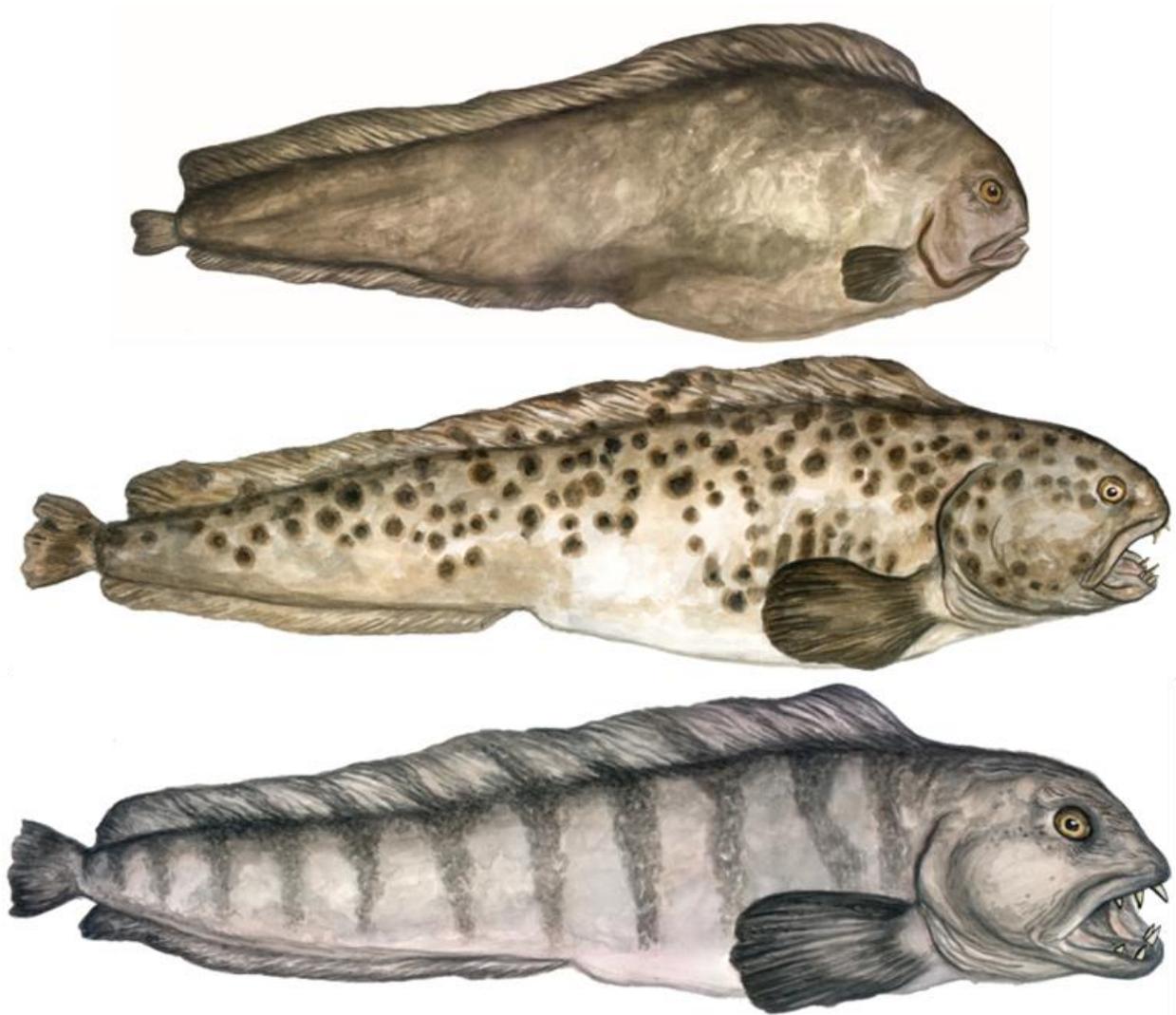


Progress Towards the Implementation of Recovery Documents for:

**Northern Wolffish (*Anarhichas denticulatus*),  
Spotted Wolffish (*Anarhichas minor*), and  
Atlantic Wolffish (*Anarhichas lupus*)**



2025

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For copies of the progress report, or for additional information on species at risk, including Committee on the Status of Endangered Wildlife in Canada (COSEWIC) status reports and other related documents, please visit the [Species at Risk Public Registry](#).

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## Preface

The *Species at Risk Act* (S.C. 2002, c.29) (SARA) requires the competent minister to report on the implementation of the recovery strategy for a species at risk (via a progress report), and the progress towards meeting its objectives within 5 years of the date when the final recovery strategy was placed on the Species at Risk Public Registry and in every subsequent 5 years, until the recovery strategy is no longer required under SARA or the species' recovery is no longer feasible. SARA also requires the competent minister to report on the implementation of the management plan and assess its implementation 5 years after the plan is included in the public registry, and in every subsequent 5 years, until its objectives have been achieved.

The Minister of Fisheries is the competent minister under SARA for the Northern Wolffish, Spotted Wolffish, and Atlantic Wolffish and has prepared this progress report.

Reporting on the progress of recovery strategy or management plan implementation via a progress report requires the collective efforts of the competent minister, provincial and territorial governments, and all other parties involved in conducting activities that contribute to the species' recovery and conservation. Recovery strategies and management plans identify broad strategies and measures that will provide the best chance of recovering and conserving species at risk. Some of the identified strategies are sequential to the progress or completion of others and not all may be undertaken or show significant progress during the timeframe of a report on the progress of recovery strategy or management plan implementation (progress report).

As stated in the preamble to SARA, success in the recovery of species at risk depends on the commitment and cooperation of many different groups that will be involved in implementing the directions set out in the recovery strategy or management plan and will not be achieved by Fisheries and Oceans Canada or any other jurisdiction alone. The cost of conserving species at risk is shared amongst different constituencies. All Canadians are invited to join in supporting and implementing the recovery strategy for the Northern Wolffish and Spotted Wolffish and the management plan for Atlantic Wolffish for the benefit of these species and Canadian society as a whole.

## Acknowledgments

This progress report was prepared by Fisheries and Oceans Canada (DFO). DFO expresses its appreciation to all individuals and organizations who have contributed to the recovery of the Northern, Spotted, and Atlantic Wolffish.

## Executive summary

The Northern Wolffish (*Anarhichas denticulatus*) and Spotted Wolffish (*Anarhichas minor*) were listed as threatened and the Atlantic Wolffish (*Anarhichas lupus*) as special concern under the *Species at Risk Act* (SARA) in 2003. The “Recovery Strategy for Northern Wolffish (*Anarhichas denticulatus*) and Spotted Wolffish (*Anarhichas minor*), and Management Plan for Atlantic Wolffish (*Anarhichas lupus*) in Canada” was finalized and published on the [Species at Risk Public Registry](#) in 2008 ([Kulka et al. 2008](#)), was amended in 2020 ([DFO 2020a](#)) to include critical habitat, and is hereafter referred to as the recovery strategy and management plan.

The goal of the recovery strategy and management plan is to increase the population levels and distributions of Northern, Spotted, and Atlantic Wolffish in eastern Canadian waters such that the long-term viability of these species is achieved.

The main threat to wolffish is bycatch in fisheries targeting other species.

This “Report on the Progress of Recovery Strategy Implementation for the Northern Wolffish (*Anarhichas denticulatus*) and Spotted Wolffish (*Anarhichas minor*) and Management Plan Implementation for Atlantic Wolffish (*Anarhichas lupus*) in Canada for the period 2018 to 2023” (progress report) details the progress made by DFO and its partners towards implementing the recovery strategy and management plan, and achieving its objectives, which include: (1) enhancing the knowledge of the biology and life history of wolffish species; (2) identifying, conserving, and/or protecting wolffish habitat required for viable population sizes and densities; (3) reducing the potential of wolffish population declines by mitigating human impacts; (4) promoting wolffish population growth and recovery; and (5) developing communication and education programs to promote the conservation and recovery of wolffish populations.

During this time period, progress has been made including:

- identification of critical habitat for Northern and Spotted Wolffish in the recovery strategy and management plan and its protection through an order published in the Canada Gazette in 2020
- publication of the “Action Plan for the Northern Wolffish (*Anarhichas denticulatus*) and Spotted Wolffish (*Anarhichas minor*) in Canada” ([DFO 2020b](#)) (action plan) and posting on the Species at Risk Public Registry in 2020
- updates to indices of abundance, biomass, distribution, and habitat preferences of all 3 species, through annual DFO Research Vessel surveys and data collected via at-sea observers and commercial harvester logbooks
- new growth and maturity parameter estimates using models for age/length-at-maturity and growth for all 3 species of wolffish in Newfoundland and Labrador waters
- continued research on influences of hypoxia on hatching success of Spotted Wolffish and survival from larvae through to juveniles which may help refine critical habitat delineation by identifying suboptimal locations for survival
- research using techniques such as environmental DNA and underwater camera stations to identify areas occupied by Atlantic Wolffish

- establishment of the [Banc-des-Américains](#) Marine Protected Area (MPA) and the [Laurentian Channel MPA](#) under the *Oceans Act* in 2019; promotion of wolffish survival and recovery are integral parts of their conservation objectives
- mitigating the impact of human activities on wolffish through:
  - inclusion of fisheries management measures in some Moderate Livelihood understandings that prohibit retention of Northern and Spotted Wolffish with mandatory release, and authorize the release of Atlantic Wolffish
  - setting of bycatch limits for Atlantic Wolffish in some fisheries and authorizing their release
- continuing to raise awareness of wolffish and their SARA status through stewardship and public outreach activities, including the development and distribution of educational materials at numerous outreach events

Progress has been made towards meeting the recovery objectives and there have been some increases in abundance since the 1990s for Northern and Spotted Wolffish in Northwest Atlantic Fishing Organization Division 2H and Divisions 2J3K. However, since the last assessment in 2014 ([DFO 2015](#)), the population status for all 3 wolffish species in Canadian Atlantic waters remains largely unchanged and has shown little recovery, while populations in Canadian Arctic waters currently show no trend. Continued monitoring, further clarification of threats and knowledge gaps, and increased scientific understanding is necessary.

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# 1 Introduction

This “Report on the Progress of Recovery Strategy Implementation for the Northern Wolffish (*Anarhichas denticulatus*) and Spotted Wolffish (*Anarhichas minor*), and Management Plan for Atlantic Wolffish (*Anarhichas lupus*) in Canada for the period 2018 to 2023” outlines the progress made towards meeting the objectives listed in the “Recovery Strategy for Northern Wolffish (*Anarhichas denticulatus*) and Spotted Wolffish (*Anarhichas minor*), and Management Plan for Atlantic Wolffish (*Anarhichas lupus*) in Canada” ([DFO 2020a](#)) during the indicated time period. It is part of a series of documents for these species that are linked and should be taken into consideration together; including the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) status report for Northern Wolffish ([COSEWIC 2001a](#); [COSEWIC 2012a](#)), Spotted Wolffish ([COSEWIC 2001b](#); [COSEWIC 2012b](#)), and Atlantic Wolffish ([COSEWIC 2000](#); [COSEWIC 2012c](#)), the above-mentioned recovery strategy and management plan, the action plan for Northern and Spotted Wolffish ([DFO 2020b](#)), and the 2013 to 2018 progress report on the implementation of the recovery strategy and management plan ([DFO 2024a](#)).

Section 2 of the progress report provides an overview of key information on the threats to the species, recovery and management objectives, recovery strategies and actions to meeting the objectives. For more details, readers should refer to the recovery strategy and management plan. Section 3 reports on the progress of activities identified in the recovery strategy and management plan, to support achieving the recovery and management objectives. Section 4 summarizes the progress toward achieving the recovery and management goals and objectives.

## 2 Background

### 2.1 COSEWIC assessment summary and threats to the species and its critical habitat

The listing of Northern Wolffish, Spotted Wolffish, and Atlantic Wolffish under SARA in 2003 led to the development and publication of the “Recovery Strategy for Northern Wolffish (*Anarhichas denticulatus*) and Spotted Wolffish (*Anarhichas minor*), and Management Plan for Atlantic Wolffish (*Anarhichas lupus*) in Canada in 2008” ([Kulka et al. 2008](#)). The recovery strategy and management plan was amended in 2020 ([DFO 2020a](#)) to include critical habitat for Northern Wolffish and Spotted Wolffish.

In 2012, COSEWIC re-examined and confirmed the status of both Northern Wolffish and Spotted Wolffish as threatened, and Atlantic Wolffish as special concern. The recovery strategy and management plan is consistent with the information provided in the COSEWIC status reports for Northern Wolffish ([COSEWIC 2001a](#); [COSEWIC 2012a](#)), Spotted Wolffish ([COSEWIC 2001b](#); [COSEWIC 2012b](#)), and Atlantic Wolffish ([COSEWIC 2000](#); [COSEWIC 2012c](#)). This information is included in Part A, Section 1.1 of the recovery strategy and management plan.

The recovery strategy and management plan identifies the threats to survival and recovery of the Northern, Spotted, and Atlantic Wolffish, as well as threats to the critical habitat of Northern and Spotted Wolffish.

Part A, section 5 of the recovery strategy and management plan provides information on the threats to survival and recovery of the Northern, Spotted, and Atlantic Wolffish, with the main threat being incidental bycatch in many fisheries.

Critical habitat for the Northern Wolffish and Spotted Wolffish has been identified, to the extent possible, in Part A, section 6 of the recovery strategy and management plan. The recovery strategy and management plan also provides examples of activities that are likely to result in the destruction of critical habitat (that is, threats to critical habitat). The list of activities provided in table 7 of the recovery strategy and management plan is neither exhaustive nor exclusive, and their inclusion has been guided by the relevant threats to habitat described in the recovery strategy. For more details on the activities likely to result in the destruction of critical habitat, consult the recovery strategy and management plan.

## **2.2 Recovery and conservation**

This section summarizes the information found in the recovery strategy and management plan on the recovery and management objectives that are necessary for the recovery and conservation of Northern, Spotted, and Atlantic Wolffish. It also summarizes the recovery strategies and specific actions to meet the recovery and management objectives.

Part B, section 2 of the recovery strategy and management plan describes the overall goal, objectives, and strategies identified as necessary to promote recovery and conservation of these species. The goal of the recovery strategy and management plan is to increase the population levels and distribution of Northern, Spotted, and Atlantic Wolffish in eastern Canadian waters such that the long-term viability of these species is achieved. To achieve this, the recovery strategy and management plan identified 5 recovery and management objectives:

1. enhance knowledge of the biology and life history of wolffish species
2. identify, conserve and/or protect wolffish habitat required for viable population sizes and densities
3. reduce the potential of wolffish population declines by mitigating human impacts
4. promote wolffish population growth and recovery
5. develop communication and education programs to promote the conservation and recovery of wolffish populations

The recovery strategy and management plan does not include performance indicators. Progress towards achieving the recovery and management objectives will be informed by the progress made in (i) the implementation of the measures in the recovery strategy and management plan, and (ii) the studies supporting the identification of critical habitat, described in sections 3.1 and 3.2 below. Part B, section 2.3 of the recovery strategy and management plan describes the 5 strategies that constitute a basis of a framework for recovery. Table 8 of the recovery strategy and management plan (table 1 below) lists the specific actions associated with the 5 strategies that are required to achieve species recovery and conservation, and the anticipated effects of those actions.

**Table 1. Linking recovery objectives to strategies and specific actions required to promote recovery of Northern Wolffish, Spotted Wolffish, and conservation of Atlantic Wolffish, reproduced from the recovery strategy and management plan (DFO 2020a).**

Priority	Recovery objective	Recovery strategy	Recovery actions	Anticipated effect
Necessary, Ongoing	1, 2, 4	A. Research	Conduct directed research on:  1. life history 2. population structure 3. identification of limit reference points 4. ecosystem interactions	Better adaptive management decisions
Necessary, Ongoing	2, 4, 5	B. Habitat conservation and protection	1. identify habitat 2. define measures to conserve and/or protect wolffish habitat	Increase potential of spawning, rearing, feeding, and other life processes
Urgent	3, 4, 5	C. Mitigate human activities	1. identify and mitigate impacts	Direct benefit to species numbers, reducing mortality at all life stages
Necessary, Ongoing	3, 4, 5	D. Promote public knowledge and stakeholder participation in the recovery of wolffish populations and the conservation and protection of their habitat	Through:  1. education 2. stewardship 3. consultation 4. cooperation	Support for management measures and other recovery strategies
Ongoing	3, 4	E. Monitor human activities	1. monitor wolffish spatial and temporal abundance patterns  2. monitor spatial and temporal patterns in natural and human-induced mortality	Better adaptive management decisions

### **3 Progress towards recovery and conservation**

The recovery strategy for the Northern and Spotted Wolffish and management plan for Atlantic Wolffish divides the recovery and management effort into 5 recovery strategies: A) research, B) habitat conservation and protection, C) mitigate human activities, D) promote public knowledge and stakeholder participation in the recovery of wolffish populations and the conservation and protection of their habitat, and E) monitor human activities.

Progress in carrying out these recovery strategies is reported in section 3.1. Section 3.2 reports on the activities identified in the schedule of studies to identify critical habitat.

### 3.1 Activities supporting recovery and conservation

Table 2 provides information on the implementation of activities undertaken to address the recovery and management objectives and recovery strategies identified in the recovery planning table of the recovery strategy and management plan. Note that the activities undertaken may address specific topics on a particular species, population, or location of wolffish, and there may be differences in research priorities and fisheries management measures among the DFO regions involved. Therefore, when reporting on activities completed in support of the recovery strategy and management plan, there may not be information available for each species of wolffish for each activity.

**Table 2. Details of activities supporting the recovery of the Northern Wolffish and Spotted Wolffish and conservation of Atlantic Wolffish from 2018 to 2023.**

Recovery strategies	Recovery action	Descriptions and results	Recovery objectives	Participants <sup>1</sup>
A. Research	Conduct directed research on: <ol style="list-style-type: none"> <li>1. life history</li> <li>2. population structure</li> <li>3. identification of limit reference points</li> <li>4. ecosystem interactions</li> </ol>	<p>Fisheries and Oceans Canada (DFO) conducts annual multispecies Research Vessel (RV) surveys, which constitute the primary source of information regarding the abundance/biomass, population structure, and distribution of all 3 wolffish species where ranges occur. Additional information is obtained from harvester observer programs and licence logbook requirements. The following paragraphs reflect the analysis of available data collected during the period 2018 through 2023.</p> <p>DFO conducted an updated assessment of Northern, Spotted, and Atlantic Wolffish in 2023 and determined that since the last assessment in 2014, the population status for all 3 wolffish species throughout Canadian Atlantic waters remains largely unchanged and has shown little recovery, while populations in Arctic waters currently show no trend. However, increases in abundance have occurred since the late 1990s for Northern and Spotted Wolffish in Northwest Atlantic Fishing Organization Division (Div.) 2H and Div. 2J3K, where the majority of both populations reside (<a href="#">DFO 2024b</a>).</p>	1, 2 and 4	<b>DFO</b> , at-sea observers, fishing industry

<sup>1</sup> Lead participant(s) is/are listed on top and in bold; other participants are listed alphabetically.

Recovery strategies	Recovery action	Descriptions and results	Recovery objectives	Participants <sup>1</sup>
		<p>A 2022 Science Advisory Report detailing recent trends in population abundance, distribution and landings of Atlantic Wolffish on the Scotian Shelf indicated that this population sustained declines in abundance and area occupied in the early 2000s, and that numbers have remained low since (<a href="#">DFO 2022</a>).</p> <p>Depth preferences and thermal habitat of wolffish species across the distribution range were recorded from DFO RV surveys throughout the regions. The majority of Northern Wolffish occur within surveyed depths down to 1,500 m, whereas the majority of Spotted and Atlantic Wolffish are restricted to depths less than 1,000 m, and inhabit nearshore waters seasonally. Thermal ranges vary among geographic regions. Spotted Wolffish have been observed more frequently at higher temperatures than Atlantic and Northern Wolffish where they co-occur (DFO 2024b).</p> <p>Estimates of growth rates and age/length-at-maturity were determined for wolffish in Newfoundland and Labrador waters. Mean length-at-age was not significantly different between male and female wolffish of all 3 species. Observations suggested that Northern Wolffish have a higher growth rate at younger ages when compared to Spotted and Atlantic Wolffish (DFO 2024b).</p> <p>During DFO RV surveys in the southern Gulf of St. Lawrence in 2020 and 2021, stomach contents of incidentally captured dead wolffish were analyzed.</p>		
B. Habitat conservation and protection	<ol style="list-style-type: none"> <li>1. identify habitat</li> <li>2. define measures to conserve and/or protect wolffish habitat</li> </ol>	Critical habitat for Northern and Spotted Wolffish was identified in the amended recovery strategy and management plan published in February, 2020. An order to protect the identified critical habitat was published in Canada Gazette II in August 2020.	2, 4 and 5	<b>DFO, Government of Quebec, fishing industry, Indigenous groups</b>

Recovery strategies	Recovery action	Descriptions and results	Recovery objectives	Participants <sup>1</sup>
		<p>An “Action Plan for the Northern Wolffish (<i>Anarhichas denticulatus</i>) and Spotted Wolffish (<i>Anarhichas minor</i>) in Canada” (<a href="#">DFO 2020b</a>) was posted to the Species at Risk Public Registry in February 2020.</p> <p>The Government of Canada established the <a href="#">Banc-des-Américains Marine Protected Area</a> (MPA) under the <i>Oceans Act</i> in 2019<sup>2</sup>, encompassing a 1,000 km<sup>2</sup> area of the underwater rocky ridge (banc des Américains) and adjacent plains. Among its conservation objectives are to conserve and protect habitat as well as to promote recovery of species at risk, such as wolffish. The area is home to the Atlantic Wolffish, while Northern and Spotted Wolffish have been observed there more rarely. Oil and gas exploration or development is prohibited throughout the MPA. Regulations have established 2 management zones. Zone 1, a more sensitive core protection zone measuring 127 km<sup>2</sup>, is closed to all commercial and recreational fishing. In Zone 2, measuring 893 km<sup>2</sup>, activities that are compatible with conservation objectives are permitted as exceptions to the general prohibitions.</p> <p>An ecological monitoring plan for the Banc-des-Américains MPA was developed and reviewed in 2019. The monitoring plan provides indicators for monitoring Atlantic Wolffish through commercial harvest bycatch data (Zone 2) and new scientific surveys that need to be tested and implemented. Scuba surveys were carried out in 2015 and 2021 to develop a sampling protocol. The next survey is scheduled for 2024. Experimentation with tools such as environmental DNA (eDNA) signatures and underwater camera surveillance are ongoing (<a href="#">DFO 2019</a>). The monitoring indicators were last reviewed in 2021 (<a href="#">DFO 2023</a>).</p> <p>The <a href="#">Laurentian Channel MPA</a> was established in 2019 and covers approximately 11,580 km<sup>2</sup>. One of its objectives is to promote the survival</p>		

<sup>2</sup> The Banc-des-Américains is the first joint project under the [Canada-Quebec Collaborative Agreement for the Establishment of a Network of Marine Protected Areas in Quebec](#) (available in French). Thus, this marine protected area benefits from a double status of protection, as a marine protected area under the *Oceans Act* and as a [proposed aquatic reserve](#) under the *Natural Heritage Conservation Act*.

Recovery strategies	Recovery action	Descriptions and results	Recovery objectives	Participants <sup>1</sup>
		<p>and recovery of Northern Wolffish by minimizing risk of harm from human activity. Commercial and recreational fishing activities are prohibited within the MPA, as well as oil and gas exploration and exploitation. A core protection zone provides additional protection by prohibiting anchoring and laying of submarine cables.</p> <p>Monitoring efforts in the <a href="#">St. Anns Bank MPA</a> (established in 2017) continued during the current reporting period, including: the tagging of Atlantic Wolffish that provided information on residency and movement within and through the MPA; and monitoring of Atlantic Wolffish size and abundance (<a href="#">DFO 2024c</a>).</p> <p>A number of <a href="#">marine refuges</a> established in eastern Arctic and Atlantic Canadian waters have varying closures to human activities to protect sensitive benthic areas within their boundaries, including corals and sponges. To ensure their protection, the use of fishing gear coming into contact with the bottom is prohibited in these areas under the <i>Fisheries Act</i>. Protecting the sensitive habitat of corals and sponges can provide a structural habitat for various stages of the lifecycle of certain fish species, including wolffish (<a href="#">Benoît et al. 2020</a>).</p>		
C. Mitigate human activities	1. identify and mitigate impacts	<p>During the regulatory review of marine activities and projects by DFO, wolffish are considered in the analysis of potential interactions and effects. Mitigation measures may be recommended to avoid or reduce adverse interactions.</p> <p>Fishery officers conduct inspections on wharves, fishing vessels and patrols at-sea (lobster, crab, herring, shrimp, and halibut fisheries) to check for bycatch retention of wolffish and other SARA-listed species. They promote the importance of properly reporting wolffish in logbooks and provide best handling practices for the release of wolffish bycatch to fish harvesters. Aerial surveillance and real-time monitoring through the</p>	3, 4 and 5	<b>DFO, Government of Quebec</b> , at-sea observers, fishing industry, Indigenous organizations, NGOs

Recovery strategies	Recovery action	Descriptions and results	Recovery objectives	Participants <sup>1</sup>
		<p>vessel monitoring system are other means of ensuring regulatory compliance.</p> <p>At-sea observer training programs provide observers with knowledge and tools for fisheries monitoring including, identification, on-board protocol, and record management for many fish species, including wolffish. Northern and Spotted Wolffish catches are recorded in observer logbooks as a capture that is discarded.</p> <p>In accordance with subsection 83(4) of SARA, the recovery strategy for the Northern Wolffish and Spotted Wolffish permits those authorized under the <i>Fisheries Act</i> to conduct commercial, recreational, or Indigenous Food, Social and Ceremonial (FSC) fishing activities for groundfish, shellfish and pelagic species (including emerging fisheries) that may incidentally kill, harm, harass, capture, or take the Northern Wolffish and/or Spotted Wolffish, with the following conditions: incidentally captured Northern Wolffish and Spotted Wolffish must be returned to the place from where they were taken, and where alive, in a manner that causes the least harm; commercial harvesters are required to report any interactions with Northern Wolffish and Spotted Wolffish in their logbook. Logbook data (which may include the number of specimens, the weight, date, and the gear's position at the time) helps to determine the impact of commercial fisheries on wolffish recovery and conservation. The recovery strategy also permits scientific research activities that are authorized under the <i>Fishery (General) Regulations</i> (section 52 licences) for the purpose of monitoring and sampling various aquatic species, including wolffish.</p> <p>For Atlantic Wolffish, incidental bycatch limits/caps are set in commercial Groundfish General Licence Conditions. In Div. 4VWX5, a limit of 10% round weight for all fleets is implemented, with Div. 4VW or Div. 4X5 landings not exceeding 10 t for the &lt;65' mobile gear and &lt;45' fixed gear fisheries in Div. 4VW or Div. 4X5. A limit of 10% round weight per trip is</p>		

Recovery strategies	Recovery action	Descriptions and results	Recovery objectives	Participants <sup>1</sup>
		<p>implemented for Div. 4RST Atlantic Halibut and Greenland Halibut and a 5% round weight is implemented per trip for Div. 4S lumpfish. For Div. 2GHJ, Div. 3KLNOP and Div. 4R, bycatch of Atlantic Wolffish must not exceed 10% round weight or 90 kg (200 lbs) round weight, whichever is greater.</p> <p>The option to release Atlantic Wolffish under subsection 93.3(2) of the <i>Atlantic Fishery Regulations, 1985</i> was extended to some fisheries. The decision was based on reports of high post-release survivability for this species. Release of Atlantic Wolffish bycatch is encouraged in certain fisheries. Bycatch of Atlantic Wolffish is recorded in harvester logbooks.</p> <p>For recreational groundfish fisheries, no wolffish species are permitted to be retained, as per variation orders under the <i>Fishery General Regulations</i> (for example, Quebec Region 2023-Q-030, Gulf Region 2023-043, and Newfoundland and Labrador Region 2023-106).</p> <p>Since 2021, conditions have been included in appropriate authorizations supporting Moderate Livelihood understandings in the Maritimes Region that prohibit the retention of incidentally caught Northern Wolffish and Spotted Wolffish and indicate that release should be in the place where they were taken, and where they are alive, in a manner that causes them the least harm. Interactions with Northern Wolffish and Spotted Wolffish are required to be reported, including the date, position, number of individuals caught, and estimated total live weight.</p> <p>DFO manages the Habitat Stewardship Program (HSP) for aquatic species at risk and the Canada Nature Fund for Aquatic Species at Risk (CNFASAR) which provide funding to non-governmental organizations (NGOs), Indigenous organizations, and others to implement species at risk recovery measures.</p>		

Recovery strategies	Recovery action	Descriptions and results	Recovery objectives	Participants <sup>1</sup>
		<p>Through the HSP, the Canadian Parks and Wilderness Society (CPAWS) received funding in 2018 for a project to obtain baseline data of local knowledge, increase education and knowledge on marine debris and wolffish bycatch, and to reduce underwater marine debris through underwater cleanups.</p> <p>The Quebec-Labrador Foundation (QLF) has received funding since 2018 through HSP and the CNFASAR for several projects to address the threat of fishing interactions on marine species at risk. A component of these projects has been to contribute to recovery of Northern Wolffish and Spotted Wolffish through dockside dialogues with fish harvesters that encourage live release and logbook recording of interactions with wolffish.</p> <p>The Quebec Fisheries Fund supported 2 projects aimed at reducing bycatch through modification of fishing gear: 1) gillnet for the Greenland Halibut fishery and 2) testing of a new model of semi-pelagic trawl using a new type of net and selectivity grid. Reducing bycatch that includes wolffish will help mitigate human impact on the species.</p> <p>DFO's Ghost Gear Program was created in 2019 to address abandoned, lost or otherwise discarded fishing gear (ALDFG, or 'ghost gear'). From 2020-2025, the program supported 144 projects by NGOs, Indigenous organizations, academic institutions, and members of the fishing industry, providing over 58M in funding. These projects retrieved over 41,000 units of gear (or over 2,400 tonnes) and more than 940 km of rope and supported responsible disposal and innovative gear technologies.</p>		
D. Promote public knowledge and stakeholder participation	Through: 1. education 2. stewardship 3. consultation 4. cooperation	DFO promotes awareness of wolffish to the general public and fishing industry through a variety of educational and community outreach activities. Examples include visits to schools and communities, participating in events such as career fairs, Girl Guides of Canada	3, 4 and 5	<b>DFO</b> , external experts, fisheries associations, fishing industry,

Recovery strategies	Recovery action	Descriptions and results	Recovery objectives	Participants <sup>1</sup>
<p>in the recovery of wolffish populations and the conservation and protection of their habitat</p>		<p>meetings, local beach cleanups, Oceans Day, and direct engagement with harvesters.</p> <p>From 2018 to 2023, DFO continued to develop and update outreach and educational material on species at risk, including wolffish. Products developed include wolffish factsheets and identification cards, life-sized textile replicas of the 3 wolffish species, and children’s booklets that provide facts about wolffish and how people can help protect them. An activity book containing facts about species at risk, including wolffish, has been translated into 3 Indigenous languages to be shared in educational outreach to Indigenous communities. Other materials developed include an educational video about wolffish, playing cards that promote the return of species at risk logbooks, and educational posters.</p> <p>DFO provided species at risk related books in mobile bookcases with signage to say, “Knowledge Helps Species at Risk” to primary and elementary schools in Newfoundland and Labrador. Fishery officers use the books during school visits to educate students on the importance of SARA-listed species, including wolffish, and how they can help educate others about protecting these species.</p> <p>DFO provides training on the SARA module to fishery officer cadets as part of the Fishery Officer Career Progression Program at the Atlantic Police Academy in Prince Edward Island. This module contains information about species at risk, including wolffish, and measures in place to protect them and aid in their recovery.</p> <p>DFO directly engages the fishing industry to bring awareness about wolffish and participation in recovery. Fishery officers monitor fishing and industry activities during dockside and at-sea inspections and patrols. They check that the species at risk section of the logbook is complete, educate harvesters on the importance of properly reporting wolffish in logbooks, and promote best practices for release of wolffish. In Quebec, DFO conducted targeted outreach activities with harvesters in 2022 to</p>		<p>Indigenous organizations, NGOs</p>

Recovery strategies	Recovery action	Descriptions and results	Recovery objectives	Participants <sup>1</sup>
		<p>2023 to encourage reporting of interactions with wolffish and to fill out logbooks.</p> <p>DFO hosted 4 workshops in Prince Edward Island and New Brunswick with fishing associations and external experts in 2022 to provide a SARA overview that explained the purpose of the Act, its processes, importance of returning logbooks, and outreach materials available. Harvesters were given the opportunity to provide feedback and recommendations to improve logbook return rates and the development of outreach materials. Activities to promote the return of species at risk logbooks include notice to harvesters posts, social media posts, signs on wharves, and outreach materials.</p> <p>DFO manages several funding programs that support education and outreach activities for species at risk. The HSP, Indigenous Partnerships for Species at Risk (formerly Aboriginal Fund for Species at Risk), and CNFASAR provide funding to NGOs, Indigenous organizations and others to implement species at risk recovery measures. These projects often include education and outreach activities. For example, in 2019, Intervale Associates Inc., received HSP funding for a project that aimed to address threats and reduce bycatch mortality of wolffish. Components of the project included outreach activities such as beach cleanups, video clips, and school presentations to encourage positive stewardship behaviour. In 2021, CPAWS was awarded HSP funding for a project to fill in knowledge gaps regarding wolffish distribution, habitats, behaviour, and species associations while promoting public knowledge and stakeholder participation in wolffish recovery of the Northern, Spotted, and Atlantic Wolffish. In 2019, The Quebec-Labrador Foundation received CNFASAR funding to develop informational placemats on the 3 species of wolffish for public distribution.</p> <p>The Prince Edward Island Fisherman's Association has started development of a SAR logbook factsheet.</p>		

Recovery strategies	Recovery action	Descriptions and results	Recovery objectives	Participants <sup>1</sup>
E. Monitor human activities	<ol style="list-style-type: none"> <li>1. monitor wolffish spatial and temporal abundance patterns</li> <li>2. monitor spatial and temporal patterns in natural and human-induced mortality</li> </ol>	<p>DFO conducts multispecies RV surveys, which constitute the primary source of information regarding the distribution and biomass/abundance of the 3 wolffish species. An updated assessment of Northern, Spotted, and Atlantic Wolffish was conducted in 2023 and indicated that since the last assessment in 2014, the population status for all 3 wolffish species throughout Canadian Atlantic waters remains largely unchanged and has shown little recovery, while populations in Canadian Arctic waters currently show no trend (DFO 2024b). However, the assessment also indicated that the data used to assess changes in population status come from numerous research RV surveys with their own spatial and temporal coverage and constraints. Also, there is currently no stock assessment available due to the lack of relevant information/data on wolffish in Canadian Atlantic and Arctic waters.</p> <p>In general, the 3 wolffish species have continued to occupy the same areas of the Continental Shelf, despite some inter-annual variability in indices of stock size during the last decade. However, in the case of Atlantic Wolffish, an expansion in distribution was detected over the shelf in Div. 2J3K since 2013 (Mello 2025).</p> <p>Analysis of the RV survey catch data indicates that the majority of the Northern Wolffish and Spotted Wolffish populations are centered in Div. 2J3K, with Atlantic Wolffish centered in Div. 2J3K and Div. 3LNO. There were noticeable increases in stock size (all species) since the mid-2000s when compared to the 1990s in these areas which suggests that they contain optimal habitat for wolffish populations (DFO 2024b).</p> <p>Trends in abundance indices show that only Spotted Wolffish in Div. 2J3K continued to sustain some level of recovery in most recent years, whereas for Northern and Atlantic Wolffish stock size tended to stabilize over time after an initial increase (Div. 2H, 2J3K, Div. 3LNO, Div. 3Ps, Div. 4RS), or decline (Div. 4T, Div. 4VWX) (Mello 2025). Catch</p>	3, 4 and 5	<b>DFO</b> , at-sea observers, fishing industry

Recovery strategies	Recovery action	Descriptions and results	Recovery objectives	Participants <sup>1</sup>
		<p>rates for all 3 species in Arctic waters varied without trend over the time series (DFO 2024b).</p> <p>An assessment of Atlantic Wolffish in NAFO Div. 4VWX was conducted in 2022 and indicated that the abundance and area occupied by Atlantic Wolffish have shown declines from the early 2000s and numbers have remained low since (DFO 2022).</p> <p>Monitoring of Atlantic Wolffish has been conducted in the Banc-des-Américains MPA from 2019 through 2021 via science surveys and bycatch data from commercial fisheries.. Science missions from 2019 through 2021 collected water samples for eDNA analysis to detect the presence of Atlantic Wolffish. A specific scuba survey on the top of the bank was done in 2021 to identify wolffish and their potential habitat. A baited camera system was also used in 2020 and 2021 as a complementary tool to monitor wolffish.</p> <p>Licence conditions issued to commercial harvesters through the National Online Licensing System include conditions on how species at risk, including wolffish, must be treated and how to report incidental bycatch. DFO collects data from commercial harvesters using logbooks, as per conditions of licence, which provide information about wolffish bycatch during fishing operations.</p> <p>Information on wolffish bycatch is also reported by at-sea observers and recorded in the Canadian At-Sea Fisheries Observers Program database. Additional monitoring of incidental bycatch of wolffish comes from dockside monitoring of commercial landings. DFO uses the information collected through these means to monitor fishing interactions with wolffish species.</p> <p>The updated DFO assessment of Northern Wolffish, Spotted Wolffish and Atlantic Wolffish (DFO 2024b) indicated that most reported wolffish interactions with commercial fisheries occurred in the bioregions where</p>		

Recovery strategies	Recovery action	Descriptions and results	Recovery objectives	Participants <sup>1</sup>
		the stocks are centered, primarily along the slopes of the continental shelf and deep channels, and to a lesser extent over the southern Grand Banks and the remaining portions of the study areas. The majority of wolffish (all species) captured by mobile gears in Newfoundland and Labrador waters were recorded as dead upon release in the commercial logbooks (2008 to 2019), whereas for fixed gears the majority were recorded as released alive.		

### 3.2 Activities supporting the identification of critical habitat

Table 3 provides information on the implementation of the studies outlined in the schedule of studies to identify critical habitat found in the recovery strategy. Each study has been assigned 1 of 4 statuses:

- 1) completed: the study has been carried out and is concluded
- 2) in progress: the planned study is underway and has not concluded
- 3) not started: the study has been planned but has yet to start
- 4) cancelled: the planned study will not be started or completed

**Table 3. Status and details of the implementation of the schedule of studies outlined in the amended recovery strategy for Northern Wolffish and Spotted Wolffish (DFO 2020a).**

Study	Timeline	Status	Descriptions and results	Participants
Research aspects of Spotted Wolffish life history as revealed by rearing and farming observations.	2025	not started	n/a	n/a

Study	Timeline	Status	Descriptions and results	Participants
Carry out new field studies to study seasonal movements and habitat associations using new technologies (data storage tags, popup tags, etc.).	<b>2021</b>	in progress	Studies have been conducted by DFO on the habitat use and movement patterns of wolffish prior to the current reporting period ( <a href="#">Simpson et al. 2015</a> ). From 2019 to 2021, DFO used environmental DNA techniques to help identify Atlantic Wolffish habitat in the Banc-des-Américains Marine Protected Area and elsewhere in the Gulf of St. Lawrence.	<b>DFO</b>
Use laboratory studies to improve knowledge of wolffish physiology.	<b>2025</b>	in progress	<p>DFO continued research on the impact of hypoxia on the hatching success of Spotted Wolffish eggs until 2020. Preliminary results indicate a sharp decline in the survival rate of eggs in hypoxic conditions. Under hypoxic conditions, survival decreased, embryonic development slowed, and the percentage malformations increased proportionally to the severity of hypoxia (Chabot pers. comm. 2023).</p> <p>A study was conducted from 2018 to 2019 to determine the impact of hypoxia on the survival and development of Spotted Wolffish larvae and young juveniles. Spotted Wolffish grew significantly more slowly with lower oxygen saturation (Chabot pers. comm. 2023).</p>	<b>DFO</b>

Study	Timeline	Status	Descriptions and results	Participants
<p>A comparison of Spotted Wolffish growth rate in the northern Gulf of St. Lawrence with the Labrador Shelf and Grand Banks (through the comparison of growth rate at age using otoliths).</p>	<p><b>2025</b></p>	<p>in progress</p>	<p>Growth rate-at-age was estimated for Spotted, Northern, and Atlantic Wolffish in Newfoundland and Labrador waters. Growth rate modelling indicated that the growth rate of age 9 wolffish (all species) was 5 cm per year and decreased gradually to 3 cm per year for Northern Wolffish and Atlantic Wolffish and 4 cm per year for Spotted Wolffish by age 18 (DFO 2024b).</p> <p>Mean length-at-age was not significantly different between male and female wolffish regardless of species. The total length of age 8 Northern Wolffish was on average 63 cm, but only 41 cm for both Atlantic Wolffish and Spotted Wolffish, whereas age 16 wolffish of all species had a mean length around 80 cm, suggesting that Northern Wolffish have a higher growth rate at younger ages when compared to the other 2 species (DFO 2024b).</p>	<p><b>DFO</b></p>

### **3.3 Summary of progress towards recovery and conservation**

#### **3.3.1 Status of performance indicators**

Performance indicators were not identified in the original recovery strategy. Progress towards achieving the recovery and management objectives are provided through descriptions of activities carried out under the recovery strategies and studies in section 3.1 and 3.2.

#### **3.3.2 Completion of action plan**

The action plan for Northern and Spotted Wolffish was published in 2020 ([DFO 2020b](#)). It is a comprehensive, threat-based plan with actions to support the recovery objectives from the recovery strategy and management plan.

#### **3.3.3 Critical habitat identification and protection**

Critical habitat was identified for Northern and Spotted Wolffish, in the amended recovery strategy and management plan published in 2020. The Critical Habitat Order was also published in 2020, in the *Canada Gazette II*.

#### **3.3.4 Recovery feasibility**

Recovery of Northern and Spotted Wolffish was considered feasible in the recovery strategy and management plan. The biological and technical feasibility of Northern and Spotted Wolffish recovery was not reassessed during this reporting period.

## **4 Concluding statement**

From 2018 to 2023, progress was made toward implementing the recovery and management actions identified in the recovery strategy and management plan.

An action plan highlighting measures to address threats to Northern and Spotted Wolffish populations, habitat and their recovery was published in 2020. The action plan outlines recovery measures to be taken by DFO and other jurisdictions and/or organizations to help achieve the objectives identified in the recovery strategy.

The Government of Canada established the [Banc-des-Américains MPA](#) and the [Laurentian Channel MPA](#) under the *Oceans Act* in 2019. Promotion of wolffish survival and recovery are an integral part of their conservation and management objectives. The MPAs prohibit any activity that disturbs, damages, destroys, or removes any living marine organisms or any part of its habitat. Commercial and recreational fishing activities are either prohibited, or only allowed under strict conditions.

Research continues on influences of hypoxia on the hatching success of Spotted Wolffish and survival from larvae through to juveniles. This research will help to identify suboptimal areas and may help to refine locations of critical habitat.

Techniques such as eDNA and underwater camera stations helped identify potential Atlantic Wolffish habitat along the ridges of the Banc-des-Américains MPA.

DFO conducts annual multispecies RV surveys, which constitute the primary source of information regarding the abundance/biomass, population structure, and distribution of all

3 wolffish species. Increases in abundance have occurred since the late 1990s for Northern and Spotted Wolffish in Div. 2H and Div. 2J3K. However, since the last DFO assessment in 2014, the population status for all 3 wolffish species in Canadian Atlantic waters remain largely unchanged and has shown little recovery, while populations in Canadian Arctic waters currently show no trend.

New growth and maturity parameters have been estimated using models for age/length-at-maturity and growth for all 3 wolffish species in Newfoundland and Labrador waters.

Bycatch is identified as an important cause of human induced mortality of wolffish. Fisheries management measures are in place in a number of fisheries such as mandatory release of Northern and Spotted Wolffish, and mandatory reporting of interactions in logbooks. Bycatch limits for Atlantic Wolffish are in place in certain fisheries, along with authorized and/or encouraged release of Atlantic Wolffish.

Stewardship and outreach projects funded through programs such as the HSP and CNFASAR have been conducted by non-governmental organizations with a focus on implementing activities described in the recovery strategy and management plan. A variety of educational materials have been developed and distributed by DFO through numerous outreach events targeting students, the fishing industry, and the general public.

While progress has been made in the implementation of recovery and conservation actions, gaps remain in the information available on wolffish life history and the effects of threats. There is currently no stock assessment model available due to the lack of relevant information and data about wolffish in Canadian and Arctic waters such as stock structure, size and age composition of population, age-at-maturity, recruitment, and natural and fishing mortality. There is also limited knowledge about breeding and nursery habitat associations (DFO 2024b). The ability to evaluate fishing mortality is limited as wolffish are rarely identified to the species level in commercial landings data, there are variations in at-sea observer coverage, and levels of post-release mortality are unknown in different fisheries (DFO 2024b). Furthermore, the effects of other potential threats identified in the recovery strategy and management plan have not been quantified. Continued research, monitoring, and further clarification of threats and knowledge gaps is needed.

DFO remains committed to continuing the effort to recover the Northern Wolffish and Spotted Wolffish, and conserve the Atlantic Wolffish. The progress made thus far has been achieved in part by the contribution from our partners. DFO is looking forward to building upon the successful collaborations with our partners and welcomes the participation of additional partners in recovery and management efforts.

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