

Priorities for Rebuilding Critical Fisheries

In October 2016, Fisheries and Oceans Canada (DFO) released publicly for the first time the detailed results of the *Sustainable Survey for Fisheries* (SSF), which indicated 19 of Canada's major fish stocks are in the critical zone (DFO 2016). In early 2017, Oceana Canada updated the status of Canada's fish stocks using the information from the SSF, its own report on the status of fish stocks released in June of 2016 (Baum and Fuller 2016) and information found in the Canadian Science Advisory Secretariat (CSAS) Science Advice Reports, Science Research Documents and Science Response Processes published in the last year. This update revealed that 26 marine fish and invertebrate stocks remain in the critical zone, most which still require rebuilding plans.

Consistent with recommendations from global bodies such as the Organisation for Economic Co-operation and Development Committee for Fisheries and the FAO Code of Conduct for Responsible Fisheries, rebuilding plans must contain elements to ensure that the depleted populations will recover to a healthy level of abundance. DFO has developed plans for three stocks and has committed to developing plans for five more (Canada 2017, Canada 2017b).

Although rebuilding plan development can sometimes be a long process, Oceana Canada believes that DFO already has many components in place required for rebuilding for several more stocks. If rebuilding plan development is made a priority, plans can be in place for all critical zone stocks within five years.

This process should develop priorities and timelines for drafting and implementing rebuilding plans, with a focus on stocks in the most depleted state, those declining rapidly, or those for which rebuilding has stagnated. Here we outline which stocks have many of the components in place for rebuilding plan development and suggest which stocks could be prioritized.

Successful rebuilding efforts often require immediate and substantial reductions in fishing mortality (Murawski 2010, Rosenberg et al. 2006). According to the Precautionary Approach (PA), for stocks in the critical zone, removals from all sources must be kept to a minimum until the stock reaches the cautious zone, as long-term sustainable fishery benefits can only come with considerable restraint during the rebuilding phase (DFO 2009). DFO should first prioritize that fishing mortality from all sources (targeted, recreational and bycatch) is reduced, with specific attention paid to those critical stocks still under targeted fishing pressure.

Stocks for which DFO has publicly committed to developing plans should be completed as soon as possible. These include stocks committed to in the responses to the Auditor General's report (Yelloweye rockfish, southwest Nova Scotia cod, and Redfish Unit 1 and Unit 2) and the 10th report of the Standing Committee on Fisheries and Oceans (Northern cod), followed by those without plans. Those stocks with plans already in existence must be regularly assessed and updated as required.

To prioritize the critical stocks without rebuilding plans—or a public commitment to develop one—Oceana Canada identified those stocks which already have four of the main components that would facilitate rebuilding progress and scored them as detailed below. It will take less work to complete rebuilding plans for those with the highest score and they could be prioritized. Within those with equal scores, the priority could be assigned to those that are most depleted.

The four components and depletion state are defined as follows:

1. **Reference points:** Without reference points it is difficult to apply the PA framework, assess the health of a stock and have targets for rebuilding depleted ones to healthy levels. When reference

points are in place, the basic building blocks for developing abundance or biomass objectives and targets already exist, which should facilitate rebuilding plan development. We assigned one point for the presence of each reference point, such that stocks with both a lower reference point (LRP) and an upper stock reference (USR) were assigned a score of two and zero if there are no reference points.

2. **Inclusion in an Integrated Fisheries Management Plan (IFMP):** Although Fisheries rebuilding should take place through a clearly defined process, related to, but distinct from fisheries management for healthy fish stocks, much of the content of a good rebuilding plan and process is also included in an IFMP. Those already included in an IFMP can also have rebuilding plans published as an appendix to the IFMP and refer to it for background information, rather than having a more robust stand-alone plan. Thus, rebuilding plan development will be facilitated when a stock is already included in an IFMP. If a stock is included in an IFMP we assigned a score of one, and zero if it is not.
3. **Recent stock assessments:** It is difficult to develop a plan for rebuilding without recent estimates of abundance. If a stock has a recent estimate of abundance then there is already a process developed for its assessment, which should facilitate developing a rebuilding plan and provide more confidence in projections evaluating alternative management options. If a stock has recently (within the last five years) been assessed, we assigned a score of one, and zero if not.
4. **Fishing mortality (F) known:** Fishing mortality is the removal rate of fish from the population, as estimated from population models. If we cannot estimate how much fish is being removed, managing stocks becomes more uncertain. Ideally, we know what mortality is from all potential sources; directed commercial fisheries, recreational fisheries, bait fisheries and bycatch. Having an estimate of fishing mortality already in place should facilitate rebuilding plan development, as the stock has robust enough data and modelling approaches to allow for its estimation. If a stock has an estimate of fishing mortality, we assigned a score of one, and zero if not.

State of depletion: Stocks that are most depleted are in most need of a rebuilding plan. We assess depletion status using the most recently available biomass abundance estimate expressed as a percentage of the lower reference point.

Oceana Canada recognizes that other considerations may influence the prioritization of rebuilding plans such as recovery and economic potential of the fishery. These and other factors may influence the readiness of industry to participate in the rebuilding process.

Among the stocks without a plan, or commitment for a plan, this process identified three stocks that scored a total of five out of a possible five, indicating they have completed four of the components necessary to facilitate the development of rebuilding plans: Atlantic herring 4T spring spawners, American plaice on the grand banks (3LNO), and Atlantic cod on the eastern Georges Bank (5Zjm) (Table 1). A further three stocks were identified with a total score of four, indicating they nearly have all the components in place.

Most stocks requiring rebuilding plans are on the Atlantic coast, with only one critical zone stock remaining in the Pacific that require a plan that does not have one, or are not already committed to having one (pink shrimp in SMA 18-19). Within the Atlantic coast, the Gulf region is responsible for seven critical zone stocks without rebuilding plans or commitments, the Newfoundland region for six stocks, the Maritimes region for two stocks, and the Quebec and National Capital region for 1 stock each.

References

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Table 1. Prioritization of Canada's marine fish and invertebrate critical zone stocks¹ for rebuilding plan development based on the presence of components required for rebuilding already in place and the state of depletion.

PRIORITY RANK	Species	Stock	Rebuilding plan	LRP	USR	IFMP	Recent Assessment	Fishing mortality	TOTAL SCORE	% of LRP	Directed fishery?
1	Redfish species	Unit 1 and Unit 2 Deepwater redfish (<i>S. mentella</i>)	Committed	✓	✓	✓*	✓	✓	4.5	15	Yes**
2	Redfish species	Unit 1 and Unit 2 Acadian redfish (<i>S. fasciatus</i>)	Committed	✓	✓	✓*	✓	✓	4.5	29	Yes**
3	Atlantic cod	Northern (2J3KL)	Committed	✓		✓	✓	✓	4	34	No††
4	Atlantic cod	Scotian Shelf and Bay of Fundy (4X5Y)	Committed	✓	✓			✓	3	44	Yes
5	Yelloweye rockfish	Inside Population	Committed	✓	✓	✓			3	54	Yes
6	Atlantic herring	4T - Spring Spawner	No	✓	✓	✓	✓	✓	5	44	Yes
7	American plaice	Grand Banks (3LNO) – DFO/NAFO stock	No	✓	✓	✓	✓	✓	5	60	No†
8	Atlantic cod	Eastern Georges Bank (5Zjm) - DFO/NOAA stock	No	✓	✓	✓	✓	✓	5	53	Yes
9	American plaice	St. Pierre Bank (3Ps)	No	✓	✓	✓	✓		4	40	No†
10	White hake	Northern Gulf of St. Lawrence (4RS)	No	✓	✓		✓	✓	4	55	No
11	Yellowtail flounder	Southern Gulf of St. Lawrence (4T)	No	✓	✓		✓	✓	4	61	Yes
12	Winter skate	Gulf of St. Lawrence (4T)	No	✓			✓	✓	3	2	No
13	Atlantic mackerel	NAFO subareas 3-4	No	✓		✓	✓		3	3-8	Yes
14	Redfish species	2+3K Deepwater redfish (<i>S. mentella</i>)	No	✓	✓	✓			3	14	No†
15	Redfish species	2+3K Acadian redfish (<i>S. fasciatus</i>)	No	✓	✓	✓			3	28	No†
16	White hake	Southern gulf of St. Lawrence (4T)	No	✓			✓	✓	3	30	No†
17	American plaice	Southern Gulf of St. Lawrence (4T)	No	✓			✓	✓	3	40	Yes
18	Atlantic cod	Southern Gulf of St. Lawrence (4TVn; 4T & 4Vn)	No	✓			✓	✓	3	42	No†
19	Atlantic cod	Southern Grand Banks (3NO) – DFO/NAFO	No	✓			✓	✓	3	64	No†
20	Pink shrimp	Pacific Shrimp Management Area 18-19	No	✓	✓	✓			3	70-99	No†
21	American plaice	Labrador NE Newfoundland (23K)	No	✓		✓			2	24	No†
22	White hake	Eastern Scotian Shelf (4VW)	No	✓			✓		2	45	No
23	Witch flounder	Gulf of St. Lawrence (4RST)	No	✓					1	50	Yes
24	Yelloweye Rockfish	Outside Population	Yes	✓	✓	✓	✓	✓	5	90	Yes
25	Atlantic cod	Northern Gulf (3Pn, 4RS)	Yes	✓	✓		✓	✓	4	15	Yes
26	Bocaccio Rockfish	Pacific	Yes	✓	✓	✓			3	18	No

¹Stocks were selected based on those included in the Sustainable Survey for Fisheries (SSF) and Oceana Canada's 2016 report on status of fish stocks and updated with information found in the Canadian Science Advisory Secretariat (CSAS) Science Advice Reports, Science Research Documents and Science Response Processes published in the last year. See *Fisheries Rebuilding: Indicators towards success* for details on methodology. Stocks also assessed as critical in the SSF 2015 results are indicated in italic font. The SSF also considered one beluga whale stock (Nunavik) and one salmon stock (Chinook WCVI AABM) as critical, which were excluded from this exercise as we focus on marine fish and invertebrates. Additionally, during the update process two stocks considered as critical in the SSF were deemed uncertain with newly available information (Iceland Scallop - SFA 16ef, 18a and Yellowtail Flounder - 5Z).

*Redfish are included in an IFMP in Unit 2 but not in Unit 1, half points were awarded.

**Redfish in Unit 1 are under moratorium, but there is an index fishery, while Unit 2 has a directed fishery.

†These stocks are under moratorium or have been declared closed.

††This stocks is under moratorium, but has a directed commercial stewardship fishery in the inshore areas of 2J+3KL.

Figure 1. Canada's marine fish and invertebrate critical zone stocks.

