; [et al.]. Department of Agricultural Economics and Agribusiness Research Report No. 654, June 1986, 21 pp.

Provides a profile of the Louisiana processing industry, its products and markets.

(Copies available from Louisiana Agricultural Experiment Station)

COMMERCIAL CRAWFISH PRODUCTION: A GUIDE FOR PROSPECTIVE CULTURISTS

Whetstone, Jack. South Carolina Sea Grant Consortium, SC-SG-MEP-88-1, Fall 1988, 16 pp.

Illustrates the life cycle of red swamp crawfish and white river crawfish. Information is also provided on soils, water quality, pond construction, forage, and harvesting.

(Copies available from South Carolina Sea Grant Consortium)

CRAWFISH CULTURE IN MARYLAND

Harrell, R. University of Maryland, UM-SG-MAP-88-06, 1988,
4 pp.

Brief but comprehensive treatment of crawfish production in
the mid-Atlantic States.

(Copies available from University of Maryland, Sea Grant
College)

CRAWFISH FARMING

La Caze, C. Louisiana Wildlife and Fisheries Commission,
Fisheries Bulletin No. 7, 1976, 25 pp.

A guide which includes chapters on biology, management, and
economics.

(Copies available from Louisiana Wildlife and Fisheries
Commission)

CRAWFISH PRODUCTION AND MARKETING WORKSHOP

Davis, J.T. [Ed.] Texas A & M University, [no. pub. no.], 1984,
68 pp.

Includes 10 papers delivered at the conference. Topics
covered are marketing, processing, forecasts, and grading.

(Copies available from Texas A & M University)

CRAWFISH PRODUCTION IN ARKANSAS

Dorman, Larry; Gray, D. Leroy; and Burtle, Gary. University of
Arkansas Cooperative Extension Service Program, University of
Arkansas, Pine Bluff, Bulletin EC 554-5M-5-85, 13 pp.

Includes information on culture techniques and marketing as
well as selling, pricing, and using crawfish as bait.

(Copies available from Arkansas Cooperative Extension Service)

DESIGN OF RECIRCULATING SOFT CRAWFISH SHEDDING SYSTEMS

Malone, R. F. and Burden, D. G. Louisiana Sea Grant College Program, July 1988, 74 pp.

Report on the recent developments in the shedding aspect of production of soft crawfish for commercial markets. Emphasis is on design and maintenance of shedding systems.

(Copies available from Louisiana Sea Grant College Program)

THE INS AND OUTS OF SOFT CRAWFISH

Louisiana Sea Grant College Program, Video Tape, 3/4 or 1/2 inch, or copied from blank tape, 25 minutes, [n.d.].

A 25-minute video on the production of soft crawfish in tray shedding systems including the steps from harvesting to packaging.

(Copies available from Louisiana State University Center for Wetland Resources)

PRODUCTION GUIDELINES FOR CRAWFISH FARMING IN SOUTH CAROLINA

Alon, Noel C. and Dean, John M. Belle W. Baruch Institute for Marine Biology and Coastal Research, Working Paper Series, [n.d.], 72 pp.

A production manual for setting up a crawfish farm. Emphasizes red swamp crawfish in open ponds.

(Copies available from South Carolina Sea Grant Consortium)

RED SWAMP CRAWFISH-BIOLOGY AND EXPLOITATION

Huner, J. V. and Barr, J. E. Louisiana Sea Grant College Program, 1984, 135 pp.

A very comprehensive book on the most economically important species of southern crawfish.

(Copies available from Louisiana Sea Grant College Program)

THE STATUS OF CRAWFISH FARMING IN MISSISSIPPI

Tubbs, E. Marty and Fuller, Marty J. Mississippi Agricultural and Forestry Experiment Station, Agricultural Economics Report 160, 1986, 11 pp.

An update on the Mississippi industry including production systems, harvesting, yields, and marketing.

(Copies available from Mississippi State University)

WATER QUALITY IN CRAWFISH FARMING

Johnson, S. K. Texas Agricultural Extension Service, Fish Disease Diagnostic Laboratory, [Report No.] FDDL-S13, February 1983, 9 pp.

Discusses various water quality factors such as temperature, soils and pH, minerals, weather, toxic gases and chemical wastes, and oxygen content.

(Copies available from S. K. Johnson)

DAPHNIA

CULTURE OF THE DAPHNIA MOINA MACROCOPA

Rottmann, R. W. Institute of Food and Agricultural Sciences, University of Florida, [n.d.], 4 pp.

Discusses protein content of daphnia, reproductive cycle, habitat and culture specifics such as feeding, aeration, and harvesting.

(Copies available from University of Florida)

CULTURING, HARVESTING, AND GRADING DAPHNIA

Howey, R. G. and Haines, P. B. Lamar Fish Cultural Development Center, Lamar Information Leaflet No. 80-04, [n.d.], 11 pp.

Describes the culture, collection, and grading of Daphnia as a cultured live food for walleye and American shad fry.

(Copies available from U.S. Fish and Wildlife Service, Lamar)

OYSTERS

ALASKA OYSTER GROWER'S MANUAL

Else, Page V. and Frady, T. Alaska Sea Grant College Program, Marine Advisory Bulletin 17, 1985, 206 pp.

This publication covers the main considerations for oyster culture in Alaska. The topics covered are oyster biology, economic considerations, permits, site selection factors, culture methods, future harvest potentials, fouling of oysters, environmental sanitation, shellfish poisoning, and harvesting techniques. There are appendices on seed sources, permit forms, equipment suppliers, PSP testing, sanitation regulations, sanitation and equipment requirements, and a list of shellfish growers in Alaska.

(Copies available from University of Alaska)

THE BIOLOGY AND CULTURE OF TROPICAL OYSTERS

Angell, C. L. International Center for Living Aquatic Resources Management (ICLARM) cont. #315, 1986, 42 pp.

This publication describes several species of tropical oysters presently cultured commercially. Three main types of oysters--Crassostrea, Saccostrea and Ostrea--are discussed, and photos of different diagnostic features are provided. There are detailed discussions of the natural ecology of the different oyster groups as well as descriptions of current culture techniques. Contains a section on hybridization. A reference section on oyster literature is fairly comprehensive.

(For information on availability contact your local public or university library)

DESIGN AND TEST OPERATION OF AN INTENSIVE CONTROLLED ENVIRONMENT OYSTER PRODUCTION SYSTEM

Thielker, Jeffrey. Sea Grant College Program, University of Delaware Report No. DEL-SG-07-81, April 1981, 28 pp.

A prototype oyster production system with a 10-bushel design capacity was operated in order to obtain information on component and biological performance, material flow, cost-related material, and energy and labor efficiencies over the long-term production cycle. The integrated system is comprised of (1) oyster life support, (2) algae production, and (3) water and waste handling facilities. Experimentation was not complete at the time this article was published, but some economic and production analyses were provided.

(Copies available on loan from National Sea Grant Depository)

DOMESTICATING THE WILD OYSTER

Leffler, Merrill. Maryland Sea Grant, University of Maryland, Publication No. UM-SG-RS-88-03, (Technical Reprint) April, 1988, 7 pp.

A reprint in color from "The World and I." Discusses history, life cycle, breeding, and hatchery spawning of *Crassostrea* sp.

(Copies available from University of Maryland, Sea Grant College)

AN OVERVIEW OF LAND-BASED OYSTER AQUACULTURE IN HAWAII

Yamauchi, Hiroshi; Lee, Kendrick K. F.; and Gee, Henry K. College of Tropical Agriculture & Human Resources, Research Extension Series 029, April 1983, 24 pp.

Covers land-based oyster culture in 1978-79 and discusses history, life cycle, and reproduction of oysters, management of land-based systems in Hawaii, and marketing.

(Copies available from Hawaii Agricultural Experimental Stations)

OYSTER CULTURE IN MARYLAND, 1980: A PROCEEDINGS HELD AT ANNAPOLIS, MARYLAND ON JANUARY 8, 1980

Webster, Donald, technical editor; and Greer, Jack, copy editor. Sponsored by University of Maryland Cooperative Extension Service in cooperation with University of Maryland Sea Grant Program and Maryland Department of Natural Resources, US-SG-MAP-81-01, 138 pp.

Discussions on seed oyster production, use of mechanized harvesting and shucking machines, processing problems, water quality, oyster diseases, hatcheries, the Bay Bottom Survey, and marketing and regulations pertaining to leased bottom areas.

(Copies available from University of Maryland, Sea Grant College)

OYSTER HATCHERY TECHNOLOGY SERIES

Krantz, George E. University of Maryland Sea Grant Extension Program, Report No. UM-SG-MAP-82-01, 1982, 126 pp.

Contains four parts: (1) Summary and Hatchery History; (2) Management Advisory; (3) The Economic Development Administration (E.D.A.) Report; (4) Oyster Hatcheries on the Chesapeake: A Prospectus. The report provides a history of oyster culture and rules and regulations for the oyster industry. The last two sections offer suggestions for improving hatchery performance and modern oyster culture techniques on the Chesapeake Bay.

(Copies available from University of Maryland, Sea Grant College)

PRODUCTION COSTS AND REVENUES IN THE FLORIDA OYSTER INDUSTRY

Prochaska, Fred J. and Keithly, Walter R. Florida Sea Grant College Report No. 87, Sea Grant Project NO. R/LR-E-8, July 1986, 16 pp.

Subtitled Economic and Financial Analysis of Production, Costs and Revenues in the Harvesting Sector of the Florida Oyster Industry. Information on production practices, costs, and revenues of oystermen in Franklin County for the year starting September 1982 and ending August 1983. Results should be useful to oystermen, lending institutions, and fishery managers.

(Copies available from Florida Sea Grant)

PURCHASING SEED OYSTERS

Webster, Donald and Meritt, Donald. Maryland Sea Grant Extension Program, Oyster Aquaculture Workbook Series 1, Report No. UM-SG-MAP-85-02, 1985, 4 pp.

Includes natural seed oysters, hatchery seed oysters, remote settings, quality considerations, and cost comparisons.

(Copies available from University of Maryland, Sea Grant College)

SIXTEEN DECADES OF POLITICAL MANAGEMENT OF THE OYSTER FISHERY IN MARYLAND'S CHESAPEAKE BAY

Kennedy, Victor S. and Breisch, Linda L. Maryland Sea Grant Program, University of Maryland, UM-SG-RS-83-03, (Technical Reprint), December 1981, 18 pp.

Describes the sociopolitical history of the oyster fishery and the involvement of the oyster fishermen and the State legislature.

(Copies available from University of Maryland, Sea Grant College)

STABILIZING OYSTER GROUND

Webster, Donald and Meritt, Donald. Maryland Sea Grant Extension Program, Oyster Aquaculture Workbook Series, No. 2, UM-SG-MAP-88-04, 6 pp.

Discusses cultch materials, bottom types, how much to plant, maintaining bottom, and limitations of methods.

(Copies available from University of Maryland, Sea Grant College)

THE SUITABILITY OF MAINE WATERS FOR CULTURING AMERICAN AND EUROPEAN OYSTERS, CRASSOSTREA VIRGINICA (GMELIN) AND OSTREA EDULIS

Packie, Robert; Hidu, Herbert; and Richmond, Mark S. University of Maine Sea Grant Technical Report TR-10-76, 30 pp.

Describes the results of tests with American and European oysters in Maine. Cultchless oysters from hatcheries were placed in many coastal locations. Growth rates were extremely rapid, up to 64.7 mm. for *C. virginica* during 4 months growth and 59 mm. for European oysters in the same period. Overwinter mortalities were higher for European oysters. The authors feel that oyster culture in Maine is promising.

(Copies available on loan from National Sea Grant Depository)

SALMON

AN ECONOMETRIC ANALYSIS OF ATLANTIC SALMON MARKETS IN THE UNITED STATES AND FRANCE

Lin, Biing-Hwan and Herrmann, Mark. University of Alaska, Alaska Sea Grant Report No. 88-5, October 1988, 19 pp.

Discusses Atlantic salmon marketing and the effects of cultured salmon marketing on markets for fresh and frozen products and demand for Pacific salmon.

(Copies available from University of Alaska)

ECONOMIC FEASIBILITY OF PRIVATE NONPROFIT SALMON HATCHERIES: AN INTRODUCTION

Orth, Franklin L. University of Alaska, Sea Grant Report 75-13, Aqua Note #1, December 1975, 15 pp.

Included is information on implications of institutional arrangements for a private nonprofit organization of hatcheries. Three levels of economic feasibility and their determinants are also discussed.

(Copies available from University of Alaska)

SALMON FARMING: A PROFILE

Kerns, Curt. Alaska Sea Grant College Program, Aquaculture Note #12, March 1988, 10 pp.

Sections covered by this publication are basic biophysical, legal, and knowledge requirements; financing; production requirements; and systems.

(Copies available from University of Alaska)

WORLD SALMON FARMING: AN OVERVIEW WITH EMPHASIS ON POSSIBILITIES AND PROBLEMS IN ALASKA

Kerns, Curt. University of Alaska Marine Advisory Program, Marine Advisory Bulletin #26, December 1986, 43 pp.

This booklet covers history and methodology of salmonid culture, as well as present status of salmon farming in the U.S., Canada, and other countries. Potential, research needs, competition, benefits, and disadvantages of this culture are also discussed.

(Copies available from University of Alaska)

SHRIMP - FRESHWATER

CONSUMER ACCEPTANCE OF FRESHWATER SHRIMP IN MISSISSIPPI RESTAURANTS

Dillard, J.; Fuller, J.; and Whitten, D. Department of Agricultural Economics, Agricultural Economics Research Report No. 170, November 1986, 19 pp.

This publication presents the results of consumer acceptance tests at four Mississippi restaurants in three different cities for freshwater shrimp. Questionnaires were provided to patrons with questions on taste, appearance, freshness, and texture. Seventy-seven percent of consumers rated freshwater shrimp as good or better than saltwater shrimp and 88 percent said they would order the product again.

(Copies available from Mississippi State University)

DEMONSTRATION OF SIMPLE HATCHERY TECHNOLOGY FOR PRAWNS IN SRI LANKA

FAO, Bay of Bengal Programme, BOBP/WP/43, June 1986, 22 pp.

Describes the procedures for the operation of a "backyard" hatchery for penaeid prawns.

(For information on availability contact your local public or university library)

FARMING FRESHWATER SHRIMP

Brick, Robert W. and Davis, James T. Texas Agricultural Extension Service, 1987, 4 pp.

This short pamphlet provides information on pond and water requirements, sources of juvenile shrimp, feeding requirements, parasites and diseases, seining and harvesting, expected production, preservation and processing, and licensing for the culture of freshwater shrimp in Texas.

(Copies available from Texas A & M University)

FRESHWATER PRAWN FARMING: A MANUAL FOR THE CULTURE OF MACROBRACHIUM ROSENBERGII

New, M. B. and Singholka, S. FAO Fisheries Technical Paper 225, Revision 1/FIRI/T225, 1985, 118 pp.

A practical guide to freshwater prawn farming. Begins with biology, continues with hatchery siting, facilities and operation; and concludes with pond siting, facilities and operation for rearing to market size.

(For information on availability contact your local public or university library)

POND CULTURE OF FRESHWATER SHRIMP, 1986

D'Abramo, Louis R.; Fuller, Marty J.; Collins, Jeffrey S.; [et al.]. Mississippi Agricultural and Forestry Experiment Station (MAFES), Information Bulletin 119, January 1988, 6 pp.

This bulletin provides the research results of shrimp (freshwater) monoculture and polyculture pond studies in Mississippi. Data summaries are provided in graph form. Survival in both shrimp monoculture and catfish/shrimp ponds were similar, and harvest size of shrimp was sufficient for marketing.

(Copies available from Mississippi State University)

PRELIMINARY ECONOMIC EVALUATION OF FRESHWATER SHRIMP PRODUCTION IN MISSISSIPPI

Clardy, Glynda N.; Fuller, Marty J.; and Waldrop, John E. Mississippi Agricultural and Forestry Experiment Station (MAFES), Agricultural Economics Research Report 159, 1985, 46 pp.

This publication discusses feasibility of adapting freshwater shrimp production from a synthesized catfish operation. The economic analysis is based on two scenarios using a 163-acre shrimp farm in Mississippi in 1985. The analysis takes most production costs such as land, construction costs, operating costs, and level of production and determines breakeven costs for shrimp production under both scenarios. Shrimp culture was not economically feasible in Mississippi during 1985.

(Copies available from Mississippi State University, Agricultural Economics Department)

PRODUCTION OF FRESHWATER SHRIMP

Wellborn, Thomas L., Jr. Mississippi State University Extension Wildlife and Fisheries, Publication No. 1511, May 1986, 8 pp.

Introductory information for the private farmer considering culture of freshwater shrimp. Information on life history and environmental requirements, pond management and stocking, water quality, diseases, harvesting, and marketing is presented in encapsulated form.

(Copies available from Mississippi State University)

SHRIMP - MARINE

BIO-ENGINEERING-ECONOMIC MODEL FOR SHRIMP MARICULTURE SYSTEMS, 1979

Adams, C. Department of Agricultural Economics, TAMU-SG-80-203,
1980, 118 pp .

A bioengineering-economic computer model was developed to produce average annual budgets, monthly and annual cash flows, and sensitivity analysis for a commercial penaeid shrimp growout system design located on the Texas Gulf Coast. Growth equations were simulated for various stocking densities. An operation consisting of twenty-four 2.5-acre ponds was found to capture most economies of size. Shrimp tail size and yield were the two most important economic factors.

(Copies available on loan from National Sea Grant Depository)

DESIGN, OPERATION AND COMPARATIVE FINANCIAL ANALYSIS OF SHRIMP FARMS IN HAWAII & TEXAS

Wyban, J. A.; Ogle, J.; Pruder, G. D.; [et al.]. Oceanic
Institute, February 1987, 26 pp.

Two hypothetical farms (Hawaii and Texas) were designed to allow financial analysis of the methods and technologies for shrimp culture in those areas. The paper describes the financial model used to analyse the economics of the two farms. Average annual operating costs by activity are presented. In a sensitivity analysis, changes in production parameters, i.e., increased survival, market price, density, and growth rate were more important than reduced labor costs, post larvae costs, feed costs, or tax rates.

(Copies available from Oceanic Institute)

EFFECTS OF TEMPERATURE CHANGE ON BROWN SHRIMP POSTLARVAE

Johnson, S. K. Texas Agricultural Extension Service, Fish Disease Diagnostic Laboratory Report No. FDDL-S2, November 1974, 2 pp.

Estimates temperature effects on shrimp after transport during release into culture systems.

(Copies available from S. K. Johnson)

FUSARIUM INFECTION IN EYES OF MATURE SHRIMP (PENAEUS VANNAMEI)

Laramore, C. R; Barkate, J. A.; and Persyn, H. O. Microbiology Research Laboratory, Ralston Purina Company, St. Louis, MO 63188, Texas Agricultural Extension Service, Fish Disease Diagnostic Laboratory Report No. FDDL-S9, May 1977, 2 pp.

Reports on *Fusarium* sp. responsible for eye infection in mature shrimp reared in tank culture and ultimate mortality of infected shrimp.

(Copies available from S. K. Johnson)

A LARVAL CYCLOPHYLLIDEAN (CESTODA) PARASITE OF BROWN AND WHITE SHRIMP

Corkern, Clifton C., II. Texas Agricultural Extension Service, Fish Disease Diagnostic Laboratory Report No. FDDL-S10, February 1978, 2 pp.

Report of a new helminth species found on shrimp.

(Copies available from S. K. Johnson)

**A MANUAL FOR LARGE-TANK CULTURE OF PENAEID SHRIMP TO THE
POSTLARVAL STAGES**

Yang, Won Tack. Sea Grant Technical Bulletin No. 31, 1975,
94 pp.

This technical bulletin provides information to construct and operate a large tank shrimp hatchery modified from the Japanese large tank system. Includes information on hatchery location, facilities, equipment, reproduction, population density control, harvesting, and shipping.

(Copies available on loan from National Sea Grant Depository)

MARINE SHRIMP CULTURE IN SOUTH CAROLINA

Whetstone, J. South Carolina Sea Grant Marine Extension Program, SCSGC-G-85-003, 1985, 2 pp.

This short paper describes four different methods of shrimp culture: extensive culture in waterfoul impoundments with no management; extensive culture in old rice impoundments with water management in order to favor shrimp recruitment and survival; semi-intensive culture in impoundments with stocking and feeding as well as water management; intensive culture in especially designed shrimp ponds with pumped water, stocking, feeding, and at times aeration.

(Copies available on loan from National Sea Grant Depository)

**MORTALITIES PRODUCED IN THE PROTOZOA STAGES OF PENAEID SHRIMP
BY AN UNSPECIATED AMOEBA**

Laramore, C. R. and Barkate, J. A. Microbiology Research Laboratory, Ralston Purina Company, St. Louis, MO 63188, Texas Agricultural Extension Service, Fish Disease Diagnostic Laboratory Report No. FDDL-S12, May 1979, 7 pp.

Reports on an amoeba responsible for high mortalities in two species of hatchery-reared penaeid shrimp.

(Copies available from S. K. Johnson)

SHRIMP MARICULTURE - STATE OF THE ART

Lawrence, A. L.; Johns, M. A.; and Griffin, Wade L. Shrimp Mariculture Project, TAMU-SG-84-502, 1984, 12 pp.

This publication summarizes the progress made in shrimp culture up to time of publication. The paper contains useful information on the species being cultured, requirements for captive maturation, fecundity and frequency of captive spawns, economics of shrimp farming, and potential for future shrimp farming. A useful reference section is provided.

(Copies available on loan from National Sea Grant Depository)

TEXAS SHRIMP FARMING MANUAL - AN UPDATE ON CURRENT TECHNOLOGY

Chamberlain, G. W.; Haby, M.; and Miget, R. Texas Agricultural Extension Service, Research and Extension Center, 1985, 276 pp.

This how-to handbook covers site selection and permitting, hatchery technology and growout technology, shrimp diseases, processing and marketing, and economics. The focus is on the Texas situation, but most information has broad application to shrimp aquaculture.

(Copies available from Texas Agricultural Extension Service, Corpus Christi)

U.S. MARINE SHRIMP FARMING CONSORTIUM: CURRENT STATUS OF DOMESTIC PRODUCERS

Pruder, G.; Wyban J.; and Ogle, J. Report prepared as part of Marine Shrimp Farming Project, Grant No. 85 - CRSR-2-2537, 1985, 24 pp.

The report identifies U.S. domestic marine shrimp farm companies. It presents up-to-date information on their operations, summarizes the characteristics of the U.S. shrimp farming industry, identifies constraints and future research needs, and makes recommendations for making U.S. shrimp farmers competitive in the world markets.

(Copies available from Oceanic Institute)

U.S. MARINE SHRIMP FARMING CONSORTIUM: TARGET MARKETS AND CURRENT SUPPLIERS

Wyban, J.; Pruder, G.; and Rackowe, R. Report prepared as part of Marine Shrimp Farming Project, Grant No. 85 - CRSR-2-2537. 1985, 32 pp.

This report covers the shrimp market situation for both New York and Tokyo. Information is provided on the product characteristics, i.e., species, sizes, product forms, regulations, brand names, consumption and demand, prices, and product substitutes. Other information on shrimp supply covers the domestic fisheries of both the United States and Japan, as well as imports.

(Copies available from Oceanic Institute)

SPORTFISH

FISHING FOR SALE: FEE-FISHING OPPORTUNITIES IN VIRGINIA

Helfrich, Louis A.; Sheehan, Robert J.; and Odenkirk, John S. Virginia Cooperative Extension Service, Publication 420-898, September 1986, 5 pp.

Explains fee-fishing and includes a directory of fee-fishing farms.

(Copies available from Virginia Polytechnic Institute)

INTENSIVE CULTURE OF WALLEYE (STIZOSTEDION V. VITREUM)

Howey, R. G.; Theis, G. L.; and Haines, P. B. U.S. Fish and Wildlife Service, Leaflet No. 80-05, 1980, 10 pp.

Intensive tank culture of walleye from larval stage to fingerlings.

(Copies available from U.S. Fish and Wildlife Service)

LARGEMOUTH BASS

Lock, Joe T. Southern Regional Aquaculture Center, [n.d.],
4 pp.

Discusses fertilization, feeding, stocking broodfish and fry, spawning, and general economics of largemouth bass.

(For information on availability contact your County Extension Office, State Cooperative Extension Service, or the U.S. Department of Agriculture, National Agricultural Library)

LARGEMOUTH BASS: BIOLOGY AND LIFE HISTORY

Lock, Joe T. Southern Regional Aquaculture Center, [n.d.],
2 pp.

Discusses food, growth, and spawning of largemouth bass.

(For information on availability contact your County Extension Office, State Cooperative Extension Service, or the U.S. Department of Agriculture, National Agricultural Library)

STOCKING SPORTFISH IN VIRGINIA PONDS: METHODS AND COMMERCIAL SUPPLY SOURCES

Helfrich, L. A. and Murphy, B. R. Virginia Cooperative Extension Service, Publication 420-009, November 1986, 9 pp.

Publication covers both warmwater and coldwater ponds.

(Copies available from Virginia Polytechnic Institute)

STRIPED BASS

THE CULTURE OF STRIPED BASS AND ITS HYBRIDS IN CAGES

Harrell, Reginal M. University of Maryland, Finfish Aquaculture Workbook Series 3, UM-SG-MAP-88-07, 1988, 8 pp.

Discusses cage or net-pen culture of striped bass and its hybrids. Includes information on ponds, feeds and feeding, diseases and marketing.

(Copies available from University of Maryland, Sea Grant College)

GUIDELINES FOR STRIPED BASS CULTURE

Bonn, E. W. Southern Division of the American Fisheries Society, November 15, 1988 [Update to be published in 1989].

Presents an illustrated summary of culture techniques that have helped create inland fisheries for striped bass.

(Copies available from American Fisheries Society)

INTERIM REARING GUIDELINES FOR PHASE II STRIPED BASS

Atstupenas, E. A. and Wright, L. D. U.S. Fish and Wildlife Service, 1987, 22 pp.

Instruction manual for rearing fingerlings to Phase II. Includes information on pond harvest and holding houses.

(Copies available from U.S. Fish and Wildlife Service)

TANK CULTURE OF STRIPED BASS PRODUCTION MANUAL

Lewis, William M. and Heidinger, R. C. Fisheries Research Lab, Southern Illinois University, IDC F-26-R, March 1981, 115 pp.

Comprehensive overview of system design and rearing procedures for tank culture of striped bass in a water-reuse system.

(Copies available from Southern Illinois University)

TILAPIA

BLUE TILAPIA CULTURE IN ARKANSAS

Torrans, Les. University of Arkansas, EC 560, [1988], 19 pp.

Provides background on distribution, morphology and feeding habits of blue tilapia (*Tilapia aurea*). Includes information on reproduction, growth, and harvesting with a section on winter management.

(Copies available from University of Arkansas at Pine Bluff)

SALINITY TOLERANCE OF THE TILAPIAS

Watanabe, Wade O.; Kuo, Ching-Ming; and Huang, Mei-Chan. ICLARM Technical Reports 16, 1985, 22 pp.

Salinity tolerance was studied in *Oreochromis aureus*, *O. niloticus* and *O. mossambicus* x *O. niloticus* hybrid. Ontogenetic changes in salinity tolerance were determined to be more closely related to body size than chronological age.

(For information on availability contact your local public or university library)

SUMMARY REPORT OF THE ICLARM CONFERENCE ON THE BIOLOGY AND CULTURE OF TILAPIAS, BELLAGIO, ITALY, 2-5 SEPTEMBER 1980

Pullin, R. S. V. ICLARM Conference Proceeding 6, 1981, 13 pp.

Briefly covers biology, physiology, culture, and research requirements for the aquaculture of tilapia.

(For information on availability contact your local public or university library)

TILAPIA CULTURE

Stickney, Robert R. and Davis, James T. Texas Agricultural Extension Service, Fact Sheet L-1863, [1981], 2 pp.

This short paper provides an overview on the tilapia species as a culturable fish. It discusses advantages and difficulties unique to this fish.

(Copies available from Texas A & M University)

TROUT

THE EFFECT OF 50° F WATER VERSUS 54° F WATER ON THE EGG QUALITY OF RAINBOW TROUT

Morrison, John K. Fish Technology Center, Bozeman Information Leaflet 29, 1983, 6 pp.

This study compared the effect of 54° F and 50° F water temperature on the percent eyed eggs produced by rainbow trout brood fish. Water temperature of 54° F was adequate for rainbow trout egg production while a lower temperature was necessary for optimum productivity.

(Copies available from U.S. Fish and Wildlife Service, Bozeman)

EFFECT OF LOWERING WATER TEMPERATURE ON HATCHING TIME AND SURVIVAL OF LAKE TROUT EGGS

Dwyer, William P. Fish Technology Center, Bozeman Information Leaflet 33, 1986, 7 pp.

The objective of this study was to determine the effect of retarding the development of lake trout eggs by lowering water temperature to delay hatching time. There was little or no difference in egg mortality or percent survival due to water temperature.

(Copies available from U.S. Fish and Wildlife Service, Bozeman)

EFFECT OF RAPIDLY CHANGING TEMPERATURE ON PLASMA CHLORIDE AND GLUCOSE LEVELS OF RAINBOW TROUT (SALMO GAIRDNERI)

Dwyer, William P. and Smith, Charlie E. Fish Technology Center, Bozeman Information Leaflet 11, 1980, 20 pp.

Eighty fish were used to test temperature change and stress for both coldwater and warmwater stocking. Elevation of glucose and depression of chloride were much greater when rainbow trout were subjected to cold stress.

(Copies available from U.S. Fish and Wildlife Service, Bozeman)

EFFECT OF WATER REUSE ON BROWN TROUT SALMO TRUTTA

Morrison, John K. and Piper, Robert G. Fish Technology Center, Bozeman Information Leaflet 25, 1982, 8 pp.

Brown trout were reared in water reused through seven troughs over 141 days. Growth rate began to decline at fourth water reuse.

(Copies available from U.S. Fish and Wildlife Service, Bozeman)

THE EFFECT OF WATER REUSE ON LAKE TROUT SALVELINUS NAMAYCUSH

MacConnell, Elizabeth and Piper, Robert G. Fish Technology Center, Bozeman Information Leaflet 34, 1986, 7 pp.

Lake trout were reared in water reused through seven troughs for 150 days. Dissolved oxygen and total ammonia were monitored. Growth rate declined and mortality increased at the fifth water use.

(Copies available from U.S. Fish and Wildlife Service, Bozeman)

THE EFFECT OF WATER REUSE ON STEELHEAD TROUT SALMO GAIRDNERI

Morrison, John K. and Piper, Robert G. Fish Technology Center, Bozeman Information Leaflet 28, 1983, 9 pp.

Steelhead trout fingerlings were reared in water reused through a series of seven troughs for a period of 225 days. Growth rate declined at the third water use.

(Copies available from U.S. Fish and Wildlife Service, Bozeman)

THE EFFECT OF WATER TEMPERATURE ON THE SEXUAL DEVELOPMENT AND EGG QUALITY OF BROOK TROUT BROODSTOCK

Morrison, John K. Fish Technology Center, Bozeman Information Leaflet 17, 1981, 8 pp.

This study was conducted to compare effects of varying water temperatures with constant temperature springwater on the sexual development and egg quality of 2-year-old brook trout.

(Copies available from U.S. Fish and Wildlife Service, Bozeman)

THE EFFECT OF WATER TEMPERATURE ON THE SEXUAL DEVELOPMENT AND EGG QUALITY OF RAINBOW TROUT BROODSTOCK

Morrison, John K. and Smith, Charlie E. Fish Technology Center, Bozeman Information Leaflet 14, 1980, 9 pp.

Fish held in springwater were larger at spawning and produced fewer but slightly larger eggs per kilogram female than those held in creekwater. There was no significant difference in total egg weight produced or total eggs and percent of eyed eggs over those held in creekwater.

(Copies available from U.S. Fish and Wildlife Service, Bozeman)

EFFECTS OF FEMALE AGE AND EGG SIZE ON GROWTH AND MORTALITY IN RAINBOW TROUT

Pitman, Robert W. Fish Technology Center, Bozeman Information Leaflet 6, 1978, 13 pp.

Progeny from 2- and 5-year-old rainbow trout broodstock were studied for 324 days post-spawning to evaluate effects of female age and egg size on hatchability, mortality, and growth of fry.

(Copies available from U.S. Fish and Wildlife Service, Bozeman)

EFFECTS OF METABOLIC PRODUCTS ON THE QUALITY OF RAINBOW TROUT

Smith, Charlie E. and Piper, Robert G. Fish Technology Center, Bozeman Information Leaflet 4, 1975, 10 pp.

This study was set up to determine the effects of serial re-use of water on rainbow trout. Total ammonia, oxygen concentrations, and un-ionized ammonia were tabulated.

(Copies available from U.S. Fish and Wildlife Service, Bozeman)

LAKE TROUT SALVELINUS NAMAYCUSH GROWTH EFFICIENCY AS AFFECTED BY TEMPERATURE

Dwyer, William P.; Smith, Charlie E.; and Piper, Robert G. Fish Technology Center, Bozeman Information Leaflet 22, 1981, 18 pp.

Trout were held for 140 days in water temperatures ranging from 4° C to 19° C growth rates; condition factor, haematological effects, and histological changes were measured.

(Copies available from U.S. Fish and Wildlife Service, Bozeman)

OBSERVED EFFECTS OF RECYCLED HATCHERY WATER ON RAINBOW TROUT

Smith, Charlie E.; Piper, Robert G.; and Dwyer, William P. Fish Technology Center, Bozeman Information Leaflet 3, [1974], 3 pp.

An 8-month recycling operation was observed for changes in water quality and its effect on rainbow trout. Indications are that additional water reconditioning is required to maintain healthy fish.

(Copies available from U.S. Fish and Wildlife Service, Bozeman)

PHOTOZONE TOXICITY IN RAINBOW TROUT, SALMO GAIRDNERI

Smith, Charlie E. and Dwyer, William P. Fish Technology Center, Bozeman Information Leaflet 13, 1980, 10 pp.

Photozone, a commercial form of activated oxygen, was studied for toxicity to rainbow trout and for ability to remove ammonia and add oxygen to water in fish-rearing tanks. Results did not show significant ammonia nitrogen removal but did show obvious gill damage and variation in mortalities.

(Copies available from U.S. Fish and Wildlife Service, Bozeman)

RAINBOW TROUT CULTURE IN SOUTH DAKOTA LAKES AND PONDS

Beem, Marley. South Dakota State University, Extension Extra 12003, May 1987, 6 pp.

Discusses growing season, feeds and feeding, as well as economics and marketing of trout.

(Copies available from South Dakota State University)

RAINBOW TROUT GROWTH EFFICIENCY AS AFFECTED BY TEMPERATURE

Dwyer, William P.; Smith, Charlie E.; and Piper, Robert G. Fish Technology Center, Bozeman Information Leaflet 18, 1981, 14 pp.

Rainbow trout were held for 84 days at six constant water temperatures ranging from 4° C to 19° C. Condition factor (K) increased at each successive test temperature although there was no significant difference between K values at 16° C and 19° C.

(Copies available from U.S. Fish and Wildlife Service, Bozeman)

STEELHEAD TROUT GROWTH EFFICIENCY AS AFFECTED BY TEMPERATURE

Dwyer, William P.; Piper, Robert G.; and Smith, Charlie E. Fish Technology Center, Bozeman Information Leaflet 27, [1983], 13 pp.

Steelhead trout were held for 252 days at six constant water temperatures ranging from 4° C to 19° C. Length increase, growth rate, condition factor, and hematology were studied. Fish held at 13° C required fewer temperature units than did fish held at any other temperature.

(Copies available from U.S. Fish and Wildlife Service, Bozeman)

MISCELLANEOUS SPECIES

AQUARIUM FISH

HORMONE SPAWNING IN TROPICAL AQUARIUM FISH

Rottmann, R. W. and Shireman, J. V. Florida Cooperative Extension Service, Bulletin 246, [n.d.], 8 pp.

Presents information on types of hormones, injections, schedules and dosages.

(Copies available from University of Florida)

MICROWORM CULTURE FOR AQUARIUM FISH PRODUCERS

Rottmann, R. W. Institute of Food and Agricultural Science, University of Florida, Fact Sheet FA-9, [1988], 2 pp.

Discusses the use and culture of nematode *Panagrellus* sp. as live food for tropical fish.

(Copies available from University of Florida)

FORAGE SPECIES

FORAGE SPECIES: PRODUCTION TECHNIQUES

Higgenbotham, Billy. Southern Regional Aquaculture Center, [n.d.], 4 pp.

Discusses production techniques for the bluegill, redear sunfish, threadfin shad, golden shiner, and fathead minnow.

(For information on availability contact your County Extension Office, State Cooperative Extension Service, or the U.S. Department of Agriculture, National Agricultural Library)

FORAGE SPECIES: RANGE, DESCRIPTION AND LIFE HISTORY

Higgenbotham, Billy. Southern Regional Aquaculture Center, November 1988, 3 pp.

Information on commonly utilized forage species as a food source for largemouth bass is provided. These species include bluegill, redear sunfish, threadfin shad, golden shiner, and fathead minnow. Range, description, and life history are provided for each species.

(For information on availability contact your County Extension Office, State Cooperative Extension Service, or the U.S. Department of Agriculture, National Agricultural Library)

FORAGE FISH: RETURN ON INVESTMENT

Higgenbotham, Billy. Southern Regional Aquaculture Center, [n.d.], 2 pp.

Discusses pond construction costs, feeding expenses, and equipment and chemicals associated with production and marketing.

(For information on availability contact your County Extension Office, State Cooperative Extension Service, or the U.S. Department of Agriculture, National Agricultural Library)

FROGS

COMMERCIAL FROG FARMING

Helfrich, L. A. and Garling, D. L. Virginia Cooperative Extension Service, [n.d.], 6 pp.

Brief discussion on culture techniques, economic factors, and future potential.

(Copies available from Virginia Polytechnic Institute)

ECOLOGY AND MANAGEMENT OF THE BULLFROG

Bury, R. Bruce and Whelan, Jill A. U.S. Fish and Wildlife Service, Resource Publication 155, 1984, 23 pp.

A review of information on the biology and ecology, present status, culture and management of the bullfrog (*Rana catesbeiana*).

(Copies available from U.S. Fish and Wildlife Service, Washington, D.C.)

MILKFISH

AQUACULTURE OF MILKFISH (CHANOS CHANOS): STATE OF THE ART

Lee, Cheng-Sheng; Gordon, Malcolm S.; and Watanabe, Wade O., Eds. The Oceanic Institute of Hawaii, 1986, 284 pp.

This book contains information on producing a reliable and adequate supply of milkfish. Chapters cover such subjects as genetics, population structure, culturing methods in Southeast Asia, and pathology.

(Copies available from Oceanic Institute)

REPRODUCTION AND CULTURE OF MILKFISH

Lee, Cheng-Sheng and Liao, I-Chiu, Eds. Proceedings for a workshop held at the Tungkuang Marine Laboratory, Taiwan, April 22-24, 1985, 226 pp.

The workshop was sponsored by the United States Agency for International Development, and the proceedings include papers on reproduction and culture of milkfish.

(Copies available from Oceanic Institute)

MOLLUSCS

SOME ASPECTS OF THE CONTROLLED PRODUCTION OF THE BAY SCALLOP

Rhodes, Edwin W. and Widman, James C. National Marine Fisheries Service, Proceedings of the World Mariculture Society. 1980 (11), pp. 235-246.

Provides methods for intermediate and final grow-out of hatchery-reared bay scallops.

(For information on availability contact your local public or university library)

WEST COAST MOLLUSC CULTURE: A PRESENT AND FUTURE PERSPECTIVE

Amidei, Rosemary, Ed. Proceedings of a California Sea Grant Workshop in cooperation with the Pacific Sea Grant College Program, July 9-10, 1987, Report No. T-CSGCP-017, 1988, 87 pp.

Evaluation of the status problems and perspective on the shellfish industry in the Pacific Northwest. Public policy, implications of waste and environmental quality, and broodstock management and improvement are described.

(Copies available from California Sea Grant College Program)

PERCH

EFFECTS OF PHOTOPERIOD AND TEMPERATURE ON THE SPAWNING OF YELLOW PERCH (PERCA FLAVESCENS)

Kayes, Terrance B. and Calbert, H. E. University of Wisconsin, WIS-SG-80-718 (reprint), 1979, 11 pp.

A short how-to guide for spawning the yellow perch.

(Copies available from University of Wisconsin)

RED DRUM

MANUAL ON RED DRUM AQUACULTURE: (CONFERENCE DRAFT)

Chamberlain, G. W.; Haby, M. G.; and Miget, R. J. Texas Agricultural Extension Service, 1987, 470 pp.

This publication is a series of papers concerning the culture of red drum (redfish, channel bass) that were part of a symposium on this subject held in June 1987. Major topic areas include an overview of red drum culture; spawning technology; fingerling production technology; biological engineering and regulatory aspects; and grow-out technology. The appendices include a bibliography, sources of information, seawater chemistry procedures, and directions for repairing fiberglass tanks.

(Copies available from Texas A & M University)

SHAD

A REVIEW OF AMERICAN SHAD RESTORATION EFFORTS ON THE SUSQUEHANNA RIVER

Howey, R. G. U.S. Fish and Wildlife Service, Leaflet No. 81-04, 1981, 14 pp.

Historical review of American shad restoration efforts.

(Copies available from U.S. Fish and Wildlife Service, Lamar)

PART II: SUBJECTS

AQUACULTURE CONVERSION TABLES

CONVERSIONS USEFUL IN FISH CULTURE AND FISHERY RESEARCH MANAGEMENT

Moore, Brenda Rodgers and Mitchell, Andrew J. U.S. Fish and
Wildlife Leaflet 10, 1987, 31 pp.

Tables of conversion from metric to English, as well as from
other systems such as British Imperial and troy. Includes
tables for Fahrenheit/Celsius, liquid measurement, and
length. Pocket size.

(Copies available from U.S. Fish and Wildlife Service,
Stuttgart)

SELECTED CONVERSIONS AND FORMULAS USEFUL TO FISH FARMERS

University of Florida, Institute of Food and Agricultural
Sciences, Florida Cooperative Extension Service, [n.d.], 5 pp.

Includes tables for volume conversion of eight chemicals and
gallon capacity determination of five shapes of water tanks.

(Copies available from University of Florida)

AQUACULTURE PLANNING AND ECONOMICS

AQUACULTURE: A GUIDE TO FEDERAL GOVERNMENT PROGRAMS

Joint Subcommittee on Aquaculture in cooperation with the
National Agricultural Library, November 1987, 34 pp.

A directional resource to aquaculture programs and services
within the Federal Government.

(Copies available from National Agricultural Library)

AQUACULTURE DEVELOPMENT IN NEW YORK STATE - FINAL REPORT

New York Sea Grant Institute of the State University of New York and Cornell University, 1985, 93 pp.

Contains statewide Aquaculture Planning Act, aquaculture overview, aquaculture and the law, financing aquaculture development, attitudes toward aquaculture, markets, research and technology transfer, and a summary of recommendations. Document also includes bibliography, tables, and charts.

(Copies available from New York Sea Grant Institute)

AQUACULTURE ECONOMICS RESEARCH NEEDS: REPORT FROM A WORKSHOP TO IDENTIFY AQUACULTURE ECONOMICS RESEARCH NEEDS

Smith, Frederick J. and Roberts, Kenneth J. South Carolina Sea Grant Program, Technical Report No. 5, SCSG-TR-76-5, April 1976, 43 pp.

Discusses the state of economic research in relation to aquaculture and suggests needs and problems.

(Copies available from South Carolina Sea Grant Consortium)

AQUACULTURE IN FLORIDA: GENERAL ECONOMIC CONSIDERATIONS

Adams, Charles M. Florida Cooperative Extension Service, Sea Grant Extension Bulletin SGEB-9, August 1986, 17 pp.

Includes information on marketing, facility construction, revenue, taxes, and obtaining financing.

(Copies available from Florida Sea Grant)

AQUACULTURE SITUATION AND OUTLOOK REPORT

Dicks, Mike and Harvey, David. United States Department of Agriculture, Economic Research Service, AQUA 1, October 1988.

Published twice a year by USDA/ERS. Covers statistics on world and U.S. fishery products with breakdown by species and retail and wholesale prices for seafood.

(Subscriptions available from U.S. Department of Agriculture)

CASH FLOW ANALYSIS OF FARM RAISED CATFISH PRODUCTION IN MISSISSIPPI

Keenum, Mark E. and Waldrop John E. Mississippi Agricultural and Forestry Experiment Station, Agricultural Economics Technical Publication No. 73, August 1988, 43 pp.

Cash-flows based on scenarios in MAFES Bulletin #155. Provides annual schedule of expenses and returns over 21-year period, quarterly operating cost outflows for 1-year period and annual cash flow analysis with marketing constraints imposed.

(Copies available from Dr. John E. Waldrop)

CATFISH PRODUCTION BUDGET FOR FARMS WITH LEVEL LAND

Burtle, Gary J.; Gray, P. Leroy; and Dorman, Larry W. University of Arkansas, Cooperative Extension Service, MP 263, May 1986, 7 pp.

Clear tables for use in estimating costs for operation of a catfish farm.

(Copies available from University of Arkansas at Pine Bluff)

COASTAL AQUACULTURE: PROTEIN, PROFITS, AND PROBLEMS FOR A HUNGRY WORLD

Shupe, Steven J. Oregon State University, Sea Grant College Program, Publication No. ORESU-X-82-003, [1982], 31 pp.

Discusses impediments that inhibit seafarming in the coastal zones of the United States. Sections include: (1) an overview of the worldwide aquaculture industry; (2) socioeconomic, biological, and legal constraints to aquaculture development; and (3) West Coast salmon ranching, and planning of aquaculture along needed U.S. coastlines.

(Copies available from Oregon State University, Sea Grant Communications)

A COST ANALYSIS OF FINGERLING SIZE AND STOCKING DATE IN THE PRODUCTION OF CHANNEL CATFISH FOR FOOD

Fuller, Marty J.; Keenum, Mark E.; Carter, Warren W.; [et al.]. Mississippi Agricultural and Forestry Experiment Station, Agricultural Economics Research Report No. 178, March 1988, 29 pp.

Discusses the results of research on estimating variations in the cost of production at alternative fingerling sizes and stocking dates. Information should be beneficial to producers of both food fish and fingerlings.

(Copies available from Mississippi State University)

AN ECONOMETRIC ANALYSIS OF ATLANTIC SALMON MARKETS IN THE UNITED STATES AND FRANCE

Lin, Biing-Hwan and Herrmann, Mark. University of Alaska, Alaska Sea Grant Report No. 88-5, October 1988, 19 pp.

Presents three single equation models: U.S. demand for cultured Atlantic salmon; supply of Norwegian Atlantic salmon to the United States; and relationship between imported cultured Atlantic and wild chinook in France.

(Copies available from University of Alaska)

ECONOMIC ANALYSIS OF SMALL-SCALE PROCESSING FOR MISSISSIPPI FARM-RAISED CATFISH

Garrard, Anthony B.; Fuller, Marty J.; and Keenum, Mark E. Mississippi Agricultural and Forestry Experiment Station, Agricultural Economics Research Report 181, June 1988, 57 pp.

This study synthesized a small-scale catfish processing plant and estimated the total cost of operation at maximum capacity.

(Copies available from Mississippi State University)

EFFECT OF PRODUCTION AND CREDIT MANAGEMENT FACTORS ON CATFISH INVESTMENT AND PROFITABILITY

Flynn, John B.; Martin, Neil R., Jr.; and Hanson, Gregory D. Alabama Agricultural Experiment Station, Bulletin 548, June 1983, 27 pp.

Discusses how profit is affected by pond size, price obtained, stocking rates, and tax deductions. Also discusses debt management and borrowing capacity.

(Copies available from Auburn University-Swingle Hall)

FARMING ALTERNATIVES

Schuck, Nancy Grudens; Knoblauch, Wayne; Green, Judy; [et al.]. Northeast Regional Agricultural Engineering Service, NRAES-32, October 1988, 88 pp.

This guide, while written for families and individuals interested in developing a new farm-based enterprise, also would be useful for the person considering aquaculture as a farming alternative.

(Copies available from Northeast Regional Agricultural Engineering Service)

FARMING FOR FUN AND PROFIT: AQUACULTURE

Marek, Linda. University of Vermont, Extension Service Brieflet 1333, 5C-182-VP, [1982], 4 pp.

Presents startup information for small-scale fish culture, including financing, costs, and types of culturing facilities.

(Copies available from University of Vermont)

A GUIDE FOR COUNTY PROGRAM PLANNING IN AQUACULTURE - FISHERIES MANAGEMENT

Lewis, George W. Georgia Cooperative Extension Service, P-P-1 Fish and Aquaculture, January 1981, 29 pp.

Discusses the development of aquaculture, economic opportunities, and county program planning. Catfish and trout production statistics in Georgia are provided for the year 1980; small-scale catfish production is described; sources of aquaculture materials and contact personnel in Georgia are provided.

(Copies available from University of Georgia)

PLANNING FOR COMMERCIAL AQUACULTURE

Helfrich, Louis A. and Garling, Donald L. Virginia Cooperative Extension Service, Publication 420-12, Reprinted October 1985, 10 pp.

Discusses planning, economic feasibility, pilot testing, and commercial operations in a phased approach for the beginner.

(Copies available from Virginia Polytechnic Institute)

CHEMICALS IN AQUACULTURE

ACUTE TOXICITY OF THREE PESTICIDES TO CHANNEL CATFISH FINGERLINGS

Fabacher, David L. and Chambers, Howard. Mississippi Agricultural and Forestry Experiment Station, Information Sheet 1238, May 1974, 1 p.

Discusses toxicity of Sincor, Propanil, and Dimethoate as it affects channel catfish fingerlings.

(Copies available from Mississippi State University)

ADVERSE EFFECTS OF SODIUM THIOSULFATE TO LARVAL PENAEID SHRIMP

Johnson, S. K. and Cichra, Charles. Texas Agricultural Extension Service, Fish Disease Diagnostic Laboratory Report No. FDDLS-15, July 1985, 4 pp.

Sodium thiosulfate is used to neutralize free chlorine. This paper discusses tests done to demonstrate adverse effects of sodium thiosulfate on survival of larval penaeid shrimp.

(Copies available from S. K. Johnson)

AGRICULTURE CHEMICAL TOXICITY TO SELECTED AQUATIC ANIMALS: BLUEGILL, CHANNEL CATFISH, RAINBOW TROUT, CRAWFISH AND FRESHWATER SHRIMP

Wellborn, Thomas L. Mississippi Cooperative Extension Service, Publication 1455, [1984], 24 pp.

Provides useful information on the risk of use of chemicals in fields adjacent to fish ponds or natural waters. Is in chart form for field use.

(Copies available from Mississippi State University)

CHEMICAL CONTROL OF HYDRILLA

Vandiver, V. V. University of Florida at Gainesville, Weeds in the Sunshine #A-87-11, October 1987, 16 pp.

Detailed information on the use of certain aquatic herbicides registered for use in Florida to control hydrilla.

(Copies available from University of Florida)

CHEMICAL CONTROL OF PERITRICHOUS CILIATES ON YOUNG PENAEID SHRIMP

Johnson, S. K. Texas Agricultural Extension Service, Fish Disease Diagnostic Laboratory Report No. FDDL-S7, July 1976, 4 pp.

Reports the effect of four chemicals on protozoa (Epistylis) common to shrimp exterior surfaces.

(Copies available from S. K. Johnson)

FIELD APPLICATION OF SEVERAL MANAGEMENT CHEMICALS IN SHRIMP-REARING PONDS

Johnson, S. K. and Holcomb, Hoyt W. Texas Agricultural Extension Service, Fish Disease Diagnostic Laboratory Report No. FDDL-S5, January 1975, 3 pp.

Demonstrates formalin, potassium permanganate, copper sulfate, and malachite green use in shrimp ponds.

(Copies available from S. K. Johnson)

A GUIDE TO APPROVED CHEMICALS IN FISH PRODUCTION AND FISHERY RESOURCE MANAGEMENT

Schnick, Rosalie; Meyer, Fred P.; and Gray, D. Leroy. Arkansas Cooperative Extension Service, MP 241, 1986, 24 pp.

Provides information on selecting a needed compound and/or deciding whether or not to use a given chemical.

(Copies available from U.S. Fish and Wildlife Service, Stuttgart)

POTASSIUM PERMANGANATE FOR FISH PONDS

Macmillan, J. Randy. Mississippi Cooperative Extension Service, Information Sheet 1265, [1984], 2 pp.

Discusses dosage and usage of potassium permanganate.

(Copies available from Mississippi State University)

TABLES FOR APPLYING COMMON FISHPOND CHEMICALS

Jensen, John and Duborow, Robert. Alabama Cooperative Extension Service, Circular ANR-414, [n.d.], 11 pp.

Treatment tables are arranged by chemical, and the table lists what can be controlled as well as the concentration and duration of the treatment.

(Copies available from Auburn University, Swingle Hall)

TOXICITY OF SEVERAL MANAGEMENT CHEMICALS TO PENAEID SHRIMP

Johnson, S. K. Texas Agricultural Extension Service, Fish Disease Diagnostic Laboratory, [Report No.] FDDL-S3, November, 1974, 12 pp.

Formalin, potassium permanganate, potassium dichromate, copper sulfate, acriflavin, malachite green, and methylene blue were chemicals selected for testing for toxicity with penaeid shrimp. Includes tables for each chemical.

(Copies available from S. K. Johnson)

USE OF QUINALDINE WITH PENAEID SHRIMP

Johnson, S. K. Texas Agricultural Extension Service, Fish Disease Diagnostic Laboratory Report No. FDDL-S4, November 1974, 2 pp.

Studies quinaldine effectiveness as a sedative for shrimp during handling and transport.

(Copies available from S. K. Johnson)

COMPUTER APPLICATIONS

This is small selection of software and computer programs available for aquaculture use. Contact your local library or County Extension Agent for other programs that may available in your area.

AUTOMATION AND DATA PROCESSING IN AQUACULTURE

Belchen, J. G., Ed. Norwegian Institute of Technology, International Federation of Automatic Control Symposium, No. 9, 1987, 282 pp.

Includes 40 pages covering such topics as modeling and simulation in aquaculture, instrumentation and monitoring, data processing and production planning, as well as reports on panel sessions.

(For information on availability contact your local public or university library)

GROWCATS FISH GROWTH SIMULATION MODEL FOR PRODUCTION PLANNING

Killcreas, Wallace E.; Leng, Jason; Ishee, Sid; [et al.].
Mississippi Agricultural and Forestry Experiment Station, AEC
Technical Publication No. 63, January 1987, 26 pp.

A software program aid to producers in estimating impacts of stocking, harvest weights, feed conversion ratios, and feed amount on catfish production.

(Copies available from Dr. John E. Waldrop)

A RECORDS PROGRAM FOR CATFISH AND SHRIMP PRODUCTION: FINANCIAL DATA AND MANAGEMENT DECISIONS FOR IBM PC AND COMPATIBLE MICROCOMPUTERS

Kilcrease, Dr. Wallace; Ishee, Sid; Wilkes, Norman; [et al.].
Mississippi Agricultural and Forestry Experiment Station,
Agricultural Economics Technical Publications No. 55, September 1985, 80 pp.

This microcomputer program is called "FISHY" which is adapted for catfish, shrimp, and crawfish production management as well as limited financial management.

(Copies available from Mississippi State University,
Agricultural Economics Department)

REGIS: REGIONAL INFORMATION SYSTEM FOR AFRICAN AQUACULTURE

Bielawski, Larry and Lewand, Robert (Authors); Hanfman, Deborah T. (Project Coordinator), Cooperative project between the Food and Agriculture Organization (FAO) of the United Nations and the National Agricultural Library, U.S. Department of Agriculture, April 1989, Full Version: six 5 1/4" diskettes (360K), PB89-170385, or three 3 1/2" diskettes (720K), PB89-170328; Abbreviated Version: three 5 1/4" diskettes (360K), PB89-170393, or two 3 1/2" diskettes (720K), PB89-170336. Both software versions include a 15-page User Manual.

(cont.)

REGIS is an easy-to-use information retrieval system on aquaculture in the African region. It contains the text of an "Aquaculture Regional Sector Survey for the African Region" compiled by the Aquaculture Development and Coordination Programme, a joint publication of FAO and the U.N. Development Programme. Additional documents, tables, and graphics have been linked to provide nonlinear access to related information on aquaculture. Hypertext and hypergraphics are merged with an expert system module and an online or CD-ROM database module. REGIS runs on an IBM PC, XT, AT, or compatible with a hard disk.

(Copies available from the National Technical Information Service, Federal Computer Products Center)

CULTURING SYSTEMS - CAGE CULTURE

BUILDING CAGES FOR FISH FARMING

Beem, Marley. South Dakota State University Cooperative Extension Service, Extension Extra 12002, May 1987, 3 pp.

Discusses materials, construction, and cage placement.

(Free copies available from South Dakota State University)

CAGE CULTURE: CAGE CONSTRUCTION AND PLACEMENT

Masser, Michael P. Southern Regional Aquaculture Center, [n.d.], 3 pp.

Discusses materials, design and construction, cage placement, and use of large cages.

(For information on availability contact your County Extension Office, State Cooperative Extension Service, or the U.S. Department of Agriculture, National Agricultural Library)

CAGE CULTURE: CAGE CULTURE PROBLEMS

Masser, Michael P. Southern Regional Aquaculture Center,
[n.d.], 2 pp.

Discusses problems of cage culture and signs of fish stress, pond stress, and human error among other problems.

(For information on availability contact your County Extension Office, State Cooperative Extension Service, or the U.S. Department of Agriculture, National Agricultural Library)

CAGE CULTURE: HANDLING AND FEEDING CAGED FISH

Masser, Michael P. Southern Regional Aquaculture Center,
[n.d.], 4 pp.

Common handling stressors during harvest, holding, and transport from fingerling ponds to culture ponds are discussed. This paper also discusses feed conversion and methods of feeding.

(For information on availability contact your County Extension Office, State Cooperative Extension Service, or the U.S. Department of Agriculture, National Agricultural Library)

CAGE CULTURE: HARVESTING AND ECONOMICS

Masser, Michael P. Southern Regional Aquaculture Center,
[n.d.], 4 pp.

Discusses harvesting, keeping records, marketing, and studying the economics of a cage culture venture. Includes a recordkeeping form.

(For information on availability contact your County Extension Office, State Cooperative Extension Service, or the U.S. Department of Agriculture, National Agricultural Library)

CAGE CULTURE IN MARYLAND

Harrell, Reginal, University of Maryland, Maryland Sea Grant Extension Program, UM-SG-MAP-88-06, 1988, 4 pp.

Discusses pros and cons of cage culture, cage construction, pond size and cage location, and species and stocking density.

(Copies available from University of Maryland, Sea Grant College)

CAGE CULTURE OF RAINBOW TROUT

Beem, Marley and Gebhart, Glen. Langston University Extension Facts, [n.d.], 4 pp.

Discusses methods for stocking, handling, and feeding trout in cages.

(Copies available from Langston University)

CAGE CULTURE: SITE SELECTION AND WATER QUALITY

Masser, Michael P. Southern Regional Aquaculture Center, [n.d.], 4 pp.

Discusses increased biological load for cage culture on ponds. Provides specific site criteria and discusses water quality, temperature, chemistry, and turbidity.

(For information on availability contact your County Extension Office, State Cooperative Extension Service, or the U.S. Department of Agriculture, National Agricultural Library)

CAGE CULTURE: SPECIES SUITABLE FOR CAGE CULTURE

Masser, Michael P. Southern Regional Aquaculture Center, [n.d.], 4 pp.

Discusses cage production of catfish, trout, tilapia, striped bass, red drum, bluegill, and carp.

(For information on availability contact your County Extension Office, State Cooperative Extension Service, or the U.S. Department of Agriculture, National Agricultural Library)

CAGED CATFISH CULTURE PROBLEMS

Beem, Marley D. Langston University Extension Facts, [n.d.], 2 pp.

Provides a checklist of cage culture problems and techniques to avoid or prevent them.

(Copies available from Langston University)

CATFISH FARMING IN CAGES IN VIRGINIA'S PONDS AND LAKES

Helfrich, L. A.; Dean, J. C.; Garling, D. L.; [et al.]. Virginia Cooperative Extension Service, Publication 420-918, Reprinted November 1984, 13 pp.

Discusses both advantages and disadvantages of cage culture, as well as construction of cages and guidelines for raising catfish in cages.

(Copies available from Virginia Polytechnic Institute)

THE CULTURE OF STRIPED BASS AND ITS HYBRIDS IN CAGES

Harrell, Reginal M. University of Maryland, Finfish Aquaculture Workbook Series 3, UM-SG-MAP-88-07, 1988, 8 pp.

Discusses cage or net-pen culture of striped bass and its hybrids. Includes information on ponds, feeds and feeding, diseases and marketing.

(Copies available from University of Maryland, Sea Grant College)

SMALL-SCALE CAGED FISH CULTURE IN OKLAHOMA FARM PONDS

Williams, Ken; Schwartz, Donald P.; and Gebhart, Glen E. Langston University Agricultural Research, Fifth edition, 1987, 35 pp.

Includes feed purchasing calculations, feed conversion calculations, phytoplankton, blue-green algae and water weed control.

(Copies available from Langston University)

WHAT IS CAGE CULTURE?

Masser, Michael P. Southern Regional Aquaculture Center,
November 1988, 2 pp.

Describes cage culture, advantages and disadvantages, and species selection.

(For information on availability contact your County Extension Office, State Cooperative Extension Service, or the U.S. Department of Agriculture, National Agricultural Library)

CULTURING SYSTEMS - MATERIALS

SOME APPLICATIONS OF COMMERCIAL PLASTICS IN FISH CULTURE

Blick, Kenneth W. Lamar Fish Technology Center, Information Leaflet No. 88-01, November 1987, 9 pp.

Discusses adapting commercially available plastics materials to fish culture use. Includes sources as well as uses in valves, tanks, and screens.

(Copies available from U.S. Fish and Wildlife Service, Lamar)

CULTURING SYSTEMS - RACEWAYS

EVALUATION OF A PUMPED RACEWAY REUSE SYSTEM WITH PACKED COLUMN AERATION

Gaston, Paul B. Lamar Fish Technology Center, Information Leaflet 88-07, December 1987, 10 pp.

Discusses the use of a 600 gallon per minute pumped reuse system with packed column aeration at the Lamar hatchery and the replacement by venturi aspirators and the limitations of each system.

(Copies available from U.S. Fish and Wildlife Service, Lamar)

RACEWAY PRODUCTION OF WARMWATER FISH

McGee, Mike and Cichra, Charles E. Florida Cooperative Extension Service, Institute of Food and Agricultural Science, [n.d.], 3 pp.

Covers general aspects of design, operation, and management; specifics for developing a system are not included.

(Copies available from University of Florida)

CULTURING SYSTEMS - RECIRCULATING SYSTEMS

OCEAN THERMAL ENERGY CONVERSION AQUACULTURE IN HAWAII

Fast, Arlo W. and Tanoue, Karen Y., Eds. University of Hawaii Sea Grant College Program, UNIHI-SEAGRANT-MR-89-01, November 1988, 177 pp.

This report discusses ocean thermal energy conversion in relation to rearing of nori (*Porphyra tenera*), abalone, lobster (*Homarus americanus*), coho salmon, chinook salmon, and rainbow trout (*Salmo gairdnei*). This report presents the results of several pioneering research projects completed at the Natural Energy Laboratory of Hawaii during 1982-84 and jointly funded by Sea Grant and Ocean Resources Branch, Hawaii Department of Business and Economic Development.

(Copies available from University of Hawaii Sea Grant College Program)

PRINCIPLES OF WATER RECIRCULATION AND FILTRATION IN AQUACULTURE

McGee, Mike and Cichra, Charles E. Florida Cooperative Extension Service, [1988], 2 pp.

Includes diagrams of several systems with three types of filters: horizontal flow filter, submerged upflow filter, and trickling filter.

(Copies available from University of Florida)

REDUCTION OF ZEOLITE BED CLOGGING IN WATER RECONDITIONING SYSTEMS USED FOR AQUACULTURE

Roem, Andries J. *Developments in Fish Culture*, Bozeman Information Leaflet, Number 26, July 1982, 9 pp.

Use of an aeration system and agitating clinoptilolite filters with compressed air brought about reduction of channeling of waterflow and increased zeolite absorption.

(Copies available from U.S. Fish and Wildlife Service, Bozeman)

THE USE OF CLINOPTILOLITE AND ION EXCHANGE AS A METHOD OF AMMONIA REMOVAL IN FISH CULTURAL SYSTEMS

Smith, Charlie E.; Piper, Robert G.; and Tisher, Howard R. U.S. Fish and Wildlife Service, *Fish Cultural Development Center*, Bozeman Information Leaflet 20, 1981, 17 pp.

Using a pilot fish-rearing system with 95 percent reconditioned and 5 percent fresh water, the author discusses use of the natural zeolite, clinoptilolite, as a method of removing ammonia from the recycled water.

(Copies available from U.S. Fish and Wildlife Service, Bozeman)

CULTURING SYSTEMS - TANKS

DESIGN AND CONSTRUCTION OF FACILITIES FOR SHORT-TERM HANDLING OF FISHES

Johnson, S. K. Texas Agricultural Extension Service, (Reprinted from the Proceedings of the 1988 Texas Fish Farming Conference, College Station, Texas, January 27-28, 1988), 3 pp.

Discusses short-term handling as a form of intensive culture which can be an open, closed, or recirculating system. Provides information on water supply, tank shape, materials used in construction, aeration, and temperature.

(Copies available from S. K. Johnson)

TANK CULTURE OF STRIPED BASS PRODUCTION MANUAL

Lewis, William M. and Heidinger, R. C. Fisheries Research Lab, Southern Illinois University, IDC F-26-R, March 1981, 115 pp.

Comprehensive overview of system design and rearing procedures for tank culture of striped bass in a water reuse system.

(Copies available from Southern Illinois University)

DISEASES AND INFECTIONS

GENERAL

ANNOTATED BIBLIOGRAPHY OF THE DISEASES AND PARASITES OF STRIPED BASS

McAllister, Kathleen W.; Mann, Joyce A.; and McKenzie, Lora C. U.S. Fish and Wildlife Service, National Fisheries Center, Fish Disease Leaflet 76, 1987, 16 pp.

Ninety-four references on the infectious and noninfectious diseases of striped bass.

(Copies available from U.S. Fish and Wildlife Service, Kearneysville)

BLUE-SAC DISEASE OF FISH ALSO KNOWN AS DROPSY, YOLK SAC DISEASE, AND HYDROCOELE EMBRYONALIS

Wolf, Ken. U.S. Fish and Wildlife Service, Eastern Fish Disease Laboratory, Fish Disease Leaflet 15, 1984, 4 pp.

A description of an edematous condition of alevins or fry probably caused by unfavorable environmental conditions such as high ammonia or low-oxygen levels.

(Copies available from U.S. Fish and Wildlife Service, Kearneysville)

BROWN BLOOD DISEASE (METHEMOGLOBINEMIA) OF FISHES

Bowser, Paul R. Department of Avian and Aquatic Animal Medicine, Cornell University, Fish Disease Leaflet 70, 1984, 6 pp.

A disease of intensively cultured salmonids and catfish caused by high nitrite concentrations. Methods are given for control.

(Copies available from U.S. Fish and Wildlife Service, Kearneysville)

DISEASES AND PARASITES OF FISHES: AN ANNOTATED BIBLIOGRAPHY OF BOOKS AND SYMPOSIA, 1904-1977

Mann, Joyce A. Fish Disease Leaflet 53, 1981 (Reprinted), 28 pp.

An annotated list of books and symposia in the field of fish diseases.

(Copies available from U.S. Fish and Wildlife Service, Kearneysville)

DISEASES OF FISH: RECOGNITION AND TREATMENT

Wellborn, Thomas L., Jr. Extension Wildlife and Fisheries Department, Mississippi State University, 1971, 6 pp.

Presents management techniques for disease prevention and identification. Provides black and white and color photographs of various symptoms.

(Copies available from Mississippi State University)

EPITHELIOCYSTIS INFECTION OF FISHES

Herman, R. L. and Wolf, Ken. U.S. Fish and Wildlife Service, National Fish Health Research Laboratory, Fish Disease Leaflet 75, 1987, 4 pp.

A chronic disease which affects the epithelial cells of gills and skin of fishes and is caused by Chlamydia or Rickettsia-organisms classified between viruses and bacteria.

(Copies available from U.S. Fish and Wildlife Service, Kearneysville)

FIN ROT, COLDWATER DISEASE, AND PEDUNCLE DISEASE OF SALMONID FISHES

Bullock, G. L. and Snieszko, S. F. U.S. Fish and Wildlife Service, National Fish Health Research Laboratory, Fish Disease Leaflet 25, 1981 (Reprinted 1984), 3 pp.

A discussion of three similar salmonid diseases.

(Copies available from U.S. Fish and Wildlife Service, Kearneysville)

FISH GRUBS IN FRESHWATER PONDS AND LAKES

Johnson, S. K. Texas Agricultural Extension Service Report No. B-1380, 1981, 8 pp.

Describes and illustrates the yellow grub, white grub, black grub, eye grubs, their harmful effects to fish, and their prevention and control.

(Copies available from S. K. Johnson)

HISTOPATHOLOGY OF GAS BUBBLE DISEASE IN JUVENILE RAINBOW TROUT

Smith, Charlie E. Fish Technology Center, Bozeman Information Leaflet 35, 1987, 11 pp.

Histological examination of tissues from rainbow trout with gas bubble disease.

(Copies available from U.S. Fish and Wildlife Service, Bozeman)

INFORMATION ABOUT THE DIAGNOSIS OF FISH DISEASES IN THE UPPER MIDWEST

Kapuscinski, Anne R. and Gross, Mark L. University of Minnesota Sea Grant Extension, Superior Advisory Note No. 23, August 1986, 3 pp.

Defines fish disease, discusses general causes and prevention, diagnosis, and sources for diagnostic services.

(Copies available from Minnesota Sea Grant)

INTRODUCTION TO FISH HEALTH MANAGEMENT

Frances-Floyd, Ruth and Wellborn, Thomas L. Department of Fisheries and Aquaculture, University of Florida, [n.d.], 7 pp.

Clear and simple discussion on aspects of most common fish diseases with suggestions for prevention and treatment.

(Copies available from University of Florida)

INTRODUCTION TO FISH PARASITES AND DISEASES AND THEIR TREATMENT

Alderidge, Frederick J. and Shireman, Jerome V. University of Florida, Circular 716, [n.d.], 14 pp.

Step-by-step procedures to aid in diagnosis and treatment with a reference list of further information and conversion tables.

(Copies available from University of Florida)

NUTRITIONAL (DIETARY) GILL DISEASE AND OTHER LESS KNOWN GILL DISEASES OF FRESHWATER FISHES

Snieszko, S. F. U.S. Fish and Wildlife Service, National Fish Health Research Laboratory, Fish Disease Leaflet 36, 1984, 3 pp.

A brief overview of gill disease, which may be caused by malnutrition, toxic substances, bacteria, fungi, and certain parasites.

(Copies available from U.S. Fish and Wildlife Service, Kearneysville)

SELECTING AND SHIPPING SAMPLES TO HELP DETERMINE CAUSES OF FISH KILLS

Wellborn, Thomas L., Jr. Mississippi Cooperative Extension Service, Mississippi State University, Information Sheet 667, 1985, 2 pp.

Lists, in order of preference, diagnostic samples from excellent to unusable.

(Copies available from Mississippi State University)

SHELLFISH DISEASES: CURRENT CONCERNS IN THE NORTHEAST

White, Alan W. Woods Hole Oceanographic Institute, Technical Report WHOI-87-13, 1987, 38 pp.

This report is a summary of a workshop on shellfish disease issues of concern to the shellfishing industry of the Northeast United States. Topics addressed by invited speakers include: MSX oyster disease, tumors of soft shell clams, brown tide, and shellfish hatcheries and shellfish importation in relation to disease concerns.

(Copies available on loan from National Sea Grant Depository)

SOME PARASITES AND DISEASES OF WARMWATER FISHES

Hoffman, Glenn L. and Mitchell, Andrew J. Fish and Wildlife Leaflet 6, 1986, 22 pp.

Lists causes, susceptible species, signs, contributing factors, verification, prevention and therapy.

(Copies available from U.S. Fish and Wildlife Service, Stuttgart)

STRESS - ITS ROLE IN FISH DISEASE

Frances-Floyd, Ruth. Department of Fisheries and Aquaculture, University of Florida, [n.d.], 6 pp.

Lists causes and effects of stress in the prevention of fish disease.

(Copies available from University of Florida)

SUBMITTING SAMPLES FOR FISH DISEASE DIAGNOSIS

Mitchell, Andrew J. and Hoffman, Glenn L. U.S. Fish and Wildlife Service, [n.d.], 14 pp.

Discusses the information that must be collected for diagnosis and gives information in transporting live specimens.

(Copies available from U.S. Fish and Wildlife Service, Stuttgart)

TREATING FISH DISEASE AND PARASITE PROBLEMS

Helfrich, L. A.; Neves, R. J.; and Weigmann, D. L. Virginia Cooperative Extension Service, Publication 420-899, November 1984, 7 pp.

A brief overview on diagnosing fish diseases and treating as well as preventing diseases and parasites of fishes.

(Copies available from Virginia Polytechnic Institute)

BACTERIA

AEROMONAS HYDROPHILA AND MOTILE AEROMONAD SEPTICEMIAS OF FISH

Cipriano, Rocco C. and Bullock, G. L. U.S. Fish and Wildlife Service, National Fish Health Research Laboratory, Georgia Cooperative Research Unit, Fish Disease Leaflet 68, 1984, 23 pp.

Primarily a bacterial disease affecting warmwater fishes such as minnows, baitfishes, channel catfish and striped bass.

(Copies available from U.S. Fish and Wildlife Service, Kearneysville)

AEROMONAS INFECTIONS

Macmillan, John R. Mississippi State Extension Service, Mississippi State University, Information Sheet 1261, 1985, 2 pp.

Discusses predisposing conditions, diagnosis, treatment, and prognosis of these bacterial infections.

(Copies available from Mississippi Cooperative Extension Service)

BACTERIAL GILL DISEASE OF FRESHWATER FISHES

Snieszko, S. F. U.S. Fish and Wildlife Service, National Fish Health Research Laboratory, Fish Disease Leaflet 62, 1981 (Reprinted 1984), 11 pp.

A bacterial disease of all juvenile salmonids and most freshwater fishes which occurs when environmental conditions are stressful to the fish.

(Copies available from U.S. Fish and Wildlife Service, Kearneysville)

BACTERIAL KIDNEY DISEASE OF SALMONID FISHES CAUSED BY RENIBACTERIUM SALMONINARUM

Bullock, G. L. and Herman, R. L. U.S. Fish and Wildlife Service, National Fish Health Research Laboratory, Fish Disease Leaflet 78, 1988, 10 pp.

A systemic disease of wild and cultured salmonids and some feral fishes.

(Copies available from U.S. Fish and Wildlife Service, Kearneysville)

COLUMNARIS DISEASE

Francis-Floyd, Ruth. Florida Cooperative Extension Service, Institute of Food and Agriculture Sciences, IFAS Fact Sheet FA-11, 1988, 2 pp.

Describes history, cause, symptoms, diagnosis, treatment, and prevention of this bacterial infection.

(Copies available from University of Florida)

COLUMNARIS DISEASE OF FISHES

Bullock, G. L.; Hsu, T. C.; and Shotts, E. B., Jr. U.S. Fish and Wildlife Service, National Fish Health Research Laboratory, and University of Georgia, Athens, GA, Fish Disease Leaflet 72, 1986, 9 pp.

An acute to chronic bacterial infection that affects anadromous salmonids and all species of warmwater fishes.

(Copies available from U.S. Fish and Wildlife Service, Kearneysville)

EDWARDSIELLA INFECTIONS OF FISHES

Bullock, G. L. and Herman, Roger L. U.S. Fish and Wildlife Service, National Fish Health Research Laboratory, Fish Disease Leaflet 71, 1985, 6 pp.

An enteric bacterial disease of many warmwater fishes and some coldwater fishes.

(Copies available from U.S. Fish and Wildlife Service, Kearneysville)

ENTERIC REDMOUTH DISEASE OF SALMONIDS

U.S. Fish and Wildlife Service, National Fish Health Research Laboratory, Fish Disease Leaflet 67, 1984, 14 pp.

A systemic bacterial disease of fishes, primarily rainbow trout, caused by *Yersinia ruckeri*.

(Copies available from U.S. Fish and Wildlife Service, Kearneysville)

ENTERIC SEPTICEMA OF CATFISH

Francis-Floyd, Ruth. Florida Cooperative Extension Service, Institute of Food and Agriculture Sciences, Fact Sheet FA-10, 1988, 2 pp.

Describes history, symptoms, diagnosis, treatment, and prevention.

(Copies available from University of Florida)

FURUNCULOSIS AND OTHER DISEASES CAUSED BY AEROMONAS SALMONICIDA

Bullock, G. L.; Cipriano, R. C.; and Snieszko, S. F. U.S. Fish and Wildlife Service, National Fish Health Research Laboratory, Fish Disease Leaflet 66, 1983 (Reprinted 1984), 29 pp.

Aeromonas salmonicida causes furunculosis in salmonids, and this bacterium, or its variants, is the probable cause of ulcerative disease of goldfish, erythrodermatitis of carp, ulcer disease of trout, and other systemic infections of warmwater and marine fishes.

(Copies available from U.S. Fish and Wildlife Service, Kearneysville)

MENINGITIS IN FISH CAUSED BY AN ASPOROGENOUS ANAEROBIC BACTERIUM

Lewis, D. H. and Udey, Lanny R. Department of Veterinary Microbiology, Texas A & M University and Department of Microbiology, University of Miami, Fish Disease Leaflet 56, 1978 (Reprinted 1984), 5 pp.

A bacterial disease of estuarine and marine fishes which has caused fishkills in the southeast coastal areas of the United States.

(Copies available from U.S. Fish and Wildlife Service, Kearneysville)

MYCOBACTERIOSIS (TUBERCULOSIS) OF FISHES

Snieszko, S. F. U.S. Fish and Wildlife Service, National Fish Health Research Laboratory, Fish Disease Leaflet 55, 1978 (Reprinted 1984), 9 pp.

A bacterial disease primarily of cultured freshwater, marine, and ornamental fishes.

(Copies available from U.S. Fish and Wildlife Service, Kearneysville)

POTENTIATED SULFONAMIDE THERAPY OF EDWARDSIELLA ICTALURI INFECTION IN CHANNEL CATFISH

Bowser, P. R.; Munson, A. D.; Francis-Floyd, R.; [et al.]. Mississippi Agricultural and Forestry Experiment Station, Research Report, Vol. 11, No. 2, March 1986, 3 pp.

Evaluation of Romet-30 was studied in aquarium trials for the control of enteric septicemia of catfish.

(Copies available from Mississippi State University)

FUNGUS

PARASITES OF FRESHWATER FISH. I. FUNGI. 1. FUNGI (SAPROLEGNIA AND RELATIVES) OF FISH AND FISH EGGS

Hoffman, Glenn L. U.S. Fish and Wildlife Service, National Fish Health Research Laboratory, Fish Disease Leaflet 21, 1969 (Reprinted 1984), 6 pp.

A discussion of the fungus diseases of fish and fish eggs, primarily Saprolegnia, with methods given for control and treatment.

(Copies available from U.S. Fish and Wildlife Service, Kearneysville)

PARASITES

ANCHOR PARASITES OF FISHES

Johnson, S. K. Texas Agricultural Extension Service Fact Sheet L-1409, 1977, 2 pp.

Covers parasite life cycle, effects of parasite infestation, and control.

(Copies available from S. K. Johnson, Texas Agricultural Extension Service)

ARGULUS, A BRANCHIURAN PARASITE OF FRESHWATER FISHES

Hoffman, G. L. U.S. Fish and Wildlife Service, Fish Farming Experimental Station, Fish Disease Leaflet 49, 1977, 9 pp.

Argulus, a fish louse, occurs on freshwater fishes, frogs, and salamanders. Methods are given for treatment and control.

(Copies available from U.S. Fish and Wildlife Service, Kearneysville)

CERATOMYXA SHASTA, A MYXOSPOREAN PARASITE OF SALMONIDS

Bartholomew, J. L.; Rohovec, J. S.; and Fryer, J. L. Department of Microbiology, Oregon State University, Fish Disease Leaflet 58, and Oregon Agricultural Experiment Station Technical Paper 5130, 1989, 8 p.

A protozoan disease of salmonids primarily from the States of California, Oregon, Washington, and Idaho, and from British Columbia.

(Copies available from U.S. Fish and Wildlife Service, Kearneysville)

CONTROL AND TREATMENT OF PARASITIC DISEASES OF FRESHWATER FISHES

Hoffman, Glenn L. U.S. Fish and Wildlife Service, Eastern Fish Disease Laboratory, Fish Disease Leaflet 28, 1970, (Reprinted 1984), 7 pp.

A compilation of the most effective treatment methods for parasites of freshwater fishes.

(Copies available from U.S. Fish and Wildlife Service, Kearneysville)

ICH: WHITE SPOT DISEASE (*Ichthyophthirius multifiliis*)

Macmillan, J. Randy. Mississippi Cooperative Extension Service, Mississippi State University, Information Sheet 1266, 1984, 2 pp.

Discusses diagnosis and effective treatment of this external parasite as it relates to catfish aquaculture. Discusses the use of copper sulfate.

(Copies available from Mississippi State University)

IMPORTANT TAPEWORMS OF NORTH AMERICAN FRESHWATER FISHES

Mitchell, Andrew J. and Hoffman, Glenn L. U.S. Fish and Wildlife Service, Fish Farming Experimental Station, Stuttgart, AK, Fish Disease Leaflet 59, 1980, 18 pp.

This leaflet discusses the life cycles of tapeworms which infect fishes and gives methods for treatment and control.

(Copies available from U.S. Fish and Wildlife Service, Kearneysville)

A LARVAL CYCLOPHYLLIDEAN (CESTODA) PARASITE OF BROWN AND WHITE SHRIMP

Corkern, Clifton C., II. Texas Agricultural Extension Service, Fish Disease Diagnostic Laboratory Report No. FDDL-S10, February 1978, 2 pp.

Report of a new helminth species found on shrimp.

(Copies available from S. K. Johnson)

ROUNDWORMS IN TEXAS FRESHWATER FISHES

Johnson, S. K. Fish Disease Diagnostic Laboratory, Texas Agricultural Extension Service Report No. FDDL-F17, 1980, 1 p.

Descriptions and pictures of roundworms.

(Copies available from Texas A & M University)

VIRUS

APPROVED PROCEDURE FOR DETERMINING ABSENCE OF INFECTIOUS HEMATOPOIETIC NECROSIS (IHN) IN SALMONID FISHES

Amend, Donald F. U.S. Fish and Wildlife Service, National Fishery Research Center, Fish Disease Leaflet 31, 1984, 4 pp.

A description of the acceptable methods for salmonid fish inspection to insure the absence of the IHN virus.

(Copies available from U.S. Fish and Wildlife Service, Kearneysville)

APPROVED PROCEDURE FOR DETERMINING ABSENCE OF VIRAL HEMORRHAGIC SEPTICEMIA AND WHIRLING DISEASE IN CERTAIN FISH AND FISH PRODUCTS

Hoffman, G. L; Snieszko, S. F.; and Wolf, K. E. U.S. Fish and Wildlife Service, National Fish Health Research Laboratory, Fish Disease Leaflet 9, 1984 (Reprinted), 7 pp.

A description of the acceptable methods for inspection of salmonids and salmonid eggs to ensure the absence of VHS virus and whirling disease.

(Copies available from U.S. Fish and Wildlife Service, Kearneysville)

CHANNEL CATFISH VIRUS DISEASE

Plumb, John A. Department of Fisheries and Allied Aquacultures, Auburn University, Fish Disease Leaflet 73, 1986, 7 pp.

A herpesvirus disease of cultured channel catfish fry and fingerlings.

(Copies available from U.S. Fish and Wildlife Service, Kearneysville)

HERPESVIRUS DISEASE OF SALMONIDS

Wolf, Ken; Sano, Tokuo; and Kimura, Takahisa. U.S. Fish and Wildlife Service, Eastern Fish Disease Laboratory, Tokyo, Japan, Tokyo University of Fisheries, and Hokkaido, Japan, Hokkaido University, Fish Disease Leaflet 44, 1975 (Reprinted 1984), 8 pp.

A viral disease of rainbow trout and kokanee or landlocked salmon fry and fingerlings. The virus has been isolated in the United States and Japan.

(Copies available from U.S. Fish and Wildlife Service, Kearneysville)

INCREASED OCCURRENCES OF INFECTIOUS HEMATOPOIETIC NECROSIS VIRUS IN FISH AT COLUMBIA RIVER BASIN HATCHERIES: 1980-1982

Groberg, W. J. and Fryer, J. L. Oregon State University Sea Grant College Program, ORESU-T-83-002, Technical Paper No. 6620, [1983], 16 pp.

This paper discusses epidemiology, life history and methods for control of this virus infection in salmonid fishes.

(Copies available from Oregon State University, Sea Grant Communications)

INFECTIONS HEMATOPOIETIC NECROSIS (IHN) VIRUS DISEASE

Amend, Donald. U.S. Fish and Wildlife Service, Western Fish Disease Laboratory, Fish Disease Leaflet 39, 1974 (Reprinted 1984), 6 pp.

A description of IHN virus disease which affects rainbow trout and is indistinguishable from the sockeye salmon virus disease and the chinook salmon virus disease.

(Copies available from U.S. Fish and Wildlife Service, Kearneysville)

INFECTIOUS PANCREATIC NECROSIS (IPN) OF SALMONID FISHES

McAllister, Philip E. U.S. Fish and Wildlife Service, National Fish Health Research Laboratory, Fish Disease Leaflet 65, 1983 (Reprinted 1984), 12 pp.

A viral disease principally of salmonids, but the virus may also affect nonsalmonid fishes and marine invertebrates.

(Copies available from U.S. Fish and Wildlife Service, Kearneysville)

LYMPHOCYSTES DISEASE OF FISH

Wolf, Ken. U.S. Fish and Wildlife Service, Eastern Fish Disease Laboratory, Fish Disease Leaflet 13, 1968 (Reprinted 1984), 4 pp.

A virus-caused disease of marine and freshwater fishes which produces tumors on wartlike growths.

(Copies available from U.S. Fish and Wildlife Service, Kearneysville)

THE ROLE OF SEDIMENT IN TRANSMISSION OF CHANNEL CATFISH VIRUS DISEASE

Brady, Yolanda Juanita and Ellender, R. D. Mississippi-Alabama Sea Grant Consortium, MASGP-81-029, May 1982, 67 pp.

This study includes the effect of various physical and biological factors on virus survival and an assessment of the potential for transmission by pond sediments.

(Copies available from Mississippi-Alabama Sea Grant Consortium)

FEEDS, FEEDING AND NUTRITION

CATFISH FEEDS AND FEEDING

McGee, Michael and Cichra, Charles E. Florida Cooperative Extension Service, Fact Sheet FA-1, [n.d.], 4 pp.

Includes simple feed schedule worksheet.

(Copies available from University of Florida)

A COMPARISON OF SILVER CUP SALMON, SD-6 AND W-7 DIETS FOR REARING WESTSLOPE CUTTHROAT TROUT

Smith, Charlie E. U.S. Fish and Wildlife Service, Bozeman Information Leaflet 2, 1974, 7 pp.

This test was conducted to determine efficiency of SD-6 and W-7 diets with Westslope cutthroat trout. Results indicated that such diets were not suitable for first-feeding cutthroat trout fry.

(Copies available from U.S. Fish and Wildlife Service, Bozeman)

COMPARISON OF TWO SEMI-MOIST STARTER DIETS FOR LAKE TROUT

Edsall, Donald A. and Smith, Charlie E. Fish Technology Center, Bozeman Information Leaflet 38, 1987, 7 pp.

Lake trout fry (*Salvelinus namaycush*) were fed for 60 days after swim-up with one of two diets, Rangen's soft-moist or Murray's Semi-moist. Performance of fish fed these diets was similar, and the two feeds would be equally suitable as starter diets.

(Copies available from U.S. Fish and Wildlife Service, Bozeman)

EFFECT OF FEEDING RATES ON SPAWNING PERFORMANCE OF TWO YEAR OLD RAINBOW TROUT BROOD STOCK

Orr, Wes; Call, Jack; Brooks, Jack; [et al.]. Ennis National Fish Hatchery, Bozeman Information Leaflet 24, 1982, 6 pp.

Salmo gairdneri fed with demand feeders grew faster and converted better than rainbow trout hand fed twice per day, but it was determined that demand feeding was not cost efficient.

(Copies available from U.S. Fish and Wildlife Service, Bozeman)

EFFECT OF INTERMITTENT FEEDING ON RAINBOW TROUT GROWTH

Kindschi, Greg A. Beulah Fish Technology Center, Information Leaflet 86-4, 1986, 9 pp.

Four feeding schedules were tested on rainbow trout (*Salmo gairdneri*) to determine the effect of starvation periods on growth with results indicating that feeding schedules could be changed to include periods of starvation without disrupting hatchery production goals.

(Copies available from U.S. Fish and Wildlife Service, Beulah)

EFFECTS OF DIETARY SALT ON RAINBOW TROUT FRY

Severson, Steven H. Beulah Fish Technology Center, Information Leaflet 86-7, 1986, 9 pp.

This study attempts to determine effects of dietary salt on growth, feed conversion, and mortality of fry of rainbow trout (*Salmo gairdneri*) and to identify tolerance levels of dietary salt. It was concluded that salt content should be below 6.3 percent in finished feed.

(Copies available from U.S. Fish and Wildlife Service, Beulah)

EFFECTS OF SOYBEAN PRODUCTS ON GROWTH AND MORTALITY OF WESTLOPE CUTTHROAT TROUT

Smith, Charlie E. and Morrison, John K. Bozeman Information Leaflet 7, 1978, 10 pp.

This study was initiated to test open-formula diets in which soybean flour and soybean oil have both been eliminated. Results indicated the elimination did not prevent excessive mortality and severe degenerative changes.

(Copies available from U.S. Fish and Wildlife Service, Bozeman)

ELECTRONICALLY-CONTROLLED AUTOMATIC LIVE-FOOD FEEDER

Theis, G. L. and Howey, R. G. Lamar Fish Cultural Development Center, Lamar Information Leaflet No. 80-01, [n.d.], 9 pp.

This paper describes an automatic unit for feeding small, live organisms. Feeding times and amounts are controlled by an electronic timing system.

(Copies available from U.S. Fish and Wildlife Service, Lamar)

EVALUATION OF STARTER DIETS FOR SNAKE RIVER CUTTHROAT TROUT

Edsall, Donald A. Beulah Fish Technology Center, Information Leaflet 86-2, 1986, 11 pp.

Fry of Snake River cutthroat trout (*Salmo clarki*) were fed one of two commercial or three open-formula diets. Results indicated which diets were better for conversion ratios and open-formula diets were less expensive than closed formula diets.

(Copies available from U.S. Fish and Wildlife, Beulah)

LARVAL SHRIMP FEEDING--CRUSTACEAN TISSUE SUSPENSION: A PRACTICAL ALTERNATIVE FOR SHRIMP CULTURE

Tacon, A. G. J. FAO Aquaculture Development and Coordination Programme, ACDP/MR/86/23, [1986], 31 pp.

This report is an evaluation of a simple and inexpensive hatchery feeding strategy originally developed in India and tested on *Penaeus monodon* in the Philippines.

(For information on availability contact your local public or university library)

PERFORMANCE OF BULL TROUT (*SALVELINUS CONFLUENTUS*) FED FOUR STARTER DIETS

Viola, Arthur E. and Smith, Charlie E. Fish Technology Center, Bozeman Information Leaflet 36, 1987, 5 pp.

Four different starter diets were fed to first-feeding bull trout: Biodet, Rangen semi-moist, Silver Cup, and Silver Cup containing 15 percent fresh beef liver. Results indicated the fish fed Biodiet gained more weight.

(Copies available from U.S. Fish and Wildlife Service, Bozeman)

PERFORMANCE OF SEVEN STARTER DIETS FOR LAKE TROUT

Kindschi, Greg A.; Edsall, Donald A.; Phillips, Ray A.; [et al.]. Beulah Fish Technology Center, Information Leaflet 86-6, 1986, 10 pp.

Seven commercially available starter diets were tested for 113 days with results indicating that diet success was related to high fat and low moisture levels in the feed.

(Copies available from U.S. Fish and Wildlife Service, Beulah)

PROTEIN AND AMINO ACID NUTRITION FOR CHANNEL CATFISH FEEDS

Wilson, Robert P. and Robinson, Edwin H. Mississippi Agricultural and Forestry Experiment Station, Information Bulletin 25, June 1982, 18 pp.

Discusses the principles of nutrition as they relate to catfish and how the information obtained from studies completed can be used in the formulation of catfish feeds.

(Copies available from Mississippi State University)

GENETICS

AQUACULTURE GENETICS AND BREEDING: NATIONAL RESEARCH PRIORITIES

Committee on Aquacultural Genetics and Breeding, Department of Animal Science, University of California, Davis. Published by U.S. Department of Agriculture, Cooperative State Research Service, Office of Aquaculture, March 1988, v. I, 56 pp.; v. II, 61 pp.

A study undertaken to assess the state of aquacultural genetics, examine institutional linkages in aquaculture research, assess resource opportunities for genetic research, and develop recommendations to enhance aquaculture production through genetics.

(Copies available from U.S. Department of Agriculture, National Agricultural Library)

GENETIC GUIDELINES FOR FISHERIES MANAGEMENT

Kapuscinski, Anne R. and Jacobson, Larry D. University of Minnesota, Sea Grant Research Report Number 17, 1987, 66 pp.

Topics covered are proper management of the genetic resources of fishes, biological principles underlying genetics, genetic tools and their applications, and genetic issues in fisheries management.

(Copies available from Minnesota Sea Grant)

GENETICS AND BREEDING OF CATFISH

Dunham, Rex A. and Smitherman, R. Oneal. Southern Cooperative Series Bulletin No. 325, November 1987, 20 pp.

Discusses components of genetic variation and genetic manipulation, as well as environmental control techniques in a catfish breeding program.

(Copies available from Auburn University)

TRIPLOID GRASS CARP FOR AQUATIC PLANT CONTROL

Clugston, James P. and Shireman, Jerome V. U.S. Fish and Wildlife Service, Leaflet 8, 1987, 3 pp.

A review of the development, history, and use of grass carp for aquatic plant control. Advantages are given.

(Copies available from U.S. Fish and Wildlife Service, Washington, D.C.)

LEGISLATION

ACCESS TO WATERS AND UNDERWATER LANDS FOR AQUACULTURE IN NEW YORK

Kaplan, Milton. New York Sea Grant Institute, Coastal Law Series, No. 84-1, April 1984, 173 pp.

Discusses competition for coastal and offshore resources, the Federal, State, and local government interests in ownership and regulation of property. Also included is a section on leasing and specific references to legislation and geographic areas.

(Copies available from New York Sea Grant Institute)

FLORIDA DEPARTMENT OF NATURAL RESOURCES AQUATIC PLANT CONTROL PERMIT PROGRAM

Vandiver, V. V. and Joyce, J. C. University of Florida at Gainesville, Weeds in the Sunshine #A-87-12, March 1987, 5 pp.

Includes detailed information about the aquatic plant control permit which is required in aquatic weed control operations in Florida.

(Copies available from University of Florida)

AN INTERIM GUIDE TO AQUACULTURE PERMITTING IN SOUTH CAROLINA

DeVoe, M. Richard and Whetstone, Jack M. South Carolina Sea Grant Consortium, SC-SG-TR-84-2, Revised August 1987, 27 pp.

Covers steps necessary to obtain permits and technical resources as well as an index of permits, leases, certifications, and licenses. Useful as a guide until a formal State-permitting mechanism is established.

(Copies available from South Carolina Sea Grant Consortium)

NATIONAL AQUACULTURE IMPROVEMENT ACT OF 1985

Food Security Act of 1985, Title XVII, Subtitle D. Amended and reauthorized National Aquaculture Act of 1980. P. L. 96-362.

The National Aquaculture Act of 1980 was amended and reauthorized as the National Improvement Act of 1985. The purpose of the original act establishes a national aquaculture policy, establishes and implements a national aquaculture plan, and encourages aquaculture activities and programs. The original act was considered landmark legislation for the aquaculture industry. The new act establishes the U.S. Department of Agriculture as the lead Federal agency for coordinating Federal activities and dissemination of aquaculture information. The Joint Subcommittee on Aquaculture (JSA) was established as the primary coordinating committee for Federal activities. In the new act, the Secretary of Agriculture is named as the permanent chairman of the JSA. Additionally, the National Aquaculture Information Center, National Agricultural Library, was established in the U.S. Department of Agriculture for improving information storage and dissemination.

(Contact your Federal legislative representative for further information)

PENDING FEDERAL LEGISLATION

Refer to "Aquaculture" in the Natural Resources section of the latest issue of Major Legislation of the Congress, Congressional Research Service, Library of Congress, U.S. Government Printing Office.

STATE LEGISLATION

State laws differ. Consult the State extension aquaculture specialist in each State of interest (see County Agents Directory in DIRECTORIES section of this publication) or contact Sea Grant Program Director for State of interest.

PONDS - CONSTRUCTION

CONSTRUCTION OF LEVEE-TYPE PONDS FOR FISH PRODUCTION

Wellborn, Thomas L. Southern Regional Aquaculture Center, [n.d.], 4 pp.

Discusses size, shape, levee width, freeboard and depth, slope of levees, orientation, site preparation and construction, and drains of fish ponds.

(For information on availability contact your County Extension Office, State Cooperative Extension Service, or the U.S. Department of Agriculture, National Agricultural Library)

OBSERVATIONS ON THE HYDROLOGY AND MORPHOMETRY OF PONDS ON THE AUBURN FISHERIES RESEARCH UNIT

Boyd, Claude E. and Shelton, James L. Alabama Agricultural Experiment Station, Bulletin 558, February 1984, 63 pp.

Provides information on rainfall, storm runoff, seepage, evaporation, and water storage, as well as budgets and on morphometrical features.

(Copies available from Auburn University, Swingle Hall)

POND CONSTRUCTION: SOME PRACTICAL CONSIDERATIONS

Pardue, Garland B. and Helfrich, Louis A. Virginia Cooperative Extension Service, Publication 420-011, Reprinted July 1984, 7 pp.

Discusses pond site selection, water supply, and spillway construction.

(Copies available from Virginia Polytechnic Institute)

PONDS--PLANNING DESIGN AND CONSTRUCTION

United States Department of Agriculture, Soil Conservation Service, Agriculture Handbook Number 590, (Supersedes Agriculture Handbook No. 387), June 1982, 51 pp.

Describes embankment and excavated ponds and outlines the requirements for building each type.

(Copies available from U.S. Department of Agriculture, Soil Conservation Service)

RENOVATION OF FARM PONDS

Higginbotham, Billy and Steinbach, Donny W. Texas Agricultural Extension Service, Fact Sheet L-2084, [1984], Reprint, 2 pp.

Discusses pond renovation for ponds with undesirable or stunted fish populations.

(Copies available from Texas A & M University)

PONDS - GENERAL

SOLUTIONS TO COMMON FARM POND PROBLEMS

Helfrich, L. A.; Pardue, G. B.; and Bromley, P. T. Virginia Cooperative Extension Service, Publication 420-019, February 1987, 34 pp.

Discusses avoidance of pond problems, solving problems as a result of bad weather, aquatic predators, nuisance fish and chemical contamination.

(Copies available from Virginia Polytechnic Institute)

SITE SELECTION OF LEVEE-TYPE FISH PRODUCTION PONDS

Wellborn, Thomas L. Southern Regional Aquaculture Center,
November 1988, 2 pp.

Discusses water availability, sources, soil characteristics, topography, draining, flooding, utility right-of-ways, and pesticides.

(For information on availability contact your County Extension Office, State Cooperative Extension Service, or the U.S. Department of Agriculture, National Agricultural Library)

A SUMMARY OF PROCEDURES FOR START-UP OF WARM WATER AQUACULTURE PONDS

University of Florida, Florida Cooperative Extension Service,
[n.d.], 3 pp.

Discusses pre-filling operations, water supply, pond fertilization, and aquatic insect and vegetation control.

(Copies available from University of Florida)

USE OF FARM PONDS FOR THE PRODUCTION OF FOOD FISH FOR HOME USE AND SPECIALIZED MARKETING

Lewis, William M. Southern Illinois University Fisheries Bulletin No. 6, January 1981, 30 pp.

Provides information on producing fish for domestic consumption or local marketing for supplemental income. Clear illustrations on pond design as well as a discussion of management, economics, and parasite control.

(Copies available from Southern Illinois University)

PONDS - MANAGEMENT

BUILDING/RENOVATING STOCK DAMS FOR FISH FARMING

Beem, Marley. South Dakota State University, Extension Extra 12004, May 1987, 3 pp.

Ideas for maximizing fishing access while minimizing weed problems, fish escape, wild fish and drainage problems.

(Copies available from South Dakota State University)

CLEARING MUDDY PONDS

Steinbach, Don and Higginbotham, Billy. Texas Agricultural Extension Service, [n.d.], [No.] L-2161, 2 pp.

Heavy rainfall, certain fish species, and negatively charged clay particles are causes of muddy pond water. Ponds should be tested to determine whether addition of gypsum or alum will alleviate problems.

(Copies available from Texas A & M University)

A CLIMATOLOGY OF POND TEMPERATURES FOR AQUACULTURE IN MISSISSIPPI

Wax, Charles L.; Pote, Jonathan W.; and Deliman, Niki C. Mississippi Agricultural and Forestry Experiment Station, Technical Bulletin 149, November 1987, 45 pp.

Records from 1951-86 data on pond temperatures were analyzed and then compiled to produce annual average daily regimes; average, maximum and minimum temperatures; and probabilities at 10 levels of occurrence through the year and monthly.

(Copies available from Mississippi State University)

COMPARISON OF NIGHTLY AND EMERGENCY AERATION OF CHANNEL CATFISH

PONDS

Steeby, James A. and Tucker, Craig S. Mississippi Agricultural and Forestry Experiment Station, Research Report, v. 13(8), November 1988, 4 pp.

Discusses the effects of plankton demands on pond oxygen levels and effects of emergency aeration.

(Copies available from Mississippi State University)

COOPERATIVELY MANAGED PANAMANIAN RURAL FISH PONDS

Lovshin, L. L.; Schwarts, N. B.; de Castillo, V. G.; Engle, C. R.; [et al.]. Alabama Agricultural Experiment Station, December 1986, 47 pp.

Twenty-two communities were selected for a pilot study of *Tilapia nilotica* and Chinese carp polyculture associated with animal husbandry in an agroaquaculture project. This publication also discusses nutritional monitoring, socioeconomic considerations, and economic evaluations.

(Copies available from Auburn University, Swingle Hall)

FARM POND MANAGMENT

Wellborn, Thomas L.; Herring, A. Jack; and Callahan, Ramon. Mississippi Cooperative Extension Service, Publication 1428, [1984], 15 pp.

Discusses planning, construction, stocking, management, aquatic vegetation control, fertilization, and other aspects of pond management. Includes clear drawings.

(Copies available from Mississippi State University)

FARM POND RENOVATION

Hill, Thomas K. and Wilson, J. Larry. University of Tennessee Agricultural Extension Service Publication 1103, 1984, 10 pp.

Mechanical and chemical techniques are described.

(Copies available from Dr. T. K. Hill)

GUIDE TO OXYGEN MANAGEMENT AND AERATION IN COMMERCIAL FISH PONDS

Jensen, Gary L. and Bankston, Joseph D. Louisiana Agricultural Experiment Station Report No. 2300, 1988, 26 pp.

Provides information on managing dissolved oxygen in commercial fish ponds using aeration procedures. The basic principles and practices of aeration and the types of aeration equipment made by commercial manufacturers are given. The energy cost of operating aeration devices and energy efficiency are also discussed. Factors for evaluating and comparing various aeration devices for decisionmaking are considered.

(Copies available from Louisiana Agricultural Experiment Station)

MANAGEMENT OF FARM FISH PONDS IN TENNESSEE

Hill, Thomas K. Agricultural Extension Service, University of Tennessee Publication 1231, 1987, 7 pp.

Discusses pond construction, fish species, pond fertilization, and fishing.

(Copies available from Dr. T. K. Hill)

MANAGING FLORIDA PONDS FOR FISHING

Cichra, Charles E. University of Florida, [n.d.], 9 pp.

Gives information on when and how to stock the pond and management of a stocked pond.

(Copies available from University of Florida)

MANAGING LOUISIANA FISHPONDS

Summers, Max; and Carver, Dudley. Louisiana Department of Wildlife and Fisheries, Technical Bulletin No. 4, 1984, 49 pp.

Discusses State fish hatcheries, fish for stocking, site selection, pond construction, reconditioning, fish production, manipulating fish populations, control of animals that may take residence in a pond, and mosquito control.

(Copies available from Louisiana Department of Wildlife and Fisheries)

MANAGING PONDS FOR GOOD FISHING

Anderson, Richard O. Missouri Cooperative Fishery Research Unit, UMC Guide 9410, 1985, 4 pp.

Discusses habitat, water quality, balancing populations, and harvest recommendations.

(Copies available from University of Missouri, Extension Publications)

ORGANIC MATTER, NITROGEN AND PHOSPHORUS CONTENT OF SEDIMENTS FROM CHANNEL CATFISH ICTALURUS PUNCTATUS PONDS

Tucker, C. S. Mississippi Agricultural and Forestry Experiment Station, Research Report, Vol. 10, No. 7, June 1985, 3 pp.

This study assesses the concentrations of sediment organic matter, nitrogen and phosphorus and their relationship to pond age.

(Copies available from Mississippi State University)

TEXAS FARM POND MANAGEMENT CALENDAR

Higgenbotham, Billy J. Cooperative Extension Program, Prairie View A & M University, Report No. 20M-9-85, 1985, 2 pp.

Provides graphic monthly milestones for pond management activities.

(Copies available from Prairie View A & M University)

TURTLE CONTROL IN FARM PONDS

Davis, James T. Texas Agricultural Extension Service, Fact Sheet L-1440, [1976], 2 pp.

Provides diagrams for types of turtle traps and includes uses of turtles when trapped.

(Copies available from Texas A & M University)

USING GRASS CARP FOR CONTROLLING WEEDS IN ALABAMA PONDS

Jensen, John W. Alabama Cooperative Extension Service Circular No. ANR-452, 1986, 2 pp.

Includes sources of grass carp and stocking information.

(Copies available from Alabama Cooperative Extension Service)

PONDS - WATER QUALITY

ARTIFICIAL CIRCULATION OF HAWAIIAN PRAWN PONDS

Fast, Arlo; Barclay, David K.; and Akiyama, G. Hawaii Institute of Marine Biology, UNIHI-SEAGRANT-CR-84-01, 1983.

A low-energy water circulator was field tested in Hawaiian prawn ponds over a 4-month period. Circulation increased bottom oxygen concentrations on the average of 4.0 mg/l and bottom temperatures by 2.8 degrees/C. Prawns harvested from the circulated pond were larger than in the noncirculated control.

(Copies available on loan from National Sea Grant Depository)

A CHECKLIST OF PHYTOPLANKTON (EXCLUSIVE OF DIATOMS) FROM MISSISSIPPI CHANNEL CATFISH PONDS

Tucker, Craig S. Mississippi Agricultural and Forestry Experiment Station, Technical Bulletin 126, February 1985, 5 pp.

Provides expanded, annotated taxonomic listing of phytoplankton from West-central Mississippi channel catfish ponds.

(Copies available from Mississippi State University)

EVALUATION OF A COMMERCIAL BACTERIAL AMENDMENT FOR IMPROVING WATER QUALITY IN CHANNEL CATFISH PONDS

Tucker, Craig S. and Lloyd, Steven W. Mississippi Agricultural and Forestry Experiment Station, Research Report v. 10, (9), October 1985, 3 pp.

Discusses studies done to evaluate Aqua-Bacta-Aid and its use in improving water quality in catfish ponds.

(Copies available from Mississippi State University)

EVALUATION OF AERATORS FOR CHANNEL CATFISH FARMING

Boyd, Claude E. and Ahmad, Tauflik. Alabama Agricultural Experiment Station, Bulletin 584, June 1987, 51 pp.

Reports on performance tests of electric- and tractor-powered aerators at the Alabama Agricultural Experiment Station and explains the principles of pond aeration.

(Copies available from Auburn University)

EVALUATION OF THE AQUATECTOR, AN AERATION SYSTEM FOR INTENSIVE FISH CULTURE

Schutte, A. R. Developments in Fish Culture, Bozeman Information Leaflet, Number 42, December 1986, 10 pp.

Aquatector, which is a commercial oxygen saturation tool, was evaluated for effectiveness under different conditions. A potential for high nitrogen-stripping capacity was observed.

(Copies available from U.S. Fish and Wildlife Service, Bozeman)

LIMING FARM FISH PONDS IN EAST TEXAS

Lock, Joe and Davis, James. Texas Agricultural Extension Service, Fact Sheet L-1864, [1982], Reprint, 2 pp.

Discusses reducing acid pond water by liming which assists in preventing stress or death of fish by low pH and increases availability of phosphorous for plant use.

(Copies available from Texas A & M University)

MANAGEMENT OF WATER QUALITY FOR FISH

Rottmann, R. W. and Shireman, J. V. University of Florida, IFAS Circular 715, [n.d.], 18 pp.

Addresses aspects of water quality specific to Florida as well as provides conversion tables.

(Copies available from University of Florida)

OXYGEN DEPLETIONS IN FARM PONDS: CAUSES, SIGNS AND CORRECTION

Higginbotham, Billy J. Cooperative Extension Program, Prairie A & M University, [January 1987], 2 pp.

Lists five major causes of oxygen depletion in ponds, indicators of low oxygen levels, and methods of correction.

(Copies available from Texas A & M University)

SOLAR RADIATION AND DISSOLVED OXYGEN CONCENTRATIONS IN FISH PONDS

Boyd, Claude E. and Hollerman, William D. Alabama Agricultural Experiment Station, Circular 261, July 1982, 12 pp.

Discusses the influence of solar radiation on dissolved oxygen concentrations in fish ponds as results of a study at the station.

(Copies available from Auburn University)

T-O-T-A-L ALKALINITY

Durborrow, Robert M. Mississippi Cooperative Extension Service, Mississippi State University, Information Sheet 1334, 1986, 2 pp.

Provides a graph of changes in a 24-hour period in waters of high and low alkalinities and recommends chemical treatment.

(Copies available from Mississippi State University)

UNDERSTANDING AND INTERPRETING WATER QUALITY

McKee, Mike and Cichra, Charles E. Institute of Food and Agricultural Sciences, Fact Sheet FA-2, [n.d.], 4 pp.

Discusses pond water chemistry and its management.

(Copies available from University of Florida)

THE USE OF OZONE IN FISH CULTURE: A BRIEF REVIEW

Anderson, A. R. Abernathy Salmon Cultural Development Center, Technology Transfer Series No. 82-2, November 1982, 32 pp.

Discusses technical aspects of the use of ozone in aquaculture as a germicide and oxidant.

(Copies available from U.S. Fish and Wildlife Service, Abernathy)

WATER QUALITY IN STREAMS AND CHANNEL CATFISH (ICTALURUS PUNCTATUS) PONDS IN WEST-CENTRAL MISSISSIPPI

Tucker, C. S. and Lloyd, S. W. Mississippi Agricultural and Forestry Experiment Station, Technical Bulletin 129, April 1985, 8 pp.

Data presented compare quality of water in streams and channel catfish ponds and the effect of pond effluent on receiving streams.

(Copies available from Mississippi State University)

WATER QUALITY MANAGEMENT FOR FISH FARMERS

Kleinholz, Conrad. Langston University Research Program, Langston University Extension Facts, [n.d.], 8 pp.

Discusses phytoplankton production and its control. Also discusses control of toxic metabolite accumulation.

(Copies available from Langston University)

TRANSPORTATION

FISH HANDLING AND TRANSPORT

McGee, Michael and Cichra, Charles E. Florida Cooperative Extension Service, Fact Sheet FA-3, [n.d.], 2 pp.

Causes of stress and techniques to reduce stress are discussed.

(Copies available from University of Florida)

HANDLING AND TRANSPORTING JUVENILE AMERICAN SHAD

Howey, R. G. and Theis, G. L. U.S. Fish and Wildlife Service, Leaflet No. 80-02, 1980, 10 pp.

Outlines specialized techniques and equipment for loading, transporting, and unloading juvenile American shad.

(Copies available from the U.S. Fish and Wildlife Service, Lamar)

KEEPING YOUR CATCH ALIVE

Schramm, Harold L., Jr. Florida Cooperative Extension Service, IFAS Circular 691, [n.d.], 7 pp.

Provides information for keeping largemouth bass alive during transport. Information may be applied to other warmwater species.

(Copies available from University of Florida)

TRANSPORT OF FISH AND CRUSTACEANS IN SEALED CONTAINERS

Johnson, S. K. Texas Agricultural Extension Service Report No. A1504, 1988, 6 pp.

Reviews changes in oxygen, carbon dioxide, ammonia, pH, and bacterial numbers in water during transport. Discusses fish changes, additives, loading rates, and novel approaches in sealed container transport.

(Copies available from S. K. Johnson)

WET TRANSPORT OF MATURE MARINE SHRIMP IN SEALED CONTAINERS

Johnson, S. K. and Cichra, Charles E. Texas Agricultural Extension Service, Fish Disease Diagnostic Laboratory Report No. FDDL-S14, June 1984, 4 pp.

Studies shrimp transport in minimal water conditions.

(Copies available from S. K. Johnson)

PART III: OTHER TYPES OF PUBLICATIONS

BIBLIOGRAPHIES

ANNOTATED BIBLIOGRAPHY OF THE DISEASES AND PARASITES OF STRIPED BASS

McAllister, Kathleen W.; Mann, Joyce A.; and McKenzie, Lora C. U.S. Fish and Wildlife Service, Fish Disease Leaflet 76, 1987, 16 pp.

This bibliography provides information on infectious and noninfectious diseases of striped bass; includes a subject index.

(Copies available from U.S. Fish and Wildlife Service, Kearneysville)

AQUACULTURE AUDIO-VISUAL FILMS CATALOG

Emery, Lee. American Fisheries Society and U.S. Fish and Wildlife Service, 1982, 17 pp.

Provides title, format, length, source, year, rental price, and a short synopsis for various types of films, videos, and slide/tape sets. Includes primarily marine and freshwater fish culture with some information on shellfish, octopus, turtles, seaweeds and plankton.

(Copies available from American Fisheries Society)

AQUACULTURE BIBLIOGRAPHY FOR AMERICAN INSULAR AREAS OF THE PACIFIC

Wang, Jaw-Kai and Koba, Sally H. College of Tropical Agriculture and Human Resources, Information Text Series 032, [1988], 37 pp.

Publications are listed and cross-indexed under 11 geographical areas, 16 species areas, and 13 fields of study.

(Copies available from Hawaii Agricultural Experiment Station)

AQUACULTURE IN THE CARIBBEAN BASIN: A BIBLIOGRAPHY

Hanfman, Deborah T.; Tibbitt, Steven; Watts, Carol; [et al.].
United States Department of Agriculture, National Agricultural
Library, BLA Number 71, September 1988, 71 pp.

Contains selected citations from 1970 to 1988 with a subject
index to common aquaculture terms. Online databases accessed
were AGRICOLA, Aquatic Sciences and Fisheries Abstracts, and
AQUACULTURE.

(Copies available from U.S. Department of Agriculture, National
Agricultural Library)

A BIBLIOGRAPHY OF IMPORTANT TILAPIAS (PISCES: CICHLIDAE) FOR AQUACULTURE

Schoenen, Peter. ICLARM Bibliographies 3, Supplement 1, 1984,
191 pp.

Provides bibliography, subject index, and geographic index on
Oreochromis (Nyasalapia) macrochir, *O. aureus*, *O. hornorum*,
O. mossambicus, *O. niloticus*, *Sarotherodon galilaeus*, *Tilapia
rendalli*, and *Tilapia zillii*.

(Copies available from International Specialized Book Services,
Inc.)

A BIBLIOGRAPHY OF IMPORTANT TILAPIAS (PISCES: CICHLIDAE) FOR AQUACULTURE

Schoenen, Peter. ICLARM Bibliographies 6, 1985, 99 pp.

Provides bibliography, subject index, and geographic index on
Oreochromis variabilis, *O. andersonii*, *O. esculentus*, *O.
leucostictus*, *O. mortimeri*, *O. spilurus niger*, *Sarotherodon
melanotheron* and *Tilapia sparmanii*.

(Copies available from International Specialized Book Services,
Inc.)

BIBLIOGRAPHY OF PUBLICATIONS OF THE NATIONAL FISHERIES RESEARCH CENTER-LEETOWN 1981-1985

McKenzie, Lora C.; Catrow, Violet J.; and Mann, Joyce A. U.S. Fish and Wildlife Service, Biological Report 87(5), September 1987, 33 pp.

Includes all publications produced by National Fisheries Research Center-Leetown between 1981 and 1985. Publications are grouped as follows: aquatic plants and their control; culture and propagation; physiology, genetics, and behavior; parasites and diseases; pollution and toxicology; and research and management.

(Copies available from U.S. Fish and Wildlife Service, Kearneysville)

A BIBLIOGRAPHY OF THE GIANT CLAMS (BIVALVIA: TRIDACNIDAE)

Munro, J. L. and Nash, W. J. International Center for Living Aquatic Resources Management, Bibliographies 5, 1985, 26 pp.

A bibliography of scientific papers and reports on the biology, ecology, exploitation, and culture of the giant clams. A subject index is included.

(Copies available from International Specialized Book Services, Inc.)

A BIBLIOGRAPHY ON ATLANTIC SALMON (SALMO SALAR)

Brown, Bruce A. Lamar Fish Technology Center, Information Leaflet 88-11, February 1988, 34 pp.

Approximately 350 citations on the subject of the Atlantic salmon.

(Copies available from U.S. Fish and Wildlife Service, Lamar)

MARINE SHRIMP FARMING IN THE WESTERN HEMISPHERE

Hanspon, Joe A.; Huguenin, John E.; Hugenin, Suzanne S.; [et al.]. Woods Hole Oceanographic Institute, WHOI-77-69, 1977, 43 pp.

This bibliography contains a subject index of selected shrimp references. An author index makes the bibliography even more useful. A resource for finding some of the earlier literature for this subject area.

(Copy available on loan from National Sea Grant Depository)

QUICK BIBLIOGRAPHY SERIES

U.S. Department of Agriculture, National Agricultural Library.

Bibliographies derived from computerized online searches of the AGRICOLA database in the field of agriculture. Several titles are available on specific subjects or species in aquaculture.

(Copies available from U.S. Department of Agriculture, National Agricultural Library)

REPORTS PUBLISHED BY THE AQUATIC PLANT CONTROL RESEARCH PROGRAM

U.S. Army Corps of Engineers, Waterways Experiment Station, December 1988.

Lists research publications from 1976 to present. Includes a broad range of topics related to plant identification, pathogens, and weed control.

(Copies available from U.S. Army Corps of Engineers, Waterways Experiment Station, CEWES-EV-I)

WALLEYE - SAUGER BIBLIOGRAPHY

Ebbers, Mark A.; Colby, Peter J.; and Lewis, Cheryl A.
Minnesota Department of Natural Resources, Investigation Report
No. 396, July 1988, 201 pp.

A comprehensive listing of technical and scientific publications on the subject of walleye and sauger. Pre-1900 and into early 1988. Includes a keyword index to access 3116 citations.

(Copies available from Minnesota Department of Natural Resources)

DIRECTORIES

AQUACULTURE: A GUIDE TO FEDERAL GOVERNMENT PROGRAMS

Joint Subcommittee on Aquaculture and Aquaculture Information Center, National Agricultural Library, November 1987, 34 pp.

Provides descriptions of each Federal Government agency with respect to its aquaculture activities and includes addresses and phone numbers.

(Copies available from U.S. Department of Agriculture, National Agricultural Library)

AQUACULTURE DEVELOPMENT IN CANADA: A GUIDE TO FEDERAL GOVERNMENT PROGRAMS

Director General, Strategic Policy and Planning Directorate, Department of Fisheries and Oceans, 1988, 83 pp.

Compendium of programs of the Federal Government that support the development of aquaculture in Canada. Part I focuses on programs of the Department of Fisheries and Oceans, and Part II focuses on other Federal departments and agencies. A total of 49 programs are covered.

(Copies available from Department of Fisheries and Oceans, Canada)

COUNTY AGENTS DIRECTORY

U.S. Department of Agriculture, Extension Service. Published by Century Communications Inc., 1988, 79 pp.

Contains listing of county agents, home economists, 4-H leaders, and government agencies.

(Copies available from Century Communications)

DIRECTORY OF AQUACULTURE INFORMATION RESOURCES

U.S. Department of Agriculture, National Agricultural Library,
BLA-25, December 1982, 53 pp.

List of libraries and information centers with special
collections and information on aquaculture.

(Copies available from National Technical Information Service)

MAJOR AQUACULTURE ASSOCIATIONS, EDUCATION AND RESEARCH RESOURCES IN THE UNITED STATES

U.S. Department of Agriculture, National Agricultural Library,
BLA-26, June 1983, 174 pp.

Identifies major educational and technical assistance
organizations and associations working with aquaculture in
the United States.

(Copies available from National Technical Information Service)

NATIONAL AQUACULTURE INFORMATION DIRECTORY, 1986

Ayers, James W. National Marine Fisheries Service, NOAA,
December 1986, 221 pp.

Private operations are listed by State and information given
includes address and aquaculture subject or species area.

(Copies available from National Technical Information Service)

THE NORTH AMERICAN DIRECTORY OF AQUACULTURE

Gordon, Kevin. Kevgor Aquasystems, October 1988, 253 pp.

Includes list of over 4,000 fish producers, equipment
suppliers, governmental agencies, aquaculture associations,
and consulting firms on the North American Continent.

(Copies available from Kevgor Aquasystems)

SELECTED BOOKS

AQUACULTURE: THE FARMING AND HUSBANDRY OF FRESHWATER AND MARINE ORGANISMS

Bardach, John E.; Ryther, John H.; and McLarney, William O.
John Wiley and Sons, New York, 1972, 868 pp.

Comprehensive coverage giving overview of present and past practices of aquaculture over the world, restricting coverage to food species. Begins with general principals and economics and then discusses individual species.

(For information on availability contact your local public or university library)

THE BIOLOGY AND CULTURE OF TILAPIAS

Pullin, R. S. V. and Lowe-McConnell R. H., Eds. International Center for Living Aquatic Resources Management, MCC P.O. Box 1501, Makati, Metro Manila, Philippines, 1982, reprinted 1983, 432 pp.

Proceedings of the International Conference on the Biology and Culture of Tilapias, 2-5 September 1980, at the Study and Conference Center of the Rockefeller Foundation, Bellagio, Italy, sponsored by the International Center for Living Aquatic Resources Management, Manila. Areas discussed: taxonomy and speciation, ecology, evolutionary history, environmental physiology, reproduction, feeding and growth, pond culture, cage culture, diseases, genetics, and hybridization.

(For information on availability contact your local public or university library)

CRC HANDBOOK OF MARICULTURE: VOL I CRUSTACEAN AQUACULTURE

McVey, James P. and Moore, J. Robert, Eds. CRC Press, Inc., 2000 Corporate Blvd., N.W., Boca Raton, FL 33431, 1983, 442 pp.

Discusses techniques in use (1982) for the culture of commercially important crustaceans. Covers penaeid species, *Macrobrachium* sp. and lobster culture.

(For information on availability contact your local public or university library)

CRC HANDBOOK OF MICROALGAL MASS CULTURE

Richmond, Amos, Ed. CRC Press, Inc., 2000 Corporate Blvd., N.W., Boca Raton, FL 33431, 1986, 528 pp.

Provides comprehensive coverage of most aspects of the mass production of microalgae. Includes cultivation techniques, biology of microalgae, environmental requirements, and economic aspects of algal production.

(For information on availability contact your local public or university library)

CULTURE OF NONSALMONID FRESHWATER FISHES

Stickney, Robert R. CRC Press, Inc., 2000 Corporate Blvd., N.W., Boca Raton, FL 33431, 1986, 201 pp.

This publication covers channel catfish, carp and buffalo, tilapia, centrarchids, Northern pike and muskellunge, yellow perch, walleye, striped bass and striped bass hybrids and baitfish. The first chapter also covers types of culture systems, water quality, nutrition, genetics and breeding and recordkeeping.

(For information on availability contact your local public or university library)

FISH HATCHERY MANAGEMENT

Piper, Robert G.; McElwain, Ivan B.; Orme, Leo E.; [et al.]. United States Department of the Interior, Fish and Wildlife Service, Washington, D.C., 1982, 517 pp.

This book covers in detail: water quality requirements, hatchery design, production methods, management, recordkeeping, broodstock management, spawning, egg handling, nutrition and feeding, fish health management, and transportation with section bibliographies.

(For information on availability contact your local public or university library)

A GUIDE TO INTEGRATED WARM WATER AQUACULTURE

Littel, David and Muir, James. Institute of Aquaculture, University of Stirling, Stirling FK94LA, Scotland, 1987, 238 pp.

Describes the principles of integrated aquaculture concentrating on tropical aquaculture and pond systems. Discussion begins with environment of fish production in a waste-fed pond and then integrates this with the farming systems.

(For information on availability contact your local public or university library)

HANDBOOK OF CULTURE OF ABALONE AND OTHER MARINE GASTROPODS

Hahn, Kirk O. CRC Press, Inc., 2000 Corporate Blvd., N.W. Boca Raton, Florida 33431, 1989, 348 pp.

This is a basic textbook on the biology and culture of abalone. Details are given on the cultivation of specific species of abalone and specific farming projects.

(For information on availability contact your local public or university library)

HOW TO KNOW THE AQUATIC PLANTS

Prescott, G. W. Wm. C. Brown Company Publishers, 2460 Kerper Blvd. Dubuque, IA 52001, 1980, 158 pp.

Includes a key to the genera of aquatic plants, habitat information, and useful illustrations. Discusses the importance and uses of aquatic plants.

(For information on availability contact your local public or university library)

INTENSIVE FISH FARMING

Shepherd, C. Jonathan and Bromage, Niall R., Eds. BSP Professional Books, Oxford OX2 0EL, United Kingdom, 1988, 404 pp.

Discusses fish farming techniques and history. Includes propagation and stock improvement, nutrition, diseases, and polyculture. Includes information on fish culture in Israel, Japan, and the United States. Addresses commercial development and future prospects. Appendices contain a case study of salmon farming as well as aquaculture journals and related publications, scientific and common names of farmed fish, a glossary, and conversion factors.

(For information on availability contact your local public or university library)

MARKETING IN FISHERIES AND AQUACULTURE

Chaston, Ian. Fishing News Books Ltd., 1 Long Garden Walk, Farnham, Surrey, England, 1983, reprinted 1987, 144 pp.

Focuses on the philosophy and means of market need identification and analysis. Uses this information for product positioning, new product opportunities, and the development of marketing strategies.

(For information on availability contact your local public or university library)

PRINCIPLES AND PRACTICES OF POND AQUACULTURE

Lannan, James E.; Smitherman, R. Oneal; and Tchobanoglous, George. Oregon State University Press, 101 Waldo Hall, Corvallis, Oregon 97331, 1986, 252 pp.

Authors address the nature of the variation observed in pond production and the economic efficiency of pond culture systems. Areas covered are: bacteria and nutrient cycling, sediment and benthos, phytoplankton and macrophytes, zooplankton, fish, fertility and chemical factors, feeds and feeding in ponds, water quality management, diseases, pests, predators and modeling of pond culture systems.

(For information on availability contact your local public or university library)

RECENT ADVANCES IN AQUACULTURE

Muir, James F. and Roberts, Ronald J. Westview Press, 5500 Central Avenue, Boulder, CO 80301, 1982, 453 pp.

Discusses the significance of mangrove swamps, farming crustaceans in Western temperate regions, biology and culture of snakeheads, nutrition of carp, intensive culture of tilapia, and recirculated water systems.

(For information on availability contact your local public or university library)

SALMON FARMING HANDBOOK

Sedgwick, J. D. Fishing News Books Ltd., 1 Long Garden Walk, Farnham, Surrey, England, 1988, 208 pp.

A comprehensive handbook for the fish farmer on the biology and culture of salmon. Details are given on freshwater and seawater farming with specific projects mentioned. Useful tables and illustrations are included throughout.

(For information on availability contact your local public or university library)

TILAPIA: A GUIDE TO THEIR BIOLOGY AND CULTURE IN AFRICA

Balarin, J. D. and Hatton, J. P. University of Sterling,
Sterling, Scotland, 1979, 174 pp.

This text is useful as general background on the biology and culture of tilapia but is also written for the fish farmer. Details are given on biology, nutrition, water requirements, and culture techniques.

(For information on availability contact your local public or university library)

SELECTED PERIODICALS AND NEWSLETTERS

ALASKA MARICULTURE REPORT

Published monthly by the Alaska Mariculture Association. Free to AMA members. Nonmembers \$20.00, domestic and Canada; foreign \$25.00. Available from Alaska Mariculture Association, 130 Seward St., Suite 201, Juneau, AK 99801. (907) 463-3600

AMERICAN FISHERIES SOCIETY (SOUTHERN DIVISION) NEWSLETTER

Published monthly by the American Fisheries Society (Southern Division). Available from Michael J. Branch, Editor, 106 Cheatham Hall, Virginia Polytechnic Institute and State University, Blacksburg, VA 24061.

AQUACULTURE

Published four issues per volume with volumes 76-83 appearing in 1989. Subscriptions approx. U.S.\$925.00 from Elsevier Science Publishers B.V., Journals Department, P.O. Box 211, 1000 AE Amsterdam, The Netherlands. Ph: 5803-911

AQUACULTURE AND FISHERIES - DEVELOPMENT IN THE WESTERN PACIFIC

Published by Guam Cooperative Extension, College of Agriculture and Life Sciences, University of Guam. Available from the Editors at University of Guam, UOG Station, Mangilao, GU 96923.

AQUACULTURE DIGEST - A MONTHLY REPORT ON MARINE FISH AND SHELLFISH FARMING

Published monthly by Editor/Publisher Bob Rosenberry, 9434 Kearny Mesa Road, San Diego, CA 92126. (619) 271-0133

AQUACULTURE MAGAZINE

Published bimonthly by Achill River Corporation. Subscriptions are \$15.00 U.S. and \$19.00 foreign annually; single copy is \$4.00; the Annual Buyer's Guide is \$12.00. Available from AQUACULTURE MAGAZINE, P.O. Box 2329, Asheville, NC 28802. (704) 254-7334

AQUACULTURE TODAY

Published four times yearly by AQUACULTURE TODAY.
Subscriptions are \$10.00 annually (single copies \$2.50).
Available from AQUACULTURE TODAY, 831 Helmcken St., Vancouver,
BC, V6Z 1B1. (604) 682-8347

AQUAFARM LETTER

Published weekly, February through November. Subscriptions are
\$85.00 annually U.S.; foreign rates \$150.00 annually.
Available from AQUAFARM LETTER, Box 14260, Benjamin Franklin
Station, Washington, DC 20044.

AQUANOTES

Published quarterly by Louisiana Sea Grant, Louisiana State
University, Center for Wetland Resources, Baton Rouge,
LA 70803-7507.

AQUATIC PLANT CONTROL RESEARCH PROGRAM INFORMATION EXCHANGE BULLETIN

Published on an irregular basis by the Waterways Experiment
Station. Free copies available from U.S. Army Corps of
Engineers, Waterways Experiment Station, ATTN: J. L. Decell,
P.O. Box 631, Vicksburg, MS 39181-0631.

AQUATIC PLANT NEWS

Published for members of the Aquatic Plant Management Society.
Available from Aquatic Plant Management Society, Inc.,
P.O. Box 16, Vicksburg, MS 39180.

AUSTASIA AQUACULTURE MAGAZINE

Published monthly on topics of aquaculture in Australia, South
East Asia, and Oceanica. Subscriptions: A\$42.00 in Australia
and A\$50.00 surface delivery to U.S.A. Available from AustAsia
Aquaculture, P.O. Box 1275, East Victoria Park, Western
Australia, 6101. Ph: (09) 361-6600

CALIFORNIA AQUACULTURE

A California Sea Grant College Program newsletter available from
Aquaculture Extension, University of California, Davis,
CA 95616.

THE CATFISH JOURNAL

Published monthly by Catfish Farmers of America for the membership. For information write THE CATFISH JOURNAL, P.O. Box 34, 550 High St., Suite 1602, Jackson, MS 39205.

CATFISH NEWS (with AQUACULTURE NEWS as insert)

Published monthly by Aquacom Inc. Subscriptions are available annually for \$20.00 from Aquacom Inc., P.O. Box 4566, Jackson, MS 39216. (601) 352-9035

COMMERCIAL FISHING

Includes articles related to the aquaculture industry. Subscriptions NZ\$27.50 for New Zealand, overseas rates NZ\$40.00 surface and NZ\$65.00 air mail. Available from Trade Publications Ltd. 13 Cheshire St. P.O. Box 37-549, Parnell, Auckland, 1033, New Zealand.

COUNTY AGENTS DIRECTORY

Published regularly for use by the USDA Extension Service county agents, home economists, 4-H leaders, and Government agencies. For information contact Century Communications Inc., 6201 Howard St., Niles, IL 60648. (312) 647-1200

FARM POND HARVEST

Published four times annually. \$10.00 per year and \$19.00 for 2 years United States. Foreign subscriptions are \$12.00 for 1 year and \$23.00 for 2 years. Available from FARM POND HARVEST, R.R. 3, Box 197, Momence, IL 60954.

FISH FARMER

Published bimonthly by Amber Publications. U.K. subscriptions £25 per year, other countries £35. Subscriptions available from Quadrant Subscription Services, Ltd., Oakfield House, Perrymount Road, Haywards Heath, Sussex RH163DH, England.
Ph: (0444) 440421

FISH HEALTH NEWS

Published quarterly by Superintendent of Documents, U.S. Government Printing Office. Available from National Fish Health Research Laboratory, Box 700, Kearneysville, WV 25430

FISHERIES: A BULLETIN OF THE AMERICAN FISHERIES SOCIETY

Published bimonthly by the American Fisheries Society, Editor, 5410 Grosvnor Lane, Bethesda, MD 20814. (301) 897-8616

JOURNAL OF THE WORLD AQUACULTURE SOCIETY

Published quarterly by the World Aquaculture Society. Library subscriptions \$75.00 per volume in the United States and \$81.00 to \$96.00 for other countries. Available from the World Aquaculture Society, 16 E. Fraternity Lane, Louisiana State University, Baton Rouge, LA 70803.

KENTUCKY FISH FARMING NEWSLETTER

Published regularly for use by Kentuckians interested in improving commercial, home-use, or recreation fish production and pond management. For information contact the Cooperative Extension Program and Community Research Service, Kentucky State University, Frankfort, KY 40601.

MARYLAND AQUAFARMER

Published by the University of Maryland Cooperative Extension Service. Available from Talbot County Office, 125 Bay Street, P.O. Box 519, Easton, MD 21601. (301) 822-1166

NATIONAL SHELLFISHERIES ASSOCIATION NEWSLETTER

Published quarterly for its members by the National Shellfisheries Association. For information contact Edwin Rhodes, National Marine Fisheries Service, 212 Rogers Avenue, Milford, CT 06460.

OCEANIC INSTITUTE NEWSLINE

Published monthly by the Oceanic Institute. For further information contact the editor Ellen Antill, Oceanic Institute, Makapuu Point, P.O. Box 25280, Honolulu, HI 96825. (808) 259-7951

PRACTICAL AQUACULTURE AND LAKE MANAGEMENT

Published bimonthly by the Aquaculture Advisory Service (AAS). Subscriptions are available annually for \$18.00 from Aquaculture Advisory Service, P.O. Box 1294, Garner, NC 27529-1294. (919) 772-8548

PROGRESSIVE FISH CULTURIST

Published quarterly by the American Fisheries Society. Subscription rates \$19.00 per volume and \$26.00 outside the United States. Available from American Fisheries Society, 5410 Grosvenor Lane, Suite 110, Bethesda, MD 20814.

SALMONID

The Official Journal of the United States Trout Farmers Association. Published quarterly by SALMONID, 515 Rock St., Little Rock, AR 72202. (501) 372-3595

SEA GRANT ABSTRACTS

Published quarterly by the National Sea Grant Depository. Copies are available (while supplies last) for \$2.00 each from Sea Grant Abstracts, P.O. Box 125, Woods Hole, MA 02543.

WORLD AQUACULTURE

Published quarterly by the World Aquaculture Society. Subscription rates are \$30.00 annually in the U.S. and \$35.00 outside the U.S. For further information contact the Editor, World Aquaculture, Biological Station, St. Andrews, NB, E0G 2X0 Canada. (506) 529-8854

WORLD AQUACULTURE SOCIETY NEWSLETTER

Published quarterly by the World Aquaculture Society for its members. For availability contact The World Aquaculture Society, Newsletter, 16 E. Fraternity Lane, Louisiana State University, Baton Rouge, LA 70803.

STATE AND REGIONAL PUBLICATIONS

ALASKA

PROCEEDINGS OF THE FOURTH ALASKA AQUACULTURE CONFERENCE

Keller, Sue, Ed. University of Alaska Sea Grant Report No. 88-4, Sept. 1988, 236 pp.

This book discusses Alaska's concerns with aquaculture for profit in the areas of seaweeds, shellfish and finfish, and comprehensive coverage on aspects of salmonid aquaculture. Also included is a section on business financing and aquaculture permitting.

(Copies available from University of Alaska)

FLORIDA

STATUS AND FUTURE OF FOOD FISH PRODUCTION IN FLORIDA

Florida State Extension Service, [n.d.], 3 pp.

Briefly covers catfish, tilapia, crawfish, Macrobrachium, redfish, and hybrid striped bass.

(Copies available from University of Florida)

HAWAII

COMMERCIAL AQUACULTURE IN HAWAII, 1986

Main, Kevan L. and Deupree, Robert H., Jr. College of Tropical Agriculture and Human Resources, Information Text Series 031, [n.d.], 24 pp.

This report is the result of a 1986 survey funded by the U.S. Department of Agriculture in the State of Hawaii from July through November 1986. Includes a table of species commercially cultured in Hawaii, distribution of commercial aquaculture farms, grouping of farms based on dominant species cultured, farms classified by level of management intensity and financial information.

(Copies available from Hawaii Agricultural Experiment Station)

ILLINOIS

THE ILLINOIS AQUACULTURE DEVELOPMENT PLAN

Aquaculture Research Committee, State of Illinois, Illinois Department of Agriculture, June 1987, Aquaculture Research and Priorities for Illinois, 9 pp.; and Guidelines for Aquaculture Permits and Licenses, 82 pp.

The first volume provides specific recommendations for developing aquaculture programs in Illinois. The second volume provides guidelines for legal access to water, facility operation, and disposal of waste.

(Copies available from Illinois Department of Agriculture)

THE ILLINOIS AQUACULTURE INDUSTRY: ITS STATUS AND POTENTIAL

Waite, Stephen W.; Kinnett, Bruce C.; and Roberts, Andrew J.
Illinois Department of Agriculture, May 1986, 197 pp.

Provides information on the government's role in aquaculture, marketing products, Illinois' resources, suitable species, economics, finances, and impact and potential of aquaculture in the State.

(In revision but copies available in the future from Illinois Department of Agriculture)

INDIANA

AQUACULTURE: A NEW INDUSTRY FOR ILLINOIS AND INDIANA

Waite, Stephen W. and Grossman, Margaret. Edited by Robin G. Goettel. Cooperative Extension Service, University of Illinois and Purdue University, IL-IN-SG-84-1, November 1984, 10 pp.

Discusses potential, production systems, legislation, and history of aquaculture.

(Copies available from University of Illinois)

MINNESOTA

AQUACULTURE COMMITTEE POSITION ON PHASE I AND II FEASIBILITY STUDY

Colt, John; Scales, Peter; and Westers, Harry. Minnesota Extension Service, Fish Factory Report No. 87/7-001F and No. 87/7-002F, March 1988, 91 pp.

Extensive assessment of aquaculture potential in Minnesota. Phase I recommends four species for commercial potential. Production cost and economic analysis are provided in Phase II.

(Copies available from Minnesota Aquaculture Advisory Committee)

SOUTH CAROLINA

AQUACULTURE IN SOUTH CAROLINA

Nussman, Michael. South Carolina Sea Grant Consortium, Working Paper Series, SC-SG-TR-84-01, March 1984, 42 pp.

Covers total resources (human, natural, institutional), the regulatory environment, the financial environment, production, marketing, processing, and a species overview.

(Copies available from South Carolina Sea Grant Consortium)

PART IV: CONTACTS IN AQUACULTURE

STATE AQUACULTURE AND FISH AND WILDLIFE SPECIALISTS

ALABAMA

Hemstreet, William
Fish Disease Specialist
Alabama Fish Farming Center
Highway 69N, P.O. Box 487
Greensboro, AL 36744
(205) 624-4016

Jensen, John W.
Fisheries Specialist
Alabama Coop. Ext. Service
Auburn University
Auburn, AL 36849
(205) 826-4786

Oakes, Perry L.
Agricultural Engineer
Alabama Fish Farming Center
Highway 69N, P.O. Box 487
Greensboro, AL 36744
(205) 624-4016

Whitis, Greg
Extension Aquaculturist
Alabama Fish Farming Center
Highway 69N, P.O. Box 487
Greensboro, AL 36744
(205) 624-4016

ALASKA

Kramer, Donald
University of Alaska
Marine Advisory Program
2221 East North Lights Blvd.
Anchorage, AK 99508
(907) 274-9691

Paust, Brian C.
Marine Advisory Agent
Alaska Marine Advisory Program
P.O. Box 1329
Petersburg, AK 99833
(907) 772-3381

ARIZONA

Stair, John
Extension Wildlife Specialist
University of Arizona, SRNR
325 Bio-Science East, Rm. 309
Tucson, AZ 85721
(602) 621-7269

ARKANSAS

Dorman, Larry W.
Extension Fisheries Specialist
P.O. Drawer D
Lonoke, AR 72086
(501) 676-3124 or 676-3125

Gray, D. Leroy
Extension Fisheries Specialist
University of Arkansas, CES
P.O. Box 3910
Little Rock, AR 72203
(501) 373-2637

Pennington, Van
Extension Fisheries Specialist
P.O. Box 230
McGhee, AR 71654
(501) 222-3972

Stone, Nathan
Extension Fisheries Specialist
University of Arkansas
P.O. Box 108
Pine Bluff, AR 71601
(501) 541-6686

CALIFORNIA

Conte, Fred S.
Aquaculture Specialist
Aquaculture Extension
University of California
Davis, CA 95616
(916) 752-7490

Deweese, Christopher M.
Marine Fisheries Specialist
Extension Sea Grant
University of California
Davis, CA 95616
(916) 752-1497

Giusti, Greg
Farm Advisor
981 H Street
Crescent City, CA 95531
(707) 464-4711

Richards, John B.
Marine Advisor
377 Storke Road
Goleta, CA 93117
(805) 968-2149

Waldvogel, Jim
Marine Advisor
981 H. Street
Crescent City, CA 95531
(707) 464-4711

Wyatt, Bruce
Area Marine Advisor
2604 Ventura Ave., Rm. 100-P
Santa Rosa, CA 95403-2894

CANADA

Whistance-Smith, Laurel
Extension Development Supervisor
Ontario Ministry of Natural Resources
Wildlife Branch
99 Wellesley St. W., Rm. 4620
Toronto, Ontario, Canada M7A 1W3
(416) 965-4252

COLORADO

Andelt, William R.
Extension Wildlife Specialist, ADC
Dept. of Fishery and Wildlife Biology
109 Wager Building
Colorado State University
Fort Collins, CO 80523
(303) 491-7093

Fetherman, Sheri (WR)
Education Specialist
U.S. Fish and Wildlife Service
P.O. Box 25486, DFC
Denver, CO 80225
(303) 776-8150

DELAWARE

Ewart, John
College of Marine Studies
University of Delaware
Lewes, DE 19958
(302) 451-2505

FLORIDA

Adams, Chuck
Marine Economics Specialist
1170 McCarty Hall
University of Florida
Gainesville, FL 32611
(904) 392-1837

Cichra, Chuck
University of Florida
Dept. of Fisheries and Aquaculture
3922 N.W., 71st Street
Gainesville, FL 32611
(904) 392-9617

Clark, Marion L.
Sea Grant Extension Program
117 Newins-Zielglar Hall
University of Florida
Gainesville, FL 32611
(904) 392-1837

Floyd, Ruth Francis
University of Florida
Dept. of Fisheries and Aquaculture
3922 N.W., 71st Street
Gainesville, FL 32606
(904) 392-9617

Wellborn, Tom
Dept. of Fisheries and Aquaculture
Northwest Florida Aquaculture Farm
P.O. Box 434
Blountstown, FL 32424
(904) 674-3184

GEORGIA

Gasaway, Bob (FA)
Fishery Biologist
Div. of Federal Aid
U.S. Fish and Wildlife Serv.
Richard B. Russell Fed. Bldg.
Suite 1290, 75 Spring St., SW
Atlanta, GA 30303-3376
(404) 242-5446

Gilbert, Ronnie J.
Extension Fisheries, Aqua. and
Fisheries Dept. Coop.
Extension Service
University of Georgia
Athens, GA 30602
(404) 542-4239

Lewis, George W.
Head, Ext. Aquaculture and Fish
Dept., Coop. Ext. Service
University of Georgia
Athens, GA 30602
(404) 542-1924

Shelton, James E.
Extension Fisheries Spec.
Ext. Aqua. and Fisheries Dept.
Cooperative Extension Service
University of Georgia
Agricultural Exp. Station
Griffin, GA 30223-1797
(404) 228-7328

GUAM

Crisostomo, David P.
Extension Aquaculture Agent
College Ag. and Life Sciences
University of Guam Station
Mangilao, GU 96913
(671) 734-2421, Ext. 359

HAWAII

Rappa, Peter J.
Information Specialist
Sea Grant Extension
University of Hawaii
1000 Pope Road, MSB 205
Honolulu, HI 96822

Takata, Howard A.
Sea Grant Extension Agent
Cooperative Extension Service
875 Komohana Street
Hilo, HI 96720
(808) 959-9155

IDAHO

Brannon, Ernie
Director, Aquaculture Program
Fish and Wildlife Resources
University of Idaho
Moscow, ID 83843
(208) 885-5830

ILLINOIS

Espeseth, Robert D.
Coor. Illinois-Indiana
Sea Grant
Outdoor Recreation Spec.
1206 So. 4th Street
Champaign, IL 61821
(217) 244-3880

Fischer, Burney
Co-Coor., IL/IN SGP
Forestry Bldg., Purdue Univ.
West Lafayette, IN 47907
(317) 494-3584

IOWA

Morris, Joseph E.
Aquaculture Extension Specialist
Department of Animal Ecology
Iowa State University
Ames, IA 50011
(515) 294-4622

KENTUCKY

Masser, Michael
Extension Aquaculture Specialist
Box 196
Kentucky State University
Frankfort, KY 40601
(502) 564-6152

LOUISIANA

Avery, Jimmy
Assistant Area Agent
Franklin Parish Office
Courthouse Boulevard
Winsboro, LA 71295
(318) 435-7551

Coreil, Paul
Associate Area Agent
(Fisheries and Wildlife)
P.O. Drawer H
Cameron, LA 70631
(318) 775-5516 or 7443

Corken, Sandy L.
Marine Advisory Agent
Rm. 314, Courthouse
Franklin, LA 70538
(318) 828-4100, Ext. 300

de la Bretonne, Larry, Jr.
Assoc. Spec. (Aquaculture)
202A Knapp Hall, LSU and A & M
Baton Rouge, LA 70803-1900
(504) 388-2180

Horst, Jerald
Associate Area Agent (Fisheries)
Louisiana Coop. Ext. Service
1825 Bornie Ann Drive
Marrero, LA 70072
(504) 341-7271

Jensen, Gary L.
Assoc. Aquaculture Spec.
Louisiana Coop. Ext. Service
202G Knapp Hall
Baton Rouge, LA 70803
(504) 388-2180

Moody, Michael W.
Specialist (Seafood Tech.)
202D Knapp Hall, LSU and A & M
Baton Rouge, LA 70803-1900
(504) 388-2180

Roberts, Kenneth J.
Spec. Marine Resources Econ.
Knapp Hall, Louisiana State Univ.
Baton Rouge, LA 70803
(504) 388-2145

MAINE

Elliott, Catherine
Wildlife and Fisheries Spec.
234 Nutting Hall
University of Maine
Orono, ME 04469
(207) 581-2902

Griffin, Conrad
CD/Marine Specialist
9 Coburn Hall
University of Maine
Orono, ME 04469
(207) 581-3166 or 3181

Stewart, Hans (PAO)
U.S. Fish and Wildlife Service
One Gateway Center
Suite 700
Newton Corner, MA 02158
(617) 965-5100

MARYLAND

Harrell, Reginal
Fisheries Specialist
Horn Point Lab.
P.O. Box 775
Cambridge, MD 21613
(301) 228-8200

Hochheimer, John H.
Ext. Spec./Agriculture Engineer
University of Maryland H.P.E.L.
P.O. Box 775
Cambridge, MD 21613
(301) 228-8200, Ext. 274

Meritt, Donald
Aquaculture Specialist
University of Maryland H.P.E.L.
Box 775
Cambridge, MD 21613
(301) 822-5595

Webster, Don
Sea Grant Extension Program
125 Bay Street, POB 519
Easton, MD 21601
(301) 822-1166 or 1244

MASSACHUSETTS

Biagi, Robert
Extension Specialist
West Experiment Station
University of Massachusetts
Amherst, MA 01003
(413) 545-2049

Jacobsen, Stewart
Regional Marine Resource Specialist
University of Massachusetts - CES
562 Maple Street
Hathorn, MA 01937
(508) 777-8720/281-1930

Progulske, Donald R.
Extension Wildlife Specialist
Dept. of Forestry and Wildlife
Management
University of Massachusetts
Amherst, MA 01003
(413) 545-2757

MICHIGAN

Garling, Donald L.
Aquaculture and Fisheries Spec.
Fisheries and Wildlife Dept.
9 Natural Resources Bldg.
Michigan State University
East Lansing, MI 48824
(517) 355-7493

McCarty, Shari L.
4-H Youth Specialist
Fisheries and Wildlife Dept.
9 Natural Resources Bldg.
Michigan State University
East Lansing, MI 48824
(517) 355-7493

McKinney, John C.
District Ext. Sea Grant Agent
400 Boardman Avenue
Traverse City, MI 49685
(616) 922-4620

Peterson, Jon
Extension Sea Grant Agent
P.O. Box 599
Tawas City, MI 48764
(517) 362-3449

Pistis, Charles
District Ext. Sea Grant Agent
101 Ottawa County Bldg.
Grand Haven, MI 49417
(616) 846-8250

Steward, Stephen R.
District Ext. Sea Grant Agent
Cooperative Ext. Service
Macomb County Building
Mt. Clemens, MI 48043
(313) 469-5180

MINNESOTA

Baken, Dale R.
Director MN Sea Grant Ext. Prg.
208 Washburn Hall
University of Minnesota
Duluth, MN 55812
(218) 726-8106

Gunderson, Jeffrey L.
Fisheries Agent
MN Sea Grant Ext. Prg.
208 Washburn Hall
University of Minnesota
Duluth, MN 55812
(218) 726-8106

Kapuscinski, Anne R.
Asst. Prof. of Fisheries and
Extension Specialist
University of Minnesota
Dept. of Fish and Wildlife
200 Madison Hall
St. Paul, MN 55108
(612) 624-2720

Landkamer, David
Aquaculture Specialist
Fisheries and Wildlife
130 Hudson Hall
1420 Eckles Avenue
St. Paul, MN 55108
(612) 624-2720

Schultz, Rick
U.S. Fish and Wildlife Service
Federal Building, Fort Snelling
Twin Cities, MN 55111
(612) 725-3563

MISSISSIPPI

Brunson, Marty
State Extension Fisheries Specialist
P.O. Box 5446
Mississippi State University
Mississippi State, MS 39762
(601) 325-3174

Crosby, M. David
Area Ext. Fisheries Specialist
P.O. Box 142
Stoneville, MS 38776
(601) 686-9311

Durborow, Robert M.
Area Ext. Fisheries Specialist
P.O. Box 142
Stoneville, MS 38776
(601) 686-9311

Martin, Robert
Extension Economist
Mississippi Coop. Ext. Service
P.O. Box 5446
Mississippi State, MS 39762
(601) 325-3174

Taylor, Peter W.
Area Ext. Fisheries Specialist
P.O. Box 631
Belzoni, MS 39038
(601) 247-2917

NEBRASKA

Johnson, Ron J.
Extension Wildlife Spec.
202 Natural Resources Hall
University of Nebraska
Lincoln, NE 68583-0819
(402) 472-6823

NEVADA

Klebenow, Donald A.
Professor
Renewable Natural Resources
University of Nevada
1000 Valley Road
Reno, NV 89557
(702) 784-4057

NEW HAMPSHIRE

Kantor, John
Extension Wildlife Spec.
Cooperative Ext. Service
110 Pettee Hall
University of New Hampshire
Durham, NH 03824
(603) 862-1065

Doyle, Brian
Program Leader
Sea Grant Extension Service
NEC Admin. Bldg.
University of New Hampshire
Durham, NH 03824
(603) 862-3460

NEW JERSEY

Flimlin, Gef
Marine Extension Agent
NJ Sea Grant Ext. Service
1623 Whitesville Road
Toms River, NJ 98753
(201) 349-1210

Tweed, Stewart M.
Marine Extension Agent
Cape May County Ext. Service
Dennisville Road, Rt. 657
Cape May Court House, NJ 08753
(605) 465-5115

NEW MEXICO

Fletcher, April (WR)
U.S. Fish and Wildlife Service
P.O. Box 1306
500 Gold Avenue, SW, Rm. 1306
Albuquerque, NM 87103
(505) 766-2321

NEW YORK

Buttner, Joe
Aquatic Ecology Section
Dept. of Biological Sciences
SUNY Brockport
Brockport, NY 14420

Voiland, Michael P.
Sea Grant Prog. Leader
Dept. of Natural Resources
12 Fernow Hall
Cornell University
Ithaca, NY 14853
(607) 255-2167

NORTH CAROLINA

Hinshaw, Jeffery M.
Extension Fisheries Spec.
2016 Fanning Bridge Road
Fletcher, NC 28732-9628
(704) 684-3562

Hobson, Ronald G.
Assoc. Director of Sea Grant
College Program
N.C. State University
Box 8605
Raleigh, NC 27695-8605
(919) 737-2454

Losordo, Tom
Extension Aquaculture Spec.
N.C. State Univ., Box 7617
Raleigh, NC 27695-7617
(919) 737-2741

Murray, Jim
Director, Marine Advisory
UNC Sea Grant Program
N.C. State Univ., Box 8605
Raleigh, NC 27607
(919) 737-2454

Rice, James A.
Extension Fisheries Spec.
N.C. State University
Box 7617
Raleigh, NC 27695-7617
(919) 737-2741

OHIO

Stockdale, Thomas M.
Extension Wildlife Spec.
375-C Kottman Hall
Ohio State University
Columbus, OH 43210
(614) 422-1981

OKLAHOMA

Beem, Marley
Area Aquaculture Spec.
Oklahoma State University
P.O. Box 1378
Ada, OK 74820
(405) 332-4100

Gebhart, Glen
Aquaculture Project Leader
P.O. Box 730
Langston University
Langston, OK 73050
(405) 466-3836

OREGON

Richmond, Merle (FA)
U.S. Fish and Wildlife Service
500 N.E. Multhomah St.
Suite 1692
Portland, OR 97232
(503) 231-6118

Wick, W. Q.
Director, Sea Grant College Prog.
Ads. 320
Oregon State University
Corvallis, OR 97331
(503) 754-2714

PENNSYLVANIA

Brittingham, Margaret C.
Assistant Professor
Extension Wildlife Specialist
111B Ferguson Building
Pennsylvania State Univ.
University, PA 16802
(814) 863-0401

PUERTO RICO

Arias, Santiago
Agricultural Agent i/c Aquaculture
Agricultural Extension Service
Building C - College Station
Mayaguez, PR 00708
(809) 834-4040, Ext. 3066

SOUTH CAROLINA

Schwedler, Thomas E., Ext.
Fisheries/Aquaculture Spec.
Room 102, Long Hall
Clemson University
Clemson, SC 29631
(803) 656-3117

Whetstone, Jack
Marine Extension Spec.
P.O. Drawer 1100
Clemson Extension
Georgetown, SC 29442-4481
(803) 546-4481

TENNESSEE

Hill, Thomas K.
Associate Professor
Dept. of Forestry, W and F
University of Tennessee
Knoxville, TN 37901
(615) 974-7230

TEXAS

Chamberlain, George
Assoc. Aqua. Specialist
Texas A & M Center
Rt. 2, Box 589
Corpus Cristi, TX 78410
(512) 265-9203

Davis, James T.
Fisheries Specialist
102 Nagle Hall, Texas A & M
College Station, TX 77843
(409) 845-7473

Haby, Michael G.
Seafood Marketing Specialist
P.O. Box 158
Port Aransas, TX 78373

Higginbotham, Billy
Fisheries Specialist
P.O. Box 38
Overton, TX 75684
(214) 834-6191

Johnson, S. K.
Fish Disease Specialist
Nagle Hall, Texas A & M
College Station, TX 77843
(409) 845-7473

Klussman, Wallace G.
Professor and Ext. Spec.
Dept. of W&F Science
Texas A & M University
College Station, TX 77843
(409) 845-7471

Lock, Joe T.
Extension Fisheries Spec.
P.O. Box 38
Overton, TX 75684
(214) 834-6191

Midget, Russell J.
Ext. Marine Fisheries Spec.
P.O. Box 158
Port Aransas, TX 78373

Steinbach, Don
Project Supervisor W&F
Nagle Hall, Room 110
Texas A & M Univ.
College Station, TX 77843
(409) 845-7471

Treece, Granvil D.
Mariculture Specialist
442 Kleberg Center
College Station, TX 77843

UTAH

Workman, Gar W.
Wildlife Extension Spec.
Dept. of Fisheries and
Wildlife UMC 5210
Utah State University
Logan, UT 84322-5210

VERMONT

Marek, Linda
Water Resources Specialist
University of Vermont
Aiken Center
Burlington, VT 05405-0088
(802) 656-3258

VIRGINIA

Helfrich, Louis A.
Fisheries Ext. Specialist
152 Cheatham Hall
Virginia Polytechnic Institute and State University
Blacksburg, VA 24061
(703) 961-5059

Nerrie, Brian L.
Extension Aquaculture Specialist
Virginia State University
Box 540
Petersburg, VA 23803
(804) 525-5903

Osterling, Michael J.
Commercial Fisheries Spec.
Marine Advisory Services
VA Institute of Marine Sci.
Gloucester Point, VA 23062
(804) 642-7165

VIRGIN ISLANDS

Knausenberger, Walter I.
Program Leader, Natural Resources
Virgin Islands Coop. Ext. Service
University Virgin Islands
Rt. 2, Box 10,000
Kinghill, VI 00850

WASHINGTON

Harbell, Steve
Marine Field Agent
Grays Harbor Courthouse
Box 552
Montesano, WA 98563
(206) 249-4332

Nosho, Terry
Aquaculture Specialist
Washington Sea Grant
3716 Brooklyn Ave., NE
Seattle, WA 98105
(206) 543-6600

Spranger, Michael
Prog. Ldr. for Marine Advisory
Washington Sea Grant
3716 Brooklyn Avenue NE
Seattle, WA 98105
(206) 543-6600

WASHINGTON, D.C.

MacDonald, Duncan
U.S. Fish and Wildlife Service
Office of Extension and Publications
Arlington Square Mailstop 725
18th and C Streets, N.W.
Washington, DC 20240
(703) 358-1706

Meryl Broussard
National Program Leader
for Aquaculture
Extension Service
U.S. Department of Agriculture
Room 3871, South Building
Washington, DC 20250
(202) 447-5468

WEST VIRGINIA

Carpenter, Glen
1066 Ag. Sci. Bldg.
West Virginia Univ.
Morgantown, WV 26506
(304) 293-3629

Grafton, William N.
Ext. Wildlife Specialist
West Virginia Univ., POB 6125
Morgantown, WV 26506-6125
(304) 293-4797

National Fisheries Research Center - Leestown
Box 700
Kearneysville, WV 25430
(304) 725-8461

WISCONSIN

Craven, Scott R.
Ext. Wildlife Specialist
215 Russell Labs
University of Wisconsin
Madison, WI 53706
(608) 263-6325

WYOMING

Powell, Jeff
Range Livestock/Wildlife
Relations Ext. Spec.
University of Wyoming
Range Management Dept.
Laramie, WY 82071
(307) 766-5154

UNITED STATES AND CANADIAN
NATIONAL AQUACULTURE ASSOCIATIONS

UNITED STATES

AMERICAN ALLIGATOR FARMERS ASSOCIATION

Rt. 2, Box 884
Dover, FL 33527
Ph: 813-752-2836

AMERICAN FISH FARMERS FEDERATION

P.O. Drawer 290
Lonoke, AR 72086
Ph: 501-676-2716

AMERICAN FISHERIES SOCIETY

5410 Grosvenor Lane
Suite 110
Bethesda, MD 20814
Ph: 301-897-8616

ASSOCIATED KOI CLUBS OF AMERICA, INC.

c/o Mr. Stan Ranson
340 Mariposa Drive
Camarillo, CA 93010

CATFISH FARMERS OF AMERICA

P.O. Box 34
Jackson, MS 39205
Ph: 601-353-7916

INTERNATIONAL ASSOCIATION OF ASTACOLOGY

P.O. Box 44650
Univ. of Southwestern Louisiana
Lafayette, LA 70504-4650
Ph: 318-231-5239

NATIONAL FISHERIES INSTITUTE

2000 M Street, N.W.
Washington, DC 20036
Ph: 202-296-5090

NATIONAL ORNAMENTAL GOLDFISH GROWERS ASSOC.

6916 Black's Mill Road
Thurmont, MD 21788
Ph: 301-271-7475

NATIONAL SHELLFISHERIES ASSOCIATION
c/o Edwin Rhodes
National Marine Fisheries Service
212 Rogers Ave.
Milford, CT 06460
Ph: 203-783-4200

THE NATIONAL SOFT SHELL CRAWFISH ASSOC.
10985 N. Harrell's Ferry Road
Suite E
Baton Rouge, LA 70816
Ph: 504-275-1791

SHELLFISH FARMERS ASSOCIATION
480 River Prado Road
Ft. Pierce, FL 34946
Ph: 407-466-2013

SHELLFISH INSTITUTE OF NORTH AMERICA
Div. of National Fisheries Institute
2000 M Street, N.W., Suite 580
Washington, DC 20036
Ph: 202-296-5170

SPORT FISHING INSTITUTE
1010 Massachusetts Avenue, N.W.
Suite 100
Washington, DC 20001
Ph: 202-898-0770

STRIPED BASS AND HYBRID PRODUCERS ASSOC.
Dr. Ron Hodson
Univ. of North Carolina/Sea Grants
Box 8605
North Carolina State University
Raleigh, NC 27695-8605

UNITED STATES TROUT FARMERS ASSOC.
P.O. Box 220
Harper's Ferry, WV 25425
Ph: 304-876-6666

WORLD AQUACULTURE SOCIETY
16 E. Fraternity Lane
Louisiana State University
Baton Rouge, LA 70803
Ph: 504-388-3137

UNITED STATES REGIONAL
AND STATE AQUACULTURE ASSOCIATIONS

ALABAMA

ALABAMA CATFISH PRODUCERS
Division of Alabama Farmers
Federation (AFF)
P.O. Box 11000
Montgomery, AL 36198
Ph: 205-288-3900, Ext. 214

ALASKA

SOUTHERN SOUTHEAST REGIONAL
AQUACULTURE ASSOCIATION
1621 Tongass #103
Ketchikan, AK 99901
Ph: 907-225-9605

ARIZONA

ARIZONA AQUACULTURE ASSOC., INC.
P.O. Box 10431
Scottsdale, AZ 85271
Ph: 602-947-5970

ARKANSAS

CATFISH FARMERS OF ARKANSAS
Rt. 2, Box 185
Carlisle, AR 72024
Ph: 501-854-5187

CALIFORNIA

CALIFORNIA AQUACULTURE ASSOC.
P.O. Box 1004
Niland, CA 92257
Ph: 619-348-0547

FLORIDA

FLORIDA AQUACULTURE ASSOC.
P.O. Box 3989
Tallahassee, FL 32315
Ph: 904-962-2814
407-827-7256

FLORIDA AQUATIC PLANT MANAGEMENT
SOCIETY
210 Valencia Shores Drive
Winter Garden, FL 32787
Ph: 401-656-5838

FLORIDA TROPICAL FISH FARMS ASSOC.
P.O. Box 1519
Winter Haven, FL 33880
Ph: 813-293-5710

GEORGIA

GEORGIA AQUACULTURE ASSOC.
P.O. Box 5773
Athens, GA 30604
Ph: 912-892-3144

ILLINOIS

ILLINOIS AQUACULTURE INDUSTRY ASSOC.
P.O. Box 2901
17 Towanda Avenue
Bloomington, IL 61702
Ph: 309-557-3251

KANSAS

KANSAS COMMERCIAL FISH GROWERS' ASSOC.
Rt. 1
Strong City, KS 66869
Ph: 316-273-6612

LOUISIANA

LOUISIANA CATFISH FARMERS' ASSOC.
Rt. 1, Box 123
Gilbert, LA 71336
Ph: 318-724-6584

LOUISIANA CRAWFISH FARMERS' ASSOC.
P.O. Box 91544
Lafayette, LA 70509
Ph: 318-235-7072

LOUISIANA SOFT-SHELL CRAWFISH ASSOC.
33203 Hwy. 1019
Denham Springs, LA 70726
Ph: 504-665-7578

MAINE

MAINE AQUACULTURE ASSOC.
P.O. Box 535
Damariscotta, ME 04543
Ph: 207-563-8168

MICHIGAN

MICHIGAN FISH GROWERS ASSOC.
19465 200th Avenue
Big Rapids, MI 49307
Ph: 616-796-2284

MISSISSIPPI

CATFISH FARMERS OF MISSISSIPPI
P.O. Box 34
Jackson, MS 39205
Ph: 601-353-7916

MISSOURI

MISSOURI FISH FARMERS ASSOC.
P.O. Box 36
Columbia, MO 65205
Ph: 314-769-2888

NEBRASKA

NEBRASKA FISH FARMERS ASSOC.
Rt. 2, Box 202
Wayne, NE 68787
Ph: 402-375-3262

NEW YORK

NEW YORK STATE AQUACULTURE ASSOC.
NY State Dept. of Agriculture & Markets
11 Winners Circle
Albany, NY 12235

OKLAHOMA

CATFISH FARMERS OF OKLAHOMA

P.O. Box 1650
McAlester, OK 74502
Ph: 918-426-1879

RHODE ISLAND

RHODE ISLAND AQUACULTURE ASSOC.

P.O. Box H
Kingston, RI 02881
Ph: 401-539-2858

SOUTH CAROLINA

SOUTH CAROLINA CATFISH ASSOC.

Box 2861
Spartanburg, SC 29304
Ph: 803-582-9866

**SOUTH CAROLINA CRAWFISH GROWERS'
ASSOCIATION**

215 Stockton Road
Rembert, SC 29128

TEXAS

TEXAS AQUACULTURE ASSOC.

P.O. Box 2948
College Station, TX 77841

WASHINGTON

PACIFIC COAST OYSTER GROWERS ASSOC.

1437 Elliott Avenue West
Seattle, WA 98119
Ph: 206-281-4010

SAN JUAN ISLANDS AQUACULTURE ASSOC.

c/o Wes Carlson, Secretary
Friday Harbor, WA 98250
Ph: 206-378-2454

WASHINGTON FISH GROWERS' ASSOC.
P.O. Box 4486
Rolling Bay, WA 98061
Ph: 206-329-FISH

WEST COAST CLAM GROWERS ASSOC.
c/o Olympia Oyster Co.
SE 1042 Bloomfield Road
Shelton, WA 98584
Ph: 206-426-3354

WISCONSIN

WISCONSIN TROUT GROWERS, INC.
Box 15
Lewis, WI 54851
Ph: 715-653-2271

CANADA

AQUACULTURE ASSOCIATION OF CANADA
Box 1987
St. Andrews, NB E0G 2X0, Canada
Ph: 506-529-8854

**AQUACULTURE ASSOCIATION OF
NOVA SCOTIA**
Box 802, Suite M
Halifax, NS B3J 3E4
Canada

BAIE D'ESPOIR SALMON GROWERS CO-OP
P.O. Box 486
St. Alban's NF A0H 2E0
Canada
Ph: 709-538-3231

BC SALMON FARMERS ASSOCIATION
2459-A Bellevue Ave.
West Vancouver, BC V7V 1E1
Canada
Ph: 604-922-4525

CANADIAN AQUACULTURE PRODUCERS COUNCIL
2459-A Bellevue Ave.
West Vancouver, BC, V7V 1E1, Canada
Ph: 604-922-4525

CANADIAN AQUACULTURE SUPPLIERS ASSOC.
Box 86267
North Vancouver, BC V7L 4K4, Canada
Ph: 604-986-7870

NEW BRUNSWICK SALMON GROWERS ASSOCIATION
7 Main Street
St. George, NB E0G 2Y0
Canada
Ph: 506-755-3526

NORTH SASKATCHEWAN RAINBOW TROUT FARMERS' ASSOCIATION
Box 5091
Saskatoon, SA S7K 4E4
Canada
Ph: 306-242-1330

ONTARIO TROUT PRODUCERS' CO-OPERATIVE, LTD.
P.O. Box 1748
Guelph, ON N1H 6Z9
Canada
Ph: 519-822-1810

PRINCE COUNTY SHELLFISH ASSOCIATION
R.R. 2
Ellersbie, PE C0B 1J0
Canada
Ph: 902-831-2698

SUNSHINE COAST AQUACULTURE ASSOCIATION
P.O. Box 2360
Sechelt, BC V0N 3A0
Canada
Ph: 604-885-3619

UNITED STATES REGIONAL AQUACULTURE CENTERS

CENTER FOR TROPICAL AND
SUBTROPICAL AQUACULTURE
Dr. Kevan Main, Acting Director
Oceanic Institute-Makapuu Pt.
(in cooperation with University of Hawaii)
Waimanalo, HI 96795
Ph: 808-259-7951

NORTH CENTRAL REGIONAL
AQUACULTURE CENTER
Dr. Cal McNabb, Director
Michigan State University
(in cooperation with Iowa State University)
East Lansing, MI 48824-1222
Ph: 517-353-1962

NORTHEASTERN REGIONAL
AQUACULTURE CENTER
Dr. Gerald Donovan, Acting Dir.
Southeastern Massachusetts Univ.
North Dartmouth, MA 02747
Ph: 508-999-8157

SOUTHERN REGIONAL AQUACULTURE
CENTER
Dr. Charles G. Shephard, Director
P.O. Box 197
Stoneville, MS 38776
Ph: 601-686-9311

WESTERN REGIONAL
AQUACULTURE CONSORTIUM
Dr. Ken Chew
Director, Admin. Center
University of Washington
Seattle, WA 98195
Ph: 206-543-4209

PART V: ADDRESSES FOR PUBLICATIONS

ADDRESSES FOR PUBLICATIONS

ALABAMA COOPERATIVE EXTENSION SERVICE

Publications Distribution
Alabama Cooperative Extension Service
Duncan Hall
Auburn University, AL 36849 Ph: (205) 826-4786

ALABAMA DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES

Alabama Department of Conservation and Natural Resources
Marine Resources Division
P.O. Drawer 458
Gulf Shores, AL 36542

AMERICAN FISHERIES SOCIETY

American Fisheries Society
5410 Grosvenor Lane
Suite 110
Bethesda, MD 20418-1299 Ph: (301) 897-8616

ARKANSAS COOPERATIVE EXTENSION SERVICE

Arkansas Cooperative Extension Service
P.O. Box 391
Little Rock, AK 72203

AUBURN UNIVERSITY

Department of Research Information
Alabama Agricultural Experiment Station
Department of Fisheries, Comer Hall
Auburn University, AL 36849

AUBURN UNIVERSITY, SWINGLE HALL

Fisheries Department
Publications Clerk
Swingle Hall
Auburn University
Auburn, AL 36849

CALIFORNIA SEA GRANT COLLEGE PROGRAM

California Sea Grant College Program
Institute of Marine Resources
University of California
A-032
La Jolla, CA 92093 Ph: (619) 452-4446

CATFISH FARMERS OF OKLAHOMA

Catfish Farmers of Oklahoma
P.O. Box 1650
McAlester, OK 74502

CENTURY COMMUNICATIONS, INC.

Century Communications, Inc.
6201 Howard St.
Niles, IL 60648 Ph: (312) 647-1200

CORNELL COOPERATIVE EXTENSION

Distribution Center-C
7 Research Park
Cornell University
Ithaca, NY 14850
(write for cost information)

DEPARTMENT OF FISHERIES AND OCEANS, CANADA

Director General
Department of Fisheries and Oceans
200 Kent Street
Ottawa, ON
Canada K1A 0E6

FLORIDA COOPERATIVE EXTENSION SERVICE

Publications
University of Florida
Dept. of Fisheries and Aquaculture
7922 N.W. 71st St.
Gainesville, FL 32606

FLORIDA SEA GRANT

Florida Sea Grant
GO22 McCarty Hall
University of Florida
Gainesville, FL 32611 Ph: (904) 392-1771

GULF COAST RESEARCH LABORATORY

Gulf Coast Research Laboratory
Ocean Springs, MS 39564 Ph: (601) 875-9808

HAWAII AGRICULTURAL EXPERIMENT STATION

Hawaii Agricultural Experiment Station
College of Tropical Agriculture and Human Resources
University of Hawaii at Manoa
3050 Maile Way
Honolulu, HI 96822

HAWAII AQUACULTURE DEVELOPMENT PROGRAM

Hawaii Aquaculture Development Program
Department of Land and Natural Resources
335 Merchant Street
Honolulu, HI 96813

HILL, DR. T. K.

Dr. T. K. Hill
P.O. Box 1071
Knoxville, TN 37901-1071

ILLINOIS DEPARTMENT OF AGRICULTURE

Coordinator Illinois Aquaculture
Illinois Department of Agriculture
State Fair Grounds
P.O. Box 19281
Springfield, IL 62794-9281

INTERNATIONAL SPECIALIZED BOOK SERVICES, INC.

International Specialized Book Services
P.O. Box 1632
Beaverton, OR 97075

JOHNSON, S. K.

Mr. S. K. Johnson
Texas Agricultural Extension Service
Texas A & M University
College Park, TX 77843

KEVGOR AQUASYSTEMS

Kevgor Aquasystems
P.O. Box 48851
595 Burrard St.
Vancouver, BC
Canada V&X 1A8 Ph: (604) 681-2377

LANGSTON UNIVERSITY

Cooperative State Research Service
Langston University
P.O. Box 730
Langston, OK 70350

LIBRARY, LOUISIANA DEPARTMENT OF WILDLIFE AND FISHERIES

Library
Louisiana Department of Wildlife and Fisheries
P.O. Box 98000
Baton Rouge, LA 70898-9000

LOUISIANA AGRICULTURAL EXPERIMENT STATION

Louisiana Agricultural Experiment Station
Division of Communications
143 Knapp Hall-LSU
Baton Rouge, LA 70803 Ph: (504) 388-4141

LOUISIANA SEA GRANT COLLEGE PROGRAM

Sea Grant Communications Office
Center for Wetland Resources
Louisiana State University
Baton Rouge, LA 70803-7507

LOUISIANA STATE UNIVERSITY

Louisiana State University
Department of Civil Engineering
Baton Rouge, LA 70803

LOUISIANA STATE UNIVERSITY CENTER FOR WETLAND RESOURCES

Louisiana Sea Grant College Program
Communications Department
LSU Center for Wetland Resources
Baton Rouge, LA 70803-7507

LOUISIANA WILDLIFE AND FISHERIES COMMISSION

Louisiana Wildlife and Fisheries Commission
P.O. Box 44095
Capital Station
Baton Rouge, LA 70804

MARYLAND COOPERATIVE EXTENSION SERVICE

Maryland Cooperative Extension Service
The University of Maryland
Symons Hall
College Park, MD 20742

MINNESOTA AQUACULTURE ADVISORY COMMITTEE

Minnesota Aquaculture Advisory Committee
State Planning Agency
300 Centennial Office Building
658 Cedar Street
St. Paul, MN 55155

MINNESOTA DEPARTMENT OF NATURAL RESOURCES

Minnesota Department of Natural Resources
Fisheries: Box 12
500 Lafayette Road
St. Paul, MN 55155

MINNESOTA SEA GRANT

Minnesota Sea Grant
University of Minnesota
208 Washburn Hall
Duluth, MN 55812

or

Minnesota Sea Grant
University of Minnesota
116 COB
1994 Buford Ave.
St. Paul, MN 55108 Ph: (612) 625-9288

MISSISSIPPI-ALABAMA SEA GRANT CONSORTIUM

Mississippi-Alabama Sea Grant Consortium
P.O. Box 7000
Ocean Springs, MS 39564 Ph: (601) 875-9341

MISSISSIPPI STATE UNIVERSITY

Publications Distribution
Mississippi State University
Building Lloyd-Ricks 313-A
Box 5187
Mississippi State, MS 39762

**MISSISSIPPI STATE UNIVERSITY, AGRICULTURAL ECONOMICS
DEPARTMENT**

Mississippi State University
Agricultural Economics Department
Mississippi Agricultural and Forestry Experiment Station
Box 5187
Mississippi State, MS 39762

NATIONAL SEA GRANT DEPOSITORY

National Sea Grant Depository
Pell Library Building
URI/GSO, Narragansett Bay Campus
Narragansett, RI 02882

**NATIONAL TECHNICAL INFORMATION SERVICE, FEDERAL COMPUTER
PRODUCTS CENTER**

National Technical Information Service
Federal Computer Products Center
5285 Port Royal Road
Springfield, VA 22161 Sales Desk Ph: (703) 487-4650

NEW YORK SEA GRANT INSTITUTE

Communications
New York Sea Grant Institute
Dutchess Hall
State University of New York
Stony Brook, NY 11794-5001 Ph: (516) 632-6905

NEW YORK STATE URBAN DEVELOPMENT CORPORATION

1515 Broadway
ATTN: Nancy Rosan
New York, NY 10036-8960

NORTHEAST REGIONAL AGRICULTURAL ENGINEERING SERVICE

Northeast Regional Agricultural Engineering Service
Cornell University
152 Riley-Robb Hall
Ithaca, NY 14853

OCEANIC INSTITUTE

Oceanic Institute
P.O. Box 25280
Honolulu, HI 96825 Ph: (808) 259-7951

OKLAHOMA STATE UNIVERSITY

Central Mailing
University Printing, Bldg. East
Oklahoma State University
Stillwater, OK 74078-550

OREGON STATE UNIVERSITY

Publications Orders
Agricultural Communications
Oregon State University
Administration Services Bldg. 422
Corvallis, OR 97331-2119 Ph: (503) 754-2513

OREGON STATE UNIVERSITY, SEA GRANT COMMUNICATIONS

Sea Grant Communications
Oregon State University
AdSA 418
Corvallis, OR 97331

PRAIRIE VIEW A & M UNIVERSITY

Cooperative Extension Service
Prairie View A & M University
Prairie View, TX 77446

SOUTH CAROLINA SEA GRANT CONSORTIUM

South Carolina Sea Grant Consortium
287 Meeting Street
Charleston, SC 29401 Ph: (803) 727-2078

SOUTH DAKOTA STATE UNIVERSITY

Mary Brashier
AAC 0206
Department of Communications
SDSU
Brookings, SD 57007

SOUTHERN ILLINOIS UNIVERSITY

Cooperative Fisheries Research Lab
Southern Illinois University
Carbondale, IL 62901-6511

TEXAS A & M UNIVERSITY

Texas Agricultural Extension Service
Texas A & M University
102 Nagel Hall
College Station, TX 77843-2859 Ph: (409) 845-7473

TEXAS A & M UNIVERSITY-SEA GRANT COLLEGE PROGRAM

Marine Information Service
Sea Grant College Program
Texas A & M University
College Station, TX 77843-4115

TEXAS AGRICULTURAL EXTENSION SERVICE, CORPUS CHRISTI

Texas Agricultural Extension Service
Research and Extension Center
Route 2, Box 589
Corpus Christi, TX 78410

TEXAS AQUACULTURE ASSOCIATION

Texas Aquaculture Association
P.O. Box 2948
College Station, TX 77841

UNIVERSITY OF ALASKA

Communications Department
Alaska Sea Grant College Program
University of Alaska
590 University Avenue, Suite 103
Fairbanks, AK 99709-1046 Ph: (907) 474-7086

UNIVERSITY OF ARKANSAS AT LITTLE ROCK

Arkansas Cooperative Extension Service
University of Arkansas
P.O. Box 391
1201 McAlmont
Little Rock, AR 72203

UNIVERSITY OF ARKANSAS AT PINE BLUFF

University of Arkansas
P.O. Box 4007
Pine Bluff, AR 71601

UNIVERSITY OF CALIFORNIA

California Sea Grant College Program
University of California
La Jolla, CA 92093

UNIVERSITY OF CONNECTICUT

University of Connecticut
Cooperative Extension Service
Avery Point Campus
Groton, CT 06340 Ph: (203) 445-8664

UNIVERSITY OF DELAWARE

Tracey Bryant
University of Delaware
Sea Grant Communications
263 E. Main Street
Newark, DE 19716

UNIVERSITY OF FLORIDA

Publications Distribution Center
IFAS Building 664
University of Florida
Gainesville, FL 32611 Ph: (904) 392-9617

UNIVERSITY OF GEORGIA

College of Agriculture
University of Georgia
Athens, GA 30602

UNIVERSITY OF HAWAII

Agricultural Publications and Information Office
Office of Tropical Agriculture and Human Resources
University of Hawaii
2500 Dole Street, Krauss Hall, Rm. 6
Honolulu, HI 96822

UNIVERSITY OF HAWAII SEA GRANT COLLEGE PROGRAM

University of Hawaii Sea Grant College Program
Communications Office
1000 Pope Road
MSB 200
Honolulu, HI 96822

UNIVERSITY OF ILLINOIS

Illinois-Indiana Sea Grant Program
65 Mumford Hall ATTN: Robin Goettel
1301 W. Gregory Drive
Urbana, IL 61801

UNIVERSITY OF MARYLAND, SEA GRANT COLLEGE

Sea Grant College
University of Maryland
1224 H.J. Patterson Hall
College Park, MD 20742 Ph: (301) 454-5690

UNIVERSITY OF MISSOURI

Instruction Materials Laboratory
University of Missouri
10 London Hall
Columbia, MO 65211

UNIVERSITY OF MISSOURI, EXTENSION PUBLICATIONS

University of Missouri
Extension Publications
115 South 5th Street
Columbia, MO 65211

UNIVERSITY OF VERMONT

Extension Service
Publications Office
Merrill Hall
University of Vermont
Burlington, VT 05405

UNIVERSITY OF WISCONSIN

University of Wisconsin
Aquaculture Research Lab
6080 McKee Road, Route 2
Madison, WI 53711

**U.S. ARMY CORPS OF ENGINEERS, WATERWAYS EXPERIMENT STATION,
CEWES-EV-I**

Waterways Experiment Station
Dept. of Army, Corps of Engineers
ATTN: CEWES-EV-I (D. Goodman)
P.O. Box 631
Vicksburg, MS 39180-0631

**U.S. ARMY CORPS OF ENGINEERS, WATERWAYS EXPERIMENT STATION,
CEWES-IM-TS-T**

Waterways Experiment Station
Dept. of Army, Corps of Engineers
Report Distribution Center
ATTN: CEWES IM-TS-T
P.O. Box 631
Vicksburg, MS 39180-0631

U.S. DEPARTMENT OF AGRICULTURE, ECONOMIC RESEARCH SERVICE

USDA/ERS
Box 1608
Rockville, MD 20860 Ph: (301) 963-2515

U.S. DEPARTMENT OF AGRICULTURE, NATIONAL AGRICULTURAL LIBRARY

National Agricultural Library
Aquaculture Information Center
Room 304
10301 Baltimore Blvd.
Beltsville, MD 20705 Ph: (301) 344-3704

U.S. DEPARTMENT OF AGRICULTURE, SOIL CONSERVATION SERVICE

Soil Conservation Service
Information Division
P.O. Box 2890
Washington, DC 20013

U.S. FISH AND WILDLIFE SERVICE, ABERNATHY

U.S. Fish and Wildlife Service
Abernathy Salmon Cultural Development Center
1440 Abernathy Road
Longview, WA 98632

U.S. FISH AND WILDLIFE SERVICE, ATLANTA

U.S. Fish and Wildlife Service
Richard B. Russell Federal Building
Suite 1290, 75 Spring St. SW
Atlanta, GA 30303-3376

U.S. FISH AND WILDLIFE SERVICE, BOZEMAN

U.S. Fish and Wildlife Service
Fish Technology Center
4050 Bridger Canyon Road
Bozeman, MT 59715

U.S. FISH AND WILDLIFE SERVICE, BEULAH

U.S. Fish and Wildlife Service
Beulah Fish Technology Center
P.O. Box 245
Beulah, WY 82712

U.S. FISH AND WILDLIFE SERVICE, KEARNEYSVILLE

U.S. Fish and Wildlife Service
Technical Information Services
National Fisheries Research Center-Leetown
Box 700
Kearneysville, WV 25430

U.S. FISH AND WILDLIFE SERVICE, LAMAR

U.S. Fish and Wildlife Service
Northeast Fishery Center
Fish Technology Center
P.O. Box 75
Lamar, PA 16848

U.S. FISH AND WILDLIFE SERVICE, STUTTGART

U.S. Fish and Wildlife Service
Fish Farming Experimental Lab
P.O. Box 860
Stuttgart, AK 72160

U.S. FISH AND WILDLIFE SERVICE, WASHINGTON, DC

U.S. Fish and Wildlife Service
18th and C Street N.W.
Room 725
Arlington Square Building
Washington, DC 20240

VIRGINIA INSTITUTE OF MARINE SCIENCE

Department of Marine Advisory Service
Virginia Institute of Marine Science
Gloucester Point, VA 23062

VIRGINIA POLYTECHNIC INSTITUTE

Virginia Cooperative Extension Service
Virginia Polytechnic Institute and State University
112 Landsdowne St.
Blacksburg, VA 24061

VIRGINIA SEA GRANT PROGRAM

Virginia Institute of Marine Science
College of William and Mary
Gloucester Point, VA 23062

WALDROP, JOHN E., Dr.

Dr. John E. Waldrop
Bldg. Lloyd-Rocks 313-A
Box 5187
Mississippi State, MS 39762

WASHINGTON STATE UNIVERSITY

Cooperative Extension
College of Agriculture
Pullman, WA 99164

NATIONAL AGRICULTURAL LIBRARY



1022256520

5/14

* NATIONAL AGRICULTURAL LIBRARY



1022256520