

Community-University Research for Recovery Alliance

RESEARCH REPORT

Marine fish, local ecological knowledge, and the Species at Risk Act in Canada: lessons from
a case study of three species of wolffish

*a thesis by Jennifer Dawe
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Introduction

At a time when commercial fish stocks are overexploited around the globe, it is paramount that measures are taken to protect those species most at risk. Many countries throughout the world have legislation in place to assess and protect species in danger of extinction.

In Canada, departments associated with the Species at Risk Act (SARA) and members of the Committee on the Status of Endangered Species in Canada (COSEWIC) work in conjunction to assess and protect species at risk. But this was not always the case. Although COSEWIC was created in 1977, SARA was not passed until 2003. Prior to 2003, COSEWIC could designate indigenous wildlife species in Canada as at risk, but there was no legal mechanism in place to support action in response to such a listing.

When the SARA became law, responsibility for administration of its conservation regulations fell on the shoulders of three federal Ministers: the Minister of Fisheries and Oceans, the Minister of Canadian Heritage, and the Minister of the Environment.

Currently, recommendations by COSEWIC and ministerial approval are necessary for a species to be listed. The species must first be recommended by COSEWIC, which bases its assessments only on biological research. However, formal listing under SARA takes into consideration not only COSEWIC's species and status reports on the recommended species but also the socio-economic impacts that any listings may incur. Before a final decision is made, the status report is made available to stakeholders and posted on the SARA public registry to provide an opportunity for input from the public.

Several marine fish species in Canada have been evaluated under COSEWIC. The three wolffish species, the Atlantic (*Anarhichas lupus*) (Figure 1a), spotted (*A. minor*) (Figure 1b), and Northern (*A. denticulatus*) (Figure 1c) are, however, the only fully marine fish species in Atlantic Canada to be listed under SARA. The listing of these wolffish species took place without any input from the industry because wolffish were recommended by COSEWIC in 2000 and 2001 and the three species were grandfathered in when SARA was implemented in 2003.

One objective of Jennifer Dawe's research on the wolffish listing was to document and compare the wolffish local ecological knowledge (LEK) of fish harvesters in the northern Gulf of St. Lawrence with the information available in scientific fisheries data for the region. Although the SARA process incorporates the possibility of using LEK and Aboriginal traditional knowledge (ATK) in listing documents, systematically collected LEK is generally unavailable to scientists and to others engaged in the listing process. A second objective of the thesis was to explore the circumstances surrounding the wolffish listings, post-listing activities, and potential criteria for



Figure 1a. Atlantic wolffish.



Figure 1b. Spotted wolffish.



Figure 1c. Northern wolffish.
All photos taken by Jennifer Dawe.

de-listing to identify possible clues for future listing and de-listings.

Methodology

Two methods were used to collect fish harvesters' LEK about wolffish: semi-structured interviews with 21 fish harvesters and on-board observations during lobster and cod fisheries with 6 harvesters. Both the onboard observations and the harvester interviews took place on the west coast of Newfoundland during the summer of 2009 (Figure 2).

The distribution, biology, and abundance trends gathered from LEK of the three wolffish species were compared to the results of analyses of scientific Research Vessel (RV) data and Sentinel fisheries data. It was hoped that the LEK data could be used to supplement the scientific information to achieve more comprehensive stock assessments. In addition, if fishers know that their firsthand knowledge is being used, it may

increase harvester involvement and support in the SARA listing process.

For the research on the wolffish listings, interviews were conducted with key informants familiar with the listing, and documents and publications related to SARA and the wolffish listing were analysed. This case study of the wolffish listing could, we thought, provide useful insights into key factors that might influence other listings of marine species.

Finally, drawing on data from the LEK interviews and with key informants, fish harvesters' and others opinions concerning the wolffish listing process were compared and suggestions made for future improvements to the listing process for other marine fishes.

Why were wolffish listed?

Although no commercial fishery exists for wolffish in the northern Gulf of St. Lawrence, they are still caught as bycatch in other Atlantic commercial groundfish fisheries. Some of the threats that wolffish in this region experience include:

- Fishing mortality as bycatch
- Habitat destruction from bottom trawling
- Ocean dumping and pollution

These threats, where they exist, are further compounded by the low productivity of wolffish as reflected in their slow growth, late age of maturity, and limited fecundity, making them susceptible to acute exploitation.

LEK and the wolffish listing

One of the concerns about the wolffish listings under SARA relates to the lack of input from industry and stakeholders associated with the listing. Stakeholder knowledge, in the form of ATK and LEK, can contribute to species status reports for a species being considered under COSEWIC. There is also a policy in Canada that requires the inclusion of LEK and ATK in assessments of species under

SARA, but this policy is rarely applied (particularly in the case of LEK) and was not applied for wolffish prior to the listing.

In order to understand how LEK can contribute to this process it is important to understand what LEK is and how it can be used. To start, LEK contains both observational and theoretical aspects. This means that LEK can offer both information as well as guesses based on observations. Because LEK is accumulated over time by different harvesters and oral rather than written, it is dynamic, somewhat fluid, is mediated by the gear used, where they fish and when, and can change in response to technological and socio-economic influences. Of course, scientific data can also be influenced by these wider processes, such as changes in the design of fishing gear used in research vessel surveys and the timing of surveys. LEK from fish harvesters generally encompasses a variety of species as well as information about tides, depth, temperatures, and wind. This information may differ from that obtained from more traditional scientific surveys because harvester observations often differ in terms of the timing, location, and frequency. LEK can, for these reasons, often compliment science and help to produce a more detailed picture of fish distribution and behaviour.

The main obstacle surrounding the inclusion of LEK in stock assessments is that it is often seen as anecdotal and unsubstantiated. Some ways to address these concerns include:

- Understanding the strengths and weaknesses of LEK and, related to this,
- Being more transparent about the methodology used for the collection of LEK.

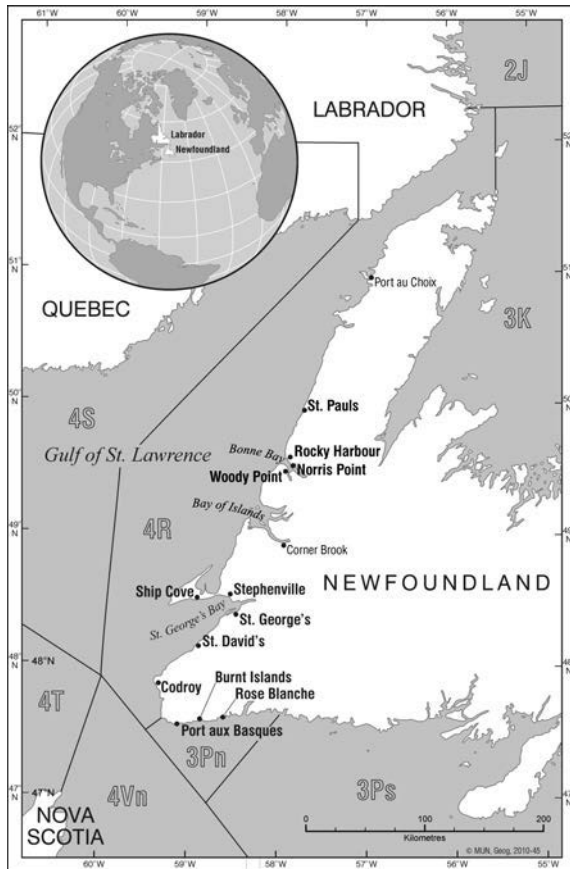


Figure 2. Location of the on-board observations and harvester interviews.

Perhaps if harvesters felt that their knowledge of species was considered in the listing process, SARA and COSEWIC would have greater support from industry participants.

Results

In terms of LEK and wolffish in the northern Gulf of St. Lawrence, a review of information in harvester interview transcripts on wolffish biology and on-board observations in the region showed that these observations are consistent with those contained in several public documents, research vessel survey data, and mobile sentinel data. LEK interviews revealed that harvesters use the same methods to visually identify wolffish as are used in scientific studies. In addition, harvesters reported changes in the seasonal distribution of wolffish and

accounted for the opportunistic feeding nature of wolffish.

Fish harvester LEK generally indicated stable catch rates, which is consistent with the trends in fisheries science data for the Northern Gulf. Locations associated with high wolffish catches reported by harvesters also matched areas documented using fisheries data. Both research vessel survey data and LEK suggest that the distribution of these three wolffish species does not extend further north than Port aux Choix in area 4R. Adult wolffish are caught by harvesters in inshore waters, whereas juveniles dominate offshore research vessel survey catches.

Analysis of transcripts from LEK, key informant interviews, and of documents about the SARA process shows that the wolffish listing process in 2003 was different from what occurs today for marine species-at-risk. A key difference is that no stakeholder or industry input was solicited or acknowledged during the wolffish listing. As well, there are higher demands placed on science for marine fish listings today than there were in the past.

There are differing opinions about the SARA process, even within the fishing industry. In the case of wolffish, there is some evidence that the listing process has increased stewardship of the species and made harvesters more aware of safe release methods for the fish. However, there are many harvesters who question the science used by COSEWIC and feel that the SARA legislation is too strong.

Conversely some key informants interviewed for this research voiced clear frustrations regarding weaknesses in the SARA and COSEWIC processes. Delays in decision-making, in the submission of species assessments, and in the allocation of funds, as well as a lack of LEK in assessments impairs, some feel, the effectiveness of SARA.

Eventual removal of a species from a list, or reducing its risk status through appropriate conservation interventions is the ultimate goal of the listing process. Unfortunately, at present, it appears that little attention is paid to exploring with multi-stakeholder groups how delisting might happen and the steps needed to protect any gains made during the listing process. More work should be undertaken to determine guidelines and timelines for recovery.

The research and results presented in this study could be further extended in the future to help assess wolffish status

and abundance trends. Such research should include:

- More research on wolffish in inshore waters and tracking seasonal migrations as one way to design management measures to potentially reduce future fishing mortality;
- Inshore and offshore sampling to obtain size and length frequencies to help understand size distributions within populations.

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