

THE HOOK



CATCH UPDATES AND CURRENT TRENDS IN AQUACULTURE IN WESTERN MA AND BEYOND

Published by the UMass Extension Aquaculture Program

Will U.S. get hooked on ocean fish farms? Some hope not

The executive director of the United Fishermen of Alaska, Mark Vinsel, fears that ocean fishermen are the last of a dying breed in a hunting-gathering tradition that stretches back into history and that the days are not long before fishermen go the way of America's small farmers, who are being squeezed off lands by the growth of agribusiness and commercial farming operations. "The oceans belong to everybody - they should not be fenced off and sold off to the highest bidder."

Vinsel and others are alarmed by Bush administration moves to open up areas off the United States to fish farms, where fish are raised in huge underwater nets. Legislation the administration sent to Congress last June, that is under consideration now, would, for the first time, allow open-ocean aquaculture on federal ocean territory from 3 miles beyond shorelines to 200 miles out. States have jurisdiction only within 3 miles of their shorelines.

William Hogarth, assistant administrator for fisheries at the Commerce Department's National Marine Fisheries Service, said that developing such fisheries could reduce U.S. imports. Over 70 percent of fish consumed in America today is imported, and about a half of that comes from foreign aquaculture projects, Hogarth said. China, Japan, Ireland, Norway and Canada have already approved oceangoing aquaculture.

Commercial operations are only beginning in the United States and its territories. Two fish farms in Hawaii and one in Puerto Rico use netting installed undersea for raising fish.

Excerpt from article by Lance Gay

Dates of interest in Aquaculture:

Northeast Aquaculture Conference Exposition (NACE)-

December 6-8, 2006, Groton, CT

<http://www.northeastaquaculture.org/>

World Aquaculture 2007 Conference

February 26 - March 2, 2007, San Antonio, Texas

<http://www.texasaquaculture.org/id237.htm>

Aquaculture becomes billion-dollar industry!

Sales of U.S. aquaculture products have grown 12 percent in seven years to \$1.1 billion, according to the National Agricultural Statistics Service.

Aquaculture production in the USA is a billion-dollar industry, with sales of fish, shellfish and related products growing by 11.7 percent over the past seven years, according to results of the 2005 Census of Aquaculture. The 2005 count was the second nationwide aquaculture census conducted by the U.S. Department of Agriculture's National Agricultural Statistics Service (NASS). The first took place in 1998. Results show that between 1998 and 2005, U.S. sales of aquaculture products grew from \$978 million to nearly \$1.1 billion.

Census results show that food fish – including catfish, perch, salmon, hybrid striped bass, tilapia and trout – accounted for 62 percent of all aquaculture sales in 2005. Molluscs – including abalone, clams, mussels and oysters – comprised 19 percent of 2005 sales. Crustaceans, such as lobsters and shrimp, and ornamental fish, such as koi and tropical fish, each accounted for approximately 5 percent of sales. They were followed by baitfish at 4 percent and sport fish at 2 percent.

Mississippi led the nation in sales of aquaculture products, with nearly \$250 million dollars in 2005. Arkansas, Alabama and Louisiana were the other states with sales topping \$100 million. Louisiana had the largest number of aquaculture farms. The state's 873 farms were more than double the number in any other state.

The 2005 Census of Aquaculture collected detailed information on issues including production methods, water sources, sales, distribution and farm labor. For the purpose of the census, an aquaculture farm was any commercial or non-commercial place from which \$1,000 or more of aquaculture products were raised and sold, or distributed for restoration, conservation or recreational purposes during the census year.

Complete results of the 2005 Census of Aquaculture are available online at: www.nass.usda.gov/aquaculture/

03 October, 2006

www.fishfarmer-magazine.com is published by Special Publications.

SPOTLIGHT ON FISH HATCHERIES IN NEW ENGLAND

Fall Focus: Berkshire Fish Hatchery

Volunteers take the reins at Berkshire Trout Hatchery

The U. S. Fish and Wildlife Service and the Berkshire Hatchery Foundation recently signed an agreement making the Berkshire Trout Hatchery the first and only hatchery in the National Fish Hatchery System run solely by volunteers. Northeast Regional Director Marvin Moriarty and Foundation Acting President George Emmons signed the agreement at a foundation fundraising event.

The new agreement allows the nonprofit foundation to raise funds for the operation of the hatchery and its programs. The group also participates in a multi-agency federal and state-supported restoration program for the facility under the agreement.

The hatchery began supplying trout to surrounding states in 1914. Over the years staff raised rainbow and brown trout, smallmouth bass, and Atlantic salmon. After 1965, budget shortages limited its operations until, in 1994, operations ended altogether.

Under the new agreement, the Berkshire Hatchery Foundation, <http://www.berksfish.org>, will manage the hatchery as an environmental education center for local youth and school groups. The foundation teaches the importance of aquatic resources, provides fish for special events for youth and persons with disabilities, and promotes aquaculture in local schools. The group also maintains and operates the hatchery's seven miles of trails.

The foundation's volunteers care for the hatchery's fish, maintain the facility, and, with UMass Extension support, run outreach programs within the local community and UMass Extension uses the hatchery for educational events, outreach and research.

The hatchery volunteers also receive technical support and assistance from staff of the Northeast Region's Pittsford National Fish Hatchery, located in Vermont.

For the first time in twelve years, the hatchery has begun raising Atlantic salmon for the Connecticut River Atlantic Salmon Restoration Program. 20,000 small Atlantic salmon now growing at the hatchery will be released in 2008 as part of the restoration program.

The Berkshire Trout Hatchery is located on Hatchery Road in Hartsville, New Marlboro, approximately 6 miles east of Gt. Barrington, Massachusetts. It is open to the public daily.

Article from USFWS website: www.fws.gov/northeast/berkshir.html



The Berkshire Fish Hatchery Office, Kelt House, & Pools
Berkshire Hatchery Foundation Photograph

WANTED: A FEW GOOD VOLUNTEERS! At the Berkshire Fish Hatchery, the only all-volunteer run hatchery in the Federal system. A few hours a week at the Hatchery can bring an understanding of the hatchery's processes, help educate the public and school groups, and allow you to work first hand in restocking local waters. Consider joining a collegial group of volunteers who are interested in fisheries and the environment. Please contact George Emmons of the BHF Board (413-528-5985) for further details.

Berkshire Hatchery Foundation Mission

"To promote and support the development of aquaculture and environment education programs for the Berkshire Community."

IMPORTANT NEWS:

A Federal Order was issued imposing a restriction on trade in live fish susceptible to transmission of Viral Hemorrhagic Septicemia. The order will immediately restrict interstate movement of fish from eight Great Lakes states (NY, WI, MI, MN, OH, IL, IN, PA) and some international importation. The susceptible species list is contained on the APHIS web site:

<http://www.aphis.usda.gov/vs/aqua/>.

A Holiday Shopping Idea

The Million Dollar Lure is crafted in just over three pounds of glimmering gold and platinum, then encrusted with 100 carats of diamonds and rubies (4,753 stones to be exact). This extraordinary big game lure is over 12 inches in length. \$1,000,000. High test line is recommended.

From:

http://www.macdaddysfishinglures.com/million_dollar_lure.shtml



Half of All Fish Eaten by Humans Are Now Farmed

Nearly half the fish consumed in the world is now farmed rather than caught in the wild, according to figures published today by the U.N. Food and Agriculture Organization. Fish farming has grown as wild stocks decline — probably for good, the U.N. body said — as a result of over-fishing. But demand for fish continues to rise, especially in rich nations.

This "spells trouble," according to the FAO, which said fish farming would struggle to satisfy even current levels of consumption without technological breakthroughs. Only 9% of the fish the world consumed was farmed in 1980, while today 43% is, according to the report "The State of World Aquaculture," published today. The Rome-based agency says the continued expansion of fish farming is probably the only way of meeting future demand. But it says the "jury is out" on whether aquaculture can deliver, because farmed carnivorous fish currently need to be fed wild-caught fish, which are themselves over-exploited.

Any expansion of fish farming is therefore dependent on the development of vegetable-based alternatives to fish oil and meal. Farmed fish, however, now amount to 45.5 million tons a year, worth \$63 billion. Currently, freshwater and marine capture fisheries produce 95 million tons annually, of which 60 million tons is destined for human consumption. Globally, consumer demand for fish continues to climb, especially in affluent nations.

*Excerpt from article by Charles Clover - The Daily Telegraph
September 5, 2006*

How El Nino Can Affect What We Feed Our Fish

This summer, fish meal prices hit an all-time high of \$1600 per metric ton (mT), up from around \$700 the previous year. What happened? In an article in the most recent Aquaculture Magazine, Dr. Ronald Hardy of the University of Idaho explains that the warm ocean currents (El-Nino) moved into the normally cool waters off Peru, affecting the coast anchovy catch. These anchovies normally account for 30% of the fish meal used to feed the world aquaculture industry.

While supporters of sustainable aquaculture techniques have been encouraging growers to use soy- and cornmeal based feeds, for largely environmental reasons, the plant-based oils have been more expensive. This year, soy and corn markets are down, especially relative to the price of fish meal. Dr. Hardy sees the possibility that there will be a movement toward these other sources of protein.

The article further points out that with the increasing ethanol production, corn oil protein can become even more abundant, as corns protein is not used for ethanol.

*Article referenced is from Aquaculture Magazine,
Achill River Corp., Arden, NC*

The Importance of Measuring Carbon Dioxide in Aquaculture

While oxygen and ammonia levels are often viewed, rightly, as critical to fish health and performance, carbon dioxide tends to be ignored and very few aquaculture facilities regularly monitor CO₂ levels. This is partly due to the fact that it is not easy to measure CO₂ and partly due to an assumption that, if other water quality parameters, particularly oxygen, are OK, then CO₂ will not be an issue.

There are, however, circumstances when carbon dioxide levels can be relatively high and there is an increasing body of evidence to suggest that there are a number of ways in which CO₂ can have an adverse effect on fish health.

Carbon dioxide levels of below 10 mg/l are thought to be well tolerated by fish, although sensitivity to the gas varies between species. The level of CO₂ in the water varies with the respiratory and photosynthetic activity of animals and plants in incoming water, the level of decomposition of organic material in that water (a very significant contributor to CO₂ levels in some nutrient-rich waters), and the respiration of the fish themselves. CO₂ can build up to significantly high levels in systems with large numbers of fish and relatively slow water turnover.

The effect of increased CO₂ in water is to reduce the rate at which CO₂ from the fish's own metabolism can be released from the blood through the gills, thus the CO₂ in the blood also increases - this is known as hypercapnia - resulting in a drop in the blood pH, an acidosis. At the same time the oxygen-carrying ability of the haemoglobin in the blood is reduced.

So, what is the effect of this hypercapnia? In the short term the physiology of the fish can counteract the effect by balancing the acidosis with an exchange of ions such as increasing the uptake of bicarbonate and losing hydrogen and phosphate ions and little harm is done. In the long term this balancing act can have a more profound effect on the health of the fish.

Do try to consider the effect of CO₂ on your fish stocks. Remember that high levels of oxygen may not help either as the fish respiratory rate is governed by levels of oxygen, high O₂ can slow the rate of elimination of CO₂ from the blood, thus increasing the hypercapnia. By increasing levels of oxygen, you may just make things worse.

Source: Fish Vet Group - July 2005

Fun Fish Fact:

Fish, with nearly 27,000 living species, are the largest population of Vertebrate animals. In fact, if you combined all the other Vertebrates, fish would still outnumber them.

www.hotfact.com/fun-fish-facts.html

Educational Programs

Recently the UMass Extension Aquaculture Program has joined up with the USFWS and Mass Department of Fish and Game as part of the Atlantic Salmon Egg Rearing Program (ASERP). We will be facilitating the expansion of ASERP in Southern Berkshire County. Our Outreach and Education Coordinator, Tara Johnson, will be the educational liaison for 3-5 classrooms this year. Here are some highlights from the USFWS website for ASERP:

The Atlantic Salmon Egg Rearing Program (ASERP) is a cooperative environmental education program designed to promote an understanding of fisheries restoration and management and hands-on watershed stewardship through experiential learning in the classroom.

The Program, initiated in Massachusetts in 1997 by Trout Unlimited, parallels similar initiatives in NH, CT and VT. Students hatch and raise young Atlantic Salmon in the classroom and later release the fish in streams within their community.

This interdisciplinary project empowers student responsibility for their own natural environment.

Mt. Everett Regional School has given a tally of three classes that they are enrolling in ASERP. We are working hard to bring more schools on board with the program. Initial fundraising is necessary for the schools, after which only small incidental costs may occur. The ASERP officials will continue to supply the classes with Atlantic Salmon eggs on an annual basis as long as the schools wish to participate. It is exciting to help spread the ASERP project throughout the Berkshires and Western Massachusetts.

UMass Extension Aquaculture Program

For more information on this program please contact Craig Hollingsworth at chollingsworth@umext.umass.edu

Requests for information or questions regarding this newsletter will be addressed by Tara Johnson at tara6509@hotmail.com.

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Aquaculture Research and Outreach by University of Massachusetts Extension

The University of Massachusetts Extension Aquaculture Team promotes the development of the finfish aquaculture industry in Massachusetts by facilitating industry expansion and by educating the public about the opportunities and benefits of aquaculture. The project provides resources to assist industry representatives, backyard hobbyists, educators, and individuals looking for information on the industry or seeking establish an aquaculture system.

This year we are completing studies at the Berkshire Hatchery on different pond cage configurations and on a number of predator deterrence techniques. We are working with farmers in Northfield who are developing a largemouth bass rearing facility and we are developing a small-scale rotifer rearing system to assist farmers who raise fish from eggs. At the USFWS Cronin Salmon Station in Sunderland, we are working with US Geological Survey fish pathologist Rocco Cipriano conducting research concerning the management of furunculosis, a disease common to salmonids.

Outreach activities include presentations on aquaculture for entry-level farmers, summer twilight meetings to highlight aquacultural enterprises and the team website (www.umass.edu/aquaculture). In Berkshire County, Tara Johnson is promoting the Atlantic Salmon Egg Rearing Program (ASERP) and connecting the school program with the salmon rearing activities at the Berkshire Fish Hatchery.

The activities of the UMass Extension Aquaculture Team are funded by a grant from the Massachusetts Department of Agricultural Resources.



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