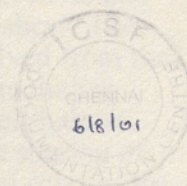


## ISSUES POSITION PAPER



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### **The Fisher's knowledge : an other source of information for a better understanding of the fisheries**

#### *Introduction*

The difficult situation in Atlantic Canada's fishing industry since the late 1980s has created a climate of mistrust where scientific assessment of fish stocks and advice on resource management have come under increasing criticism. The lack of confidence exhibited by the industry, which wants to have a say in issues of concern to it, made it imperative to devise new approaches for stock assessment and management. At the Maurice Lamontagne Institute (MLI), a marine science research facility of the Department of Fisheries and Oceans, collaborative research has been undertaken since 1991 between biologists and fishers from Quebec and the Atlantic provinces and brought the industry to get more involved in research activities related to resource assessment. This co-operation gave rise to a number of projects in which the industry's involvement goes from a strictly advisory approach to a broader sharing of responsibilities.

**One of the projects involving industry relied on an ethnoscientific approach, the objective was to harness and analyse the fishers' knowledge and the study was done on the lobster fishery of Magdalen Islands (Quebec). The project was undertaken jointly by Louise Gendron, Réjeanne Camirand et Renée Morneau, marine scientists from MLI and Yvan Breton and Josée Archambault, anthropologists from Laval University.**

#### **Application of Traditional ecological knowledge to fisheries science at MLI : the exemple of the lobster fishery of Magdalen Islands**

The project was undertaken on an experimental basis between 1995 and 1997 with lobster fishers from the Magdalen Islands. The principal objectives were to build a data base of information provided by lobster fishers, to make this information available to biologists and to evaluate the possibility of integrating this type of knowledge to stock status assessments. An ethnoscientific



approach was used in the project to incorporate contextual information on fishers' background, and on their social organization as well as on their goals and concerns towards the lobster fishery. The research focused on four main themes : 1) their fishing practices and how these had evolved from the time they began fishing, up until now, 2) their empirical knowledge of lobster biology including their knowledge of the spatial distribution of lobsters, their behavior, their life cycle, their habitat, their relations with other species 3) the social organization of their fishing activities, the sharing of the fishing grounds, the local initiatives for conservation of this resource and the internal rules of the fishing activities, and 4) the observations and the interpretations of fishers of changes that had occurred in the environment.

The interviews were semi-structured. The interview schedule was made of closed questions requiring precise answers and open questions that invited a narration of events as perceived by the fishers. Interviews were conducted by two people : a marine scientist from MLI and an anthropologist. Each interview, which lasted two hours on average, was recorded and then transcribed. The information was processed in an Microsoft Access database. Information was classified into 220 variables. This database was made available to the biologists, who then used the data in the assessment of lobster stock status in 1996. This knowledge serves as a complement to the other databases currently in use by scientists.

Among the informations gathered from lobster fishers, those related to their fishing practices (50 different variables) were taken into account in the stock assessment process. These informations allowed to document more precisely the nature of the changes that were brought in the equipment and the fishing strategies in the past 20 years, occurred in keeping with the phenomenon of the increase in landings and catch rates observed between 1975 and 1995 and finally to determine the causes and scope of changes in the community of lobster fishers of the Magdalen Islands.

The results of this study has shown three important points :

1. **An increase in the fishing capacity of the fleet.** The modifications made to vessels since the early 1980s have enhanced their power, speed, stability, and trap transportation capacity. In addition, the use of electronic navigation systems has enabled fishers to move farther from the coast and reduce the time it takes to retrieve traps. Fishers have become less dependent on weather conditions and now lose fewer days of fishing. With the advent of colour sounders around the mid-1980s, new fishing grounds were discovered and fishers gained access to fine-scale topographic information, which also revealed the type of seabed. All these changes served to expand the area harvested. According to the fishers, it appears that today, all lobster grounds have been discovered and now being exploited.
2. **A change of fishing strategy, shifting from interception to deliberate pursuit of the species.** During the 1980s, the lobster fleet became more mobile and more efficient at seeking out and locating lobster. The fishers are now able to go after lobster wherever they are : for example, they exploit offshore lobster grounds early in the season rather than waiting for lobster to reach traps set near the coast, and they follow the lobsters' movements during the season. This pursuit strategy is probably conducive to catching more lobster than simple interception, given that not all lobster would reach the interception site before the end of the season.
3. **An increase in fishing efficacy.** Aside from the increased mobility of the lobster fleet, which gradually led to the pursuit strategy, fishers in the 1990s have become much more effective at exploiting the resource. Modifications to traps (size, weight, entrance, rings, proportions escape mechanisms) have made them more efficient at catching lobster, and adjustments in the method of operating traps (organization of traps on lines, deployment of lines) have definitely helped to increase the yield per trap.



The information obtained was very useful and helped to give a new insight to the status of Magdalen Islands lobster. It provided contextual information helping us to refine our interpretations of changes in the catch rates and exploitation rates. It appeared more obvious that the Magdalen Islands lobster had been subject over the past 10 or 15 years to an increasing fishing pressure. The improvement of the harvesting capacity and efficacy brought in the last decades allow now fishers to remove a much larger proportion of recruits than before. The exploitation of zones that may have been refuges in the past, adjustments made to traps to target the biggest lobsters and the strategy of pursuit rather than interception are all elements that have increased the rate of exploitation of the lobster stock.

This project, which sought directly the input from the fishers, highlighted the merits of establishing personal contacts with them. Also, by favouring the ethnoscientific approach we were able to gather information related to their social organization and on their local management system of common fishing grounds. It therefore brought to light much additional information that improved our understanding of the evolution of fishing practices. The significance of competition and relationships between lobster fishers revealed in the interviews clarified the changes that occurred and highlighted differences between localities.

Following the stock assessment exercise in 1997, results were presented to the Magdalen Islands community of fishers. The incorporation of the information given to us by fishers increased the credibility of the scientific conclusions on the level harvesting of lobster populations. It caused fishers to be more concerned about the level of exploitation of the Magdalen Islands lobster populations and about their high fishing efficiency. They could better acknowledge the fact that the high level of landings and catch rates was not exclusively due to an increase in lobster biomass. The exercise provided the opportunity for scientists and fishers to adopt the same viewpoint about stock status, from which both parties can build the future of lobster conservation. This element certainly contributed to the success of the recent implementation of stronger conservation measures to which fishers were very receptive.

### **The actual context slows down the application of the ethnoscience in the fisheries sciences.**

The ethnoscience applied to fishery science allows biologists to diversify the source of information related to fisheries and take into account the knowledge of those that have experience of several years on sea. In the lobster project, it shed a new light and complementary information, providing more precision to the different variables used in the determination of stocks status.

In a more general sense, ethnoscience provides the methodology necessary to plan, conduct and analyse the interviews. It represents the only way to obtain and record informations related to the past that only the fishers behold; and also it helps establish direct contacts with fishers and building an information exchange network. No form, regardless of how complete, could ever hope to match this kind of exchange.

However, many factors contribute to slow down application of the ethnoscience in the fisheries sciences. First, there is a lack of knowledge of this field of study and its possible applications within the Department of Fisheries and Oceans. This is felt at different levels of the organization including fisheries scientists. Secondly, in the context of budget restrictions, the projects related to this field of study are strongly disadvantaged because they are considered of low priority. Finally, the work of fisheries scientists is more recognized within DFO and in the scientific community if it is based on state-of-the-art technology (ex. hydroacoustic) and mathematical models.

The projects related to ethnoscience need more visibility, and actions to better inform the scientific community on its potential are necessary.