



UPDATED INDICES OF ABUNDANCE TO 2018 FOR AMERICAN PLAICE AND YELLOWTAIL FLOUNDER FROM NAFO DIV. 4T

Context

Fisheries and Oceans Canada (DFO) Ecosystems and Fisheries Management has instituted a multi-year management approach for American Plaice and Yellowtail Flounder stocks of the southern Gulf of St. Lawrence (sGSL; NAFO Div. 4T). The last full assessments of the American Plaice and Yellowtail Flounder stocks of the sGSL were completed in March 2016 with advice for the May 2016 to May 2021 fisheries period (DFO 2016b, 2016c). Following on the advice of DFO (2016a) and as identified in the respective science advisory reports for American Plaice (DFO 2016b) and Yellowtail Flounder (DFO 2016c), an update of indicators of stock status is to be provided at the end of the year 2018, mid-way in the five-year assessment and fisheries management cycle. In line with this advice this Science Response Report, resulting from the Science Response Process of December 13, 2018, provides an update of indices of abundance to 2018 for American Plaice and Yellowtail Flounder of the sGSL, assessed and managed by DFO Gulf Region. For both American Plaice and Yellowtail Flounder, the analysis of the indicator relative to an identified trigger value is presented to determine if a full stock re-assessment may be warranted earlier than March 2021, the next scheduled assessments of their five-year stock assessment cycle for these two species.

Background

The American Plaice (*Hippoglossoides platessoides*) stock of the sGSL is currently under commercial fishery moratorium (directed fisheries are closed) with a bycatch allocation of 250 t per year (Table 1). Directed commercial fishing of the Yellowtail Flounder (*Limanda ferruginea*) of the sGSL is permitted with an annual Total Allowable Catch (TAC) of 225 t (Table 1).

Table 1. Total allowable catch (TAC) values (t) in effect in 2016 to 2018 for American Plaice and Yellowtail Flounder in the southern Gulf of St. Lawrence. For American Plaice, the TAC is a bycatch allocation for fisheries directing for other groundfish species.

Species	Total Allowable Catch in 2018
American Plaice (<i>Hippoglossoides platessoides</i>)	250 t ¹
Yellowtail Flounder (<i>Limanda ferruginea</i>)	225 t

¹ To cover by-catch in other groundfish fisheries, a limited recreational fishery, for scientific purposes, and negotiated Aboriginal food, social and ceremonial fisheries agreements.

The September research vessel (RV) survey of the sGSL follows a stratified random sampling design (Figure 1) and includes sampling of fish and invertebrates using a bottom trawl. The RV survey was designed to provide abundance trends for fish and invertebrates distributed between depths of about 20 m to 350 m. This survey, conducted annually since 1971, is the primary source of data for monitoring trends in species distribution, abundance, and biological characteristics (e.g., size and age composition, growth) in the sGSL (for details see Savoie

2015). The same stratification scheme has been used since 1971, with the exception of the addition of three inshore strata (401 to 403) in 1984. The analyses are presented here for the 24 offshore strata (415 to 439) sampled since 1971. The survey indices have been standardized for changes in survey vessels, gears, and protocols which have occurred over the time series (Benoît and Swain 2003; Benoît 2006). Survey indices are expected to be proportional to abundance for most species.

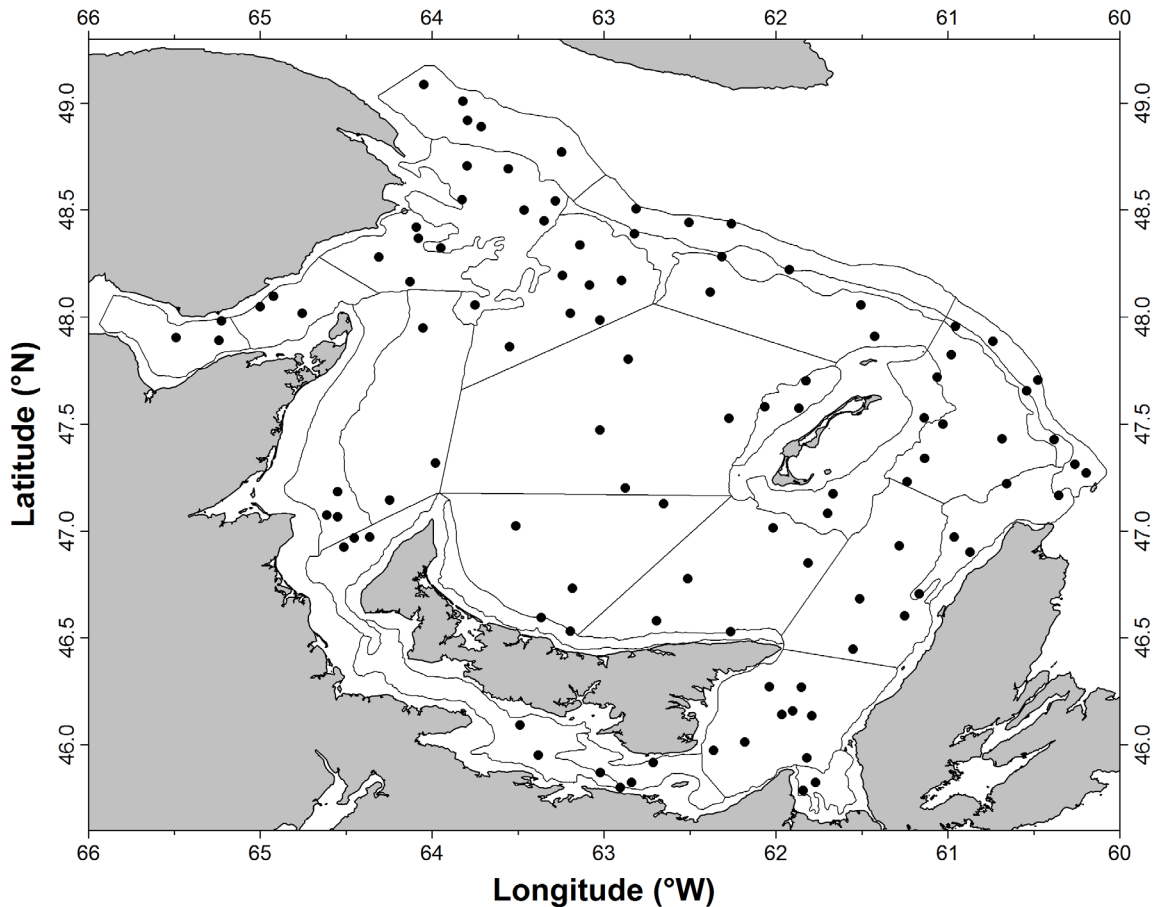


Figure 1. Location of the fishing sets from the September RV survey ($n = 106$ tows in all strata and $n = 99$ tows in strata 415 to 439) in 2018.

Analysis and Response

Indices by species

As part of the full assessment for American Plaice and Yellowtail Flounder stocks of the sGSL completed in March 2016, DFO indicated that an interim year update would be provided mid-way in the five-year assessment cycle, no later than early December 2018, to allow sufficient time to complete a full assessment and plan the peer review if the species-specific indicator signaled that a re-assessment was warranted in winter 2019 (DFO 2016b, 2016c).

Gulf Region

American Plaice

The last full assessment of the American Plaice stock of the sGSL, NAFO Div. 4T, was completed in March 2016 with advice for the May 2016 to May 2021 fisheries period (DFO 2016b; Ricard et al. 2016). In that assessment it was indicated that the three-year moving average of the RV survey biomass index for commercial-sized plaice (≥ 30 cm) would be used as the indicator of stock status in the interim years of the multi-year management cycle. This index is to be compared to the Limit Reference Point (LRP) value for this stock, adjusted to the scale of the biomass index which is not corrected for survey gear catchability. The re-scaled LRP is 33,770 t of trawlable biomass in September, equivalent to a catch rate from the survey of 19.5 kg per tow.

An assessment before the scheduled five-year cycle would be recommended if the three-year moving average of the RV biomass index for commercial-sized American Plaice exceeded the re-scaled LRP of trawlable biomass. For 2018, the three-year (2016 to 2018) average value of the index is 3.11 kg per tow (Figure 2). This value is well below the threshold value of 19.5 kg per tow which if it had been exceeded would trigger an earlier than scheduled assessment.

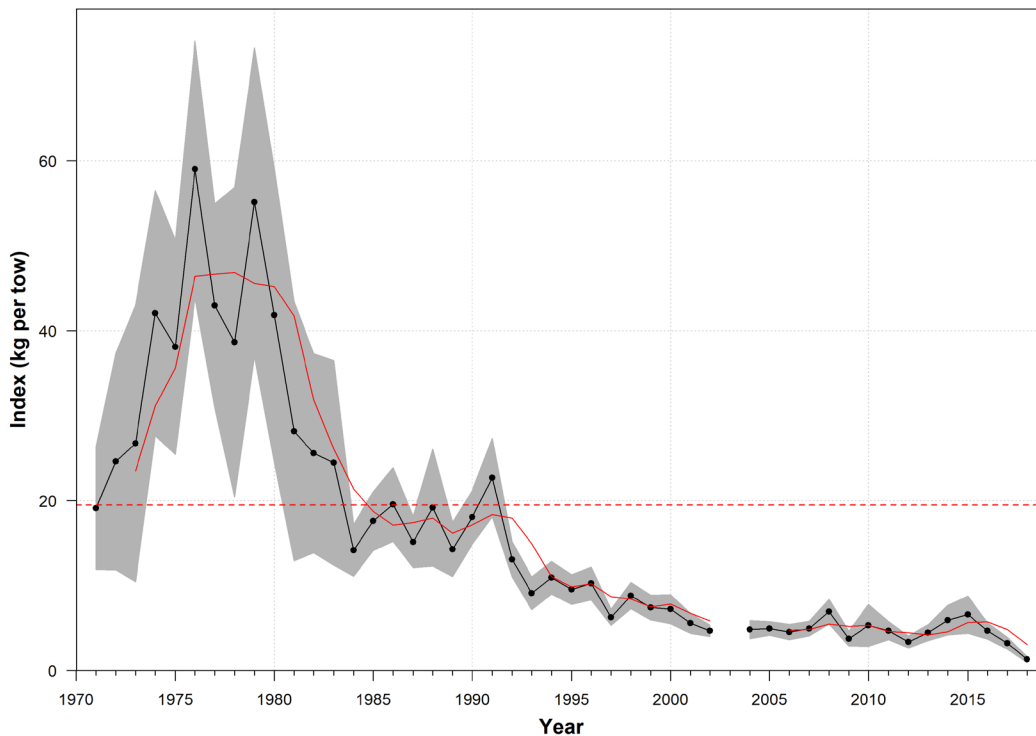


Figure 2. Annual RV survey index (kg per tow) of commercial size (≥ 30 cm total length) American Plaice from strata 415-439 in the southern Gulf of St. Lawrence, 1971 to 2018. The black circles and solid black line are the stratified mean estimates and the grey shading denotes the 95 % confidence intervals of the annual means. The red solid line is the three-year moving average shown in correspondence to the third year of the block of years. The horizontal dotted line is the threshold value of 19.5 kg per tow. Data from 2003 is omitted from the figure as an uncalibrated vessel was used in that year.

Yellowtail Flounder

The last full assessment of the Yellowtail Flounder stock of the sGSL, NAFO Div. 4T, was completed in March 2016 with advice for the May 2016 to May 2021 fisheries period (Surette

and Swain 2016; DFO 2016c). In that assessment it was indicated that the three-year moving average of the RV survey biomass index for commercial-sized Yellowtail Flounder would be used as the indicator of stock status in the interim years of the multi-year management cycle. Commercial-sized Yellowtail Flounder are defined as fish measuring 25 cm and longer. This index is to be compared to the Limit Reference Point (LRP) value for this stock, adjusted to the scale of the survey biomass index which is not corrected for catchability. The re-scaled LRP of trawlable biomass in September is 1.06 kg per tow.

An assessment before the scheduled five-year cycle could be undertaken if the three-year moving average of the RV survey biomass index for commercial-sized Yellowtail Flounder exceeded the LRP equivalent value of 1.06 kg per tow. For 2018, the three-year (2016 to 2018) average value of the index is 0.21 kg per tow (Figure 3). This value is well below the threshold value of 1.06 kg per tow which if it had been exceeded would trigger an earlier than scheduled assessment.

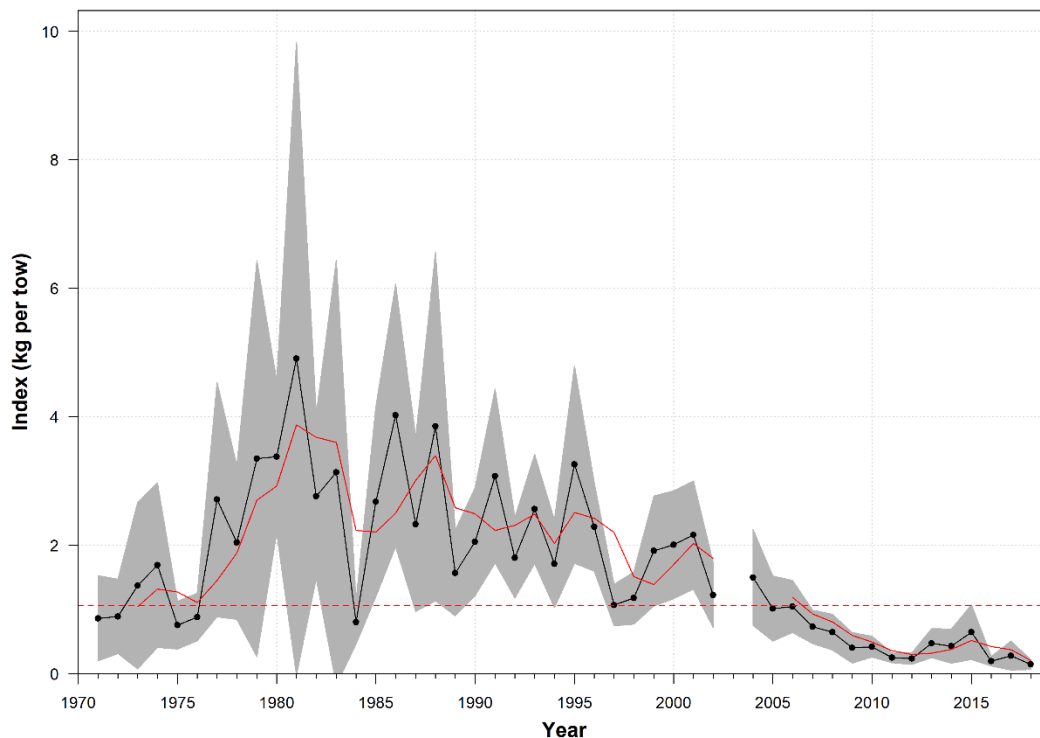


Figure 3. Annual RV survey index (kg per tow) of commercial sized (≥ 25 cm total length) Yellowtail Flounder from strata 415-439 in the southern Gulf of St. Lawrence, 1971 to 2018. The black circles and solid black line are the stratified mean estimates and the grey shading denotes the 95 % confidence intervals of the annual means. The red solid line is the three-year moving average shown in correspondence to the third year of the block of years. The horizontal dotted line is the threshold value of 1.06 kg per tow. Data from 2003 is omitted from the figure as an uncalibrated vessel was used in that year.

Conclusions

The RV biomass indices for commercial sizes of American Plaice and Yellowtail Flounder in the southern Gulf of St. Lawrence indicate that there has been no improvement in status for these stocks since their last assessment. The indices indicate that the commercial biomass of each species remains at or near record low levels.

For American Plaice, the three-year (2016 to 2018) average value of the indicator is 3.11 kg per tow (Figure 2). This value is well below the threshold value of 19.5 kg per tow. Analysis of the indicator shows the indicator's trigger value has not been reached. A stock re-assessment is not warranted and the previous advice for the fishery remains appropriate. The next full assessment for American Plaice for the sGSL is scheduled for winter 2021.

For Yellowtail Flounder, the three-year (2016 to 2018) average value of the indicator is 0.21 kg per tow (Figure 3). This value is well below the threshold value of 1.06 kg per tow. Analysis of the indicator shows the indicator's trigger value has not been reached. A stock re-assessment is not warranted and the previous advice for the fishery remains appropriate. The next full assessment for Yellowtail Flounder for the sGSL is scheduled for the winter of 2021.

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January 17, 2019

Sources of information

This Science Response Report results from the Science Response Process of December 13, 2018 on the update of indices of abundance to 2018 of American Plaice (NAFO Div. 4T) and Yellowtail Flounder (NAFO Div. 4T) assessed and managed by DFO Gulf Region. No additional publications from this process will be produced.

Benoît, H. 2006. Standardizing the southern Gulf of St. Lawrence bottom-trawl survey time series: results of the 2004-2005 comparative fishing experiments and other recommendations for the analysis of the survey data. DFO Can. Sci. Advis. Sec. Res. Doc. 2006/008. iv + 127 p.

Benoît, H. and Swain, D. 2003. Standardizing the southern Gulf of St. Lawrence bottom-trawl survey time series: adjusting for changes in research vessel, gear and survey protocol. Can. Tech. Rep. Fish. Aquat. Sci. 2505. iv + 95 p.

DFO. 2016a. Guidelines for providing interim-year updates and science advice for multi-year assessments. DFO Can. Sci. Advis. Sci. Advis. Rep. 2016/020.

DFO. 2016b. Stock assessment of American plaice (*Hippoglossoides platessoides*) of the southern Gulf of St. Lawrence (nafo div. 4t) to 2015. DFO Can. Sci. Advis. Sci. Advis. Rep. 2016/031.

DFO. 2016c. Stock assessment of Yellowtail flounder (*Limanda ferruginea*) of the southern Gulf of St. Lawrence (NAFO Div. 4T) to 2015. DFO Can. Sci. Advis. Sci. Advis. Rep. 2016/033.

- Ricard, D., Morin, R., Swain, D. and Surette, T. 2016. Assessment of the southern Gulf of St. Lawrence (NAFO Division 4T) stock of American plaice (*Hippoglossoides platessoides*), march 2016. DFO Can. Sci. Advis. Sec. Res. Doc. 2016/057. ix + 43 p.
- Savoie, L. 2015. Indices of abundance to 2014 for six groundfish species based on the september research vessel and august sentinel vessel bottom-trawl surveys in the southern Gulf of St. Lawrence. DFO Can. Sci. Advis. Sec. Res. Doc. 2015/085. v + 52 p.
- Surette, T. and Swain, D. 2016. The Status of Yellowtail Flounder in NAFO Division 4T to 2015. DFO Can. Sci. Advis. Sec. Res. Doc. 2016/058. x + 74 p.

This Report is Available from the:

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ISSN 1919-3769

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Correct Citation for this Publication:

DFO. 2019. Updated indices of abundance to 2018 for American Plaice and Yellowtail Flounder from NAFO Div. 4T. DFO Can. Sci. Advis. Sec. Sci. Resp. 2019/006.

Aussi disponible en français :

MPO. 2019. Mises à jour des indices d'abondances jusqu'en 2018 pour les stocks de plie canadienne et de limande à queue jaune de la Div. 4T de l'OPANO. Secr. can. de consult. sci. du MPO, Rép. des Sci. 2019/006.