



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 2007: PENNSYLVANIA

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

### Industry Trends and Outlook

The USDA National Agricultural Statistic Service Aquaculture Census of the Pennsylvania agricultural industry reports aquaculture sales of \$10.9 million in the 2004. Sales of food fish comprised 68% of total sales with the remainder of the sales composed of sport and game fish, baitfish, crustaceans, molluscs, ornamental fish and water garden plants, and other animal aquaculture (tadpoles, frogs, trout eggs, and others). While trout comprises most of the fish food sales, tilapia and hybrid striped bass are also produced.

Recreational fishing activities associated with the release of hatchery fish also contributes a substantial amount to Pennsylvania's economy. For example, the Pennsylvania Fish and Boat Commission and Penn 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 in 2003, steelhead anglers spent \$9.5 million on trip-related expenditures. 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.

Up 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



**Pond aquaculture in Pennsylvania (Photo: Charlie Conklin)**

transferred registration and regulation of aquaculture activities to the Pennsylvania Department of Agriculture (PA DAG), which remains the lead agency promoting and regulating the aquaculture industry). The PA DAG Aquaculture Production Development Program is located within the Bureau of Market Development. The program is designed to help current and prospective aquaculture farmers to access information easily to help them achieve success. The program provides:

- Links to information regarding regulations affecting aquaculture, species production research sales and marketing
- Guidance on business development
- Access to local sources for food fish, ornamental fish, sports fish and baitfish

## 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.
- Help bring the industry into compliance with the National Pollution Discharge Elimination System permits with a minimal financial effect on the farmer.
- Provide clear messages and balanced public awareness of the risks and benefits of consuming farmed fish.
- Develop of practical bird predation deterrent methods to reduce the economic losses to the aquaculture industry.

- Marketing initiatives designed to help fish farmers penetrate new markets and expand sales
- Educational opportunities for aquaculturalists

## Commercial Fish List

- 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 chryssoleucas*)
- Goldfish (*Carassius auratus*)
- Koi (*Cyprinus carpio*)
- Rainbow trout (*Oncorhynchus mykiss*)
- Tiger trout (*Salvelinus fontinalis* x *Salmo trutta*)

## 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 strength of the State's research, as with its industry, lies in 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 individuals and resources.

There are two strictly commercial research groups in the state who have had long tenures and significant success. Aquamarine Fish Farms, Inc., under the leadership of Dr. Steven Van Gorder, specializes in research on recirculating system and urban aquaculture. Van Gorder 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 1990's. 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 and their latest initiative to create an Aquaculture Research Consortium within the State could lead to significant 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. In addition, 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 facility has greatly facilitated the ability of its researchers to provide outreach to all regions of the state from the Great Lakes to the Delaware River Basin.

<b>Research Contact Information</b>		
<b>Name</b>	<b>Address</b>	<b>Specialty</b>
Corinne Sweeney	University of Pennsylvania New Bolton Center <a href="http://www.vet.upenn.edu/nbc">http://www.vet.upenn.edu/nbc</a>	fish nutrition
Steven Hughes	Cheyney University of Pennsylvania (610) 399-2275 or 1-800-CHEYNEY	finfish nutrition
<b>Extension Contact Information</b>		
Charles A. Conklin II	Pennsylvania Department of Agriculture (570) 629-0427 <a href="mailto:charlieconklin@verizon.net">charlieconklin@verizon.net</a>	trout aquaculture
Eric Obert	Pennsylvania Sea Grant (814) 217-9018 <a href="mailto:eco1@psu.edu">eco1@psu.edu</a>	VHS and biosecurity
Ann Faulds	Pennsylvania Sea Grant (215) 806-0894 <a href="mailto:afaulds@psu.edu">afaulds@psu.edu</a>	risk communications and fish consumption issues
<b>Education Contact Information</b>		
Richard W. Soderberg	Mansfield University (717) 662-4539	fisheries biology
Steven Hughes	Cheyney University of Pennsylvania (610) 399-2275 or 1-800-CHEYNEY	
<b>State Aquaculture Coordinator</b>		
Charles A. Conklin II	Pennsylvania Department of Agriculture (570) 629-0427 <a href="mailto:charlieconklin@verizon.net">charlieconklin@verizon.net</a>	
<b>Aquaculture Industry Association(s)</b>		
Sam Sherk	Aquaculture Council of Penn Ag Industries (717) 651-5920	
Gary Reddinger	Pennsylvania Trout Farmers Association (570) 992-4429	
<b>Testing Laboratories</b>		
Corinne Sweeney	University of Pennsylvania School of Veterinary Medicine - New Bolton Center <a href="http://www.vet.upenn.edu/nbc/">http://www.vet.upenn.edu/nbc/</a>	
Michael Millard	U.S. Fish and Wildlife Service, Lamar Fish Health Center (570) 726-6611	
John I. Enck, Jr.	Penn State University, Animal Diagnostic Laboratory (814) 863-0837	



Trout aquaculture raceway (Photo: Charlie Conklin)

Pennsylvania is the only state in the northeast 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 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 mostly been centered around fish nutrition research. Drexel University has begun in the past few years to develop a program for the culture of 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. The students trained in this program are from throughout the U.S. and their continued research in the culture of native and endangered species 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 fish culture.

## Aquaculture Extension

The Pennsylvania State Department of Agriculture hosts a statewide aquaculture workshop, *PennAqua*, biennially that serves as the main training opportunity for the aquaculture industry. The Pennsylvania Aquaculture Coordinator leads this effort, and works with the industry to solve emerging problems. Pennsylvania Sea Grant and New Bolton Center have also been active in helping the industry prepare for and respond to biosecurity issues such as Integrated Pest Management and Viral Hemorrhagic Septicemia.

## 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 Web sites.

## 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>

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