



STOCK ASSESSMENT OF REDFISH (*SEBASTES* SPP.) IN NAFO SUBAREA 2 AND DIVISION 3K IN 2025

CONTEXT

The Resource Management sector of Fisheries and Oceans Canada (DFO) requested science advice on redfish status in Northwest Atlantic Fisheries Organization (NAFO) Subarea (SA) 2 and Division (Div.) 3K to inform fisheries management decisions. The stock was last assessed in 2021 as part of a Multi-Regional Peer Review Process.

This Fisheries Science Advisory Report is from the regional peer review meeting of May 19–22, 2026, on the 2026 Assessment of Redfish (*Sebastes* spp.) in Northwest Atlantic Fisheries Organization (NAFO) Subarea 2 + Division 3K. Additional publications from this meeting will be posted on the [Fisheries and Oceans Canada \(DFO\) Science Advisory Schedule](#) as they become available.

SCIENCE ADVICE

Status

- Redfish in NAFO SA 2 + Div. 3K are above the newly adopted Limit Reference Point (LRP) with a very high (>95%) probability, and in 2025 were estimated to be at 1.77 (1.58 to 1.96) times the LRP.

Trends

- Survey indices from Divs. 2HJ3K have increased following a prolonged period of low abundance and biomass from the late 1980s to early 2000s.
- Recent increases have been driven by time series high recruitment observed in 2020–21, but have yet to contribute to spawning stock biomass.
- This stock has been under moratorium since 1997. Relative harvest rate has been low since 2007. Estimates of total removals – which are primarily from bycatch – ranged between 40 to 656 t from 2007–25.

Ecosystem and Climate Change Considerations

- Ocean climate is a major driver of ecosystem-level productivity in the Newfoundland and Labrador (NL) bioregion. The ongoing warm phase that started around 2020, along with recent improvements in zooplankton biomass levels, is favourable for groundfish productivity. The long-term impacts of increasing warming due to climate change remain unknown.
- Ecosystem biomass as measured by the research vessel (RV) survey is at the highest level since the ecosystem collapse in the late 1980s and early 1990s, but remains below pre-collapse levels. The recent increases are driven by groundfish, with Redfish making a major contribution.

Stock Advice

- As a result of the adoption of a new LRP, this stock is now considered to be above the Critical Zone. A harvest strategy has not yet been developed for this stock.
- Redfish recruitment is unpredictable and this is a mixed species complex. These factors add uncertainty in the assessment of this stock.
- Redfish are slow-growing and the extent to which the recent pulse in recruitment will lead to sustained long-term rebuilding is unknown.

BASIS FOR ASSESSMENT**Assessment Details****Year Assessment Approach was Approved**

2026

Assessment Type

Full Assessment

Most Recent Assessment Date

1. Last Full Assessment: 2021 (DFO 2023)
2. Last Interim-Year Update: NA

Stock Assessment Approach

1. Broad category: Index-based
2. Specific category: Index-based (fishery-independent indices)

This assessment uses a relative index of spawning stock biomass determined from the fall research vessel survey for Divs. 2HJ3K.

Ecosystem and Climate Change Assessment Approach

The physical environment was characterized by examining trends in ocean climate using oceanographic indicators, and the Newfoundland and Labrador Climate Index (NLCI). Food web components examined included: lower trophic levels characterized using primary production and zooplankton indicators, status and trends of the fish community, and seabird and marine mammal information. The characterization of ecological and environmental interactions included fish diets and estimations of food consumption. Habitat elements included a summary on Significant Benthic Areas and existing fisheries closures. Aggregated fisheries metrics included the fishing footprint and a metric of ecosystem overfishing. The link between ocean climate and ecosystem productivity was discussed as it related to climate change impacts.

Stock Structure Assumption

Redfish in NAFO SA 2+Div. 3K are managed collectively with one LRP, however data used to determine stock status are based on Divs. 2HJ3K. Three species of redfish are present in the stock area: Deepwater Redfish (*Sebastes mentella*), Acadian Redfish (*S. fasciatus*), and Golden Redfish (*S. norvegicus*, previously *S. marinus*). These species are not separated in commercial fisheries and have not always been separated in research vessel surveys.

Reference Points

- Limit Reference Point (LRP): 109 kt. The LRP was derived using a “spasmodic stock” approach (adapted from ICES 2017), the value was calculated as the average survey indices of SSB from 2014 to 2017, assumed to have contributed to the time-series high recruitment observed in 2020.
- Upper Stock Reference (USR): N/A; not defined
- Removal Reference (RR): N/A; not defined
- Target Reference Point (TRP): N/A; not defined

Data

- DFO Research Vessel (RV) Survey (1978–2021, 2023–25)
- Commercial fishery landings (1959–2025)
- DFO-NL Ecosystem Research Program Indicators (1960–2025)
- Atlantic Zone Monitoring Program Indicators (1950–2025)
- Ocean Colour - ESA Climate Change Initiative (1998–2025)
- Northern Shrimp Research Foundation (NSRF) Survey (2005–25)
- At-sea observer data (1995–2021)

Data changes: Conversion factors were applied to standardize the survey time series to modified Campelen units. Survey indices from 1996 onward were adjusted to account for incomplete coverage. Incomplete strata were filled in based on the average of recent observations. Previously, the stock trends were determined based on the RV survey data from Divs. 2J3K. At this assessment, this was updated to include Div 2H survey data.

ASSESSMENT

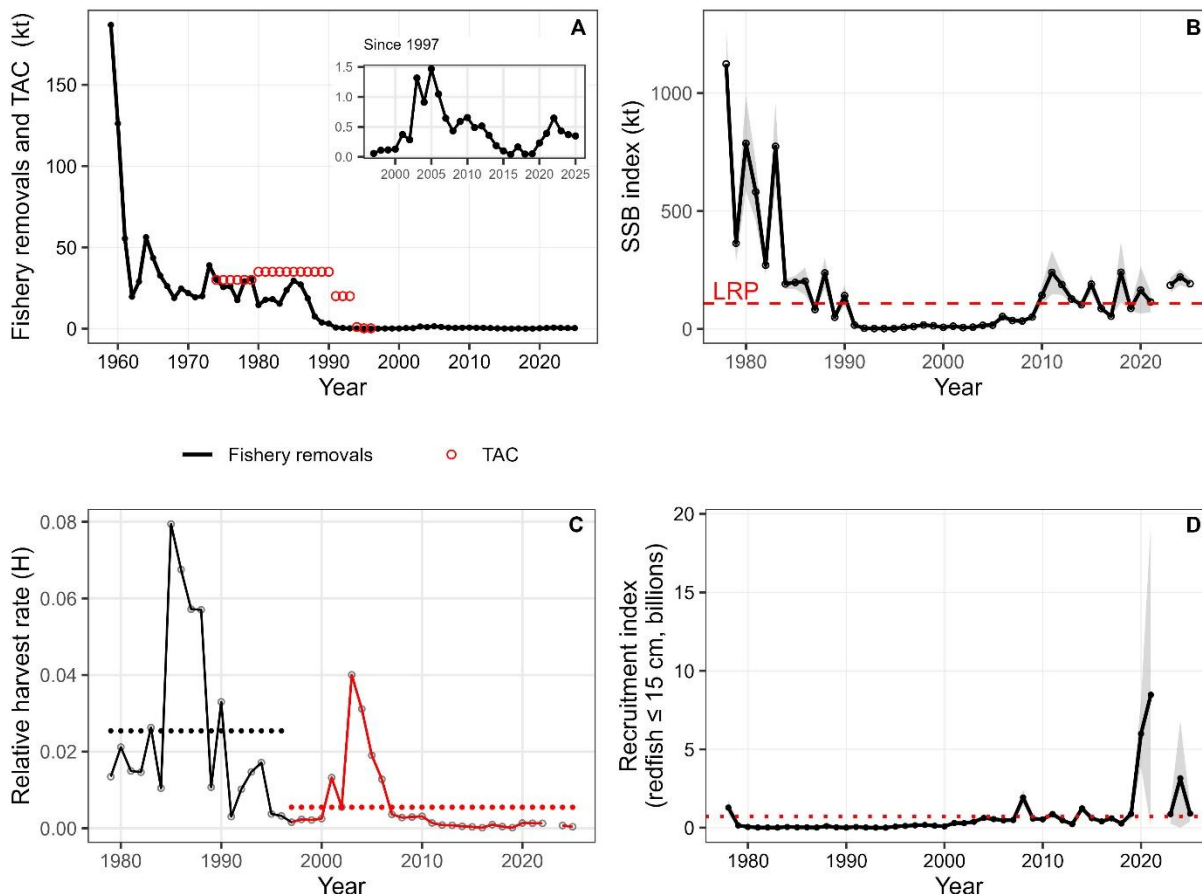


Figure 1. (A – upper left panel) Catch and Total Allowable Catch, (B – upper right panel) Survey biomass index for Divs. 2HJ3K in relation to the Limit Reference Point (LRP). Grey shading represents the 95% confidence interval, (C – bottom left panel) Relative harvest rate (H), calculated as annual removals divided by previous-year survey biomass. Dotted horizontal lines indicate mean H during the pre- and post-moratorium periods, (D- bottom right panel) Recruitment index for Divs. 2HJ3K, defined as the abundance of redfish ≤ 15 cm from the RV survey. Grey shading represents the 95% confidence interval. Dotted horizontal lines indicate time series mean recruitment.

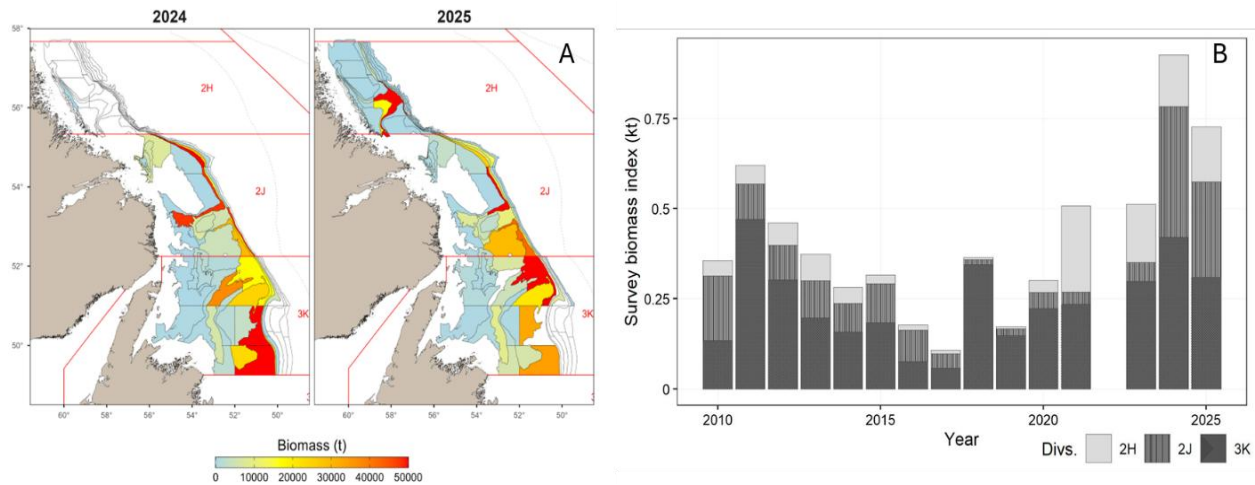


Figure 2. (A – left panel) Survey biomass index (t) by index strata in Divs. 2H, 2J, and 3K in 2024 and 2025. Strata shown in white were not surveyed or were considered incomplete because fewer than two sets were completed. (B – right panel) Survey biomass index for Divs. 2HJ3K) from 2010 to 2025, showing that the contribution from Div. 2H has increased in recent years.

Stock Status and Trends

Survey biomass

Survey biomass indices were highest during 1978–85, declined to low levels during 1986–2003, increased gradually during 2004–18, and increased more sharply after 2019. Biomass indices are now approaching levels observed in the mid-1980s. Recent increases are associated with primarily small fish which have yet to contribute to spawning stock biomass (Figure 1B).

Recruitment

The recruitment index (Figure 1D), defined as survey abundance of redfish less ≤ 15 cm, was low from the late 1970s through the 1990s and increased after the early 2000s. The 2020–21 recruitment event was exceptionally strong across Divs. 2H, 2J, and 3K. Redfish are slow-growing and the extent to which the recent pulse in recruitment will lead to sustained long-term rebuilding is unknown.

Distribution

Redfish are mainly found along bank slopes and deeper channels. Historically, most survey biomass occurred in Divs. 2J and 3K, but recent surveys show increased biomass in Div. 2H (Figure 2B).

Since 2000, the DFO RV survey has not included Div. 2G. The distribution of Redfish is known to extend in this area, with NSRF survey data suggesting a recent increase in this area as well.

Harvest Rate

Relative harvest rate, calculated as annual removals divided by the previous year survey biomass index, has remained below 1% since 2007 (Figure 1C).

Current Status

This stock is above the LRP with a very high (>95%) probability, and in 2025 was estimated to be at 1.77 (1.58 to 1.96) times the LRP. The stock is not in the Critical zone. The boundary between the Cautious and Healthy Zones has not been defined for this stock.

History of Landings & Total Allowable Catch

Table 1. Total fishery removals (t) of Redfish in NAFO SA 2 + Div. 3K during the most recent five years (2021–25).

Year	2021	2022	2023	2024	2025
Removals	392	647	434	370	349

Total recorded catch peaked at approximately 187,000 t in 1959, declined to about 20,000 t by 1962, and fluctuated between approximately 15,000 t and 56,000 t from the early 1960s to late 1980s. Landings declined sharply after 1988 and averaged about 1,800 t annually until the 1997 moratorium (Figure 1A).

The fishery has been managed under a Total Allowable Catch (TAC) since 1974, when a 30,000 t quota was introduced. The TAC increased to 35,000 t in 1980, declined to 20,000 t in 1991, and was reduced to 1,000 t in 1994 and 200 t in 1995. A moratorium on directed fishing was implemented in 1997 and remains in effect.

Since the moratorium, removals have mainly occurred as bycatch in shrimp and Greenland Halibut fisheries, with recent contributions from the Atlantic Cod fishery. Post-moratorium annual removals ranged from approximately 56 t to 1,500 t and averaged 431 t, compared with an average of 438 t over the last 5 years (Table 1).

Bycatch estimates were derived from observer data and scaled based on observer coverage in the directed fisheries. Since observer coverage varies by year, division, and fishery, bycatch estimates are uncertain. Removal estimates and the harvest rate are therefore associated with a large degree of uncertainty. Continued monitoring of redfish bycatch is important, especially with the observation of redfish bycatch in the newly re-opened Northern cod fishery.

Ecosystem and Climate Change Considerations

The ocean climate in the NL bioregion shows multi-year to decadal scale cold and warm phases, and is a major-driver of ecosystem-level productivity. The warm phase that started around 2020 continued in 2025. Recent phytoplankton blooms have been early, which favours recruitment of the copepod *Calanus finmarchicus*, a key food item for many fish. Total zooplankton biomass has been improving since the lows in the early-mid 2010s. These conditions are generally favourable for groundfish production, but long-term impacts of increasing warming due to climate change remain unknown.

NL marine ecosystems collapsed in the late 1980s and early 1990s associated with extreme cold ocean conditions and ecosystem overfishing. Declines in biomass of groundfish and capelin were not offset by increases in shellfish at the time. While these ecosystems continue experiencing overall lower productivity compared to the pre-collapse period, likely related to bottom-up processes (e.g., food limitation), improvements have been observed since the collapse. Ecosystem biomass as measured by the RV survey increased between the mid-2000s and early 2010s, when declines occurred. Positive trends have been observed since the lows in the mid-late 2010s, reaching post-collapse highs in 2024–25. The recent increases are driven by groundfish, with Redfish making a major contribution.

In the northern areas (NAFO Divs 2HJ), the importance of Redfish in the diets of Atlantic Cod *Gadus morhua* and Greenland Halibut *Reinhardtius hippoglossoides* has increased in recent years, tracking the trend in Redfish biomass. As a predator, Redfish has a highly variable diet

that includes invertebrates, pelagic fishes and squid. Amphipods and Shrimp *Pandalus spp.* dominate the diet of small Redfish (≤ 25 cm), while pelagic fishes, like lanternfish and capelin *Mallotus villosus* are more frequent in larger Redfish (> 25 cm).

Redfish biomass dynamics show broad scale consistency across the Newfoundland and Labrador Shelves. These are associated with environmental conditions in preceding years, suggesting that ocean climate plays an important role in regulating these dynamics.

Stock Advice

Projections cannot be completed for this stock, given its index-based assessment framework.

A harvest strategy has not yet been developed for this stock.

Redfish are slow-growing and the extent to which the recent pulse in recruitment will lead to sustained long-term rebuilding is unknown.

Current removals remain low relative to historical levels, and relative harvest rates have been below 1% since 2007.

Although survey biomass has increased, much of the increase is recruitment-driven. The majority of the Redfish observed in the survey are around 20–25 cm, and have not yet translated to spawning stock biomass. Given the current size distribution, increased removals would be expected to include a high proportion of immature fish.

SOURCES OF UNCERTAINTY

The stock is a species complex dominated by *S. mentella* and *S. fasciatus*. There are also presumed to be relatively low levels of *S. norvegicus* within the stock area, with observations of these within the RV survey not included in current estimation of stock status (estimated to be ~1–2% of survey observations in this area).

Because *S. mentella* and *S. fasciatus* are difficult to distinguish visually, they are not separated in commercial catches and have not always been consistently separated in surveys. Ongoing genomic research indicates additional complexity within the stock complex, including distinct genomic components in *S. fasciatus* and potentially more than one *S. mentella* genomic component within this stock area.

There is high uncertainty in the conversion of survey data between Engel and Campelen trawls for redfish < 20 cm, because Campelen trawls are more efficient at capturing fish in this size range (DFO 2001). Recruitment estimates prior to 1996 are therefore associated with a higher degree of uncertainty.

As the fall RV survey has not been completed in Div. 2G since 1999, data from this area are not included in evaluation of stock status and trends. Div. 2H has only had continuous annual coverage 1996–2000 and since 2010. Observations early in the time series indicate consistently small amounts of Redfish in Div. 2H, and this is therefore assumed negligible in years prior to 1996 when this area was not or was poorly sampled.

Survey coverage in Divs. 2HJ3K is incomplete in some years, with important gaps in the 2025 fall survey (Figure 2A). Incomplete strata in Divs. 2H, 2J, and 3K required imputation, which reduces potential bias but adds uncertainty.

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