
HOOK, LINE AND THINKER

The Newsletter of the Fishermen and Scientists Research Society

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Summer 2005

UNDERSTANDING THE BIG PICTURE: FISHERMEN AND SCIENTISTS PLAN PROJECT TO BETTER UNDERSTAND THE DYNAMICS AND STRUCTURE OF THE INSHORE ECOSYSTEM

By Patty King, FSRS General Manager

With the move towards ecosystem-based and integrated fisheries management, it has become increasingly important that we improve our understanding of the structure and dynamics of the inshore ecosystem. Who better to help us understand the ecosystem than fishermen, who are users and observers of the ecosystem on a daily basis and have first hand knowledge of many of the components of the ecosystem, what affects it, and how it has changed over time. Recording that knowledge is an important part of a joint project proposed by the Fishermen and Scientists Research Society (FSRS) and DFO Science (including the newly established Population Ecology Division (PED), Ecosystem Research Division (ERD), and Ocean Sciences Division (OSD)). The project also seeks to involve other researchers and the fishing industry on a broad scale.

The *DFO/FSRS Proposal For Inshore Ecosystem Research On The Scotian Shelf In Support Of An Inshore EOAR And Definition Of EBSAs* is being funded through the recently announced Ocean Action Plan (OAP). The OAP provides a unique opportunity to focus research on the inshore area of the Scotian Shelf, defined in this project as the area inshore of 50 fathoms (the inshore limit of the DFO July research vessel survey) and/or the 12 nautical mile territorial sea limit, from Cape North to Cape Sable Island. We propose to synthesize existing inshore data from a range of sources, identify knowledge gaps and begin the process of directed research to collect new data to fill those gaps.

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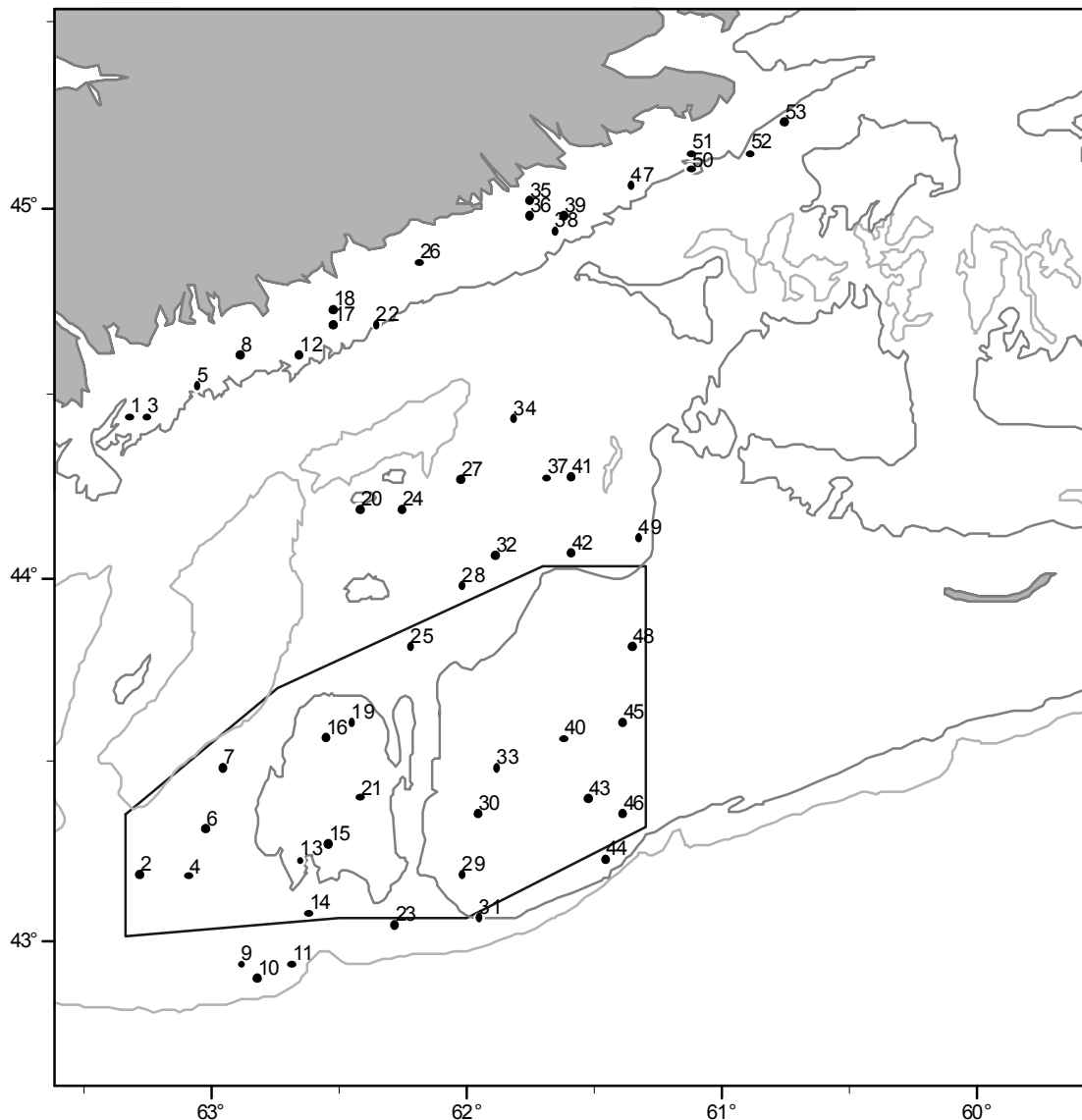
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4VSW SENTINEL MONITORING PROGRAM UNDERWAY

By Carl MacDonald, FSRS Research Biologist

The fall is now here and the 11th annual 4VsW Sentinel Monitoring Program is underway. Beginning September 1st, three longline fishing vessels were contracted by the Fishermen and Scientists Research Society (FSRS) to participate in a groundfish survey carried out fully by the fishermen themselves. The fishermen will survey 53 predetermined stratified random stations. The 4VsW Sentinel Monitoring Program area encompasses the inshore waters from Sambro to Canso and the offshore waters including Emerald and Western Banks (Figure1).

Figure 1. 2005 4VsW Sentinel Monitoring Stations



Following the 4VsW Survey protocols, the longline fishermen will be setting 1500 number 12 circle hooks baited with mackerel. The fishermen are responsible for gathering all the scientific fisheries information as well as oceanographic information via the use of CTD's and minilog temperature recorders. The fishermen must record where they set their gear, how long the gear fished, and the number of hooks that were snarled - if any. They also record all species caught on the hooks, the number and weight of each species caught, and the length, sex, and stage of sexual maturity of the fish. The fishermen also remove the fish otoliths (used to age the fish) and remove the fish stomach if there

are contents inside. All this work is completed by the fishermen on relatively small fishing vessels, 40 to 50 feet in length. To add to all this, the fishermen have to watch for hurricanes, ship traffic, and other fishing vessels and gear. Over the last decade, the survey was executed to perfection. The fishermen deserve a great deal of credit. In past years, the fishermen had to complete five times as many sets in the survey.

In 2004 and 2005, the Sentinel Survey was reduced in scale due to economic reasons. Previous 4VsW Sentinel Surveys investigated 253 random stations. A 200 station reduction occurred in 2004. A 4VsW Sentinel Monitoring Project was then established. Due to the large reduction in the number of stations we can no longer refer to the survey as the 4VsW Sentinel Survey, it is now called the 4VsW Sentinel Monitoring Project. The 4VsW Sentinel Monitoring Project is a bridging groundfish survey. Only 53 random stations in pre-selected strata are to be sampled. The 2005 Sentinel Monitoring Program only maintains continuity in the 6 strata surveyed including; 462, 463, 464, 465, 468, 469. The strata surveyed were chosen because they had previously showed higher catch rates of a number of more economically valued groundfish species, and warranted continued surveying. By monitoring catch rates in only these 6 strata, it is hoped one will be able to recognize significant changes in groundfish abundance within 4VsW. If significant changes were to happen within these 6 strata, it would then be beneficial to reinstate the 4VsW Sentinel Survey over the whole of 4VsW. In 2005, three longliners are contracted to survey the 6 strata chosen in the 4VsW Sentinel Monitoring Project (Table 1).

Table I: 2005 Sentinel Survey Participants.

There is a second part or phase of the Sentinel Monitoring Program called the Commercial Index. The

| Name | Vessel | Home Port |
|-----------------|---------------------|---------------|
| Paul Drew | Catch Ya Later | Sambro |
| Nick Henneberry | Nicole & Sisters II | Sambro |
| Randy Boutilier | Jeff & Troy | Mushaboom |

Commercial Index phase of the Program was designed to address concerns by fishermen that data collected from standardized gear fished on randomly selected sites did not give an accurate picture of normal fishing activity. In addition, catch and population data from specific areas has become increasingly rare, as the area is under continuing moratoria.

In the 2005 Commercial Index (CI) phase, vessels are each given 12 fishing days in which to fish as they would normally do in areas where they would normally fish (with the exception of the closed haddock nursery area). There is an opportunity for 20 vessels to participate in the commercial index, for a total of 240 fishing days. The fishermen are allowed to set a maximum of 15,000 hooks per day baited with their choice of bait.

Vessels are required to choose a start date between July 1, 2005 and March 15, 2006, and must finish all fishing activity by March 31, 2006. Vessels are paid 90% of the revenue generated by the sale of all fish, except halibut. The other 10% of the revenue goes to the FSRS to defray the cost of vessel participation in the project. To discourage vessels from directing for halibut, vessels are only paid 50% of the revenue generated by the sale of halibut. Participants are required to pay their own hail, DMP and observer costs. Observers or FSRS technicians are required to observe a minimum of 30% of vessels' fishing trips.

In the past number of years, there has been very little activity in the Commercial Index Phase of the Program due to the lack of groundfish abundance, low wharf prices for the fish, and soaring costs of bait and fuel. Hopefully participation will increase this year. It is very important to have a well established Sentinel Program so that if things turn around in terms of increasing groundfish abundance in 4VsW we will have the data to confirm it.

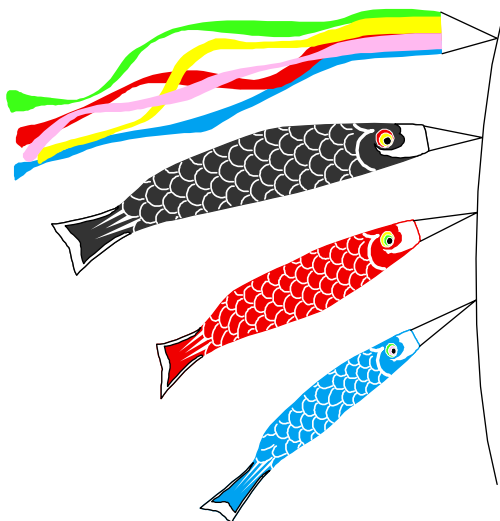
Understanding the Big Picture continued from page 1.

Deliverables at the end of the project will include a draft Ecosystem Overview and Assessment Report (EOAR) of the Scotian Shelf inshore area and the identification of candidate Ecologically and Biologically Significant Areas (EBSAs) within this area. Furthermore, it will provide data, identification of data gaps and a plan of research, including methodology for future EBSA research in the inshore area.

We will use a two stage approach to the Inshore Ecosystem Project, with a “Baseline Research” component first supplying some fundamental information on the distribution and relative abundance of fisheries, marine and diadromous fish, marine mammals, invertebrates and marine plants by surveying existing literature, Local Ecological Knowledge (LEK) gathered from interviews with fishermen, and by using inshore fisheries as our sampling platform. Through analysis in year one, specific areas of interest will be identified and activities in the “Directed Research” component during the second year will focus on fisheries independent sampling to produce a detailed description of two or three of these inshore areas.

This project relies upon the participation of inshore fishermen, both in the initial collection of existing data and LEK in the baseline research component and in the collection of new data during the directed research component, through the involvement of the Fishermen and Scientists Research Society (FSRS). Fishermen members have already been involved in the design of the project and will be further involved in its implementation. The project will take full advantage of the FSRS community technicians that have been in place for the past number of years. Through these field personnel, the community presence of the FSRS will be maintained. This process will also help strengthen stakeholder participation in the implementation of the Oceans Action Plan.

The FSRS is seeking fishermen to participate in the interview process to gather LEK, to take FSRS Technicians to sea to do sampling, and to provide vessel services to assist with other aspects of the research. If you are interested in participating in the project, or would like to learn more about this initiative, or comment on the project, please contact Patty King, FSRS General Manager, at 902-876-1160, Carl MacDonald, FSRS Research Biologist, at 1-800-226-3777, or Alida Bundy, DFO Research Scientist, Population Ecology Division, at 902-426-8353.



THE FSRS WELCOMES NEW MEMBERS

The Fishermen and Scientists Research Society would like to welcome the following members, whose applications were approved at the July and September Executive Committee meetings. We trust that this expansion of the FSRS’s membership will prove to be beneficial to all involved.

H. Craig Avery
 Roger Cullen
 Jennifer Hackett
 Kari Lavalli
 Eugene O’Leary
 Patel Pinkesh
 Stephen Robbins III
 Jennifer Voutier

Timothy Birt
 Walter Day
 Robert Ingalls
 José Marto
 Bradford Parady
 Mashiur Rahman
 Kevin Squires

THE 2ND ANNUAL AVC LOBSTER SCIENCE WORKSHOP: A SUCCESS!

By Jean Lavalée, AVC Lobster Biologist

The AVC Lobster Science Centre, at the Atlantic Veterinary College, University of Prince Edward Island, recently hosted its 2nd Annual Lobster Science Workshop, at the Delta Prince Edward hotel in Charlottetown, PEI. The workshop, held this past July 27-28, was well attended with approximately 75 fishermen, scientists, processors, live shippers and government representatives participating in this one day event. Dr. Robert Bayer, Executive Director of the Lobster Institute of the University of Maine was the keynote speaker and gave a very good overview of some of the Lobster Institute research projects, past and present, with direct impact and practicality for the lobster industry. Dr. Bayer's presentation definitely set the tone for the remainder of the workshop that had "Lobster Research in an Applied



Context" as its theme. Other than Dr. Bayer, eight (8) other presenters, including Patty King of the FSRs, contributed to the scientific presentation sessions while Dr. Timothy Ogilvie, Dean of the Atlantic Veterinary College at the University of Prince Edward Island chaired the Open Forum on lobster research. A lot of discussion on lobster research was generated during the open forum session and some of the topics brought forward by the audience included: gaffkemia status in juvenile lobsters; early stage survival and larvae drift; food source & predation; what are the most important factors in egg production; the potential effects of seismic testing on lobster health; and environmental impact on lobster stocks (see www.lobsterscience.ca/workshop for a detailed list of topics discussed). Finally, when discussing who should pay for the research, it was the general consensus that we need to fund research with "fee for service" or "voluntary taxing" but without the industry buy-in, good lobster research is becoming a rare commodity! Similar to last year's event, the 2nd Annual Lobster Science Workshop ended with a fabulous banquet where, of course, lobster was king!

The AVCLSC would like to acknowledge the following sponsors of the workshop, without whom this event would not have been possible; Atlantic Veterinary College, Chase's Lobster Pound Limited, Clearwater Seafoods Limited Partnership, Darden Restaurants, Ferguson's Lobster Pound Co., NB Department of Agriculture, Fisheries & Aquaculture, NL Department of Fisheries & Aquaculture, NS Department of Agriculture & Fisheries, National Seafood Sector Council, Millbrook First Nation, Ocean Choice PEI Inc., PEI Atlantic Shrimp Corp. Inc., PEI Department of Agriculture, Fisheries & Aquaculture, PEI Fishermen's Association, Paturel International Company and the University of Prince Edward Island. Finally, thank you to all who attended and therefore, contributed to making this event a success.

ATTENTION INTERNATIONAL SUBSCRIBERS TO ***HOOK, LINE AND THINKER***

In an effort to reduce mailing and printing costs, the Fishermen and Scientists Research Society is encouraging member and non-member subscribers to *Hook, Line and Thinker*, particularly those outside Canada, to switch to an on-line subscription. I would like to ask your help with this initiative. I encourage you to switch to an on-line subscription by going to our website at <http://www.fsrns.ca/newletter/subscribe.htm> and selecting the "I would like to change how I receive the newsletter" option.

Thank you for your assistance and support.

FSRS SEEKING FISHERMEN'S INPUT TO DETERMINE LOCATION OF INSHORE GREY SEAL PUPPING AREAS

By Patty King, FSRS General Manager

The Fishermen and Scientists Research Society (FSRS) is seeking fishermen's input to determine the location of inshore grey seal pupping areas. Fishermen's local knowledge of grey seal pupping areas will be gathered through an interview process. The results of the survey will be used to help the Department of Fisheries and Oceans (DFO) design an effective study to reliably estimate pup production in the Maritimes Region. This project is part of a larger initiative to study the inshore ecosystem on the Scotian Shelf.

Increases in grey seal populations in coastal areas have been noted and are of concern to the fishing industry. The distribution of pupping areas has also expanded. The need for an accurate estimate of the grey seal population has been identified. DFO is planning to do pup counts in 2007 as part of a population assessment. To ensure the best possible results are achieved, it is important to identify inshore pupping areas in advance. FSRS members have expressed interest in doing a written survey to determine pupping areas.

The survey will be administered by phone or in person whenever possible. Respondents will be asked to give the common name of the location where mother/pup pairs of grey seals are seen during December to mid-February, the GPS position if possible, the number of pups (by range, not exact count), the year first seen and the year last seen. All FSRS fishermen members will be contacted for an interview. Non-members who express an interest in participating in the survey will also be contacted.

If you are interested in contributing your knowledge of grey seal pupping areas to this project, please contact Patty King, FSRS General Manager, at 902-876-1160 or pmdservices@eastlink.ca, or Carl MacDonald, FSRS Research Biologist, at 1-800-226-3777 to arrange to be interviewed.

OCEAN SUNFISH: RECORD-BREAKING GIANTS

By Jennifer LeBlanc, FSRS Fisheries Technician

If you ever get the chance to see a sunfish while at sea, you won't forget it. And chances are, you'll know what it is as soon as you see it. While conducting a crab sample in Saint Mary's Bay in 2004, I had the pleasure of observing an ocean sunfish lazily floating on its side at the surface, and flapping its giant dorsal fin against the water.



Courtesy of <http://www.oceansunfish.org>

One of the first things one notices is their odd body shape. The common ocean sunfish (*Mola mola*) has an oval, grey, flattened body covered in a thick, leathery, scaleless skin. It has a small mouth with four, fused teeth forming a sharp beak (similar to that of its cousins, the pufferfish and porcupine fish). It has no tail, and basically looks like a giant swimming head. The dorsal and anal fins are extremely long, and when swimming near the surface, they are often mistaken for sharks. When seen floating at the surface there is often a gull nearby. The gulls will clean the fish, which are often heavily ridden with parasites. Once a sunfish has had enough, it will spit water at the bird and swim away. Although they are not the strongest swimmers, sunfish can move quickly through the water if need be. They can jet propel themselves by squirting water out of their mouth and gills and, surprisingly, can even breach 10 feet into the air.

If you see a sunfish off Nova Scotia, there's a good chance it will look like this. This common sunfish is lying on its side at the surface to sun itself and get warm.

Another thing you'll notice if you see one is their size. The average adult reaches approx 1.8 meters in length, and 2.4 meters from the tip of the anal fin to the tip of the dorsal fin. The average weight is 2200 lbs (1 tonne). (A sunfish's brain, however, is the size of a nut.) Presently, the world record for the heaviest bony fish is held by a 10 foot long specimen that weighed 2235 kg (4927 lbs). As large as they are, though, sunfish are gentle giants, posing no threats to humans. They eat mainly jellyfish, but also squid, small fish, sponges, algae, and more. (Notice their prey comes from all depths.) They will eat practically anything, slurping the food in through the beak, shredding it, spitting it out, and repeating until the food can be swallowed.

Their impressive size means few predators, but great white sharks, orcas, marlins, and sea lions have been known to prey upon them, particularly when they are younger. Parasites also claim some, but humans are a major threat through bycatch, recreational fishing, and impacts with large vessels. There is a real concern that sunfish are declining due to accidental catch in drift net and longline fisheries.

Sunfish lay up to 300 million eggs from a single ovary. That's more than any other vertebrate on the planet produces. Not surprisingly, the eggs are tiny; a sunfish larva is no longer than 2.5 millimeters. That means if it lives to adulthood, a sunfish can gain more than 60 million times its weight. As large as these fish are, though, nothing is known about when, where, or how they mate.

Sunfish are considered oceanic, tropical and subtropical fish, but are regularly sighted in temperate climates and sometimes seen along the coast. This is largely due to the fact that these fish are weak swimmers, and so get carried by the Gulf Stream to as far north as Scotland and Ireland. Unfortunately, these freezing and numb fish often wash ashore and die.

For more information, to see some great pictures, or to report sightings, visit <http://www.oceansunfish.org>. Dr. Tierney Thys, an explorer for National Geographic, studies and tags ocean sunfish.



Courtesy of <http://www.oceansunfish.org>

NEW TO THE FSRS LIBRARY

DFO. 2004. Proceedings of the National Workshop on Collaboration in Fisheries Science; February 17-19 2004. DFO Can. Sci. Advis. Sec. Proceed. Ser. 2004/026.

DFO, 2004. Revised Framework for Evaluation of Scope for Harm under Section 73 of the Species at Risk Act. DFO Can. Sci. Advis. Sec. Stock Status Report 2004/048.

DFO, 2005. Eastern Scotian Shelf Integrated Ocean Management Plan (2006-2011): Draft for Discussion. ES-SIM Planning Office, Oceans and Coastal Management Division, Oceans and Habitat Branch, Maritimes Region. Oceans and Coastal Management Report 2005-02.

Facey, A., B. Petrie 2005. Temperature Conditions in Lobster Fishing Area 34 on the Scotian Shelf and Eastern Gulf of Maine: 1999-2004. Canadian Science Advisory Secretariat Research Document - 2005/027, 28 pp.

Fisheries Resource Conservation Council 2005. Strategic Conservation Framework for Atlantic Snow Crab. Report to the Minister of Fisheries and Oceans. FRCC.05.R1.

COMMUNITY WORKSHOPS ON OCEANS MANAGEMENT ANNOUNCED BY DFO

Fisheries and Oceans Canada (DFO - Maritimes) recently released a draft Integrated Oceans Management Plan for the Eastern Scotian Shelf. The draft Plan sets out objectives and strategies for the sustainable use and conservation of a 325,000 km² offshore area between Halifax and the Laurentian Channel. The Government of Canada also recently released a federal Oceans Action Plan, which identifies the entire Scotian Shelf, including inshore areas, as a priority region for integrated management. Integrated management is a 'big picture' approach that considers the entire ecosystem and all of its users in planning decisions. This fall DFO will be holding community workshops to discuss future directions for oceans management along the Scotian Shelf. Topics discussed will include:

- The draft Integrated Oceans Management Plan
- Objectives for Human Use of the Ocean
- Identification of Important Marine Areas
- Priorities for Action Planning

These workshops will provide an opportunity for coastal residents and other interested parties to learn more about and provide input into how we use, manage, and protect our oceans. Anyone with an interest in marine industries, fisheries, marine conservation, ocean science, or marine management is encouraged to participate. Comments on the draft Integrated Oceans Management Plan can also be submitted directly to DFO Maritimes until October 31st, 2005 at the address below. Workshop dates and locations are as follows:

Shelburne: October 18th, Community College, 1:00-4:00 pm and 6:00-9:00 pm

Sydney: October 20th, Coast Guard College 1:00-4:00 pm and 6:00-9:00 pm

Sheet Harbour: October 25th, United Church Hall, **1:00-4:00 pm only**

Moser River: October 25th, IOOF Hall, **6:00-9:00 pm only**

Guysborough: October 26th, Guysborough Legion, 1:00-4:00 pm and 6:00-9:00 pm

Complimentary refreshments will be served at all workshops. For more information or to register for a workshop, please contact: David Millar, Oceans and Coastal Management Division – DFO Maritimes, Ph: (902) 244-6069, Fax: (902) 426-3855, E-mail: Millardc@mar.dfo-mpo.gc.ca, Web: <http://www.mar.dfo-mpo.gc.ca/oceans/e/essim/essim-intro-e.html>

Fast Fact: Do lobsters feel pain?

The Lobster Institute has received many inquiries about whether boiling lobsters is humane. Being concerned about this important question, researchers conducted experiments and studied the lobster's nervous system. The nervous system of a lobster is very primitive; in fact it is most similar to the nervous system of an insect. If one compares the diagram of a lobster's nervous system to that of a grasshopper, the similarities are apparent. Neither insects nor lobsters have brains. For an organism to perceive pain it must have a complex nervous system. Neurophysiologists tell us that lobsters, like insects, do not process pain. (Lobster Institute: Some comments on... Cooking Lobsters. Lobster Institute, University of Maine)

SLIME EELS: THEY'RE SLIMY, BUT THEY'RE NOT EELS!

By Jennifer LeBlanc, FSRS Fisheries Technician



Courtesy of www.zoology.ubc.ca/labs/biomaterials/slim.html

The Atlantic Hagfish (*Myxine glutinosa*), also known as a slime eel, is infamously known for secreting huge amounts of slime. In fact, one hagfish can fill a milk jug with slime! Besides shocking and disgusting humans, the slime is used to protect them from predators and aids in movement. If you have seen a hagfish in action, you would not be surprised to learn the hagfish has no known predators other than humans.

Most species of hagfish are found in deep water (up to 4000 feet), but the Atlantic Hagfish is often found within 30m of the surface. The Atlantic Hagfish ranges from Baffin Island, Canada, to North Carolina, USA and is generally found in soft, muddy bottoms where they can burrow.

Atlantic Hagfish grow up to 76 cm (30 inches), and are eel-shaped. They are pinkish brown, and have no paired fins, but they do have a caudal fin (like an eel) with is slightly rounded. Hagfish are closely related to lampreys but are not closely related to most fish (including eels), because they have no real bones; the skeletons are made of cartilage. They also have no scales or jaws, and their eyes are beneath the skin (they are practically blind). They have tooth-like structures on their tongues, a circular mouth with rows of sharp teeth, tentacles around their snouts, and one nostril, which it clears of slime by sneezing.

So what's up with all this slime? Hagfish generally produce copious amounts of slime when stressed or provoked. The slime is concentrated when excreted, but quickly expands when it comes in contact with sea water. It is believed this mucus could actually suffocate fish predators. Miraculously, the hagfish itself does not suffocate because it ties itself into a knot and passes the knot down the body to wipe away the slime! Similarly, when the hagfish wants to disengage from its prey, it forms a knot, and pushes the knot against the prey in order to pull the mouth away.

Hagfish feed on dead or dying fish (especially those trapped in nets or on hooks), but they are not solely carrion eaters. They also eat marine worms and small crustaceans. The hagfish uses its teeth, and toothy tongue to bore into the prey's body and eat the prey inside out.

The Atlantic Hagfish fishery is relatively small, and is currently unregulated. For example, in 2002 in Northeastern US, 3 million pounds were landed. The major market for hagfish, which are generally fished with eel traps, is in Korea, where the meat is eaten and the skin is used to make "eel" leather items. Demand for these fashionable items has depleted the Asian stocks, because hagfish have low reproductive and turnover rates.

Future possibilities for hagfish slime include: use as an egg white substitute in cooking, as oils in various ointments, in synthetic gels and fibers, biodegradable polymers, space-filling gels, and to stop blood flow in accident victims and surgery patients. It was also recently discovered that the slime contains threadlike fibers not unlike those in spider silk.

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BEACHCOMBING - What's New in The News

New Publications of Interest

Temperature Conditions in Lobster Fishing Area 34 on the Scotian Shelf and Eastern Gulf of Maine: 1999-2004.

Facey, A., B. Petrie 2005. Temperature
Conditions in Lobster Fishing Area 34 on
the Scotian Shelf and Eastern Gulf of Maine:
1999-2004. Canadian Science Advisory
Secretariat Research Document - 2005/027,
28 pp.

Website at [http://www.dfo-mpo.gc.ca/csas/csas/
publications/resdocs-
docrech/2005/2005_027_e.htm](http://www.dfo-mpo.gc.ca/csas/csas/publications/resdocs-docrech/2005/2005_027_e.htm)
[http://www.dfo-mpo.gc.ca/csas/csas/
publications/resdocs-
docrech/2005/2005_027_e.htm](http://www.dfo-mpo.gc.ca/csas/csas/publications/resdocs-docrech/2005/2005_027_e.htm)

Revised Framework for Evaluation of Scope of Harm under Section 73 of the Species at Risk Act.

DFO, 2004. Revised Framework for Evaluation
of Scope for Harm under Section 73 of the
Species at Risk Act. DFO Can. Sci. Advis.
Sec. Stock Status Report 2004/048.

Copies of these reports can also be found in the
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UPCOMING EVENTS

FSRS 13th Annual Conference
February 24 and 25, 2006
Howard Johnson Hotel, Truro, NS

Watch future newsletters and our website for more information, coming soon.