
HOOK, LINE AND THINKER

The Newsletter of the Fishermen and Scientists Research Society

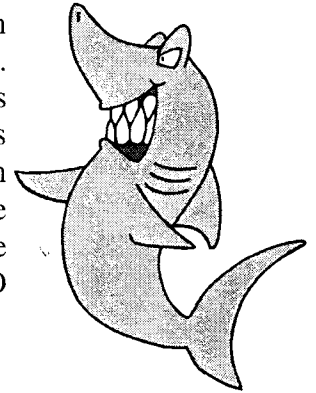
Issue: 2003 - 2

Spring 2003

FSRS IMPLEMENTS DOGFISH SAMPLING PROGRAM

In response to requests from a number of industry management boards, who are required by the Department of Fisheries and Oceans (DFO) to have a sampling program in place before their vessels can go fishing for dogfish, the FSRS has implemented a dogfish sampling program. To date, contracts have been signed with the 4VW Management Board, and the ENS 4X, Halifax West 4X and Yarmouth 4X Management Boards. The Queens/Lunenburg Management is expected to sign onto the program shortly. Discussions are underway with representatives of the Shelburne and Digby Management Boards.

The sampling program includes doing at-sea and shore-based sampling. Each sample consists of 400 dogfish. Length frequencies will be done for all the fish. Detailed sampling will be done for one fish per sex per centimetre grouping; this is estimated to be 50 to 75 fish per sample. Detailed sampling includes determining the maturity stage, measuring the diameter of up to five ova in each mature female, counting and measuring embryos, and collecting a sample of the second dorsal fin to be used for aging. FSRS staff will enter the detailed sample data into a spreadsheet; the length frequency data will be entered into the DFO database.



● Inside this Issue ●

FSRS Implements Dogfish Sampling Program	1
Swordfish Veils Or Monkfish Eggs?	2
Live from Yarmouth It's the Exposition Team.....	3
FSRS Appears Before Fisheries Standing Committee	4
FSRS Fundraising Campaign Reaches \$1,600.....	5
41 Students Receive FSRS Oceans 11 Program Award for Outstanding Achievement ...	6
Marine Biodiversity Essay Contest - Winners Announced	7
LFA 34 V-Notch Survey, 2002.....	8
Patty's Picks	10
Creature Feature	11
Cape Breton Island's New FSRS Fisheries Technician.....	12
Looking for my Sea Legs	12
Climate Change and the Marine Ecosystems- What Will Be the Effects?	13
STFX Research Casts Doubt on Common Lobster Management Tool	15
Seeking Answers and Learning Lessons from White Hake Stomachs	16
11 Commercial Longline Vessels Participating in Groundfish Sentinel Program	19

SEEKING ANSWERS AND LEARNING LESSONS FROM WHITE HAKE STOMACHS: AN EXAMPLE OF RESULTS FROM COLLABORATIVE RESEARCH

By Holli MacPherson, Hadley Watts, and Anthony Davis, Social Research for Sustainable Fisheries*, St. Francis Xavier University, Antigonish, Nova Scotia

Many St. Georges Bay Nova Scotian fishermen are concerned with groundfish predation, particularly predation of white hake (*Urophycis tenuis*) on juvenile American lobster (*Homarus americanus*). These marine harvesters, fishing from a range of Southern Gulf of St. Lawrence (sGSL) Nova Scotian ports, are concerned that as groundfish populations recover under the protection of the fishing moratorium there will be increased predation on juvenile lobster. Anticipated increases in predation are then thought likely to reduce the recruitment of juveniles into the harvestable size-classes, thereby jeopardising the economic viability of the fishery and fisheries livelihoods.

Fueling these concerns is the fact that lobster in the sGSL is the region's economically most important fishery. Indeed, the groundfish moratorium has only served to heighten the dependency of fish harvesters on the lobster fishery. Harvester scepticism regarding the lobster-focused marine and fisheries science conducted within the region has heightened concerns. For instance, many harvesters argue that the annual fisheries surveys take samples in the wrong places and at the wrong time of year to document white hake predation on lobster.

A research partnership was formed to address these concerns, involving the collaboration of Social Research for Sustainable Fisheries (SRSF) at St. Francis Xavier University, Fisheries and Oceans Canada (Gulf Region), and the Gulf Nova Scotia Bonafide Fisherman's Association (GNSBFA). This collaboration was formed to seek answers through fish harvesters' knowledge of the local fishing grounds. The intention was to incorporate harvesters' knowledge in the research design. The harvesters' inputs were understood as important particularly to identifying the sites and times of year where white hake should be sampled. To accomplish this, fish harvesters were interviewed systematically to determine the sites within the local fishing grounds and times of year in which the study of white hake predation on juvenile lobster should be conducted.

As a result, three phases of sampling were conducted at six sites in two depth zones of shallow water (15-30 m) and deep water (30-40 m). The first phase, conducted in September 2001, sampled in the three deep water sites, while Phase II (July 2002) sampled fish in the three shallow water sites. Phase III, executed in September 2002, included sampling in both depth zones and all six sites. All sampling was done with 5 1/2 and 6 inch mesh gill nets. One 4 1/2 mesh net were added to the gill net fleets for Phase III in an effort to increase the proportion of hake smaller than 45 cm. in the samples taken. Sampling occurred at sites and during times of the year specified by local fishermen as those most likely associated with white hake predation on juvenile lobster.

A total of 3,452 groundfish stomachs were collected, including 3,093 of white hake. These stomachs' contents were examined under the supervision of Dr. Mark Hanson, Science Branch, Gulf Region DFO. Phase I sampled 1,618 white hake, mainly fish longer than 45 cm. No lobster were found in these stomachs. White hake's principal prey were Atlantic herring (*Clupea harengus*) and mackerel (*Scomber scombrus*).

Despite intensive fishing efforts, only 159 white hake (mainly fish longer than 45 cm) were sampled during Phase II. This indicated that white hake were not abundant in waters 15-30 m deep during July 2002. As with Phase I, no lobster were found in white hake stomachs. Once again herring and mackerel were the most common prey.

Phase III sampled 1,316 white hake (mainly fish longer than 45 cm). Greater numbers of fish per unit effort were sampled from the inside shallow water sites. Again, no lobster were found in the white hake stomachs. Once again, herring and mackerel were the most important prey.

Other roundfish identified in the white hake samples included snakeblenny (*Lumpenus lumpretaeformis*), sculpin (*Myoxocephalus scorpius*, *Triglops murrayi*), ocean pout (*Marcrozoarces americanus*), white hake (*Urophycis tenuis*), and Atlantic cod (*Gadus morhua*). Various flatfish also contributed to the diet of white hake. These included American plaice (*Hippoglossoides platessoides*), yellowtail flounder (*Pleuronectes ferrungines*), and winter flounder (*Pleuronectes americanus*). Invertebrates found in the stomachs of white hake included various squids (*Loligo pealei* and *Illex illecebrosus*), rock crab (*Cancer irroratus*), toad crab (*Hyas araneus*), shrimp (*Pandalus montagui*, *Crangon septemspinosa*, *Axius serratus*, *Argis dentata*), and various gammarid amphipods.

Lobster, although not found in white hake, were found to be eaten occasionally by Atlantic cod and more frequently by shorthorn sculpin. Of the 175 Atlantic cod sampled, one contained the lobster remains (Phase I sampling). In the case of shorthorn sculpin, lobster were found in 13 of the 73 stomachs sampled.

The occurrence of the shrimp species *Axius serratus* in the stomachs of four white hake may explain some of the fish harvesters' reports of white hake predation on juvenile lobster. *Axius* is a benthic crustacean which is very similar in appearance to juvenile lobster, especially when partially digested. *Axius* have virtually identical exoskeletons as juvenile lobster and are distinguishable only by the morphology of their claws and the shape of the abdomen. *Axius* have sharp protrusions on their claws while the claws of lobster are smooth. *Axius* also have abdomens that are similar in width to the carapace. The abdomen of lobster tends to be more slender than the carapace. Thus, it is possible that organisms harvesters identified as lobster were actually *Axius*.

Although we did not find any juvenile lobster in white hake, past research reports that white hake do occasionally prey on lobster. For example, one recent study conducted by DFO in the eastern Northumberland Strait and St. Georges Bay found three lobsters in the 2,300 white hake stomachs examined. But, as our results confirm, predation is uncommon. Hopefully, the results of this research will relieve fish harvesters concerns respecting the prospect and impact of white hake predation on lobster.

In addition, this study has greatly improved knowledge of white hake feeding habits in the sGSL. Little was known, prior to this study, about white hake feeding habits in shallow, coastal waters. The few published studies were conducted in deep shelf waters, primarily in the Gulf of Maine. Nevertheless, one general conclusion is that adult white hake eat mostly fish and the species eaten depends mainly on which prey species are available and abundant.

Aside from the analysis white hake stomach contents, this research contributes to two other important considerations. On the one hand, it demonstrates that consulting and incorporating fish harvesters' ecological knowledge will enhance the design and conduct of studies aimed at exploring groundfish

ecology. While the analysis does not support fish harvesters' concerns about predation, the fish harvesters' advice respecting the time of year for and location of sampling did produce successful sampling results. This research demonstrates that fish harvesters' observations and experiences have much to contribute to marine research, especially to the design and conduct of research focused on examining local ecosystem concerns.





On the other hand, the fact that the research was conducted collaboratively and produced useful results demonstrates, for both government and university based researchers as well as for fish harvesters, the positive prospects associated with putting the time and energy into forming research partnerships. In this instance, harvesters' scepticism about fisheries research has been somewhat diminished through the experience of having their concerns taken seriously and of being involved in spelling out where, when and how the research should proceed. Government and university researchers, for their part, learn that fish harvesters have much to contribute to the design and conduct of successful research. Fish harvesters' willingness to engage enthusiastically and to share their knowledge illustrates the potentials of developing and working with an approach to research that is inclusive, sincere, and respectful. Through these practices, important issues and concerns are addressed effectively and meaningfully. These are important 'good news' lessons for government and university fisheries and marine scientists interested in developing mutually benefiting research collaborations with fish harvesters and their organisations.

To find out more about this study and to view the complete research reports, visit the SRSF website at: www.stfx.ca/research/SRSF/2006c.htm

* Social Research for Sustainable Fisheries is a research alliance of Northeastern Nova Scotian Mi'kmaq and non-native marine harvester organisations funded through the Social Sciences and Humanities Research Council of Canada's Community-University Research Alliance programme. The research was supported by a Fisheries and Oceans Science Subvention grant and two Fisheries and Oceans Science and Technology Horizon internships.

Oh Fishial Info

Where do you find the fertilised eggs of these fishes?

	stuck on the bottom
	floating near the surface
	in the brood pouch of the male
	in the ovaries of the female

Answers: Cod - floating. Herring - on the bottom. Redfish - in the brood pouch of the male. Seahorse - in the brood pouch of the male.

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

Fast Fact

The deepest dwelling lobsters have recently been located 695 metres below the surface, going about their business along the outer edge of the continental shelf.

From The Chronicle-Herald,
Saturday Dec. 29, 2001, pg A4,
By Brain Medel