

ECONOMICS AND MARKETING

Project Termination Report for the Period
September 1, 1993 to May 31, 1997

NCRAC FUNDING LEVEL: \$40,000 (September 1, 1993 to May 31, 1997)

ARTICIPANTS:

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REASON FOR TERMINATION

The objective for this project was completed and funding was finally expended.

PROJECT OBJECTIVE

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 North Central Region (NCR).

PRINCIPAL ACCOMPLISHMENTS

HYBRID STRIPED BASS

Kohler compiled a mailing list of 56 producers of phase III hybrid striped bass (HSB) both within and outside the NCR. A mail survey was sent to these 56 producers to obtain data on production costs. The response rate was low due to a hesitation on the part of producers to reveal this information.

Two large fish farms in Arkansas (Malone's and Keo) and one in Missouri (Osage Catfisheries) were visited to discuss HSB production and gather production information. In all three cases, other species in addition to HSB were produced, therefore, species-specific production figures were not available.

Kohler compiled an annotated bibliography on HSB production and production costs. This bibliography is available from Kohler for anyone needing the information. Kohler also summarized HSB cost of production estimates from six published reports on HSB production. Those estimated costs were presented at the North Central Regional Aquaculture Center (NCRAC) Hybrid Striped Bass Workshop in November 1995.

WALLEYE

Work has advanced on identifying and analyzing the cost of production for advanced walleye fingerlings and food-sized walleye in intensive culture systems. O'Rourke and Illinois State University graduate students completed an extensive walleye production/culture literature review with the primary focus of finding research findings that might be useful in ascertaining the cost of production for walleye fingerlings and food-sized fish under intensive and extensive culture regimes. Very little economic research was found and even less was found that was documented well enough to be useful. The literature reviews were reported in two Master's theses. The first thesis was finished in December 1994. It is an economic feasibility analysis of a tank-based intensive walleye fingerling production system. The second thesis, an economic feasibility analysis of a tank based intensive food-sized walleye system, was finished in August 1995.

Research experts and hatchery personnel familiar with walleye culture were surveyed using a modified Delphi approach for both the fingerling and food-sized studies. It was surprising that some "experts" were as reluctant to share research information as were some entrepreneurs/producers. This stage of the research was completed in 1995.

The two theses produced for this project contain the best economic feasibility data for any known/proposed production systems for commercial production of walleye fingerlings and food sized fish. Commercial production is considered to be potentially profitable but highly risky and uncertain due to lack of actual commercial production data for systems (especially for food-sized grow out), the difficulties in domestication of the fish and the potential market (price) impacts of commercial production.

YELLOW PERCH

Knowing the number of commercial producers of yellow perch to be very small, Riepe conducted a literature review in early 1993 to determine whether any data on the production requirements for yellow perch were available. Unfortunately, most research on yellow perch has been limited to attempts to spawn them out of season and successfully culture and harvest eggs, fry, and eventually fingerlings habituated to commercial diets. Riepe then rejected the historical method for developing enterprise budgets and used the economic engineering approach.

Riepe considered alternatives for obtaining the needed information, and came up with two methods. The first method used to collect production-related information upon which the budgets must be based was a record keeping procedure. Riepe developed a record keeping sheet for the non-funded collaborators involved in the yellow perch project who were testing the commercial scale feasibility of food-size yellow perch production systems. The record keeping sheets asked for the itemization of all costs and inputs into the production process used by the collaborators. The resulting information was of limited value.

The second method was a Delphi approach to obtaining the expert opinions of NCRAC researchers on the production relationships needed to underpin the yellow perch production cost budgets. Expert opinions were solicited from the researchers and extension persons involved in the NCRAC Yellow Perch Work Group during 1994. The opinion data were entered into a spreadsheet to average the responses and then re-submitted to the researchers. Also budget assumptions were clarified so that all researchers were thinking of production relationships relating to a similar set of assumptions. Expert opinions were solicited for several types of related production values (death loss, feed conversion, fingerling size, harvest size, etc.) for a producer with average skill under average conditions and then for minimum and maximum values representing above and below average skills and conditions.

It was not financially feasible to model all life stages in all production systems at all sizes of production. Researchers and the membership of the Indiana Aquaculture Association were queried to solicit their views on priorities for budgets modeled. The decision was made that the budgets to be modeled would be the life stage of advanced fingerling grow out; the production systems of cage, constructed fish pond, and recirculating tank; and two sizes, 2,268 kg (5,000 lb) and 22,680 kg (50,000 lb).

Sensitivity analysis was conducted to test the impact of alternative budget parameters (production values and individual cost items) on the overall break-even price. A Master's graduate student was assigned to conduct research in costs of producing perch in recirculating tank systems and a thesis was completed in 1995. Costs of growing out yellow perch in recirculating tank systems were analyzed for two sizes of operations; 1,588 kg (3,500 lb) and 2,268 kg (5,000 lb).

A technical bulletin and a fact sheet (NCRAC Extension Fact Sheet #111 and NCRAC Extension Technical Bulletin #111) detailed the costs of producing yellow perch in cages and ponds. These may contain the best economic feasibility study and data for any known/proposed production systems for commercial production of yellow perch in the NCR.

IMPACTS

Extension Liaison Garling hosted a Yellow Perch Workshop in June 1995. The results of Riepe's work on yellow perch production costs were presented at that workshop. Attendees indicated that they were considering the types of systems modeled by Riepe. O'Rourke presented the preliminary results of the work on walleye fingerling tank based system cost of production at the Minnesota Aquaculture Conference in February 1995. Kohler presented the results of the review of HSB production costs at the NCRAC Hybrid Striped Bass Workshop in November 1995. The information developed and presented is anticipated to be directly useful to the attendees (producers and potential producers) as they consider their own operations and intentions in light of the cost data and analytical tools presented.

This project has already benefited the aquaculture industry in the NCR through those workshop presentations. As a result of this project, economists have been able to develop and deliver presentations on economic issues in aquaculture production to current and potential aquacultural producers. These presentations and publications may reduce the impacts of uninformed investment decisions by current and potential aquaculture entrepreneurs.

RECOMMENDED FOLLOW-UP ACTIVITIES

This project showed that good economics work could contribute to the knowledge base of species studies. Unfortunately the objective and the budget restricted the scope to fish that are not the most common produced commercially in the NCR. A new Economics and Marketing Work Group should be started and adequately funded for at least four years to continue the work of ascertaining the potential profitability of various commercially adopted species and production systems for 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
		UNIVERSITY	INDUSTRY	OTHER FEDERAL	OTHER	TOTAL	
1993-97	\$40,000	\$59,683				\$59,683	\$99,683
TOTAL	\$40,000	\$59,683				\$59,683	\$99,683

APPENDIX

ECONOMICS AND MARKETING

Publications in Print

Aubineau, C.M. 1996. Characterization of the supply of walleye fingerlings in the north central region of the U.S. Master's thesis. Illinois State University, Normal.

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

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.

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.

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.

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.

Riepe, J.R. 1997. 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.

Riepe, J.R. 1997. 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.

Riepe, J.R. 1997. Yellow perch markets in the North Central Region: results of a 1996/97 survey. Office of Agricultural Research Programs, Department of Agricultural Economics, Purdue University, West Lafayette, Indiana.

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

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

Papers Presented

Brown, G.J., and L.J. Hushak. 1991. The NCRAC producers survey and what we have learned: an interim report. First North Central Regional Aquaculture Conference, Kalamazoo, Michigan, March 18-21, 1991.

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, New Orleans, Louisiana, January 12-18, 1994.

Gleckler, D.P., L.J. Hushak, and M.E. Gerlow. 1991. Distribution channels for wild-caught and farm-raised fish and seafood. First North Central Regional Aquaculture Conference, Kalamazoo, Michigan, March 18-21, 1991.

Kohler, S.T. 1995. Hybrid striped bass cost of production. North Central Regional Aquaculture Center Hybrid Striped Bass Workshop, Champaign, Illinois, November 2-4, 1995.

O'Rourke, P.D. 1995. Profitability and volume-cost business analysis tools for the aquaculture enterprise. Presented at Illinois-Indiana Aquaculture Conference and North Central Regional Aquaculture Center Hybrid Striped Bass Workshop, Champaign, Illinois, November 2-4, 1995.

O'Rourke, P.D. 1996. The economics of recirculating aquaculture systems. Conference on Successes and Failures in Commercial Recirculating Aquaculture, Roanoke, Virginia, July 19-21, 1996.

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 Tradeshow (Second North Central Regional Aquaculture Conference), 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, 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.

Riepe, J.R. 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.

Riepe, J.R. 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.

Riepe, J.R. 1997. Revisiting retail and wholesale markets (walleye and yellow perch). Third North Central Regional Aquaculture Conference, Indianapolis, Indiana, February 6-7, 1997.

Riepe, J.R., J. Ferris, and D. Garling. 1995. Economic considerations in yellow perch aquaculture. Yellow Perch Aquaculture Workshop, Spring Lake, Michigan, June 15-16, 1995.

Robinson, M., D. Zepponi, and B.J. Sherrick. 1991. Assessing market potential for new and existing species in the North Central Region. First North Central Regional Aquaculture Conference, Kalamazoo, Michigan, March 18-21, 1991.

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, 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, 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, New Orleans, Louisiana, January 12-18, 1994.