



American Institute of Fishery Research Biologists

Promoting excellence in fishery science

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President's Message

I just returned from a productive week in St. Paul MN, and am inspired by the progress we made at the AIFRB Executive Board meeting. Thanks to Kathy Dickson, Allen Shimada, Tom Keegan, Tom Ihde, Dick Beamish, Jack Helle, Doug Vaughan, Jeff Schaeffer and Ed Roseman for their time and efforts. One of the most important items was an extensive discussion of keeping active Districts strong while reviving other Districts. We recognized that some well-established Districts (e.g., Northern and Southern California Districts) have regular and well-attended meetings, some Districts are reviving membership with dinner lectures and training courses (e.g., New England), and other Districts are in need of support to establish more frequent activities. In general, successful District activities are:

- focused on an attractive topic or speaker,
- well advertised,
- inclusive to all District members and selected non-members,
- attractive to students,
- organized by small group,
- have a local host who can organize the meeting,
- meetings are geographically central or rotational around the District,
- partner with other local organizations (AFS chapters, sportsmen groups)

In addition to offering this guidance on organizing successful District activities, the Board also recognized that District activities can be financially risky. Therefore, the Board decided to increase financial support to District Directors. The Board is requesting proposals from all District Directors to help fund District activities. Proposals should include planning details for funding up to \$500 per proposal, but Districts can submit more than one proposal. Proposals will be reviewed by the Treasurer, Membership Chair and President (Allen Shimada, Tom Keegan and me). Proposals should be submitted to me (scadrin@umassd.edu). Once again, I thank Board members for their time and personal investment in AIFRB for supporting District activities and many other aspects of AIFRB governance. We hope that our efforts can help improve the benefits of membership.

Steve Cadrin

Seeking Nominations for Outstanding Achievement Awards

The Institute is seeking nominations for individual and group Outstanding Achievement Awards. The Outstanding Achievement Awards are the highest recognition given by AIFRB to individuals and to research groups.

The Individual Achievement Award is given to an individual who has made significant contributions to the advancement of fishery science. Candidates are rated on the following criteria: significance of publications, exceptional service to the profession, outstanding teaching or training of students, important discoveries or inventions, and significant contributions to the advancement of fishery science.

The Group Achievement Award is given to research groups with outstanding records of scientific contribution to fishery science or fishery resource policy. It is the Institute's highest award recognizing research groups that nurture excellence in fishery science. Candidates will be rated on the following criteria: sustained contribution of significant publications, exceptional service of the fishery profession, outstanding teaching or training programs, important discoveries or inventions, and significant contributions to the advancement of fishery science.

Members are encouraged to submit nominations to the Award Committee through the President (Steve Cadrin, scadrin@umassd.edu) by the end of 2012.

Clark Hubbs Research Assistance Award Recipients

The AIFRB Hubbs Research Assistance Award program promotes one of the Institute's primary roles by supporting the professional development and performance of its members. This years recipients are David Bethoney, Jessica Combean, Brandon Harris and Abigail Lynch. Abstracts and photos follow:



David Bethoney

PhD candidate and research associate at the University of Massachusetts Dartmouth School for Marine Science and Technology. My research is focused on increasing our understanding of river herring and American shad distribution at sea and using this information to help Atlantic herring and mackerel fishermen reduce incidental catch of river herring and shad.

David Bethoney:

Quantifying and reducing river herring bycatch in the U.S. northwest pelagic trawl fisheries

N. David Bethoney, Bradley Schondelmeier, Kevin Stokesbury and William Hoffman.

Abstract

Mid-water trawling, the primary method of harvesting Atlantic herring (*Clupea harengus*) and mackerel (*Scomber Scombrus*) in the U.S., can capture hundreds of tons of fishes in a single tow. Vessels using this fishing gear are efficient but have the potential to catch large amounts of non-target species that are difficult to quantify. Decreases in the number of anadromous river herring (*Alosa pseudoharengus*, *A. aestivalis*) and American shad (*A. sapidissima*) returning to spawn has led to speculation that these fishes are incidentally caught in large numbers by midwater trawl vessels. Although the role of bycatch in the decline of river herring and American shad is unclear, mid-water and bottom trawl Atlantic herring and mackerel fishermen collaborated with the University of Massachusetts Dartmouth School of Marine Science and Technology and the Massachusetts Division of Marine Fisheries to quantify and minimize bycatch. This collaborative project increased portside sampling of vessels landing in Massachusetts and Rhode Island from ~15% to 50% and created a near-real time communication system to notify vessels of areas with high bycatch. Portside sampling is an efficient, cost-effective method to estimate catch of river herring and American shad, which are pumped aboard vessels with targeted catch. Industry cooperation and the appearance of small scale spatial and temporal bycatch patterns suggest rapid communication may be effective for reducing bycatch. As managers of the Atlantic herring and mackerel fisheries consider adding regulations to reduce bycatch, this project provides fishermen with a tool to achieve this goal without increased regulation.



Jessica Comben

Jessica received a Bachelors degree in Fisheries Management for Lake Superior State University and is currently working towards her Masters degree in Aquatic Sciences at Grand Valley State University's Annis Water Resource Institute. Jessica's research interest are species of concern, specifically lake sturgeon, wetlands and aquatic insects.

Jessica Comben:

Distribution of age-0 lake sturgeon in the lower section of a Lake Michigan tributary

Jessica N. Comben^{1,2}, Carl R. Ruetz III², Gregg M. Smith³, Elizabeth Binoniemi-Smith¹

¹Gun Lake Tribe (GLT), ²Annis Water Resources Institute, Grand Valley State University,

³Michigan Department of Natural Resources, Fisheries Division

Abstract

Knowledge of spatial distribution and habitat use of juvenile lake sturgeon (*Acipenser fulvescens*) is critical for successful restoration of this threatened species. Juvenile lake sturgeon distribution was assessed in September-December 2009-2011 using gill nets in the lower section of the Kalamazoo River near Lake Michigan. Captured lake sturgeon were fitted with either a radio or ultrasonic tag to track movement. We used side-scan sonar and hydro-acoustics to map areas where juvenile lake sturgeon were captured. Ten juvenile lake sturgeon (1 wild and 9 hatchery reared) from the Kalamazoo River were fitted with transmitters and tracked until signals were unattainable. All juvenile lake sturgeon appeared to emigrate to Lake Michigan in September-November shortly after being tagged. Total residency time of juvenile lake sturgeon in the lower section of this river is unclear, but our preliminary results suggest juveniles (d' age 1) are not utilizing the lower section of this system for nursery habitat before migrating to Lake Michigan in the late fall.



Brandon Harris

Brandon Harris is a graduate student at Grand Valley State University's Annis Water Resources Institute. Brandon's research interests are in fisheries biology and his thesis addresses questions related to population dynamics of a threatened fish species (lake sturgeon *Acipenser fulvescens*).

Brandon Harris: Evaluating Removal and Mark-Recapture Methods for Estimating Abundance of a Small, Non-Game Fish

Brandon S. Harris, Carl R. Ruetz III, Jared Homola and James N. McNair, Grand Valley State University

Abstract

Unbiased estimates of stream fish abundance are critical for sound fisheries management. Most studies investigating the bias associated with estimates of stream fish abundance focus on salmonines, yet non-game fishes often comprise a major portion of many stream fish assemblages. We evaluated mark-recapture (i.e., Lincoln-Peterson model with Chapman correction) and removal methods (i.e., models M_b and M_{bh}) for estimating the abundance of mottled sculpin (*Cottus bairdii*), a common non-game fish. Specific objectives were to: (1) compare estimates of mottled sculpin abundance, (2) assess bias of removal methods by comparing estimated abundance to known abundance, and (3) evaluate closed-population model assumption. We sampled eight streams via backpack electrofishing; each stream was sampled over 2-days. On day one, fish were batch marked in three sections of a 90-m reach. On day two, fish were captured and temporarily removed from the stream during four electrofishing passes; the number and marking status of fish was recorded during each pass. Removal abundance estimates generated with program CAPTURE were significantly lower (range=22-58%) than mark-recapture estimates. Moreover, the removal method underestimated (range=38-59%) known abundances of marked mottled sculpins. Movement of marked fish was minimal among sections of the 90-m reach in all but one study stream. Survival and mark retention of mottled sculpin after capture was 100% for fish retained overnight in stream enclosures ($n=405$ fish). Our results suggest the closed-population assumption was valid in most streams and the removal method yielded negatively biased abundance estimates. Consequently, we recommend using mark-recapture methods to estimate abundance of small, non-game fishes.



Abigail Lynch

Abigail J. Lynch is a University Distinguished Fellow in the Center for Systems Integration and Sustainability at Michigan State University. She is a doctoral student in Fisheries and Wildlife with a dual major in Ecology, Evolutionary Biology, and Behavior; a Doctoral Specialization in Environmental Science and Policy, and a Certificate in College Teaching. Her research interests include marine and freshwater fish conservation with a policy and management focus on fisheries systems.

Abigail Lynch: Projected impact of climate change on lake whitefish (*Coregonus clupeaformis*) in the Laurentian Great Lakes

Lynch, Abigail J.¹; Taylor, William W.¹; Ebener, Mark P.²

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²Inter-Tribal Fisheries and Assessment Program, Chippewa Ottawa Resource Authority, 179 West Three Mile Road, Sault Ste. Marie, MI 49783

Abstract

Since 1980, populations of lake whitefish (*Coregonus clupeaformis*) have supported the most economically valuable and productive commercial fishery in the upper Laurentian Great Lakes (Lakes Huron, Michigan, and Superior; annual catch value = US\$16.6 million). Changes in regional climate variables are expected to increase surface temperatures of the Great Lakes by as much as 6 degrees C and result with substantially reduced ice cover. Additionally, the average wind speed over these lakes is expected to decline. These changes are predicted to impact the ecology, productivity, and value of the lake whitefish fishery because the development of year class strength has been linked with these climatically influenced factors. This research will provide the foundation for a decision support tool to optimize harvest management in a changing climate by examining the correlation of climate projections with the compensatory resilience of lake whitefish and their recruitment dynamics in the upper Great Lakes. Specifically, this tool will integrate the impact of changes in climate on the ecology and population dynamics of this species in order to facilitate the management of this multi-jurisdictional fishery resource at a landscape-scale and assist in coordination of harvest strategies for this species in the face of changing global and regional climatic conditions.

AIFRB Seeking Young-Scientist Member for Executive Board

The Executive Board is seeking nominations for an Associate member to represent young professionals at the 2013 Board meeting (Little Rock AR, September 7-8 2013; the weekend before the Annual AFS meeting). Up to \$600 in travel support is available to attend the meeting and participate in Board discussions. Associate members can nominate themselves or other members can nominate Associate Members who are willing to attend the meeting. Nominations and CVs should be sent to the Membership Committee Chair, Tom Keegan (tkeegan@ecorpconsulting.com).

Biography of AIFRB Founders

FREDERICK C. CLEAVER

Frederick C. Cleaver was born on June 27, 1916, in Everett, Washington, the first son of an English sailor and an Iowa farmer's daughter who met on a train near Tacoma, Washington. He grew up in Kalama, Washington, where he graduated from high school in 1933, earning two letters playing football as a 135-pound guard.

He earned his B.S. degree from the School of Fisheries of the University of Washington in 1941 and his Ph.D. degree from the same institution in 1967.

He worked for the Washington Department of Fisheries from 1942 to 1948, for the U.S. Fish and Wildlife Service in Honolulu, Hawaii, from 1948 to 1951, for the Oregon Fish Commission from 1951 to 1956, and again for the U.S. Fish and Wildlife Service from 1956 until his retirement in 1976. Dr. Cleaver's duties and assignments included research into the methodologies of determining sustainable yields of various fisheries, including Alaska king crab, salmon, and steelhead trout, and conducting biological research on various domestic and international fish populations, including flounder, herring, and tuna. In 1968, he became program director of the Columbia River Fisheries Program, where he managed programs to increase the runs of salmon and steelhead through the operation of hatcheries, establishment of bypass fish-ways at migration obstructions, and installation of screens at dangerous river diversions. He wrote and published numerous scientific papers, and reports from his research were instrumental in commercial fishing negotiations with Canada, Japan, and the former U.S.S.R.

He married Rosemary Hays of Portland, Oregon, in 1941. Rosemary passed away in June 1993, ending their long marriage of 52 years.

He belonged to many professional societies, including the American Fisheries Society, the Pacific Fishery Biologists, and, of course, the American Institute of Fishery Research Biologists—the organization that he helped establish in 1956.

Fred Cleaver died on February 6, 2002, at the age of 85, in Portland, Oregon.

John Butler Retires

Dr. John Butler, AIFRB Editor, recently retired from the National Oceanographic Atmospheric Administration's National Marine Fisheries Service (NMFS) after a long and distinguished career in fishery research. After earning his BS in Biological Oceanography from the University of Washington (1967) in and MS from Oregon State University (1971), he began his career in 1972 working for the Smithsonian Institution under Elbert. H. Alstrom as an Ichthyologist. With Dr. Ahlstrom and Barbara Sumida, I published "Pelagic Stromateoid Fishes (Pisces, Perciformes) of the Eastern Pacific: Kinds, Distributions, and Early Life Histories and Observations on Five of these from the Northwest Atlantic", which has been cited more than 200 times. After earning his Ph.D. degree in Marine Biologist from the Scripps Institution of Oceanography in 1987, Dr. Butler worked for the National Marine Fisheries Service on a variety of topics including age and growth of the early stages of marine fishes, stock assessments, and survey technology. I was twice awarded the best paper in the Fishery Bulletin. In 2003 the "Biology and Population Dynamics of Cowcod (*Sebastes levis*) in the southern California Bight" won the award. In 2006 "Use of Multibeam Benthic Mapping Techniques to Refine Population Estimates of the Endangered White Abalone (*Haliotis sorenseni*)" won the award. Most recently I led the white abalone recovery program and the Remotely Operated Vehicle (ROV) program charged with monitoring white abalone. To meet these requirements he supervised the development and construction of a new ROV system with High Definition Video, fiber optics and advanced instrumentation specifically designed to survey benthic invertebrates and demersal fishes.

After conducting a stock assessment on cowcod rockfish which lead to creation of the Cowcod Conservation Area (4,200 sq. mi.), Dr. Butler began developing techniques to combine acoustics with optical surveys to monitor the recovery of cowcod in the area now closed to fishing and lethal sampling. His final contribution is a book "A Guide to the Rockfishes, Thornyheads and Scorpionfishes of the North Eastern Pacific" by John L. Butler, Milton S. Love, and Tom E. Laidig which is being published the University of California. The book draws largely on the 40,000 digital still images take by the ROV program from Mexico to the Gulf of Alaska and is intended to improve identification of rockfish by visual surveys.



Benefits of Rebuilding Global Marine Fisheries Outweigh Costs

Rebuilding global fisheries would make them five times more valuable while improving ecology, according to a new University of British Columbia study, published today in the online journal PLoS ONE. By reducing the size of the global fishing fleet, eliminating harmful government subsidies, and putting in place effective management systems, global fisheries would be worth US\$54 billion each year, rather than losing US\$13 billion per year. “Global fisheries are not living up to their economic potential in part because governments keep them afloat by subsidizing unprofitable large scale fishing fleets with taxpayer money,” says study lead author Rashid Sumaila, a fisheries economist and director of the UBC Fisheries Centre. “This is like sinking money into a series of small, cosmetic fixes in an old home rather than investing in a complete, well thought-out renovation that boosts the home’s value.” Despite the US\$130- to US\$292-billion price tag for transitioning global fisheries, the study’s authors estimate that in just 12 years, the returns would begin to outweigh the costs and the total gains over 50 years would return the investment three- to seven-fold. “We should be getting more from our fisheries, rather than less,” says Sumaila. “If the environmental and sustainability reasons alone can’t convince global governments to take action, the financial incentives should.” “This study shows that politicians can no longer use the excuse that rebuilding fisheries is too expensive,” says Daniel Pauly, principal investigator of UBC’s Sea Around Us Project and a study co-author. “Not only is rebuilding better for the economy, it’s better for ecology.” In addition to eliminating harmful subsidies, new policies would need to address poor regulation, particularly on the high seas, and illegal fishing.

From PHYS.ORG

Fishing in the US Industry Market Research Report Now Available from IBISWorld

The US Fishing industry operates commercial fishing on a global scale. Exports account for almost all of the US industry’s revenue, and imports largely satisfy US seafood demand. In other words, fish caught in American waters mostly end up on foreign plates where intense demand outstrips the available supply. In turn, supply shortages overseas due to strong demand make prices more lucrative for US operators. According to IBISWorld industry analyst Josh McBee, “in Asian countries especially, US fishing firms can sell at better prices than at home.” Meanwhile, Asian fisheries are able to supply fish cheaper than domestic operators; thus, the industry has acquired a trade deficit of about \$7.0 billion for much of the past decade. The trade-weighted index plays a key role in understanding revenue movements; an overall depreciation of the US dollar’s value over the past five years has rendered a favorable environment for exports. Other influential factors on revenue include downstream demand from seafood preparation and per capita seafood consumption, while the prices for oil and seafood factor into profit margins. In the five years to 2012, industry revenue is expected to grow at an annualized rate of 4.6% to \$5.7 billion on the back of strong export sales. In 2012 alone, revenue is expected to grow a marginal 0.6%; while disposable incomes increase, export demand is expected to level off as contamination fears following the Fukushima reactor scare in Japan die down.

Most participants in this industry are relatively small nonemploying firms. As such, industry concentration is very low. Fisheries management policies that restrict the number of operators issued commercial fishing licenses have increased concentration. Likewise, the limited availability of licenses spurs competition in the Fishing industry. Greater government regulation could increase concentration. For example, a reduction in the number of vessels permitted into a particular fishery would allow remaining incumbents to increase their share of the annual catch. “If some firms succeed in cornering a market with exclusive legal rights to certain waters, their business could expand to gain a significant market share,” says McBee. Even if such a scenario did occur in the United States, industry concentration would remain low because nonemployers currently have such a vast majority of establishments.

Overall, reduced per capita disposable income in the past five years has driven US consumers away from fish and seafood purchases, as fish and seafood are often featured as part of the “white tablecloth” dining market. Although concerns about red meat’s reported links to increased cancer risks have driven consumers to the industry’s alternative protein source, seafood’s higher prices relative to chicken and turkey have failed to fully capture the health-minded market. However, as the economy recovers and consumer spending picks up over the next five years, sales of fish are expected to rise. In addition, the trend toward health-consciousness is expected to gain traction, supporting demand. Through 2017, the Fishing industry is forecast to grow at a steady rate. As marine-bound animal stocks recover after the 2010 BP oil spill, operators in the Gulf will be able to yield more pounds per catch and rebuild revenue. For more information, visit IBISWorld’s Fishing in the US industry report page.

In new report, UN urges improved fisheries management to help ensure food security

The United Nations food agency today urged countries to effectively manage their fisheries and aquaculture sectors to help ensure the food security for millions of people, warning that failing to do so would have serious environmental, economic and social consequences. “Fisheries and aquaculture are making a vital contribution to global food security and economic growth,” the head of the Food and Agriculture Organization’s (FAO) Fisheries and Aquaculture Department, Árni M. Mathiesen, said in a news release. “However, the sector faces an array of problems, including poor governance, weak fisheries management regimes, conflicts over the use of natural resources, the persistent use of poor fishery and aquaculture practices. “It is further undermined by a failure to incorporate the priorities and rights of small-scale fishing communities and the injustices relating to gender discrimination and child labour,” Mr. Mathiesen added.

According to the latest issue of its report on the matter, entitled *The State of World Fisheries and Aquaculture 2012*, world fisheries and aquaculture produced a record 128 million tons of fish for human food last year – an average of 18.4 kilograms per person. In addition, the report notes that the sector is a source of income for 55 million people. It goes on to note that the primary threats undermining the food and nutrition security potential of fisheries and aquaculture result principally from ineffective management coupled with poor conservation of habitats – and states that a transition towards people-centred approaches is required to enhance the sector’s contribution to food and livelihoods security.

In the report, FAO calls on governments to boost their efforts to ensure sustainable fisheries around the world, noting that many of the marine fish stocks monitored by the agency are under great pressure as nearly 30 per cent of them are overexploited, and 57 per cent are fully exploited, meaning that they are at their maximum sustainable production. “Overexploitation not only causes negative ecological consequences, but it also reduces fish production, which leads to negative social and economic consequences,” the report states. “To increase the contribution of marine fisheries to the food security, economies and the well-being of coastal communities, effective management plans must be put in place to rebuild overexploited stocks.”

In the news release, FAO’s Director-General, José Graziano da Silva, said that fisheries and aquaculture play a vital role in the global, national and rural economy. “The livelihoods of 12 per cent of the world’s population depend directly or indirectly on them. Fisheries and aquaculture give an important contribution to food security and nutrition,” he said. “They are the primary source of protein for 17 per cent of the world’s population and nearly a quarter in low-income food-deficit countries.”

The report argues that strengthened governance in this sector is required to prove incentives for sustainable ecosystem mechanisms, and recommends the development of voluntary guidelines to attain a global sustainable food production system which takes into account the role of small-scale fisheries. “Enabling fisheries and aquaculture to flourish responsibly and sustainably requires the full involvement of civil society and the private sector,” Mr. Mathiesen said. “Business and industry can help develop technologies and solutions, provide investment and engender positive transformation. Civil society and international and local non-governmental organizations can hold governments accountable on agreed commitments and ensure that the voices of all stakeholders are heard.”

Fed Action To Limit Albatross Deaths From Longline Fishing Not Enough, Says Conservation Group

The U.S. Fish and Wildlife Service (FWS) issued a permit under the Migratory Bird Treaty Act (MBTA) on Monday, authorizing a limited number of seabirds to be killed or injured by Hawaiian swordfish vessels. This action is the first permit ever issued under the MBTA – America’s foremost law protecting migratory bird species – to regulate the “take” of migratory birds in the operation of an otherwise lawful commercial activity.

Until now, only regulation under the Endangered Species Act had been used to prevent seabird deaths caused by commercial longline fishing, and then only in relation to the endangered Short-tailed Albatross. It has been well-known for decades that Hawaiian swordfish boats kill and injure Black-footed and Laysan albatrosses. The birds are attracted to and dive on baited hooks, becoming ensnared in lines or impaled by the hooks and dragged under the surface to be drowned. However, the MBTA had not historically been applied to this fishery because the National Marine Fisheries Service (NMFS – the federal agency that oversees the U.S. fishing fleet) had asserted that the areas where it operates, federal waters and on the high seas, lie outside the jurisdiction of the MBTA. But NMFS evidently reversed their position in 2011, when they decided to apply for this permit.

From the The Chattanoogan

White abalone slide toward extinction

Scientists from the federal fisheries lab in La Jolla have reported a serious decline of white abalone along the San Diego coastline, confirming some of the worst fears about the species as it slides toward extinction. “In the absence of fishing, we hoped to see the population stabilize or increase,” said Kevin Stierhoff, a biologist at NOAA’s Southwest Fisheries Science Center, and lead author of a new article in the journal *Biological Conservation*. “However, our latest assessment using data collected in 2008 and 2010 indicates that the white abalone population has continued to decline by approximately 78 percent over the last ten years.”

In 2001, white abalone became the first marine invertebrate listed under the Endangered Species Act. The mollusk was once abundant off the coasts of Baja and Southern California, thriving in waters 15 to 200 feet deep.

Scientists have been surveying white abalone along the local shoreline since 2002 using a remotely operated vehicle. Their results confirm earlier predictions that wild populations had dwindled too low to support successful reproduction, and that as animals died of natural causes a new generation would not emerge. “The continuing decline 30 years after the last major commercial harvest demonstrates that the strategy of benign neglect, or allowing the population to recover without intervention, has clearly failed,” the research study said.

White abalone are “broadcast spawners,” projecting eggs and sperm into the water column at the same time for fertilization. If there is not a suitable partner close by, its offspring are unlikely. “Unfortunately we have continued to see white abalone grow larger, older and further apart with no evidence of significant numbers of offspring for the last ten years,” said John Butler, a NOAA scientist and co-author of the article. “While it could be the juveniles are hiding or too difficult to see, it is more likely that the species is just failing to reproduce.”

From the San Diego Union

Conch fishery lucrative, imperiled

MARTHA’S VINEYARD — While you won’t find conch on menus at seafood joints on the Cape and Islands, in recent years it has become one of the southern New England fishing community’s most lucrative fisheries, with most of the catch heading to Asia. Fishermen in southern New England have been so successful that state officials now say that unless significant conservation measures are implemented soon, the little-known industry will be in danger of collapse. According to the state Division of Marine Fisheries, last year the state’s conch fishery brought in more than \$6 million. For many fishermen, conch has come to replace lobster as the catch of choice, after stocks of the crustacean dropped in southern New England’s warming ocean waters, said state senior marine fisheries biologist Robert Glenn. “As opportunities to fish for lobster have dramatically declined, the guys who historically didn’t conch fish are now putting a substantial amount of effort into it,” he said.

A jump in price of conch in recent years due to increased demand from Asia created what state fisheries managers called a “gold rush” mentality for the sea snail among fishermen from the Cape and Islands, and Buzzards Bay. According to the state, the conch fishing effort in Nantucket Sound has more than doubled in the past five years. That has meant more fishermen pulling in fewer and fewer conch. Earlier this month, at daybreak, fisherman Donald Benefit pulled his boat, *Payback*, into Edgartown harbor to refuel. “Conch is just about over,” he said. “It’s tough. A lot of people pounding them. The boats will be thinned out quickly . . . because there’s not much left.”

At the same time the conch population is diminishing, little is known about the animal’s biology — information that could help formulate conservation plans. In 2010 and 2011, Glenn led a survey team to determine the age, sexual maturity, and growth rates in local conch. “You would have thought this kind of study would have been done years ago,” he said. “What we found was that virtually zero of the female conchs at minimum legal size [of 2.75 inches] are sexually mature. For a long-term harvest strategy, harvesting off the animals before they have the chance to spawn, even once, is probably not a sustainable strategy.” Technically, the conchs are not conchs at all, but channeled whelks. True conchs are tropical herbivores while whelks live in more temperate waters and are predators. But the term conch has stuck for the local sea snails. The constant demand for conch in Asia, where they are popular in soups, has led to localized collapses all over the globe, from the Netherlands to Japan to South Carolina to Costa Rica. In many of those areas, populations of various kinds of sea snails have failed to recover because of their reproductive behavior. Where currents can carry lobster larvae from afar to repopulate an area where they have been completely removed, conch anchor their egg casings — familiar to beachcombers as twisting papery necklaces on the wrack line — on the ocean floor. Moving at literally a snail’s pace, it takes decades for them to repopulate an area.

At the end of a recent weekday, Danny Chan returned from his daily rounds of Martha’s Vineyard’s harbors and unloaded 1,300 pounds of conch at his small sorting facility in Vineyard Haven. Chan is the president of the wholesale company *Aqua World Seafood Corp.*, which he founded two decades ago, and one of the Vineyard’s main buyers of conch. From his modest warehouse in Vineyard Haven, he ships the conch to shucking houses in New Bedford and New York City. Some of the catch stays stateside, where it is shipped to Chinatowns and the rare Italian restaurant serving “scungilli,” but much of it ends up in Asia, especially Hong Kong. Surveying the bags of whorled, seaweed-crusting shells Chan said that day’s haul was a shadow of

the catches of former years. “Every boat used to bring in four times this much when I first started,” he said.

University of New Hampshire doctoral candidate Shelley Edmundson has been working with Vineyard fishermen to tag more than 2,000 conch as part of a multiyear project to illuminate the poorly understood fishery. Her work was partly inspired by the concerns of local fishermen whose horseshoe crab-baited pots dot the bottom of Horseshoe Shoal, the future site of Cape Wind. It is unknown how the proposed wind farm would affect the fishery, but local fishermen fear the worst. “We don’t know a lot about the juveniles,” Edmundson said. “Once they hatch, nobody knows where they go, what they feed on, what their growth rate is, or what is happening, so we’re trying to figure that out.”

This spring, Glenn visited fishermen on the Vineyard and in Bourne to discuss possibly increasing the minimum catch size limit from 2.75 inches to 3.5 inches, the point at which his team found that 50 percent of conch are sexually mature. This fall the state will hold public hearings on the proposed regulations. Benefit is skeptical that a new size restriction will help much and estimates it will put most of the current conch fishermen out of business. He proposes shutting down the fishery in August when the catch drops and scientists and fishermen believe the animals are breeding. “If you don’t have enforcement now, what’s a half inch gonna do?” he said. “It’s like every other fishery they have: Wait until it’s depleted then put so many restrictions on it that you can’t fish it again. The conch will come back quick, maybe five years. But that’s a long time when you’re paying off a mortgage.”

From the Boston Globe

Willapa Bay oyster grower sounds alarm, starts hatchery in Hawaii

A Willapa Bay shellfish company is shifting some of its business to Hawaii because of ocean acidification that scientists believe is killing tiny oyster larvae in shellfish farms along Washington’s coast. After 34 years rearing shellfish in Willapa Bay, Dave Nisbet was in a bind: Nature had stopped providing. Oysters were no longer reproducing naturally on the Washington Coast. Oyster larvae were even dying in nearby hatcheries, which use seawater to raise baby shellfish that get sold as starter seed to companies like Nisbet’s Goose Point Oysters. But when, in 2009, Nisbet heard oceanographers identify the likely culprit — increasingly corrosive ocean water, a byproduct of the same greenhouse gases that contribute to global warming — the oysterman did the unthinkable.

Nisbet took out a loan and spent three years testing and building a new hatchery that opened recently. In Hawaii.

Most of Washington’s \$100 million-a-year oyster industry has been whipsawed in recent years by ecological problems. But Nisbet’s oyster company appears to be one of the first businesses in the Northwest — perhaps anywhere — to shift part of its business to a new region in response to ocean acidification. “I just got nervous,” Nisbet said. “I was afraid if I didn’t do something, then our business would just slowly die.”

Now, rather than relying on oysters that have spawned in Willapa Bay or on juvenile oysters purchased from a nearby hatchery — as he has for years — Nisbet raises larvae in tanks in a million-dollar, 20,000-square-foot plant in Hilo, Hawaii. The tiny larvae are then sent by mail to Washington, where Nisbet and his team oversee the rest of the multiyear growing cycle in Willapa Bay. “It would have been much easier and cheaper to start a hatchery here,” Nisbet said. “But we just saw the hatcheries having failures, the larvae dying in the tanks and just decided to sidestep the issue completely.” Nisbet’s move is just the latest sign of how the threat of ocean acidification is altering the way Washington’s shellfish growers do business.

Changes come fast

Scientists for years have warned that excess carbon dioxide from the burning of fossil fuels eventually would be taken up by marine waters and begin lowering the pH of the world’s oceans. In the last five years, oceanographers at the National Oceanic and Atmospheric Administration (NOAA) working along the U.S. West Coast repeatedly have documented that ocean chemistry is already changing, decades earlier than anyone predicted. Scientists are still learning just how those changes ultimately may upend marine food webs. Researchers have shown that less-alkaline seawater causes sea urchin larvae to change shape, makes squid more lethargic and prompts clown fish to race toward rather than away from predators. But the type of calcium carbonate used by juvenile oysters during the initial stage of forming their shells is particularly vulnerable to even slight increases in acidity. And the dark, frigid water that wells up from the deep along the Northwest coast during north winds already is naturally richer in carbon dioxide than most ocean surface water.

Those natural conditions combined with greenhouse-gas emissions, scientists reported earlier this year, have turned the tidal currents on Washington’s once oyster-rich coast into a death trap for juvenile oysters. “We’re the tip of the spear for the worst of the worst because of the way the ocean circulates,” said Bill Dewey, with Taylor Shellfish. Oysters now haven’t reproduced on their own in Willapa Bay since 2005, so every grower now relies on hatchery-produced larvae. Once the oysters make it to that stage they can survive acidic conditions just fine. But even producing larval oyster has become a complex game.

Already, the Taylor Shellfish hatchery on Hood Canal and the owners of the Whiskey Creek Hatchery on Oregon’s Netarts Bay have started tracking breezes because heavy north winds draw water from the deep that tends to be more damaging. Both

now use expensive carbon-dioxide monitors to time the uptake of water into their growing tanks.

Taylor has even begun a series of experiments to add sodium carbonate — similar to baking soda — to its hatchery waters to counteract Hood Canal's increasingly acidity. "We have a huge investment in that hatchery and we can't just turn off the lights and walk away," Dewey said. "We're investing instead in the science to try and find a way to make it work."

But the Nisbets took another approach.

"We're on an escalator"

Goose Point Oysters employs 70 people and processes several million pounds of shellfish a year, which are sold all over the world. Since water quality is as important to an oyster grower as air to a human, the company had been following the changes closely. "We didn't know what was going on but we knew by 2009 that we could no longer depend on our current seed supply," said Kathleen Nisbet, Dave's daughter. When her father attended a meeting with NOAA oceanographers the depth of the problem became clear.

"They said, 'We're on an escalator with this thing,' " she said. "The problem is going to get worse and we're going to have to adapt." Kathleen Nisbet had attended the University of Hawaii-Hilo and had contacts there, including Maria Haws, an associate professor of aquaculture. Hawaii also doesn't experience the same upwelling events and acidification doesn't appear to be a problem — at least not yet. "The Northwest is really the canary in the coal mine, though sooner or later we won't have any place to run if we don't somehow reverse the trend," Haws said.

She and the Nisbet family spent several years working out kinks and started operating the hatchery earlier this year. "Luckily we've come out of this not too scarred," Kathleen Nisbet said. "We think we've come up with a way to work around things." But she said the experience has opened her eyes to how quickly acidification is taking hold. "What I think is scary is that not everybody knows this is real, that it's actually started to impact people," she said. "For now, here, it's oysters. But it's going to start affecting a lot of other fish and a lot of other food that we get from the sea."

From the Seattle Times

Ruling on river herring puts common sense into fishery

This month's decision by a federal judge to criticize the National Marine Fisheries Service over the senseless slaughter of herring by trawlers represents an important, overdue victory for environmentalists and local fishermen alike. The potentially precedent-setting decision finally puts some legal teeth into righting an injustice that has been decimating fish stocks for years.

The ruling found that both the fisheries service and the New England Fishery Management Council failed to follow federal law when they omitted river herring from their 2011 management plan for Atlantic sea herring. Both groups must now amend the plan to include catch limits for river herring. They must also draw up a plan to reduce the amount of river herring that perishes as bycatch, that is, when the fish is inadvertently caught by large trawlers.

River herring play a vital role in the ocean's food chain. They eat plankton, and are then consumed by larger fish, such as cod and tuna. They are not at the bottom of the food chain, but they are a crucial link in it. Given the precarious status of fishing stocks along the East Coast, anything that helps protect that ecosystem is welcome news. With any luck, it is also a harbinger of better regulatory action to come.

The case, brought by a Chatham charter boat captain, a recreational fisherman from Wareham and a Cambridge-based environmental group, reveals the power of individuals to make a difference, even when the opponents are nothing less than state and federal enforcement agencies, and the issue is as large as an entire ecosystem. Together, these three parties, likely with somewhat different agendas, were able to present a compelling argument that we need to do better when it comes to protecting river herring.

The case could have long-term repercussions far beyond this particular species; representatives on both sides of the issue concur that the decision may set a precedent in terms of how the regional and federal regulatory bodies draw up their protection plans. In essence, if a threatened fish is being caught, it needs to be part of the plan.

This sounds like a commonsense approach. The fisheries council and the National Marine Fisheries Service originally hoped to manage the river herring population by working toward limits on how many fish were killed as part of bycatch. That, too, is an important component to keeping the fishery viable, but in and of itself, it is insufficient when it comes to preserving the stocks.

For its part, the National Marine Fisheries Service has indicated that it will not challenge the court's decision, and has in fact already begun working on complying with the order. This is a positive step toward creating a sustainable fishery, which is good news for fish, fishermen and anyone who values the environment. It may be a small step, but it is definitely one in the right direction.

From the South Coast Today

Thousands of fish die as Midwest streams heat up

LINCOLN, Neb. — Thousands of fish are dying in the Midwest as the hot, dry summer dries up rivers and causes water temperatures to climb in some spots to nearly 100 degrees.

About 40,000 shovelnose sturgeon were killed in Iowa last week as water temperatures reached 97 degrees. Nebraska fishery officials said they've seen thousands of dead sturgeon, catfish, carp, and other species in the Lower Platte River, including the endangered pallid sturgeon. And biologists in Illinois said the hot weather has killed tens of thousands of large- and smallmouth bass and channel catfish and is threatening the population of the greater redhorse fish, a state-endangered species.

So many fish died in one Illinois lake that the carcasses clogged an intake screen near a power plant, lowering water levels to the point that the station had to shut down one of its generators.

"It's something I've never seen in my career, and I've been here for more than 17 years," said Mark Flammang, a fisheries biologist with the Iowa Department of Natural Resources. "I think what we're mainly dealing with here are the extremely low flows and this unparalleled heat."

The fish are victims of one of the driest and warmest summers in history. The federal U.S. Drought Monitor shows nearly two-thirds of the lower 48 states are experiencing some form of drought, and the Department of Agriculture has declared more than half of the nation's counties — nearly 1,600 in 32 states — as natural disaster areas. More than 3,000 heat records were broken over the last month.

Iowa DNR officials said the sturgeon found dead in the Des Moines River were worth nearly \$10 million, a high value based in part on their highly sought eggs, which are used for caviar. The fish are valued at more than \$110 a pound.

Gavin Gibbons, a spokesman for the National Fisheries Institute, said the sturgeon kills don't appear to have reduced the supply enough to hurt regional caviar suppliers.

Flammang said weekend rain improved some of Iowa's rivers and lakes, but temperatures were rising again and straining a sturgeon population that develops health problems when water temperatures climb into the 80s.

"Those fish have been in these rivers for thousands of thousands of years, and they're accustomed to all sorts of weather conditions," he said. "But sometimes, you have conditions occur that are outside their realm of tolerance."

In Illinois, heat and lack of rain has dried up a large swath of Aux Sable Creek, the state's largest habitat for the endangered greater redhorse, a large bottom-feeding fish, said Dan Stephenson, a biologist with the Illinois Department of Natural Resources.

"We're talking hundreds of thousands (killed), maybe millions by now," Stephenson said. "If you're only talking about game fish, it's probably in the thousands. But for all fish, it's probably in the millions if you look statewide."

Stephenson said fish kills happen most summers in small private ponds and streams, but the hot weather this year has made the situation much worse.

From USA Today

Trying To Tame The (Real) Deadliest Fishing Jobs

Boat captain Joe Neves remembers when a crew member got knocked overboard. "We heard him screaming 'Help me!'" Neves says, grimacing. "But you know, on the water at night, your head is like a little coconut." They didn't find him.

Mike Gallagher discovered a friend who was entangled in still-running hydraulics. "I knew right away he was dead," he says.

And Fred Mattera was fishing 125 miles off the coast of Cape Cod when the 21-year-old son of a close friend succumbed to poisonous fumes in a nearby boat. "That was a brutal week in this port," he says.

The Deadliest Catch

The Bureau of Labor Statistics ranks commercial fishing as the deadliest job in the United States. And despite the popular notion from reality TV's *Deadliest Catch*, which features Alaskan crab fishermen, the most dangerous American fishery is in the Northeast.

From 2000 to 2009, workers in the Northeast's multi-species groundfish fishery (which includes fish such as cod and haddock) were 37 times more likely to die on the job as a police officer. A National Institute for Occupational Safety and Health report shows that 70 percent of those deaths and those in the second-deadliest fishery, Atlantic scallops, followed disasters such as a vessel catching fire, capsizing or sinking. Most of the rest came from onboard injuries or falling overboard — often caused by heavy overhead equipment. Not one of those who fell overboard and drowned was wearing a life jacket.

An investigation by the Center for Public Integrity, NPR News and WBUR in Boston found that despite earning the odious ranking as America's deadliest job, commercial fishing in the Northeast operates in a cultural tradition and regulatory environment that thwarts promising safety measures.

Out To Sea, Out Of Mind

Despite the strikingly high fatality rate in the fishing industry, pushes for reform have taken decades to come to fruition. In 1988, Congress required fishing boats to carry life boats, personal flotation devices and other safety equipment. Yet while the Coast Guard mandates seaworthiness inspections of passenger ferries and other commercial vessels, fishing boats are not inspected. “We’ve ... requested authority to do inspections on vessels,” says Jack Kemerer, chief of the fishing vessels division of the Coast Guard. Congress did not include that power in the U.S. Coast Guard Authorization Act of 2010. “So I can’t answer why or why not,” Kemerer says. “But, you know, it’s not that we haven’t asked for it in the past.”

The Last Of The Ocean Cowboys

Most fishermen don’t want to be supervised. Some are fatalistic about their life on the seas. New England fishermen used to buy steel-toed boots, believing that if they fell into the frigid Atlantic, it was better to drown faster. Others espouse a rugged individualism and see themselves as the last cowboys on the ocean. At Chatham Harbor on Cape Cod, Bill Amaru runs one of the last cod-fishing boats from a harbor that used to be so prolific, fish markets labeled cod Chathams. Now, strict federal rules limit how much he can catch. Many other cod fishermen have gone out of business. Amaru doesn’t like the idea of the feds inspecting his boat. “If there’s a resentment to these kinds of rules,” Amaru says as he moors his boat in the harbor, “it’s based on the overall huge number of regulations that have come down on our industry in the last decade — so much federal ‘nanny state,’ kind of telling us how to operate — when I think I have a pretty good understanding of what I need to do to keep safe.” Still, the 2010 law requires boat owners like Amaru to prove that their safety equipment is up to date. Coast Guard checks have forced many fishermen to throw out old and disintegrating life rafts, and replace the expired batteries from their emergency signal beacons. But just because a boat has updated safety gear doesn’t mean the crew knows how to use it.

‘We Will Make This A Safer Industry’

When Fred Mattera raced his boat to help fishermen overcome by poisonous fumes in a nearby boat in 2001, he didn’t know exactly what to do to help them. The radio was no help, either. “What I heard there was this hodgepodge [of] try this, try that,” Mattera remembers. “And nobody knew for certain.” When 21-year-old Steven Follett, the son of a close friend, died, Mattera was frustrated. Some people in port called him a hero for trying. “Being a hero is ... someone survives,” he says, shaking his head. Mattera told his friend he would make good come from the loss of life. “I just said, I promise you, we need to change the culture. We will make this a safer industry.” The incident turned Mattera into a safety evangelist. Earlier this month, he helped the crews of two boats organize a disaster training and man-overboard exercise.

‘Get Your Panic Out Now!’

In one exercise, crew members clumsily put on bright orange-red survival suits. Insulated, watertight and buoyant, the suits cover each fisherman from head to toe; only their faces are exposed. They step off the boat into the calm dockside water. But even in these conditions, wearing what some guys call a “Gumby suit” feels claustrophobic to some, and they thrash around until they get their bearings. “Get your panic out now!” Fred Matter shouts from the deck. The crew members are practicing abandoning ship in the case of a fire or capsizing. The immersion suits are designed to keep them alive and afloat in the icy Atlantic until someone can rescue them. Mattera coaches them to link up with each other back-to-back and paddle together over to a life raft and climb in. When it’s all over, the crew looks winded.

“There’s a ‘Holy crap!’ issue to it,” boat captain Norbert Stamps says of the training. “You jump in, you kind of realize that this isn’t fun and games. This is real serious stuff. And you gotta practice, and you gotta know what to expect.” Crew member Mike Gallagher says fishermen-organized trainings are becoming more common. “To be honest with you,” he says, “the safety thing hasn’t really been paid much attention to until the past several years. Really, it’s been overlooked.”

Learning From Alaska

Alaskan waters had been viewed as the most hazardous place for commercial fishing — that is, until a closer focus on safety reduced the number of fatalities in those fisheries. “I believe that fishermen want to be safe,” says National Institute for Occupational Safety and Health epidemiologist Jennifer Lincoln, who’s based in Alaska. “They just want things to be practical. They want the solutions to really address the hazards that exist.” In Alaska, fishermen, state regulators and the Coast Guard have worked together to make fishing less deadly:

Bering Sea crabbing boats now transport fewer crab pots when they head out to sea. In turn, that weight limit prevented capsizing. Fatalities fell by 60 percent.

Because capsizing often occurred in deaths of Alaska’s salmon fishermen, skiff operators are now allowed the option of leaving immersion suits off their small boats, as long as they wear a life preserver at all times.

Pilot projects with life preservers designed for their working conditions encouraged scallop boats to require crew members to wear them.

That kind of safety progress is what Fred Mattera and others want to replicate in the Northeast, the home of today’s deadliest catch. Since that deadly accident in 2001, Mattera has trained hundreds of fishermen at Point Judith in Narragansett, R.I. But he’s not done. “I’m just a fisherman,” Mattera says. “That’s what I loved, and that’s what I did for a long time. I promised a family we’d make a difference. [As long as] I’m still breathing, that’s what we’re going to strive to do.” Mattera hopes that someday, the deadliest job in America will only be as dangerous as it has to be, and not one bit more.

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