

HYBRID STRIPED BASS⁽⁷⁾

Project Termination Report for the Period
September 1, 1995 to August 31, 2001

NCRAC FUNDING LEVEL: \$30,000 (September 1, 1995 to August 31, 2001)

PARTICIPANTS:

Fred P. Binkowski	University of Wisconsin-Milwaukee	Wisconsin
Christopher C. Kohler	Southern Illinois University-Carbondale	Illinois
Joseph E. Morris	Iowa State University	Iowa
Robert J. Sheehan	Southern Illinois University-Carbondale	Illinois
<i>Extension Liaison:</i>		
Joseph E. Morris	Iowa State University	Iowa

REASON FOR TERMINATION

The objectives were completed and funds terminated.

PROJECT OBJECTIVES

- (1) Coordinate selection of various culture systems and implement field testing (fingerling to advanced fingerling to food size).
- (2) Write an initial culture manual using information generated by all the hybrid striped bass research sponsored by the North Central Regional Aquaculture Center (NCRAC).
- (3) Provide associated fact sheets, bulletins, and videos for hybrid striped bass research in the North Central Region (NCR).
- (4) Conduct workshops presenting technologies developed through NCRAC-funded projects covering general methods of culturing this fish.

PRINCIPAL ACCOMPLISHMENTS

Coordination and implementation of field testing involving the grow out of fingerlings to advanced fingerlings and advanced fingerlings to food size was done in conjunction with several NCRAC aquaculture extension contacts.

Morris and Gibson T. Gaylor (post-doctoral fellow, Iowa State University) wrote "Hybrid Striped Bass Culture: Current Knowledge in the Industry." This manual provides an overview of previous hybrid striped bass culture manuals published in the 1980s ("Culture and Propagation of Striped Bass and Its Hybrids" produced by the American

Fisheries Society and "Farming a New Fish: Hybrid Striped Bass" available from North Carolina Sea Grant) and as an update based on current information and that garnered from NCRAC-funded research activities, e.g., nutritional and gamete storage and transportation. The document has been reviewed by Kohler as well as four additional reviewers. Final publication is scheduled for Spring 2002 and will be NCRAC Culture Series #103.

A hybrid striped bass fact sheet that was developed by Morris and Kohler was published October 1999 (NCRAC Fact Sheet Series #107).

A video is being produced by Kohler using a combination of computer software, slides, and moving-video footage. It covers basic aspects of hybrid striped bass production and advances made by the various NCRAC Hybrid Striped Bass projects.

The first of two hybrid striped bass workshops was held in November 1995 in Champaign, Illinois. Workshop topics included larval culture, cage culture, brood stock management, and an industry perspective. The attendees were from Illinois, Indiana, Iowa, and Missouri. Speakers, who had been participants in various NCRAC-funded projects, included Chris Kohler, Sue Kohler, and Bob Sheehan of Southern Illinois University-Carbondale, George Brown and Joe Morris of Iowa State University, and LaDon Swann of Purdue University. Proceedings from this workshop are available from the NCRAC Publications Office at Iowa State University.

A second workshop will be held in St. Louis, Missouri in February 2002. It will also focus on presenting technologies developed through NCRAC-funded projects on hybrid striped bass. General methods used for culturing this important food fish will be fully covered. Speakers will include selected members of past NCRAC Hybrid Striped Bass Work Groups, as well as one or more guest speakers from the private sector. Workshop registrants will receive information packets covering important details of hybrid striped bass culture, i.e., NCRAC Fact Sheet #107. To obtain the greatest number of conference attendees, a workshop brochure will be developed, advertised, and distributed throughout the NCR using existing extension and research networks. It is anticipated that attendees will come from the NCR as well as other regions.

IMPACTS

The proceedings from the 1995 NCRAC hybrid striped bass workshop have been used in addressing many concerns and questions about hybrid striped bass culture. The 2002 workshop will build upon previous related outreach materials in bringing forth new information to the aquaculture industry.

RECOMMENDED FOLLOW-UP ACTIVITIES

Future extension programming, including materials and workshops, should use information garnered from this project as a base. In addition, new information from the

newest (seventh) NCRAC Hybrid Striped Bass project should be included in any modifications to this information base.

PUBLICATIONS, MANUSCRIPTS, OR PAPERS PRESENTED

See the [Appendix](#) for a cumulative output for all NCRAC-funded Hybrid Striped Bass activities.

SUPPORT

YEARS	NCRAC- USDA FUNDING	OTHER SUPPORT					TOTAL SUPPORT
		UNIVER- SITY	INDUSTRY	OTHER FEDERAL	OTHER	TOTAL	
1995-97	\$15,000	\$16,968				\$16,968	\$31,968
1999-00	\$15,000						\$15,000
TOTAL	\$30,000	\$16,968				\$16,968	\$46,968

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Publications in Print

Allyn, M.L., R.J. Sheehan, and C.C. Kohler. 2001. The effects of capture and transportation stress on white bass semen osmolality and their alleviation via sodium chloride. *Transactions of the American Fisheries Society* 130:706-711.

Anonymous. 1995. Proceedings of the NCRAC Hybrid Striped Bass Workshop. NCRAC Publications Office, Iowa State University, Ames.

Brown, P.B., R. Twibell, Y. Jonker, and K.A. Wilson. 1997. Evaluation of three soybean products in diets fed to juvenile hybrid striped bass *Morone saxatilis* × *M. chrysops*. *Journal of the World Aquaculture Society* 28:215-223.

Kelly, A.M., and C.C. Kohler. 1996. Sunshine bass performance in ponds, cages, and indoor tanks. *Progressive Fish-Culturist* 58:55-58.

Kelly, A.M., and C.C. Kohler. 1999. Cold tolerance and fatty acid composition in striped bass, white bass and their hybrids. *North American Journal of Aquaculture* 61:278-285.

Kemeh, S., and P.B. Brown. 2001. Evaluation of different stocking densities for hybrid striped bass in small-scale recirculation systems. *North American Journal of Aquaculture* 63:234-237.

Kohler, C.C. 1997. White bass production and broodstock development. Pages 169-185 in R.M. Harrell, editor. *Striped bass and other Morone culture*. Elsevier Press, Amsterdam.

Kohler, C.C., R.J. Sheehan, C. Habicht, J.A. Malison, and T.B. Kayes. 1994. Habituation to captivity and controlled spawning of white bass. *Transactions of the American Fisheries Society* 123:964-974.

- Kohler, C.C., R.J. Sheehan, J.J. Myers, J.B. Rudacille, M.L. Allyn, and A.V. Suresh. 2001. Performance comparison of geographic strains of white bass (*Morone chrysops*) to produce sunshine bass. *Aquaculture* 202:351-357.
- Morris, J.E., C.C. Kohler, and C.C. Mischke. 1999. Pond culture of hybrid striped bass in the North Central Region. NCRAC Fact Sheet Series #107, NCRAC Publications Office, Iowa State University, Ames.
- Myers, J.J. 1999. Acute responses to salinity for sunshine bass and palmetto bass. Master's thesis. Southern Illinois University-Carbondale.
- Myers, J.J., and C.C. Kohler. 2000. Acute responses to salinity for sunshine bass and palmetto bass. *North American Journal of Aquaculture* 62:195-202.
- Settor, K. 1998. Evaluation of different densities for hybrid striped bass (*Morone saxatilis* × *M. chrysops*) in cages and small-scale recirculation system. Master's thesis. Purdue University, West Lafayette, Indiana.
- Woods, L.C., C.C. Kohler, R.J. Sheehan, and C.V. Sullivan. 1995. Volitional tank spawning of female striped bass with male white bass produces hybrid offspring. *Transactions of the American Fisheries Society* 124:628-632.

Manuscripts

- Brown, G.G., R.J. Sheehan, C.C. Kohler, C. Habicht, L. Koutnik, L. Ellis, and L.D. Brown. In preparation. Short-term and long-term storage of striped bass *Morone saxatilis* semen. *Journal of the World Aquaculture Society*.
- Kohler, C.C. In press. Striped bass and hybrid striped bass aquaculture. In R.R. Stickney, editor. *Encyclopedia of aquaculture*, Wiley Science, New York.
- Suresh, A.V., J.B. Rudacille, M.L. Allyn, V. Sheehan, R.J. Sheehan, and C.C. Kohler. In review. Induction of ovulation in white bass (*Morone chrysops*) using hCG and LHRHa. *Aquaculture*.

Papers Presented

- Brown, P.B., R. Twibell, Y. Hodgins, and K. Wilson. 1995. Soybeans in diets fed to hybrid striped bass. 24th Annual Fish Feed and Nutrition Workshop, Columbus, Ohio, October 19-21, 1995.
- Brown, P.B., Y. Hodgins, R. Twibell, and K.A. Wilson. 1996. Use of three soybean products in diets fed to hybrid striped bass. 27th Annual Meeting of the World Aquaculture Society, Bangkok, Thailand, January 29-February 2, 1996.
- Brown, G.G., L.D. Brown, K. Dunbar, C. Habicht, R.J. Sheehan, C.C. Kohler, and L. Koutnik. 1991. Evaluation of white bass semen with 31P-NMR for the improvement of transportation, storage, and fertility methods. 53rd Midwest Fish and Wildlife Conference, Des Moines, Iowa, November 30-December 4, 1991.
- Brown, G.G., R.J. Sheehan, C.C. Kohler, C. Habicht, L. Koutnik, L. Ellis, and L.D. Brown. 1995. Use of cryopreservatives. North Central Regional Aquaculture Center Hybrid Striped Bass Workshop, Champaign, Illinois, November 2-4, 1995.

- Brown, G.G., R.J. Sheehan, C.C. Kohler, C. Habicht, L. Koutnik, L. Ellis, and L.D. Brown. 1998. Short-term storage of striped bass *Morone saxatilis* semen. 29th Annual Meeting of the World Aquaculture Society, Las Vegas, Nevada, February 15-19, 1998.
- Habicht, C., R.J. Sheehan, C.C. Kohler, G.G. Brown, and L. Koutnik. 1991. Routine collection, storage, and shipping of white bass sperm. 29th Annual Meeting Illinois Chapter of the American Fisheries Society, Champaign, Illinois, March 5-7, 1991.
- Kohler, C.C. 1993. The farm fish of the future: hybrid stripers. Aqua '93: 7th Annual Minnesota Aquaculture Conference, Alexandria, Minnesota, March 5-6, 1993. (Invited paper)
- Kohler, C.C. 1994. Hybrid striped bass aquaculture. Yellow Perch and Hybrid Striped Bass Production: From Fry to Frying Pan, Piketon, Ohio, July 3, 1994. (Invited speaker)
- Kohler, C.C. 1995. Broodstock management of white bass. North Central Regional Aquaculture Center Hybrid Striped Bass Workshop, Champaign, Illinois, November 2-4, 1995.
- Kohler, C.C. 1996. Induced out-of-season spawning of fishes. Missouri Aquaculture Industry Association Annual Meeting, Jefferson City, Missouri, February 3-4, 1996 .
- Kohler, C.C. 1996. Advancing hybrid striped bass culture in the North Central Region and elsewhere. U.S. Chapter of the World Aquaculture Society, Arlington, Texas, February 14-17, 1996.
- Kohler, C.C. 1997. Induced spawning of fishes. Third North Central Regional Aquaculture Conference, Indianapolis, Indiana, February 6-7, 1997.
- Kohler, C.C. 1998. Hybrid striped bass culture in the Midwest. Joint Missouri-Kansas Aquaculture Conference, Springfield, Missouri, March 4-6, 1998.
- Kohler, C.C., and R.J. Sheehan. 1991. Hybrid striped bass culture in the North Central Region. First North Central Regional Aquaculture Conference, Kalamazoo, Michigan, March 18-21, 1991.
- Kohler, C.C., R.J. Sheehan, M.L. Allyn, J.B. Rudacille, and A. Suresh. 1996. Controlled spawning of white bass. U.S. Chapter of the World Aquaculture Society, Arlington, Texas, February 14-17, 1996.
- Kohler, C.C., R.J. Sheehan, C. Habicht, J.A. Malison, and T.B. Kayes. 1992. Acclimation to captivity and out-of-season spawning of white bass. 23rd Annual Meeting of the World Aquaculture Society, Orlando, Florida, May 21-25, 1992.
- Kohler, C.C., R.J. Sheehan, J.J. Myers, J.B. Rudacille, M.L. Allyn, and A.V. Suresh. 1998. Performance comparison of geographically distinct strains of white bass to produce sunshine bass. Striper 2000, College Park, Maryland, June 6-7, 1998.
- Kohler, C.C., R.J. Sheehan, C. Habicht, V. Sanchez, J. Finck, J.A. Malison, and T.B. Kayes. 1991. Domestication and out-of-season spawning of white bass. 53rd Midwest Fish and Wildlife Conference, Des Moines, Iowa, November 30-December 4, 1991.
- Kohler, C.C., R.J. Sheehan, C. Habicht, V. Sanchez, J.A. Malison, and T.B. Kayes. 1992. Collection, acclimation to captivity, and out-of-season spawning of white bass. 122nd Annual Meeting of the American Fisheries Society, Rapid City, South Dakota, September 14-17, 1992.

- Kohler, C.C., R.J. Sheehan, C. Habicht, V. Sanchez, J.A. Malison, and T.B. Kayes. 1993. Development of white bass brood stock and spawning protocol. U.S. Chapter of the World Aquaculture Society, Hilton Head Island, South Carolina, January 27-30, 1993. (Invited paper)
- Kohler, C.C., R.J. Sheehan, and T.B. Kayes. 1989. Advancing hybrid striped bass culture in the Midwestern United States. 51st Midwest Fish and Wildlife Conference, Springfield, Illinois, December 5-6, 1989.
- Kohler, C.C., R.J. Sheehan, V. Sanchez, and A. Suresh. 1994. Evaluation of various dosages of hCG to induce final oocyte maturation and ovulation in white bass. 25th Annual Meeting of the World Aquaculture Society, New Orleans, Louisiana, January 12-18, 1994.
- Kohler, C.C., R.J. Sheehan, A. Suresh, L. Allyn, and J. Rudacilffe. 1996. Effect of hCG dosage on hatching success in white bass. International Congress on the Biology of Fishes, San Francisco, California, July 15-18, 1996.
- Kohler, C.C., R.J. Sheehan, J.J. Myers, J.B. Rudacille, M.L. Allyn, and A.V. Suresh. 1999. Performance comparison of geographically distinct strains of white bass to produce sunshine bass. Aquaculture America '99, Tampa, Florida, January 27-30, 1999.
- Kohler, S.T. 1995. Cost of production. North Central Regional Aquaculture Center Hybrid Striped Bass Workshop, Champaign, Illinois, November 2-4, 1995.
- Koutnik, L.A., R.J. Sheehan, C.C. Kohler, C. Habicht, and G.G. Brown. 1992. Motility and fertility of extended and cryopreserved *Morone* sperm: when is cryopreservation the best option? Annual Meeting, Illinois/Wisconsin Chapters of the American Fisheries Society, Waukegan, Illinois, February 10-13, 1992. (Awarded Best Student Paper)
- Morris, J. 1995. Pond preparation for larval fish. North Central Regional Aquaculture Center Hybrid Striped Bass Workshop, Champaign, Illinois, November 2-4, 1995.
- Myers, J.J., C.C. Kohler, R.J. Sheehan, M.L. Allyn, J.B. Rudacille, and A.V. Suresh. 1998. Geographic strain comparison of hybrid striped bass (*Morone chrysops* × *M. saxatilis*) to a market size in earthen ponds. Illinois Renewable Natural Resources Conference, Springfield, Illinois, March 4-6, 1998.
- Rudacille, J.B., and C.C. Kohler. 1996. Relative performance of white bass, sunshine bass, and palmetto bass fed a commercial diet. U.S. Chapter of the World Aquaculture Society, Arlington, Texas, February 14-17, 1996. (Awarded Best Student Presentation)
- Rudacille, J.B., and C.C. Kohler. 1997. Performance of Phase III palmetto bass, sunshine bass and white in a recirculating water system. 28th Annual Meeting of the World Aquaculture Society, Seattle, Washington, February 19-23, 1997.
- Rudacille, J.B., and C.C. Kohler. 1997. Relative performance of Phase III sunshine bass, palmetto bass, and white bass in an indoor recirculating system. 35th Annual Meeting of the Illinois Chapter of the American Fisheries Society, Collinsville, Illinois, March 4-6, 1997. (Awarded Lewis L. Osborne Best Student Paper)
- Sheehan, R.J. 1995. Use of sperm extenders. North Central Regional Aquaculture Center Hybrid Striped Bass Workshop, Champaign, Illinois, November 2-4, 1995.
- Swann, L. 1995. Cage culture. North Central Regional Aquaculture Center Hybrid Striped Bass Workshop, Champaign, Illinois, November 2-4, 1995.