ECONOMICS AND MARKETING[2]

Project Termination Report for the Period
May 1, 1989 to August 31, 1993

NCRAC FUNDING LEVEL: $214,988 (May 1, 1989 to August 31, 1993)

PARTICIPANTS:

Donald W. Floyd	Ohio State University	Ohio
Mary E. Gerlow	Ohio State University	Ohio
Jeffrey E. Hanson	Michigan State University	Michigan
Leroy J. Hushak	Ohio State University	Ohio
David J. Landkamer	University of Minnesota	Minnesota
Judith A. Maxwell	Ohio State University	Ohio
Jeffrey Mittelmark	University of Minnesota	Minnesota
Bruce J. Sherrick	University of Illinois	Illinois
Robert L. Vertrees	Ohio State University	Ohio
Extension Liaisons:		
David J. Landkamer	University of Minnesota	Minnesota
Frank R. Lichtkoppler	Ohio State University	Ohio

REASON FOR TERMINATION
The objectives for this work on Economics and Marketing were completed.

PROJECT OBJECTIVES
(1) Identify existing and needed economic data; develop statistical reporting methods; design an information management system and prototype annual situation/outlook report on the North Central Region (NCR) aquaculture industry; begin collecting and compiling a regional database; and prepare a situation/outlook report.

(2) Develop and implement an extension program designed to educate current and potential aquaculture producers on the need to provide accurate economic information on their operations.

(3) Investigate economic production and marketing feasibility for selected species currently produced in the NCR and other species which offer commercial potential.

(4) Identify existing policy impediments and incentives for expanded aquaculture development in each participating state within the NCR.

PRINCIPAL ACCOMPLISHMENTS
The first Situation and Outlook (S&O) Report for the 12-state NCR was published in August 1993. The report was developed to compile preliminary statistics and information about aquaculture in the NCR. Data and information contained in the report was obtained from a variety of sources including an extensive mail survey conducted in 1991 to gain information about the aquaculture industry in the NCR during 1990. Accurate information from respondents to that and other surveys was the result of the extension educational program of the project. Numerous contacts were established with state agencies interested in commercial aquaculture (e.g., natural resources, environmental licensing/permitting, and agriculture agencies), state aquaculture associations, state extension services, Sea Grant programs and economic development groups in each of the states within the NCR seeking input and support for information gathering components of the project. Key individuals respected by the aquaculture industry were chosen from those various groups to facilitate legitimation of the data and to explain the value of accurate economic data reporting.

Two surveys of retail, wholesale, and other firms that comprise the traditional marketing channels for fish and seafood products within the NCR were completed in 1990 and 1991. The results of these surveys determined that channel catfish, trout, salmon (salt- and freshwater), freshwater shrimp, and tilapia were the five cultured freshwater species that were most frequently sold in the NCR. The species that were judged to have the most marketing potential were walleye, yellow perch, bluegill (sunfish), largemouth bass, and frogs. The surveys also indicated that the general perception of farm-raised products was positive within seafood distribution channels. Compared to wild-caught species, farm-raised aquaculture products were perceived as being fresher, of higher quality and had greater price stability.

Trout and catfish cost of production budgets were developed. Based on the 1990 survey of producers in the NCR, these two species are the largest revenue generators for this region's growers.

There were 65 trout producers who grew trout and sold in excess of $1,000 during 1990. Twenty-nine of these producers were chosen for the cost of production study to reflect differences in sizes of operations. Nineteen of the facilities were visited in person; the remaining ten were sent a questionnaire and then interviewed by telephone. The initial 19 were also contacted by telephone, as needed, to clarify initial responses when questions arose. Of the ten participants who were not visited, five did not respond to the telephone survey. Three questionnaires were not used because the data provided was too incomplete to develop budgets. The remaining 21 producer surveys provided the data base for the trout study. The level of cooperation received from trout growers in completing a very lengthy and difficult questionnaire was a very pleasant surprise.

Data were collected for the calendar year 1991. Producers were asked to provided information about variable and fixed operating costs of raising trout, the prices of variable and fixed inputs for which producers would have price data, type(s) of fish stocked, stocking size, market size, food conversion rate, and physical relationships such as water temperature and flow rates.

The 21 producers were divided into three groups. The small group contained nine producers with gross sales of $1,250 to $45,000, with average sales of $20,039. These producers sold an average of 8,845 kg (19,500 lb) live weight. The medium group contained seven producers with sales ranging from $92,178 to $130,000, and averaging $108,220. Output averaged 278,671 kg (61,435 lb) live weight. The large group contained five producers who averaged $324,184 in sales and 72,746 kg (160,375 lb) live weight in output. The smallest of this group sold $225,000 during 1991.

Variable plus fixed operating costs were $21,140 for the average small producer resulting in negative operating revenues of $1,101; so there was a negative balance before any allocation to the operator's labor, management and investment. The medium and large groups had variable plus fixed costs of $95,927 and $239,510, respectively, leaving returns of $12,293 and $84,674, respectively, available for operator's labor, management and investment.

The cost and revenue data were of questionable validity at best. Most of the trout producers interviewed have very weak cost accounting skills, and, therefore, have limited ability to evaluate whether their trout operations are profitable or not. In addition, trout operations as a group are very complex when compared to other agricultural production enterprises because of the number of growing ranges for the fish (hatching eggs, selling or buying fingerlings, selling or buying stockers, selling food size fish). Also, there are a large variety of production facilities, i.e., ponds, raceways, cages, etc. and all possible combinations of these facilities, plus variations in the costs of obtaining water. Experience suggests that very basic educational programs in management, cost accounting, and budgeting would be highly beneficial to these producers in NCR.

It was determined that states within the NCR are in various stages of aquaculture policy development. Minnesota, Illinois, and Indiana have enacted legislation promoting the

development of the aquaculture industry. At the other end of the spectrum, North and South Dakota have so few producers that private fish culture is not likely to reach the public agenda for quite some time. Most of the states in the region fall somewhere in between, with aquaculture interests working toward the development of a state aquaculture development plan or the implementation of legislation supporting the industry.

Five major resource policy issues for aquaculture in the region were identified: (1) regulatory jurisdiction, (2) predator control, (3) water quality, (4) regulation of game and non-native species, and (5) environmental contamination. While producers have generally favored the classification of aquaculture as agriculture, in hope of avoiding environmental regulation, the research indicated that there is little reason to believe that such a reclassification will resolve the underlying substantive issues.

Most policies affecting the growth and marketing of fish in the NCR are found in state natural resources agencies. They are found in these agencies because they were developed to regulate open access fisheries, and now are the only policies that apply to cultured settings. However, for aquaculture to become more feasible, reconsideration of this regulatory policy framework is necessary. A cautionary and studied approach is suggested for any attempt to revise the regulatory structure that affects fish farmers. Producer issues in many cases have similarities to those for other livestock enterprises, but often in increased intensity because of application in water instead of on land.

The investigators found that one of the barriers to the growth and development of the aquaculture industry in the NCR was a lack of comprehensive information on the state laws and regulations that affect the industry. One of the outputs of the project was the publication of a digest that includes the laws related to the marketing and production of aquacultural products for the 12-state NCR. The publication entitled “Aquaculture Law in the North Central States: A Digest of State Statutes Pertaining to the Production and Marketing of Aquacultural Products” was published in May 1992 as the first publication in NCRAC’s Technical Bulletin Series.

IMPACTS

The S&O Report provided a widely distributed report of the state of aquaculture in the NCR. It indicated that farm-raised aquaculture products have become more important in fulfilling seafood markets in the United States.

The marketing study showed that the primary species being cultured in the NCR are highly marketable and are well-accepted in commercial seafood marketing channels.

The benefits of the cost of production budgets are two. First, for the first time, budgets using North Central trout and catfish producer data are available for use by regional producers and NCRAC Extension agents in assisting producers and others to assess the profitability of existing and proposed fish enterprises. These budgets are also useful in helping producers assess the feasibility of growing other species in the region. Second, these budgets provide an educational tool in the hands of Extension agents to teach fish growers how to improve cost accounting and budgeting procedures on their operations. Improved cost accounting will make producers better managers and assist regional researchers in assessing the feasibility of growing particular species under varying conditions.

Incorporation of cost of production budget parameters into budget software will give current or potential fish producers, financial institutions and policy makers regional results about the feasibility of producing trout and catfish in various locations of the NCR. In addition, the data on some costs such as water and facilities will be transferable to other species of interest.

RECOMMENDED FOLLOW-UP ACTIVITIES

A new Economics and Marketing Work Group will begin to develop cost of production budgets and expected revenues for the raising of food-sized walleye, yellow perch, and hybrid striped bass on farms in the NCR.

PUBLICATIONS, MANUSCRIPTS, OR PAPERS PRESENTED
See the Appendix for a cumulative output for all NCRAC-funded Economics and Marketing activities.

SUPPORT

YEARS	NCRAC-USDA FUNDING	OTHER SUPPORT					TOTAL SUPPORT
		UNIVER-SITY	INDUSTRY	OTHER FEDERAL	OTHER	TOTAL	
1989-91	$161,688	$59,683				$59,683	$221,371
1991-92	$53,300	$66,457				$66,457	$119,757
TOTAL	$214,988	$126,140				$126,140	$341,128

APPENDIX

ECONOMICS AND MARKETING

Publications in Print

Brown, G.J. 1994. Cost analysis of trout production in the North Central states. Master's thesis. Ohio State University, Columbus.

Brown, G.J., and L.J. Hushak. 1991. The NCRAC producers survey and what we have learned: an interim report. Pages 69-71 *in* Proceedings of the North Central Aquaculture Conference, Kalamazoo, Michigan, March 18-21, 1991.

Edon, A.M.T. 1994. Economic analysis of an intensive recirculating system for the production of advanced walleye fingerlings in the North Central Region. Master's thesis. Illinois State University, Normal.

Floyd, D.W., and R.M. Sullivan. 1990. Natural resources and aquaculture: the policy environment in the North Central states. Proceedings of the Third Symposium on Social Science and Resource Management, Texas A&M University, College Station, Texas.

Floyd, D.W., R.M. Sullivan, R.L. Vertrees, and C.F. Cole. 1991. Natural resources and aquaculture: emerging policy issues in the North Central states. Society and Natural Resources 4:123-131.

Gleckler, D.P. 1991. Distribution channels for wild-caught and farm-raised fish and seafood: a survey of wholesale and retail buyers in six states of the North Central Region. Master's thesis. Ohio State University, Columbus.

Gleckler, D.P., L.J. Hushak, and M.E. Gerlow. 1991. Distribution channels for wild-caught and farm-raised fish and seafood. Pages 77-81 *in* Proceedings of the North Central Aquaculture Conference, Kalamazoo, Michigan, March 18-21, 1991.

Hushak, L.J. 1993. North Central Regional aquaculture industry situation and outlook report, volume 1 (revised October 1993). NCRAC Publications Office, Iowa State University, Ames.

Hushak, L., C. Cole, and D. Gleckler. 1993. Survey of wholesale and retail buyers in the six southern states of the North Central Region. NCRAC Technical Bulletin Series #104, NCRAC Publications Office, Iowa State University, Ames.

Hushak, L.J., D.W. Floyd, and R.L. Vertrees. 1992. Aquaculture: a competitive industry in North Central states? Ohio's Challenge 5:3-5.

Lipscomb, E.R. 1995. The biological and economic feasibility of small scale yellow perch (*Perca flavescens*) production. Master's thesis. Purdue University, West Lafayette.

O'Rourke, P.D. 1996. Economic analysis for walleye aquaculture enterprises. Pages 135-145 *in* R.C. Summerfelt, editor. The walleye culture manual. NCRAC Culture Series #101, NCRAC Publications Office, Iowa State University, Ames.

O'Rourke, P.D. 1996. The economics of recirculating aquaculture systems. *In* Proceedings of successes and failures in commercial recirculating aquaculture, Roanoke, Virginia, July 19-21, 1996.

Makowiecki, E.M.M. 1995. Economic analysis of an intensive recirculating system for the production of walleye from fingerling to food size. Master's thesis. Illinois State University, Normal.

Robinson, M., D. Zepponi, and B.J. Sherrick. 1991. Assessing market potential for new and existing species in the North Central Region. Pages 72-76 *in* Proceedings of the North Central Aquaculture Conference, Kalamazoo, Michigan, March 18-21, 1991.

Thomas, S.K. 1991. Industry association influence upon state aquaculture policy: a comparative analysis in the North Central Region. Master's thesis. Ohio State University, Columbus.

Thomas, S.K., R.M. Sullivan, R.L. Vertrees, and D.W. Floyd. 1992. Aquaculture law in the North Central states: a digest of state statutes pertaining to the production and marketing of aquacultural products. NCRAC Technical Bulletin Series #101, NCRAC Publications Office, Iowa State University, Ames.

Thomas, S.K., R.L. Vertrees, and D.W. Floyd. 1991. Association influence upon state aquaculture policy--a comparative analysis in the North Central Region. The Ohio Journal of Science 91(2):54.

Tudor, K.W., R.R. Rosati, P.D. O'Rourke, Y.V. Wu, D. Sessa, and P. Brown. 1996. Technical and economical feasibility of on-farm fish feed production using fishmeal analogs. Journal of Aquacultural Engineering 15(1):53-65.

Manuscripts

Rosscup Riepe, J. In press. Costs for pond production of yellow perch in the North Central Region, 1994-95. NCRAC Fact Sheet Series #111, NCRAC Publications Office, Iowa State University, Ames.

Rosscup Riepe, J. In press. Enterprise budgets for yellow perch production in cages and ponds in the North Central Region, 1994-95. NCRAC Technical Bulletin Series #111, NCRAC Publications Office, Iowa State University, Ames.

Rosscup Riepe, J. In review. Managing feed costs: limiting delivered price paid. NCRAC Fact Sheet Series #110, NCRAC Publications Office, Iowa State University, Ames.

Papers Presented

Foley, P., R. Rosati, P.D. O'Rourke, and K. Tudor. 1994. Combining equipment components into an efficient, reliable, and economical commercial recirculating aquaculture system. 25th Annual Meeting of the World Aquaculture Society Silver Anniversary Meeting, New Orleans, Louisiana, January 12-18, 1994.

O'Rourke, P.D. 1995. Profitability and volume-cost business analysis tools for the aquaculture enterprise. Presented at Illinois-Indiana Aquaculture Conference and NCRAC Hybrid Striped Bass Workshop, Champaign, Illinois, November 2, 1995.

O'Rourke, P.D., and A.M.T. Edon. 1995. Economic analysis of advanced walleye fingerling production in an intensive recirculating system. Combined North Central and Ninth Annual Minnesota Aquaculture Conference and Trade Show, Minneapolis, Minnesota, February 17-18, 1995.

O'Rourke, P.D., K. Tudor, and R. Rosati. 1994. The selection and use of economic tools in the aquacultural engineering decision making process to determine the comparative costs of alternate technical solutions. 25th Annual Meeting of the World Aquaculture Society Silver Anniversary Meeting, New Orleans, Louisiana, January 12-18, 1994.

O'Rourke, P.D., K. Tudor, and R. Rosati. 1994. Economic risk analysis of production of tilapia (*Oreochromis niloticus*) in a modified Red Ewald-style recirculating system operated under commercial conditions. 25th Annual Meeting of the World Aquaculture Society Silver Anniversary Meeting, New Orleans, Louisiana, January 12-18, 1994.

Rosscup Riepe, J. 1994. Production economics of species cultured in the north central region. Animal Science, AS-495, one-week summer course "Aquaculture in the Midwest," Purdue University, West Lafayette, Indiana, June 13-17, 1994.

Rosscup Riepe, J. 1994. Getting started in commercial aquaculture: economics. Workshop on Getting Started in Commercial Aquaculture Raising Crayfish and Yellow Perch, Jasper, Indiana, October 14-15, 1994.

Rosscup Riepe, J., J. Ferris, and D. Garling. 1995. Enterprise budgets for yellow perch production in cages and ponds in the North Central Region. Yellow Perch Aquaculture Workshop, Spring Lake, Michigan, June 15-16, 1995.

Rosati, R., P.D. O'Rourke, K. Tudor, and P. Foley. 1994. Production of tilapia (*Oreochromis niloticus*) in a modified Red Ewald-style recirculating system when operated under commercial conditions. 25th Annual Meeting of the World Aquaculture Society Silver Anniversary Meeting, New Orleans, Louisiana, January 12-18, 1994.

Rosati, R., P.D. O'Rourke, K. Tudor, and P. Foley. 1994. Technical and economical considerations for the selection of oxygen incorporation devices in a recirculating aquaculture system. 25th Annual Meeting of the World Aquaculture Society Silver Anniversary Meeting, New Orleans, Louisiana, January 12-18, 1994.

Tudor, K., R. Rosati, P.D. O'Rourke, Y. V. Wu, D. Sessa, and P. Brown. 1994. Technical and economical feasibility of on-farm fish feed production using fishmeal analogs. 25th Annual

Meeting of the World Aquaculture Society Silver Anniversary Meeting, New Orleans, Louisiana, January 12-18, 1994.