



University of Maryland, 2113 Animal Science Building
 College Park, Maryland 20742-2317
 Telephone: 301-405-6085, FAX: 301-314-9412
 E-mail: nrac@umd.edu Web: <http://www.nrac.umd.edu>

AQUACULTURE SITUATION AND OUTLOOK REPORT 2009: PENNSYLVANIA

Ann Faulds, Pennsylvania Sea Grant
Charles Conklin, Pennsylvania Department of Agriculture

Industry Trends and Outlook

The USDA Trout and Aquaculture Census reports Pennsylvania aquaculture sales of \$10.48 million in 2008. Sales of food fish comprised 83.4 percent of total sales, with the remainder of the sales composed of sport and game fish, baitfish, crustaceans, molluscs, ornamental fish, water garden plants, and other animal aquaculture (tadpoles, frogs, trout eggs, and others). While trout comprises most of the food fish sales, tilapia and hybrid striped bass are also produced, albeit on a smaller scale. Pennsylvania hatcheries, including those of the Pennsylvania Fish and Boat Commission, also produce additional trout valued at \$14.7 million for conservation and recreational purposes. This brings the total value of trout produced in Pennsylvania to \$20.12 million in 2008.

Recreational fishing activities associated with the



Trout aquaculture raceway (Photo: Charles Conklin)

release of hatchery fish also contributes a substantial amount to Pennsylvania's economy. For example, the Pennsylvania Fish and Boat Commission and Pennsylvania State University released a 2004 report entitled, "*Creel Analysis and Economic Impact of Pennsylvania's Lake Erie Tributary Fisheries in Erie County, Pennsylvania, with Special Emphasis on Landlocked Steelhead Trout (*Oncorhynchus mykiss*)*." This report concluded that steelhead anglers spent \$9.5 million on trip-related expenditures in 2003. The report goes on to conclude that this activity accounts for 219 jobs through direct and indirect efforts. The Pennsylvania Fish and Boat Commission annually stocks over one million steelhead smolts into Lake Erie to support this important fishery.

Until 1998, the Pennsylvania aquaculture industry was regulated primarily by the Pennsylvania Fish and Boat Commission as an activity related to fish and fishing in Pennsylvania waters. Act 1998-94 recognized aquaculture as a farming activity and transferred registration and regulation of aquaculture activities to the Pennsylvania Department of Agriculture (PADA), which remains the lead agency promoting and regulating the aquaculture industry. The PADA Aquaculture Production Development Program is located within the Bureau of Market Development. The program is designed to give existing and prospective aquaculture farmers easy access to information to help them achieve success. The program provides links to information regarding regulations affecting aquaculture, species production, research, sales, and marketing. It provides many

educational opportunities for aquaculturalists, as well as guidance on business development, access to local sources for food fish, ornamental fish, sports fish, and baitfish, and marketing initiatives designed to help fish farmers penetrate new markets and expand sales.

Commercial Fish List

- Bluegill (*Lepomis macrochirus*)
- Bluntnose minnow (*Pimephales notatus*)
- Brook trout (*Salvelinus fontinalis*)
- Brown trout (*Salmo trutta*)
- Coho salmon (*Oncorhynchus kisutch*)
- Comets (*Carassius auratus*)
- Common carp (*Cyprinus carpio*)
- Creek chub (*Semotilus atromaculatus*)
- Emerald shiner (*Notropis atherinoides*)
- Fathead minnow (*Pimephales promelas*)
- Golden rainbow trout (*Oncorhynchus mykiss*)
- Golden shiner (*Notemigonus chrysoleucas*)
- Goldfish (*Carassius auratus*)
- Hybrid Stripped Bass (*Morone saxatilis* x *M. chrysops*)
- Koi (*Cyprinus carpio*)
- Largemouth Bass (*Micropterus salmoides*)
- Rainbow trout (*Oncorhynchus mykiss*)
- Smallmouth bass (*Micropterus dolomieu*)
- Tiger trout (*Salvelinus fontinalis* x *Salmo trutta*)
- Tilapia (*Oreochromis* sp.)
- Yellow perch (*Perca flavescens*)

Addressing Industry Needs

Researchers, extension specialists, resource managers, industry associations, and concerned stakeholders all play a role in addressing industry needs. The following sections outline the new initiatives and recent accomplishments in these areas.

Aquaculture Research

As Pennsylvania's aquaculture industry continues to develop, the need for research is being addressed through private, governmental, feed manufacturing, and university-based research programs. This research provides a broad base of support for Pennsylvania, and for the aquaculture industry throughout the Northeast. The bulk of the State's research, as with its industry, concerns salmonid aquaculture, but significant resources are also devoted to other species including tilapia, striped and hybrid striped bass, ornamentals, and freshwater shellfish. The organizations mentioned below provide an essential research core for the State and have access to other specialists and resources.

There are two strictly commercial research groups

Emerging Issues and Critical Needs

- Development of more effective and uniform regional policies and management techniques dealing with interstate regulations on fish health and biosecurity.
- Provide assistance in bringing the industry into compliance with the National Pollution Discharge Elimination System permits, with minimal financial impacts on the farmer.
- Provide clear messages and balanced public awareness of the risks and benefits of consuming farmed fish.
- Development of practical bird predation deterrent methods to reduce the economic losses to the aquaculture industry.
- Establishment of a comprehensive Pennsylvania fish pathogen laboratory that can test for viral, bacterial, and parasitic disease.

in the State who have had long tenures and significant success. Aquamarine Fish Farms, Inc. (AFF, Inc.), specializes in research on recirculating system and urban aquaculture. AFF, Inc. has partnered with several other organizations to provide support to commercial aquaculturists in Pennsylvania for over 20 years, and much of his work with salmonids, tilapia, and striped bass has been groundbreaking. In a similar fashion, the staff of Emperor Aquatics have been leaders in water treatment research since the early 1990s. In particular, their expertise in both UV sterilization and in foam fractionation has supported superior fish health in venues from ornamental backyard ponds to full-scale commercial growout facilities and municipal aquariums.

The State has two federal facilities devoted to aquaculture. The Northeast Fishery Center Complex of the U.S. Fish and Wildlife Service, which is based in Lamar, specializes in culture and management techniques for threatened and endangered species as well as providing fish health services and research for both natural and aquacultured populations. Their expertise in research on the culture of river herrings, Atlantic sturgeon, striped bass, Atlantic salmon, and rainbow trout, has made their staff a critical resource to many aquaculturists in the region. Their latest initiative, to create an Aquaculture Research Consortium within the State, could lead to significant

Research Contact Information		
Name	Address	Specialty/Title
Corinne Sweeney	University of Pennsylvania New Bolton Center http://www.vet.upenn.edu/nbc csweeney@vet.upenn.edu	fish nutrition
Steven Hughes	Cheyney University of Pennsylvania (610) 399-2275 or 1-800-CHEYNEY shughes@cheyney.edu	finfish nutrition
Extension Contact Information		
Charles A. Conklin II	Pennsylvania Department of Agriculture (570) 629-0427 charlieconklin@verizon.net	trout aquaculture
Eric Obert	Pennsylvania Sea Grant (814) 217-9018 ecol@psu.edu	VHS and biosecurity
Ann Faulds	Pennsylvania Sea Grant (215) 806-0894 afaulds@psu.edu	risk communications and fish consumption issues
Education Contact Information		
Richard W. Soderberg	Mansfield University (717) 662-4539 rsoderbe@mansfield.edu	fisheries biology
Steven Hughes	Cheyney University of Pennsylvania (610) 399-2275 or 1-800-CHEYNEY shughes@cheyney.edu	urban aquaculture, fish nutrition
Aquaculture Coordinator/Pennsylvania USDA Contact		
Charles A. Conklin II	Pennsylvania Department of Agriculture (570) 629-0427 charlieconklin@verizon.net	
Aquaculture Industry Association(s)		
Kelly Caldwell	Aquaculture Council of PennAg Industries (717) 651-5920 kcaldwell@pennag.com	

Aquaculture Industry Association(s) (continued)		
Name	Address	Specialty/Title
Gary Reddinger	Pennsylvania Trout Farmers Association (570) 992-4429	
Testing Laboratories		
Corinne Sweeney	University of Pennsylvania School of Veterinary Medicine New Bolton Center http://www.vet.upenn.edu/nbc/csweeney@vet.upenn.edu	laboratory
Michael Millard	U.S. Fish and Wildlife Service Lamar Fish Health Center (570) 726-6611 Mike_Millard@fws.gov	fish population ecology
John I. Enck, Jr.	Penn State University, Animal Diagnostic Laboratory (814) 863-0837 jie2@psu.edu	laboratory

collaborations among private and public groups within Pennsylvania's aquaculture community. Likewise, the U.S. Geological Survey's Northern Appalachian Research Laboratory in Wellsboro has significant resources and expertise invested in all aspects of salmonid culture. Research conducted at this facility has led to the development of culture methodologies for American eels (*Anguilla rostrata*) and various freshwater mussels. The central location of this laboratory has aided researchers in providing outreach to all regions of the state from the Great Lakes to the Delaware River Basin.

Pennsylvania is the only northeastern state with two aquaculture feed producers, and both are family-owned and operated. Melick Aquafeeds in Catawissa has served the region under several different names during the past three decades and produces a wide variety of aquatic animal feeds. Zeigler Brothers in Gardners is in the second generation of ownership and not only produces aquatic animal feeds, but also produces pet and zoo animal feeds. Along with its feed production, Zeigler also provides equipment and consulting services to the aquaculture industry. Both firms are committed to collaborative research and also export products outside of the United States.

Five universities in the State have significant investments in aquaculture research and education. The University Park campus of Penn State and the New

Bolton Center Campus of the University of Pennsylvania both provide aquatic animal health research and diagnostic support to the State's industry as component laboratories in the Pennsylvania Animal Diagnostic Laboratory System (PADLS). There is also some fish culture research carried out at the New Bolton Center which has been centered primarily on fish nutrition research. Drexel and Cheyney Universities have begun to develop a program to culture freshwater mussels native to the region. Proposed collaborations with several federal and State agencies promise to expand this program significantly in the future. Mansfield University has had a strong program in aquaculture education and research for over 20 years attracting students from throughout the country. Research into the culture of native and endangered species accomplished by Mansfield aquaculture program graduates has been well received by both government agencies and professional organizations. In 2004, Cheyney University began an aquaculture program whose main educational and research focus is on urban aquaculture, aquaponics, fish nutrition, and aquarium, bivalve, and fish culture.

Aquaculture Extension

The Pennsylvania State Department of Agriculture hosts a biennial statewide aquaculture workshop, *PennAqua*, that serves as the main training opportunity for the aquaculture industry. The Pennsylvania

Aquaculture Coordinator leads this effort working with the industry to solve emerging problems. Pennsylvania Sea Grant and the New Bolton Center are also helping the industry address biosecurity issues, such as Viral Hemorrhagic Septicemia, and are providing training in Integrated Pest Management and Hazard Analysis and Critical Control Points (HACCP) methodologies.

Aquaculture Education

Mansfield University and Cheyney University both offer coursework in aquaculture. See the Aquaculture Research section above for more information about their programs, and the Contact section for websites.

Aquaculture Resources

Northeastern Regional Aquaculture Center

The NRAC is one of five Regional Aquaculture Centers established by the U. S. Congress which supports research and outreach efforts to promote the development of the aquaculture industry.

<http://www.nrac.umd.edu>

Acknowledgements

This publication was prepared with funding from the Northeastern Regional Aquaculture Center (NRAC) as part of project Numbers 2006-385-17065 and 2007-385-18589 from the United States Department of Agriculture National Institute of Food and Agriculture. The authors gratefully acknowledge support from NRAC and USDA NIFA.

The cooperating agencies' programs are open to all citizens without regard to race, color, gender, disability, religion, age, sexual orientation, marital or parental status, or national origin. Any opinions, findings, conclusions, or recommendations expressed in this publication are those of the authors and do not necessarily reflect the views of the U.S. Department of Agriculture, the Northeastern Regional Aquaculture Center, or the University of Maryland. This fact sheet was prepared with assistance from the Connecticut Sea Grant College Program.

A copy of this report may be downloaded from: <http://www.nrac.umd.edu>

© 2009



United States Department of Agriculture
National Institute of Food and Agriculture