

The Quality of Recent Rebuilding Plans in Canada

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Introduction

As part of its initial policy under the Sustainable Fisheries Framework, the Department of Fisheries and Oceans (DFO) committed to implementing rebuilding plans for critically depleted stocks starting in 2009 (DFO, 2009). Given that only 30.4% of Canada's fisheries are in a healthy state, with little improvement over six years of Oceana Canada's Fishery Audit, the rebuilding process is taking a long time. Over the past 13 years, only 13 rebuilding plans have been published (Oceana Canada, 2022) and, unfortunately, many existing plans fall short of meeting national and international standards (Archibald et al., 2017; Archibald and Rangeley, 2018, 2019; Levesque et al., 2021). In 2017, DFO committed to implementing 19 rebuilding plans by March 2021 and to keep on track by publishing annual workplans (CESD, 2016; DFO, 2017). Each year, rebuilding plans are delayed, and with only one new rebuilding plan released this year, the trend continues. Canada would have double the rebuilding plans it currently does if the publication of workplans proceeded according to DFO's commitments.

New revisions to the *Fisheries Act* were finalized in 2019 (Legislative Services Branch, 2019), and the associated rebuilding regulations were published in April of this year (Public Works and Government Services Canada, 2022). The development of rebuilding plans is expected to accelerate now, because all critical stocks listed in the regulations require a plan that meets legally defined criteria and is developed within 24 months (DFO, 2022a). As a result, at least eight new rebuilding plans are expected to be published between 2022 and 2023 (DFO, 2022b). The 24-month timeline ends April 3, 2024 and that under the rebuilding regulations there is a possibility of extension up to 12 months (April 3, 2025).

Witch Flounder in 2J3KL Rebuilding Plan Review

Witch flounder, *Glyptocephalus cynoglossus*, in NAFO area 2J3KL is amongst the many Atlantic groundfish species that were overexploited by expanding industrial trawl fisheries equipped with post-war technology, peaking in mid-1960s and early 1970s, and collapsing in the 1990s. The population biomass has been consistently below the Limit Reference Point (LRP) for three decades (Wheeland et al., 2019), and a moratorium has remained in place since 1995. Witch flounder are still caught as bycatch, primarily from the Greenland halibut fishery, with around 141 tonnes landed in recent years. The rebuilding plan for witch flounder in NAFO area 2J3KL was initially included in a previous year's fiscal year workplan for rebuilding plan development with a deadline for completion by end of 2020/2021 (DFO, 2021c). One year after the expected deadline, the plan was completed in July 2022 (DFO, 2022c).

Oceana Canada developed a set of minimum and additional criteria and content for rebuilding plans based on DFO's policy guidelines for rebuilding plans (DFO 2022a) and international best practices (Garcia et al., 2018; OECD, 2012). As well, plans for prescribed stocks must now meet the full legal requirements and intent of the *Fisheries Act* rebuilding regulations (Public Works and Government Services Canada, 2022). Witch flounder in 2J3KL is not currently prescribed to the Fish Stock provisions, so the plan is not bound by the legal obligations of the provisions. Compared to other stocks with rebuilding plans (Archibald and Rangeley, 2019), the witch flounder plan meets more of Oceana

Canada's minimum and additional criteria (Tables 1 and 2). For example, Northern cod and Atlantic mackerel plans (DFO, 2021a, 2021b) met less than half of the minimum criteria and 2/6 of the additional criteria (Levesque et al., 2021). However, the witch flounder plan as it stands still lacks key components, including those in DFO's policy guidelines for rebuilding plans (DFO 2022a), and fails to meet the full legal requirements and intent of the *Fisheries Act* rebuilding regulations (Public Works and Government Services Canada, 2022).

Importantly, the plan describes stock status and trends, probable cause for the stock's decline, and measurable objectives, including abundance targets in the healthy zone (Tables 1–3). In line with the *Fisheries Act*, the harvest strategies and decision rules do not permit fishing while the stock is below the LRP. There are management measures and methods to track progress until the stock reaches the interim milestones associated with growth to the mid-cautious zone. Furthermore, there is a schedule for periodic review of the plan every five years in consultation with rightsholders and stakeholders.

However, the plan lacks an analytical population assessment model and biomass projections needed to determine timeframes to achieve short- and long-term objectives. While the Fish Stock provisions and regulations do not require use of projections or an analytical model, without projections, managers have little information available to inform realistic expectations (Shelton et al., 2007). This missing analysis also precludes the ability to estimate with a probability of at least 75 per cent that the target abundance will be met within the timeframe. In addition, there are no simulations of catch scenarios by DFO Science with independent peer review to ensure that it has an acceptable robustness to uncertainty, meets performance expectations, has a high probability of achieving management objectives, and conforms to DFO policy.

Since this stock is not yet prescribed under the Fish Stock provisions, it is not legally required to contain all components of the rebuilding regulations. However, it is expected that all critically depleted stocks will be prescribed in future batches. When this occurs, the missing requirements will need to be addressed and the plan will need to be revised within 24 months of the listing of witch flounder. Therefore, it is more effective to create rebuilding plans that are compliant with the regulations to avoid prolonged and repetitive rebuilding planning processes and instead implement robust and legally compliant plans.

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Tables

Table 1. A

comparison of Oceana Canada’s minimum requirements for rebuilding plans to DFO’s witch flounder (2J3KL) rebuilding plan.

To rebuild, the plan <i>must at a minimum</i> :		Does the 2J3KL witch flounder rebuilding plan meet Oceana Canada’s minimum requirements?	Score
Be compliant with the rebuilding regulations: All fisheries interacting with the target stock must comply with the rules in place to rebuild the stock.		No – This stock is not currently prescribed in the Fishery (General) Regulations and therefore not bound by the legal obligations of the new provisions of the <i>Fisheries Act</i> . The rebuilding plan is missing content required by the regulations and should the stock be prescribed; the plan would require revisions.	0/1
Be developed and implemented in consultation with rights-holders and stakeholders: All parties directly affected by the rebuilding plan should be consulted.		Yes – The plan specifies that the 2+3KLMNO Groundfish Advisory Committee, established in 2019, exists as an opportunity for stakeholders and Indigenous groups involved in 2J3KL witch flounder management to discuss issues. The Committee meets annually in the fall and consists of academics, government, Indigenous groups, industry, and ENGOs.	1/1
Set objectives that include:	Target abundance that is in the healthy zone – i.e., at or near the biomass that supports maximum sustainable yield (B_{MSY}) – and allows the stock to support a high-yield, sustainable fishery.	Yes – The long-term objective is to grow the stock to the healthy zone and maintain biomass at or near B_{MSY} .	1/1
	Timeframe based on a scientific estimate of how long rebuilding will take.	No – A lack of an analytical population assessment model and biomass projections precludes the ability to determine timeframes to achieve objectives.	0/1
	Probability estimate of at least 75 per cent that the target abundance will be met within the timeframe.	No – As above, the lack of an analytical model does not allow for probability comparison.	0/1
	Associated milestones – specific and measurable interim targets that represent the steps towards rebuilding.	Yes – An interim milestone is stated as the stock growing to the midpoint of the cautious zone.	1/1

<p>Set management measures that will have a high probability of successfully achieving the objectives. Management measures will require, at a minimum, harvest decision or control rules and will often also require immediate and substantial reductions in fishing mortality.</p>	<p>Partially – The plan contains a section dedicated to management measures and states the harvest strategy and decision rules for the stock. The strategy uses historical average harvest rates as a proxy for fishing mortality from periods of stock growth and decline. Harvest rates from a period of stock growth are set as permitted harvest rates once the stock is out of the critical zone. No fishing is to occur while the stock is below the LRP. A lack of an analytical model precludes simulations of catch scenarios and associated probabilities of meeting objectives.</p>	<p>0.5/1</p>
<p>Establish a plan for monitoring, review, evaluation, and revision to track progress towards rebuilding objectives and make changes as needed.</p>	<p>Yes – There is a dedicated section for evaluation and performance review stating that the rebuilding plan will undergo a comprehensive review every 5 years unless an exceptional circumstance occurs. The outcomes from applying the plan will be monitored periodically.</p>	<p>1/1</p>
<p>Be publicly available to increase transparency of decision-making and ensure everyone has access to the information required to evaluate the plan.</p>	<p>Yes – The rebuilding plan is available when searched through the Integrated Fisheries Management Plan page.</p>	<p>1/1</p>
TOTAL		<p>5.5/9</p>

Table 2. A comparison of Oceana Canada’s further comprehensive requirements for rebuilding plans to DFO’s witch flounder (2J3KL) rebuilding plan.

<p>A comprehensive rebuilding plan should also contain:</p>	<p>Does the 2J3KL witch flounder rebuilding plan meet Oceana Canada’s additional criteria?</p>	<p>Score</p>
<p>Other stock-specific objectives, such as achieving a target size or age structure, restoring historical distribution,</p>	<p>No – Objectives related to this rebuilding plan all focus on stock biomass, trajectory, and prevention of small-fish catch.</p>	<p>0/1</p>

<p>maintaining social or cultural value, or restoring economic benefits.</p>	<p>It is noted that rebuilding will have significant commercial value around \$5 million.</p> <p>The small-fish protocol could be seen as an objective to maintain size and age-structure. However, there is no baseline data for age structure after 1993 for witch flounder in Newfoundland and Labrador.</p>	
<p>An overview of all fisheries interacting with the stock, including all directed commercial fisheries and all other fisheries (including bycatch, recreational, bait, and food, social, ceremonial), with a summary of socioeconomic and cultural importance; history of management and assessment; and an overview of all contributions to fishing mortality.</p>	<p>Yes – The rebuilding plan gives an overview of the history of the fishery prior to the moratorium. The plan also describes the estimated bycatch rates and landings for witch flounder within the groundfish fishery. The stock's economic importance was mentioned as being a relatively small contribution to overall groundfish value. All sources of fishing mortality are not fully quantified but estimated to be low. Social and cultural values are unknown.</p>	<p>1/1</p>
<p>A review of impediments to successfully rebuilding the stock, including considerations of the biology of the species, any recent evolutionary changes, impacts of environmental conditions, multispecies interactions, other fisheries impacts, and the levels of uncertainty and risk.</p>	<p>Partially – The rebuilding plan reviews management issues for the stock, including bycatch in other fisheries. However, without a population model, the impacts of this can't be fully understood. Further, there is no information on the rates of natural mortality for this stock. No specific threats to witch flounder themselves were identified, save for general ecosystem conditions that are indicative of low productivity.</p>	<p>0.5/1</p>
<p>An evaluation or consideration of alternative management measures to increase transparency of decision-making.</p>	<p>No – The plan only details the management measures that will be implemented and does not discuss alternatives that may have been considered.</p>	<p>0/1</p>
<p>An overview of economic, social, and ecological impacts of the rebuilding plan to reduce surprises and allow for mitigation planning.</p>	<p>Partially – The rebuilding plan states that rebuilding witch flounder would have an ecological benefit. However, the value of this benefit is unknown. The rebuilding plan also</p>	<p>0.5/1</p>

	states that a rebuilt fishery could represent significant commercial value for the region.	
An outline of the steps to follow when objectives are met to prepare for changes to management once the stock is rebuilt and fishing efforts may be increased.	Yes – The plan states that once the short-term objective of clearing the mid-cautious zone is achieved, the stock will be managed under the 2J3KL Groundfish Integrated Fisheries Management Plan to support rebuilding to the long-term objective of growing to the healthy zone.	1/1
TOTAL		3/6

Table 3. A comparison of the requirements for rebuilding plans set out in the Fishery (General) Regulations (FGR) in support of the Fish Stocks provisions of the *Fisheries Act* to DFO's witch flounder (2J3KL) rebuilding plan¹, a stock not yet prescribed in the provisions.

To rebuild, a plan must legally contain:	Does the 2J3KL witch flounder rebuilding plan meet minimum <i>Fisheries Act</i> requirements?	Score
The stock status and trends.	Yes – The rebuilding plan contains detailed information on stock status and trends over nearly 4 decades.	1/1
The probable causes for the stock's decline.	Yes – The probable cause for the stock's decline was noted as historical overfishing in the Newfoundland and Labrador shelves in combination with an environmental shift within the bioregion impacting a number of groundfish. The recovery of witch flounder has been slower than that of other benthivores, and biomass has been stagnant since 2010.	1/1
Measurable objectives aimed at rebuilding the stock, including a target for rebuilding the stock.	Yes – The long-term objective is to grow the stock into the healthy zone, with biomass maintained at or near the biomass that supports maximum sustainable yield (B_{MSY}). The short-term objectives include growing the stock out of the critical zone, maintaining small fish as less than 15% of catch, promoting stability in total allowable catch (TAC) when the stock is in the cautious zone, and using an exploitation rate that promotes a positive stock trajectory.	1/1

¹ Witch flounder 2J3KL is not prescribed to the Fish Stocks provisions, and thus the regulatory requirements for rebuilding plans are not applicable to this stock. It is a policy expectation that non-prescribed stocks will include all the elements set out in the FGR, but that expectation is not legally binding. This comparison is intended to demonstrate if the stock satisfies the requirements in advance of being prescribed in the provisions at a later date.

The timelines for achieving the objectives, including a timeline for achieving the target.²	No – The lack of a population model and biomass projections for witch flounder precludes managers from estimating the timeline to rebuild the stock. There are no estimates of the time it would take to rebuild the stock in the absence of fishing or generation times.	0/1
The management measures aimed at achieving the objectives, including the target.	Partially – Management measures have been laid out in detail explaining how managers came to use the harvest rates selected, based on past exploitation rates that were observed during a period of stock growth. While the stock is in the critical zone, no fishing is to occur. When the stock is above the LRP, harvest rates of 2.5% apply. When the stock is between 125% and 150% of the LRP, the harvest rate will be 4%. Harvest rates when the stock grows above the mid-cautious point will be determined at a later date when more information on stock performance is available, and likely within the scheduled 5-year review.	0.5/1
A method to track progress towards achieving the objectives and target using performance metrics.	Partially – An interim milestone of the stock reaching the mid-cautious point was noted. Witch flounder are not subject to a defined stock assessment cycle, but the plan states that progress will be monitored through the 2J3KLMNO Groundfish Advisory Committee periodically.	0.5/1
A schedule for a periodic review of the plan to assess progress towards the objectives and to determine whether an adjustment to the plan is needed.	Yes – The plan is set to be reviewed comprehensively every 5 years.	1/1
TOTAL		5/7

² Policy suggests that timelines be between T_{min} and $2-3x T_{min}$, where T_{min} is the time it would take to rebuild the stock in the absence of fishing; or $1.5-2$ generations if T_{min} cannot be calculated; or based on expert judgement if T_{min} cannot be calculated and generation time is unknown.