HOOK, LINE AND THINKER

The Newsletter of the Fishermen and Scientists Research Society

Issue: 2003 –4 **Fall 2003**

REGISTER NOW FOR THE 11TH ANNUAL FSRS CONFERENCE

You are invited to attend the Fishermen and Scientists Research Society 11th Annual Conference being held on February 20 & 21, 2004 at the Holiday Inn Select in Halifax, Nova Scotia. The Conference will include workshops on:

- Research on Lobster/Pipeline Interaction
- FSRS Lobster Recruitment Project 5 Year Review
- Marine Ecosystem of the Eastern Scotian Shelf
- Measuring the Abundance of Eggers, Larvae, Juveniles and Window Female Lobsters
- Underwater Video Footage of Lobster Movements and Migrations

An informal reception is also planned for the evening of February 20st. Spouses are also welcome to attend the reception.

The FSRS Annual General Meeting will be held following the Conference. Members are asked to ensure they attend the Annual General Meeting to be part of important decisions on the future direction of the FSRS and the restructuring of its research programs, including the 4VsW Sentinel Program, in light of continuing declines in Sentinel Program revenue and general fiscal constraints.

Register on-line at www.fsrs.ns.ca or contact Patty King at 902-876-1160, fax 902-876-1320.

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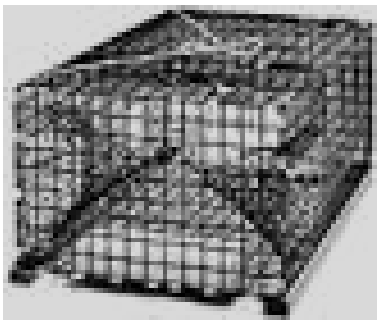
LOBSTER TRAP EFFECTIVENESS RESEARCH

By Carl MacDonald, FSRS Research Biologist



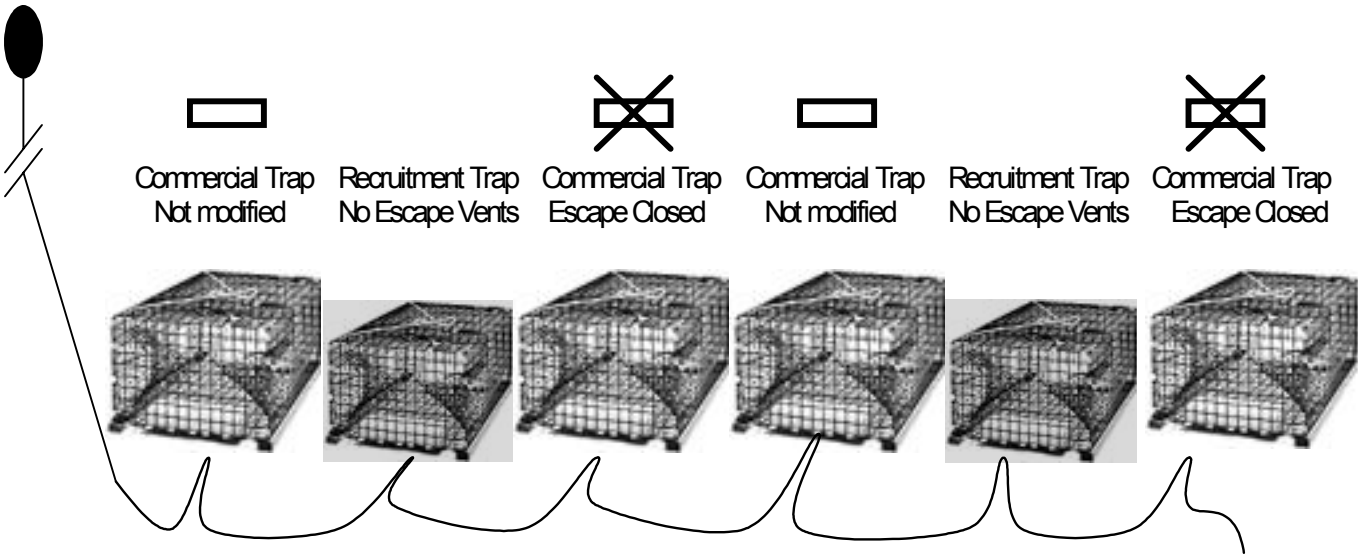
In the spring of 1999 the Fishermen and Scientists Research Society (FSRS) launched a Short Term Lobster Recruitment Index Project. This project is designed to give an indication of the number and size of juvenile lobsters that will be recruiting into the lobster fishery in the upcoming seasons. Specially designed 1 inch mesh lobster traps with no escape vents are used to capture and retain the smaller lobsters. These science traps have 5 inch entrance rings and are 14 inches high, 40 inches long, and 21 inches wide. Currently there are over 160 fishermen fishing the science traps during their lobster season from Lobster Fishing Area (LFA) 27 through to 34. We now have five years of lobster data from the top of Cape Breton (Bay St. Lawrence) all along the Atlantic coast up the Bay of Fundy to Digby. It was felt that the recruitment traps work effectively at capturing small lobsters. Various fishermen said the science traps work very well at catching small lobsters but not as good as their own traps. Hence, we wanted to test how well the science traps caught lobsters compared to commercial traps.

In the fall of 2002, the FSRS proposed a lobster trap effectiveness study. The purpose of the study was to determine how effective the FSRS science recruitment traps are at catching lobsters compared to commercial traps. We wanted to determine if the FSRS recruitment traps catch higher numbers of smaller lobsters. We wanted to test if a closed-vent commercial trap catches the same number and size lobsters as the FSRS science recruitment trap. Preferably, three fishermen would participate in the trap effectiveness study from different harbours. Having fishermen participating from different harbours would be beneficial for comparison reasons. The study was scheduled to take place on every normal fishing day during the lobster season for the fall 2002 and spring 2003.

We chose LFA 34 for the study as fishermen are mainly fishing their traps in trawls. The participants were asked to fish the trawl with the study traps in one area. From one trawl, fishermen would measure and sex the catch of lobsters from two commercial traps, two FSRS recruitment traps, and two commercial traps with the escape vents closed off. To compare the traps they were placed alternately (Figure 1). The lobsters would be measured from each trap with a measuring device and recorded in a record book. Only the two FSRS recruitment traps were in addition to the fisherman's maximum trap limit. All six traps were to be identified with a special DFO research tag. The modified commercial traps would have the escape vents closed off with cable ties or possibly twine. The same bait(s) were required to be used in all tested traps.

Only one fisherman from Cape Sable Island, LFA 34, participated in the lobster trap effectiveness study. Other fishermen were interested but just didn't feel they had the time to do the research during their season. For the fisherman that did the research, he fished these traps in a trawl all season long. He hauled this trawl 62 times over the 2002 fall and 2003 spring season. He measured the lobsters from each trap and recorded the sex and size of the lobsters caught. In total, the fisherman and/or crew members measured approximately 1200 lobsters out of those six traps.

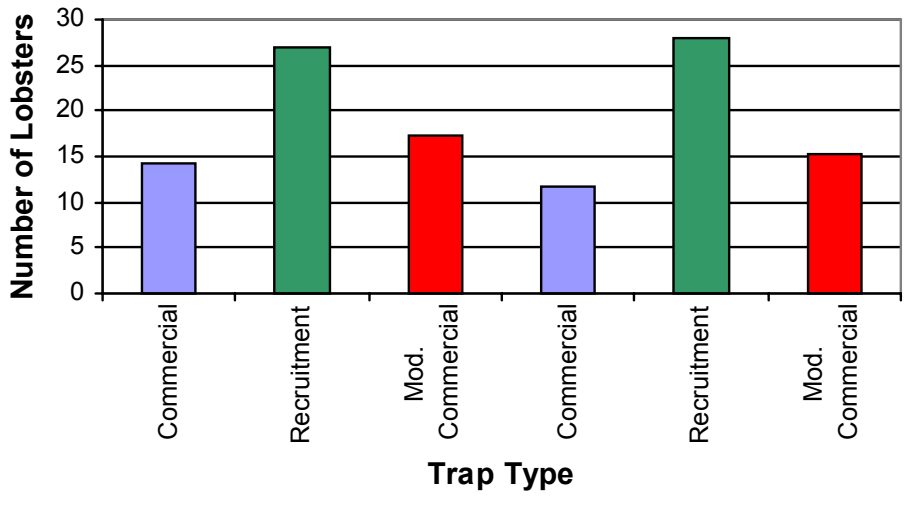
Figure 1: Trap Arrangement



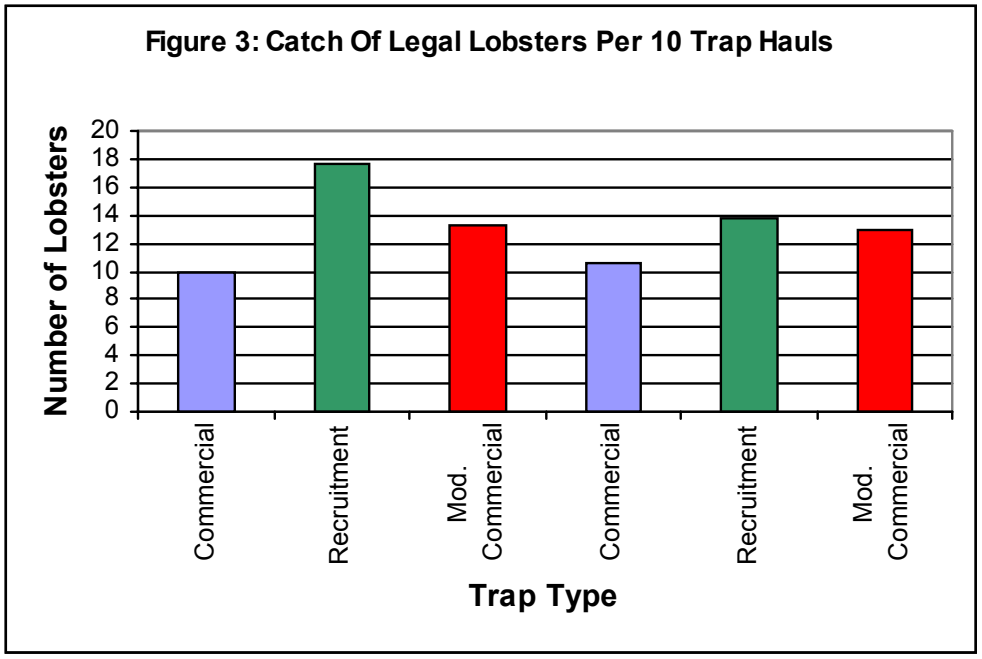
The fisherman from Cape Sable Island who participated in the study agreed to allow the FSRS to present a summary of his results. The fisherman's commercial traps used in the study were constructed out of 1 ½ inch wire. They were 42 inches long, 22 ½ inches wide, and 15 inches high. The 6 inch entrance rings were at one end of the trap and tied at an angle. There was one parlor just like the recruitment traps. The main differences between the commercial and recruitment traps were the size of the wire, the size of the entrance rings, and the height of the entrance ring from the bottom of the trap. The FSRS entrance ring is approximately 5 ½ inches off the bottom of the trap while the commercial trap's entrance ring was about 4 inches off the bottom of the trap.

The results of the study were very interesting. As expected the recruitment traps caught more lobsters under the legal size compared to the commercial traps because the recruitment traps do not have escape vents (Figure 2). What was interesting was the fact that the recruitment traps were more successful at catching lobsters under the legal size compared to the commercial traps with the escape vents closed off (Figure 2). The end result of this experiment was the recruitment traps had greater success at catching lobsters under the legal size compared with the commercial traps.

Figure 2: Catch Of Sub-Legal Lobsters Per 10 Trap Hauls



In the same manner, we were quite interested in finding out how well the recruitment traps were at catching legal size lobsters. We did not expect the recruitment traps to catch more legal size lobsters compared to the commercial traps. The commercial traps with the vents open had the lowest catch rate of legal size lobster (Figure 3). The commercial traps with the vents closed had slightly better catch rates, while the recruitment traps had the highest catch rate of legal size lobsters. The end result of this experiment was the recruitment traps were more successful at catching legal size lobsters compared with the commercial traps (Figure 3).



In the end, we must ask ourselves why the recruitment traps had a slightly higher catch rate than the commercial traps. Speaking with the fisherman who did the project, we came up with a theory. The fisherman felt his entrance rings in the commercial traps were too large for the size of lobster that he was catching. Most of the legal lobsters he was catching in this trawl were in the 1 to 1.5 pound range. The larger entrance ring in the commercial trap, which was 4 inches off the bottom of the trap, could be allowing lobsters to escape. He felt the larger rings were good a few years ago when there were greater numbers of larger lobsters in his fishing area. After being presented with these results, he is considering some changes in trap design.

I want to stress that we only tested the recruitment traps against one type of commercial trap in one area. Results would vary with the design of the commercial trap and where the traps were fished. Almost every commercial fisherman works continually at creating the best lobster trap design. Most fishermen believe they are close to having the best design. I don't believe the recruitment traps are the best lobster traps on the East Coast of Canada. They are not meant to be. The reason the study was done was to make sure they are catching undersize lobsters like intended. Furthermore, I want to say that regardless of how the recruitment traps catch lobsters, it is a constant, as every fisherman in the study has the exact same recruitment trap. The recruitment traps are standardized so we can compare results from one year to the next and one area to another.

FISHERIES STANDING COMMITTEE RECOMMENDS FUNDING FOR FSRS

By Patty King, FSRS General Manager

The article "FSRS Appears Before Fisheries Standing Committee" in Issue 2003-2 of *Hook, Line and Thinker* talked about my experience testifying before the Standing Committee on Fisheries and Oceans in May 2003, to address the subject of the quality of DFO science and research. One of the issues discussed was funding for the Fishermen and Scientists Research Society (FSRS). I requested the Committee's support in helping ensure the continuation of the FSRS by ensuring that the Minister of Fisheries and Oceans and others appreciate the importance of the FSRS and the need to support it financially. I am pleased to inform FSRS members that in its recent report the Committee made recommendations specifically dealing with this issue.

In its report titled "Atlantic Fisheries Issues: May 2003, Report of the Standing Committee on Fisheries and Oceans", released in November 2003, in the section dealing with DFO Science the Committee made specific recommendations related to the FSRS. The following is an excerpt from the report:

> *Recommendation 8*
> *The Committee recommends:*
>
> *That the Department of Fisheries and Oceans provide some financial support to the Fishermen & Scientists Research Society with a view to promoting mutual understanding between scientists and fishermen; and*
>
> *That the Department of Fisheries and Oceans consider promoting similar societies in other regions of the country.*

The Committee also recommended that DFO needs to properly fund scientific research. They also recognized the importance of making results of the research available to both fishermen and the general public in a timely manner.

Another recommendation dealt with the Sentinel Program. The Committee recommended that DFO should encourage the use of sentinel fisheries and that such programs need to be adequately funded.

In its report, the Standing Committee on Fisheries and Oceans recognized the value of the FSRS and the importance of supporting and promoting it. They acknowledged the role the FSRS is playing in bridging the gap between fishermen and scientists, promoting cooperation. It is to be hoped the Minister of Fisheries and Oceans and his advisors heed the Committee's recommendation to provide financial support to the FSRS so that we can continue to do our valuable research and continue to build trust between fishermen and scientists.

Reference:

Atlantic Fisheries Issues: May 2003, Report of the Standing Committee on Fisheries and Oceans, House of Commons Canada, November 2003.

HIGH SCHOOL ESSAY CONTEST 2004

By Kirsten Querbach, Essay Contest Coordinator

The Centre for Marine Biodiversity is now in its second year of offering the Atlantic-wide Marine Biodiversity Essay Contest, which is open to all grade 12 students. The contest is intended to increase awareness of the biological diversity within Canada's vast ocean territories. In particular, it provides an opportunity for motivated students at the pre-University level of education to learn about marine biodiversity in Canada and to share what is learned in a creative and effective manner. The student with the most creative and effective essay will be awarded their **first year's tuition** in a Science program at any accredited public Canadian University. Other subsidiary prizes may be available depending on further contributions.

The Centre for Marine Biodiversity (CMB) is a largely virtual institute established in 2000 to provide a focus for the broad array of marine biodiversity research being conducted in Atlantic Canada. Canada has the longest coastline of any country in the world bordering three Oceans, and has long been a leader in marine biological research. In the mid-1990s Canada signed the International Convention on Biological Diversity, which states that all member countries will identify the extent of biological diversity in their territories, and make plans to conserve or enhance this diversity. In spite of this, the full scope of biological diversity in Canada's marine waters, it is not yet well understood. Many efforts are underway to address this; however, the CMB is aware that future marine biodiversity research and decision making, which will govern the quality of Canada's Oceans, lies with young people now in high school and considering their educational directions. It is fitting that these young people be given an opportunity to learn and write about marine biological diversity and by doing so, benefit from their efforts by receiving assistance for post-secondary education.

The contest was extremely successful last year with over 30 essays submitted. The essays were excellent; they were extremely creative and very well thought out. Our winners from last year were Sapna Jha (First Prize), Matthew Higgins (Second Place) and Jeff Hilchey (Third Place). Upon winning, they visited the Bedford Institute of Oceanography to accept their prize and were interviewed by CBC radio. They also had a tour of the Institute where they were introduced to a number of activities that take place in the *real world* of marine biodiversity research. We hope to continue this trend and offer both a tour of the institute and of a research vessel for winners in the upcoming year.

The essay contest will be open to any student currently enrolled in Grade 12 at a Canadian high school in the Atlantic Region (i.e. Newfoundland, Nova Scotia, New Brunswick and Prince Edward Island). Essays are due on January 15th, 2004 and the winners will be announced by April 15th, 2004. Judging will take place by a panel of researchers who have expertise in areas of biological diversity. The winners will be invited to attend the Spring CMB meeting, where their essays will be on display. Essays will also be posted on the Centre for Marine Biodiversity website after the final decisions have been made. If you are interested in submitting an essay, please visit www.marinebiodiversity.ca for the details.

TWENTY-SEVEN FISHERMEN SELECTED FOR LOBSTER STUDY

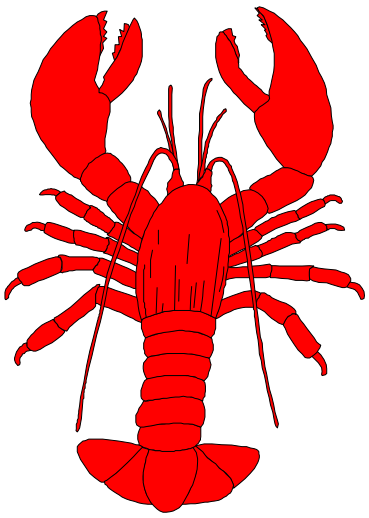
Twenty-seven additional fishermen will be collecting data on juvenile lobsters as part of a project by the Fishermen and Scientists Research Society (FSRS) to look at size composition of catches. The Lobster Recruitment Index Project is designed to identify the number of lobsters caught under a specified size. Since size is one of the major considerations in the lobster fishery, the information generated by this study will be valuable to fishermen, as well as scientists and resource managers in the Department of Fisheries and Oceans (DFO), as they work to develop management and conservation plans.

This is the sixth year data will be collected for this project which began in the spring of 1999. A total of 160 fishermen are now participating in the project from ports throughout lobster fishing areas from Cape Breton to the Bay of Fundy. The specific objective of the Lobster Recruitment Index Project is to collect information in Lobster Fishing Areas (LFA) 27, 28, 29, 30, 31A, 31B, 32, 33, and 34 required to develop a short term recruitment index. This will be done by collecting catch information on: number of males and females, number of juvenile lobsters, and length of juvenile lobsters.

Applications to participate in the project were reviewed on October 9, 2003 in Dartmouth by a Selection Board consisting of representatives from the FSRS and Mr. Bruce Osborne from the provincial Department of Agriculture and Fisheries, who served as independent chair of the Board. Representatives from the LFA's were also invited to sit on the Board, and provided input on applicants prior to the selection process. In reviewing the applications, fishing experience, data collection capabilities, geographical location and a clean record in relation to lobster violations/ sanctions were taken into consideration.

Board Chair Bruce Osborne stated, "The FSRS Lobster Recruitment Project is entering its sixth successful year. The dedicated effort and commitment shown by project participants is apparent by the quality of the scientific information that is produced." Mr. Osborne also noted "Each year interest in the project grows as more fishermen recognize the benefits of the information gained. This project was met with skepticism in some areas a few years ago; now many ports have fishermen approved as alternates, waiting for their chance to participate. This project is a tangible example of co-management in the lobster fishery."

Selected to participate in the Short Term Recruitment Index Project were: Percy Fraser - Bay St. Lawrence, George Rambeau - Dingwall, David Pondanovitch - Dingwall, Michael Buffett - Neil's Harbour, Thomas Boutilier - Big Bras D'Or, Peter Harrison - Seal Island, Bernard MacDonald - False Bay, Gabriel MacKay - Little Harbour, Jamie Osborne- Eastern Passage, Tom Henneberry - Eastern Passage, Wayne Purdy - Halifax, David Baker - Big Tancook Island, David Schnare - Blandford/Deep Cove, Gerald Mossman - La Have, Rickey Joudrey - Voglers Cove, Gerald Risser - LaHave Island, Philip Irwin - Brooklyn, Donald Fralic - Liverpool, Victor Westhaver - Liverpool, Bradford Crouse - West Berlin, Todd Nickerson - Woods Harbour, Pius d'Entremont - Dennis Point/Lower West Pubnico, Ted Jacquard - Little River Harbour, Brent Pothier - Pinkney's Point, Wayne Pothier - Pinknery's Point, J. Roy Atkinson - Little River Harbour, and James McDormand - Westport. Also approved as alternates for their areas were Ricky Demings - Port Mouton and Derrick Purdy - Eastern Passage.



FISH DIETS IN THE NORTHWEST ATLANTIC

By Marjo Laurinolli, Ecosystem Biologist, DFO and FSRS

The four year Comparative Dynamics of Exploited Ecosystems in the Northwest Atlantic (CDEENA) project was developed to look at changes in the structure and function of Canadian East Coast marine ecosystems before and after the collapse of groundfish. Ecosystem models were developed to explore the effects of fishing, predation, and environmental variation on changes in structure and function of ecosystems reflecting changes in mortality, production, predator-prey interactions and energy flow. A critical input to these models is fish diet. To this end, CDEENA instituted a diet studies program to collect data on ontogenetic, seasonal, annual and geographic variation in predator-prey relationships.

The CDEENA project diet data collection involved compilation of all existing and available stomach contents data at DFO. The data set began with less than 1,800 specimens and has now accumulated over 100,000 (Table 1). From 1999-2001, a three-year enhanced fish diet sampling program was undertaken, targeting 32 common commercial and non-commercial fish of the Scotia-Fundy region. Samples were collected during research groundfish and herring surveys, industry surveys, and commercial fishing. All of these stomach contents were analysed by FSRS technicians. The addition of trawl impact study and commercial shark fishery samples resulted in over 20,000 stomachs.

Archival data also uncovered and restored almost 84,000 samples from pre-1970's surveys, Fisheries Ecology Program surveys, a swordfish survey, pollock surveys, juvenile fish surveys, groundfish surveys and a silver hake survey. Numerous samples were also collected during various research projects throughout DFO.

All the data were reformatted and entered into a single Oracle database to provide a single, secure, easily accessible location to which new data could be easily added. Where possible, data are linked to other databases containing information on ship and set information.

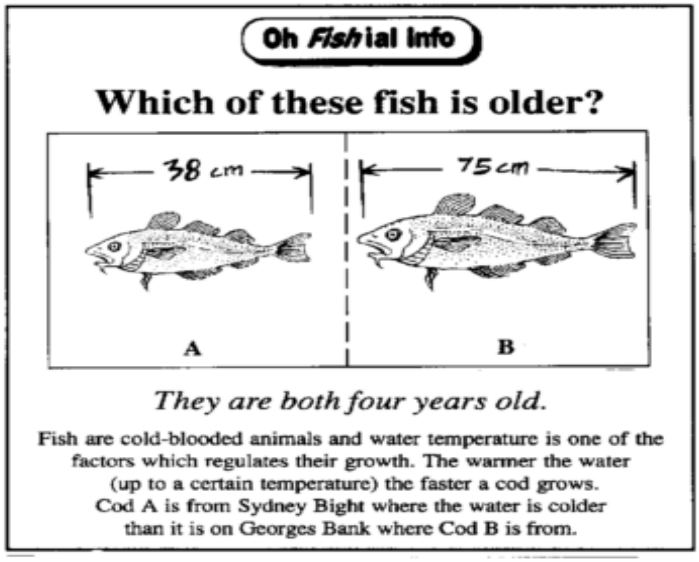
One usage for this data is determination of diet compositions of various species and the subsequent estimation of daily consumption. Consumption estimates should take into consideration differences in digestion rates for different prey species. Hard to digest foods will remain in the stomach longer and thus would be over-represented if stomach contents at the time of analysis were considered to be equivalent to the amount eaten in a day. Gastric evacuation is defined as the expulsion of broken down food from the stomach to the small intestine so gastric evacuation rates for different prey items can then be used in consumption models to estimate actual food eaten.

One example of a consumption model is that of dos Santos and Jobling (1995) based on cod experiments. Temperature and prey type, not predator species, are the most important factor in gastric evacuation rates (Durbin and Durbin 1980). Consumption depends on water temperature, predator body size, weight of food in stomach, and initial meal size. The effect of using the consumption model versus just reporting stomach contents for cod data in 1999-2000 is that the amount of small pelagics and shrimps eaten is probably less than what is seen in the stomach and the proportion of zooplankton in the stomach under-represents the amount actually eaten (Figure 1).

Detailed summaries and further consumption analyses of the stomach database can be found in Laurinolli *et al.* 2003. Although the CDEENA project has come to an end, hopefully data will continue to be added to the stomach database as it becomes available.

Table 1. Stomach data currently available in the stomach database by species and era.

Species	Species code	1958-1969	1982-1988	1995-2000	Total
Alewife	62	277	3		280
American Plaice	40	5690	10	1988	7692
Argentine	160	1026	25	59	1110
Barndoor Skate	200	215			215
Black Dogfish	221	19			19
Capelin	64			214	214
Cod	10	21530	80	4741	26375
Eelpouts	642	35			35
Cusk	15	626	3	57	686
Fourbeard Rockling	114	10	3		13
Gray's Cutthroat Eel	602	11			11
Haddock	11	26450	4447	3861	34762
Halibut	30	526		252	758
Herring	60	562	1	409	950
Little Skate	203	28		8	36
Longfin Hake	112	152	4		156
Longhorn Sculpin	300	189		493	680
Lumpfish	501	22		5	27
Mackerel	70		5	388	217
Marlin-Spike Grenadier	410	74			74
Monkfish	400	262	16	117	395
Northern Sandlance	610		3	614	617
Ocean Pout	640			38	38
Pollock	16	2487	1203	502	4192
Red Hake	13	26	55	149	230
Redfish	23	771	12	689	1473
Sea Raven	320	51		87	138
Silver Hake	14	1179	132	1122	2433
Smooth Skate	202	95	1	129	225
Spiny Dogfish	220	147	323	380	851
Spotted Wolffish	51	23			23
Striped Atlantic Wolffish	50	76		220	296
Thorny Skate	201	999	2	637	1640
Turbot	31	4		502	470
Vahl's Eelpout	647			165	165
White Hake	12	1236	785	702	2723
Winter Flounder	43	244		428	672
Winter Skate	204	380		167	549
Witch Flounder	41	2721	7	1548	4282
Wolffish, unid.	59	220			220
Yellowtail Flounder	42	3195		951	4147
10 Other Species		31	6	13	50
Totals		71589	7126	21635	100350



Oh Fishial Info has been provided by the Communications Branch of the Department of Fisheries and Oceans.

AN OVERVIEW OF FISHERIES AND RESEARCH IN IRAN

By Mohammd Mazloomi Arjagh

Editor's Note: As the Fishermen and Scientists Research Society's membership expands to encompass the globe (we now have members from as far away as Australia and Iran), we have an opportunity to learn about fisheries around the world and what they are doing in the way of fisheries science and collaboration between fishermen and scientists. The following article was written by a member from Iran and provides insight into their fishery and the research they do.

There are two main water bodies in Iran, the Caspian Sea in the north with famous species of sturgeon fishes, and the Persian Gulf and Iranian part of the Gulf of Oman in the south with a variety of fish.

The Fishery in the North

Five species of sturgeon fishes are caught in the Caspian Sea. They are: Stellate - Acipenser stellatus, Spiny sturgeon - Acipenser nudiventris, Russian sturgeon - Acipenser gulden stadti, Percicus sturgeon - Acipenser persicus, Beluga - Huso huso. The total catch is about 700 tones per year. These fishes are caught by Fixed Gill Net method; mesh size varies from 100 to 300 mm.

Another important fishery activity is Beach Seine, which is used for catching bony fishes. The two main species caught by this method are cutum and mugilidae. The total annual catch is about 15000 tons.

An important method formerly used for anadromous fishes was by making a band in the rivers. They plunged sticks at the bottom in spawning season, and the fishes were caught by Cast Net when they were struggling to go to the upper part of the rivers. This method is abolished now, due to environmental changing of rivers such as bridges, dams and also using fresh water for agriculture purpose. In this circumstance the stocks are rehabilitated by an artificial breeding program.

The Lift Funnel Net is used for small species of anchovy sprat. Fishermen use a 1500 W lamp at the middle part of a net and they are caught when they gather around the light. Also, in the northern part of Iran in some fresh water resources a special type of trap is used for catching cray fish.

The Fishery in the South

Industrial fishing methods in the South include bottom trawl and purse seine. Bottom trawl is used by different sizes of vessels for catching commercial fishes in the Persian Gulf. Recently, governments established temporal and spatial limitations for this method in order to protect these important species and the environment. They also encourage fishermen to change their fishing gear. However, the side trawl method will be continued for shrimp catching.

Purse seine is another industrial method and is used for tuna fishes. Five vessels equipped with this method catch about 8000 tons of tuna fishes in the Iranian part of the Gulf of Oman and Arabian Sea.

Artisanal fishing methods are widely used by fishermen. One of the most important ones is Drift Gill Net. More than 3000 dhows (wooden or fiberglass boats from 20-100 feet long) catch about 70000 tones of tuna fishes in the Gulf of Oman, Arabian Sea and Indian Ocean. The fishermen keep fishes inside ice powder until they are landed. The main species of tuna caught are long tail tuna, yellowfin tuna and skipjack.

Hook and line is also widely used by fishermen that go fishing by boats. Cages, plastic or wire, are used for special species. Plastic traps are used for lobsters, and wire traps for cuttle fish and demersal fishes in coral and rocky areas. Special Set Nets are used in rural places in coastal areas in some provinces. This method works in the base of low and high tide. Fishes go inside the Set Nets in high tide time and they are trapped inside the bags in low tide time. Drift Gill Net is also used in rivers ending at the Sea by small boats for some anadromous species.

Fisheries Science Programs

The headquarters of the Iranian Fisheries Research Organization (IFRO) is located in the Capital (Tehran), which supports nine research centers all over the country. The Research Centers in the North are: the Sturgeon Fisheries Research Center, the Bony Fishes Research Center, the Caspian Sea Ecology Center and the Caspian Sea Coastal Fisheries Research Center. The Research Centers in the South are: the Offshore Fisheries Research Center, the Persian Gulf and Oman Sea Ecology Center, the Shrimp Research Center and the Marine Culture Research Center. Another Research Center is located north-west of Iran at Urumia Lake Beaches, focusing on artemia.

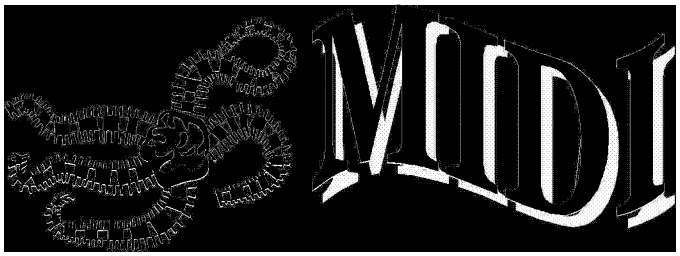
The IFRO headquarters enjoys five scientific departments. They are as follows: Stock Assessment, Aquaculture, Ecology, Biotechnology, and Fish Diseases. Little or no funding comes from the private sector. Budgets needed for research projects predominantly come from the public sector. There are research vessels both in the North and South, but the main data for stock assessment purposes were collected from fishermen. For implementing of research projects in the aquaculture section, there are enough shrimp ponds of research scale in some of the shrimp culture sites in the south, however, the main data needed in managing issues were collected from fish farmers. Fisheries research areas were collected by departments from the executive sector every year and were classified and conveyed to the scientific departments, to be developed as research projects.

For more information, please check out our website at www.ifro.org, where you can find the map of Iran and Fisheries Research Centers distribution.

FSRS WELCOMES NEW MEMBERS

The Fishermen and Scientists Research Society would like to welcome the following members. Whose applications were approved at the November 6th Executive Committee meeting. We trust that this expansion of the FSRS's membership will prove to be beneficial to all involved.

Bradford Crouse	Sharon Greenlaw	Kirby Nickerson
Robert Stoddard	Paul Swim	Peter Symonds
Nemi Ujjania	Herbert Vandermeulen	Victor Westhaver



CREATURE FEATURE
Northern Red Anemone

By: Elizabeth Vardy, MIDI coordinator

If you have seen *Finding Nemo*, you've probably heard about sea anemones! These invertebrate animals are found in the waters of many parts of the world, including Atlantic Canada. They are sessile and live attached to rocks. If you uncover a rock in the intertidal zone you are likely to find an anemone of some sort attached to the bottom. Northern Red Anemones grow to 4.0-7.5cm in height and 7.5-12.5cm in width. Larger anemones tend to be found in deeper waters. If their bodies are disturbed they will contract, pulling their stinging tentacles inside. Instead of searching for food they wait for it to land on their tentacles. Stinging cells aid in the capture of prey, serve to protect against predators, and help the anemone attach to surfaces. They eat amphipods, polychaetes, copepods, nauplii and large particles that float through the water column.

Photo © Strong/Buzeta

NEW TO THE FSRS LIBRARY

The 3rd North Atlantic Responsible Fishing Conference Final Report, June 9-11, 2003, Yarmouth Nova Scotia - Canada.

Atlantic Fisheries Issues: May 2003, Report of the Standing Committee on Fisheries and Oceans, November 2003.

PATTY'S PICKS - WEBSITES OF INTEREST

www.nafo.int - Northwest Atlantic Fisheries Organization (NAFO) website.

Do you know of a website that would be of interest to FSRS members?
Please send suggestions to: pattyfsrs@auracom.com.

NAFO – INTERNATIONAL COOPERATION IN THE NORTHWEST ATLANTIC

By Dr. Johanne Fischer, Executive Secretary, Northwest Atlantic Fisheries Organization

Goto: www.nafo.int

Just a few months ago, following the last NAFO (Northwest Atlantic Fisheries Organization) Annual Meeting in September 2003, the Nova Scotian "Sou'wester" printed an article with the enthusiastic title: "*NAFO - inches ahead on conservation*". NAFO had just agreed on a 15-year rebuilding plan for turbot (Greenland halibut) that included an overall reduction of 60 percent in the Total Allowable Catch (TAC). The contrast of these headlines to those of almost 10 years ago could not have been greater. Back then, NAFO was mentioned in the context of reckless "foreign overfishing" after a Spanish captain had been arrested in Newfoundland and accused of illegally fishing for turbot. Until today, some Canadians still suspect that NAFO supports an irresponsible exploitation of Canadian fish resources by a bunch of selfish foreigners. But what is NAFO really and how does it operate?

Fish in the Northwest Atlantic Ocean have been captured since half a millennium ago when European fishermen fished off the coast of Newfoundland long before the first colonies were established. Spanish, English, and Portuguese fishing vessels harvested fish from this area and marine resources appeared to be endless. Only a century ago, people started to become concerned about dwindling stocks. Consequently, in 1921 the first formal international cooperation for fishery research in North America was founded by Canada, Newfoundland, and the United States (France joined later): the North American Council on Fishery Investigations (NACFI). However, after 17 years it was discontinued and instead a new Convention came into place a decade later in 1949. The International Commission for the Northwest Atlantic Fisheries (ICNAF) not only aimed at cooperation in research but also strived for the protection and conservation of fishery resources in international waters of the northwest Atlantic. In addition to joined fishery investigations ICNAF thus exerted control of the fisheries in its convention area by defining Total Allowable Catches (TAC) and quotas as well as other conservation measures for commercial species. Its initial members were Canada, Denmark, Iceland, the UK, and the USA who were later joined by 10 other European countries plus Cuba, Japan, and the USSR. ICNAF had a strong influence on the development of standards in international fisheries work in the 1950s and, together with ICES (International Council for the Exploration of the Seas) and the FAO (Food and Agriculture Organization of the United Nations), helped define concepts, techniques and terms associated with fishing effort and fishing mortality.

When national fishing zones were extended to 200 miles off the coasts, the ICNAF Convention was replaced by a new agreement in 1979, the Convention on Future Multilateral Cooperation in the Northwest Atlantic Fisheries. This Convention provided for the establishment of the Northwest Atlantic Fisheries Organization (NAFO) with its explicit objective to "*contribute through consultation and cooperation to the optimum utilization, rational management and conservation of the fishery resources of the Convention Area*". The Convention applies to all fishery resources in the Convention Area except salmon, tunas and marlins, cetaceans, and sedentary species (e.g. shellfish). Today, NAFO has 17 Members from Central and North America, Europe, and Asia.

In contrast to many other regional fishery bodies that either specialize on scientific advice to fishery managers (e.g. ICES, FAO) or just mutually manage international resources based on advise requested elsewhere (e.g. North East Atlantic Fisheries Commission, NEAFC), NAFO provides for both scientific

advise and fisheries management. The two NAFO bodies responsible for these tasks are the Scientific Council and Fisheries Commission. These are supplemented by the General Council that is responsible for administrative and financial matters of the organization. The NAFO Headquarters are located in Dartmouth, Nova Scotia, Canada.

The work of the Scientific Council forms the foundation on which the Fisheries Commission determines the necessary management measures for the NAFO Regulatory Area, i.e. the international waters in the Northwest Atlantic off the 200 miles under national jurisdiction. These consist of a variety of provisions such as establishing TACs for commercial fish stocks, prescribing mesh sizes, closed areas or seasons, regulating by-catch, implementing a Vessel Monitoring System and a scheme of observers on board, providing for inspections at sea and at port, etc. All these measures are updated on a yearly basis during the NAFO Annual Meeting each September and compiled in the "*NAFO Conservation and Enforcement Measures*". Let us have a look at how the necessary background information for all these measures is elaborated within NAFO.

First of all, the NAFO Fisheries Commission or a NAFO Coastal State (e.g. Canada, USA, or Greenland) puts in a formal request for information to the Scientific Council. The Fisheries Commission, for example, routinely asks the Scientific Council to assess the status of commercial fish species in the Convention Area. Each NAFO member is obliged to make available all statistical and scientific information related to such requests. The Scientific Council encourages and promotes coordinated international surveys and investigations in the NAFO Convention Area that are related to the requests for information received. It organizes several meetings per year where scientists from NAFO Member States present and discuss findings from these activities. The results (stock and environmental assessments) are published in the NAFO Scientific Council Reports (also called NAFO "*Redbook*") and presented to the Fisheries Commission at the Annual NAFO Meeting.

In addition to the advice upon request, the Scientific Council compiles and maintains statistics and records. It publishes reports, information and materials pertaining to the fisheries of the Convention Area, including environmental and ecological factors affecting these fisheries. All Scientific Council publications can be found on the NAFO website under: http://www.nafo.int/publications. Apart from the "*Scientific Council Reports*" mentioned above, these are:

- "*Journal of Northwest Atlantic Fishery Science*". It contains peer-reviewed articles on fish, fisheries, environment, methodology, reviews, etc. related to the Northwest Atlantic. One or more volumes are published per year.

- "*NAFO Scientific Council Studies*". This irregular publication contains review papers of topical interest and importance, more recently focusing on results from NAFO Workshops.

- Scientific Council Research and Summary Documents that contain un-reviewed scientific information made available by NAFO scientists.

In addition to their regular meetings throughout the year, NAFO also organizes workshops and symposia on topics of special interest to fisheries science and management that are open to the scientific public worldwide. For example, in 2003, they held a workshop on "*Precautionary Approach to Fisheries Managemen*t" and a workshop on "*Mapping & Geostatistical Methods for Fisheries Stock Assessments*". In 2004 we are looking forward to the Symposium on "*The Ecosystem of the Flemish Cap*". Information on NAFO scientific events can be found on our website under: http://www.nafo.int/activities/FRAMES/AcFrSci.html.

At present, Joanne Morgan from Canada is Chair of the Scientific Council and Antonio Vazquez from the European Union is its Vice-Chair. The Scientific Council has established four Standing Committees, one on Fisheries Science (STACFIS), one on Research Coordination (STACREC), one on Publications (STACPUB) and one on Fisheries Environment (STACFEN). Each of these Committees consists of scientists, one from each Contracting Party, who are assisted by experts and advisers. The Chair and Vice-Chair of the Scientific Council and the Chairs of the Standing Committees form the "Executive Committee" that ensures that the Council works effectively and efficiently. Currently, fishers do not attend the NAFO stock assessment meetings. The fishing industry is, however, present as a part of many NAFO member delegations at the Annual Meetings.

Naturally, the different type of studies and methods used by scientists of NAFO members will impact the work of the Scientific Council. With the contribution of so many scientists from different countries NAFO offers a fascinating platform for the discussion of new ideas and the advancement of fishery assessment. A good example is the grim projections of Greenland halibut stock development that were co-authored by scientists from the UK, Canada and France and that ultimately led to the highly praised unique NAFO long-term rebuilding plan for turbot.

NAFO has shown that it takes its commitment to sustainable fisheries and resource protection seriously. Nobody is perfect; NAFO not being an exception from this rule has suffered drawbacks and problems on its long way. The "turbot war" in the mid-nineties also affected the climate of negotiations within NAFO. Fortunately, the Organization not only survived but probably became stronger for it. With its long tradition, solid scientific components and advanced scheme of fishery surveillance NAFO has a good chance of continuing to do international assessment and management for international fisheries in international waters for quite some time in the future.

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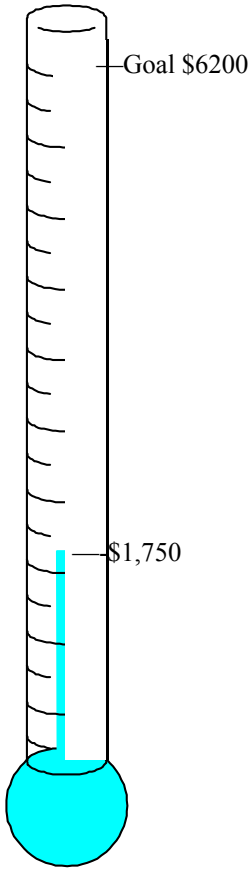
FUNDRAISING CAMPAIGN CONTINUES

The Fishermen and Scientists Research Society (FSRS) is still looking for donations for their fundraising campaign to raise $6200 to purchase much needed equipment. We have now raised $1750 in donations from generous members, individuals and organizations. The FSRS must raise enough funds to purchase 25 minilogs for various ongoing studies, three GPS units, and mapping software so that data gathered by fishermen can be mapped.

Help us reach our goal of $6200 so we can purchase equipment needed to continue our research. Send your cheque or money order to: FSRS, P.O. Box 25125, Halifax, NS B3M 4H4. Every little bit helps! Please give whatever you can. For more information contact Patty King at (902) 876-1160 or email pattyfsrs@auracom.com.

We would like to take this opportunity to thank our latest contributors, the Ecology Action Centre and Randy Boutilier, for their generous donations.



BEACHCOMBING – What's New in The News

The Bay of Fundy Discovery Centre Association

The Bay of Fundy Discovery Centre Association is a registered charity that is working on plans for a world-class interpretive centre to be located in Freeport, Nova Scotia. One of the main features of the Centre will be a large model of the Bay of Fundy. This model will be supported by exhibits in eleven themes: highest tides, geology, paleontology, oceanography, ornithology, marine mammals, flora and fauna, natural phenomena, Joshua Slocum and the age of sail, fisheries, and exploring on land and sea.

The Discovery Centre will also have a research facility, a theatre and a gift shop. It is the intent to be able to tie the research activities into the interpretive component of the Centre. It is also hoped that there will be several associated sites on Digby Neck and the Islands that will tie into the themes of the Centre and encourage people to visit the rest of the area.

Close to $85,000 has already been raised for the project (in donations and pledges) but there is still quite a way to go to make the multi-million dollar project a reality. The next fundraiser is being planned for the coming months and it will involve ticket sales and a community supper. The membership drive for the Association is still ongoing with new members still welcome.

For more information about the project contact Glenda Prest at 638-3044 or you can check out their website at www.discoverfundy.com.

We're on the Web! www.fsrs.ns.ca

EXECUTIVE COMMITTEE

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UPCOMING EVENTS

FSRS 11TH ANNUAL CONFERENCE

February 20-21, 2004 at our new location
Holiday Inn Select
Halifax, Nova Scotia
For more information contact Patty King
Phone: 902-876-1160 Fax: 902-876-1320
Email: pattyfsrs@auracom.com

FISH CANADA/WORKBOAT CANADA 2004

February 26-28, 2004 at the Moncton Coliseum Complex, Moncton, New Brunswick
For more information contact Sydney Peacock
Phone: 1-888-454-7469 Fax: 506-658-0750
Email: speacock@masterpromotions.ca