



**Fisheries New Zealand**

Tini a Tangaroa

# **Review of Sustainability Measures for Top of the South Island Trawl Fishery for 2019/20**

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# 1 Stocks being reviewed

## Red gurnard (GUR 7)

*(Chelidonichthys kumu)*, Kumukumu

## Rig (SPO 7)

*(Mustelus lenticulatus)*, pioke, makō, mango

## John dory (JDO 7)

*(Zeus faber)*, Kuparu

## Elephant fish (ELE 7)

*(Callorhinchus milii)*, Reperepe

## Flatfish (FLA 7)

*(flounders, soles, brill and turbot species)*, Patiki

## Snapper (SNA 7)

*(Pagrus auratus)*, Tamure, Kouarea

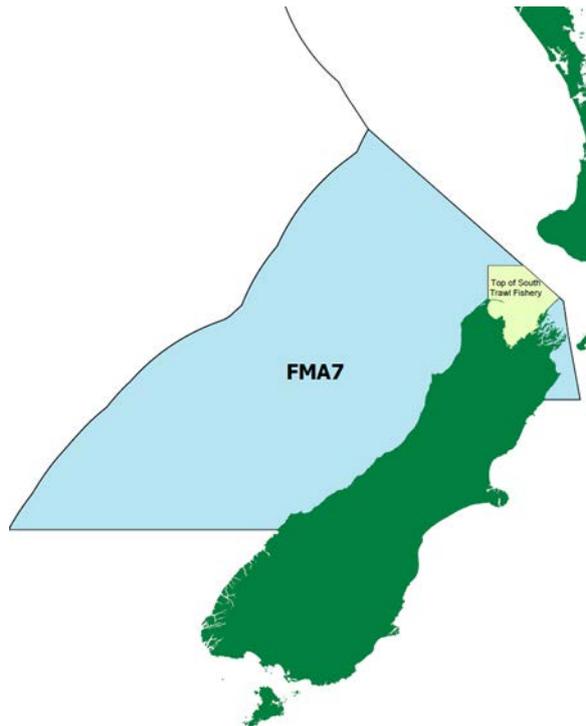


Figure 1: The Challenger/Central (Plateau) Quota Management Area 7 with the Top of the South Trawl Fishery Area (indicative area shaded yellow).

# 2 Summary

Fisheries New Zealand proposes to review catch settings for a number of species taken together in the Tasman and Golden Bays mixed trawl fishery (Top of the South trawl fishery). The best available information suggests that increases to the total allowable catch (TAC) for red gurnard, rig, and John dory could be considered. A TAC can also be set for elephant fish.

Fisheries New Zealand proposes either maintaining the status quo, or the following TAC options for these stocks:

Red gurnard: Increase the TAC for red gurnard from 1,065 tonnes, to 1,176 tonnes or 1,273 tonnes

Rig: Increase the TAC for rig from 346 tonnes to 373 tonnes, or to 400 tonnes

John dory: Increase the TAC for John dory from 226 tonnes to 247 tonnes

Elephant fish: Set a TAC for elephant fish of 127 tonnes.

Fisheries New Zealand seeks your input and views on these proposals.

The review is being completed in two stages. In this first stage we are providing options for those stocks that have adequate information to support varying the TAC (red gurnard, rig and John dory) or to set a TAC (elephant fish). A TAC and allowances have not been previously set for elephant fish as the stock has not been reviewed since it entered the quota management system. Decisions on these stocks will be made for the start of the next fishing year on 1 October 2019.

The second stage will be to consider TAC settings for snapper and flatfish once further scientific assessments have been completed, and wider multi-sector engagement has occurred on these important shared fisheries.

This multi-species review approach allows more explicit consideration of the linkages and dependencies between stocks. In particular the approach allows biological factors such as stock productivity and abundance, and target and bycatch interactions, to be taken into account in management settings.

### 3 Quota Management System

Red gurnard, rig, John dory, elephant fish, flatfish and snapper within New Zealand are managed using the Quota Management System (QMS), with a 1 October to 30 September fishing year. For more information about the QMS go to <https://www.mpi.govt.nz/law-and-policy/legal-overviews/fisheries/quota-management-system/>.

### 4 Legal basis for managing fisheries in New Zealand

The Fisheries Act 1996 provides the legal basis for managing fisheries in New Zealand, including the Minister's responsibilities for setting and varying sustainability measures. See the separate document *Overview of legislative requirements and other considerations* on the Fisheries New Zealand sustainability consultation webpage (<https://www.fisheries.govt.nz/news-and-resources/consultations/review-of-sustainability-measures-for-1-october-2019>) for more information.

### 5 Treaty of Waitangi Obligations

#### 5.1 Input and participation of tangata whenua

Information on the proposal to consult on the above fish stocks was provided to the Te Waka a Māui me Ōna Toka Iwi Forum on 12 March 2019. The forum noted that for many of the stocks the scientific information was not (at that time) available to allow for their consideration.

#### 5.2 Kaitiakitanga

Red gurnard, rig, flounder and snapper are identified as taonga species in the Te Waipounamu Iwi Forum Fisheries Plan; in addition, the Te Waka a Maui me Ona Toka Iwi Forum considers all fish species taonga. The Forum Fisheries Plan contains objectives to support and provide for the interests of South Island iwi, including the following which are relevant to the options proposed in this paper:

**Management objective 1:** To create thriving customary non-commercial fisheries that support the cultural wellbeing of South Island iwi and whanau;

**Management objective 3:** To develop environmentally responsible, productive, sustainable and culturally appropriate commercial fisheries that create long-term commercial benefits and economic development opportunities for South Island iwi; and

**Management objective 5:** to restore, maintain and enhance the mauri and wairua of fisheries throughout the South Island.

The following customary management areas are located within Quota Management Area (QMA) 7:

- the taiāpure of Whakapuaka (Delaware Bay)
- the mātaihai reserves of Okuru/Mussel Point, Tauperikaka, Mahitahi/Bruce Bay, Manakaiaua/Hunts Beach, Okarito Lagoon, Te Tai Tapu (Anatori), Te Tai Tapu (Kaihoka).

## 6 Relevant plans, strategies, statements and context

There are a number of regional plans in place within QMA 7, including:

- Regional coastal plans to address the cumulative effects of activities in the coastal marine area, and the adverse impacts from land-based activities on the marine environment.
- The Marlborough Environment Plan (publicly notified on 9 June 2016) sets out provisions relating to fishing methods in specified areas. The outcome of the associated panel hearing on these provisions is pending.

Fishers are subject to the rules in the plans (for example, small scale restrictions on fishing methods), however, the large area of Fisheries Management Area (FMA) 7 means these rules do not, in general, stop fishers taking their annual catch entitlement (ACE) from other areas within FMA 7.

The National Plan of Action for Sharks (NPOA Sharks 2013) is also relevant to rig and elephant fish (as they are elasmobranchs). One of the goals of the NPOA Sharks is to maintain the biodiversity and long-term viability of New Zealand shark populations, based on a risk assessment framework; including maintaining those species in the QMS at or above target.

A draft National Inshore Finfish Fisheries Plan (2011) also provides guidance on management objectives and strategies for finfish fisheries. This plan is currently being reviewed. The new plan will identify a shift towards a fisheries complex approach to managing inshore finfish fisheries.

## 7 Current state of the stocks

### 7.1 GUR 7

Fisheries New Zealand considers GUR 7 to be very likely (>90% probability) to be at or above target levels. The proxy  $B_{MSY}$  target limit for this fishery is 460 tonnes with a soft limit of 50% of the target and a hard limit of 25% of the target.

GUR 7 appears to be experiencing a recruitment pulse (consecutive years of good recruitment) as both the 2015 and 2017 West Coast South Island (WCSI) trawl survey biomass indices have been high. The preliminary 2019 WCSI trawl survey results indicate the relative biomass remains high for the time series.

Red gurnard have a fast growth rate and relatively short lifespan, and fluctuations in recruitment tend to result in large fluctuations in stock biomass. The WCSI trawl survey series, which includes the Top of the South, provides relative biomass indices for GUR 7. The Southern Inshore Working Group regards the series as a reliable index of abundance.

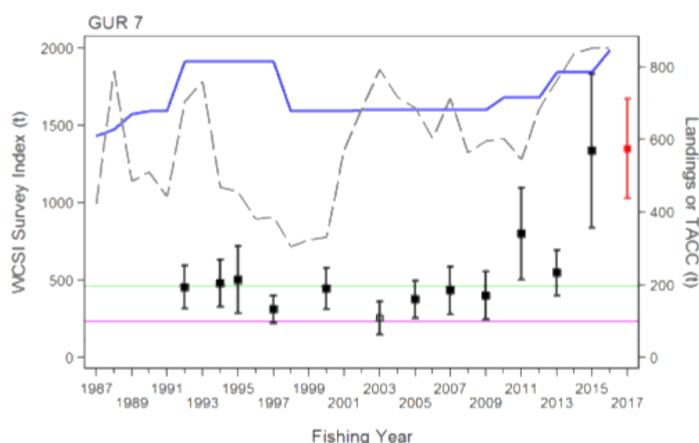


Figure 2: Comparison of GUR WCSI trawl survey indices with commercial landings (grey dashed line) and TACC for GUR 7 (blue line). The management target  $B_{MSY}$  proxy (green line); the soft limit (purple line).

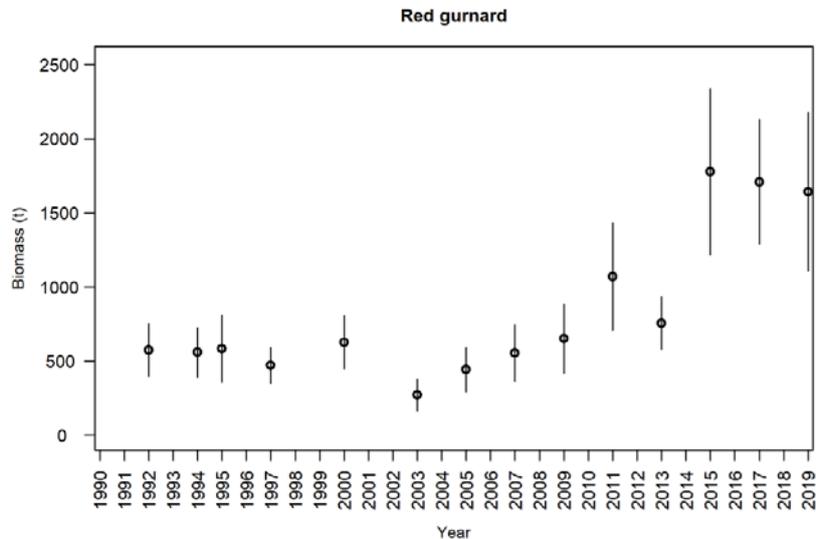


Figure 3: Preliminary biomass estimates from the 2019 WCSI trawl survey. Coefficient of variation is 16.3%.

## 7.2 SPO 7

Fisheries New Zealand considers SPO 7 to be likely (>60% probability) to be at or above target levels.

The Southern Inshore Working Group agreed to set a proxy  $B_{MSY}$  target for this fishery, based on twice the soft limit. The soft limit is 148 tonnes, and the hard limit is 50% of the soft limit (ie, 74 tonnes).

The WCSI trawl survey series shows relative biomass of rig declined more than 50% between 1995 and 2005, increased to a stable level from 2007-2013, and then sharply increased in 2015. Estimated biomass remained high in 2017 (second highest for time series), slightly down from 2015. The preliminary estimated biomass for 2019 is also slightly down, but remains high comparative to earlier trends. Size composition data from the WCSI trawl survey catches suggests strong recruitment in recent years.

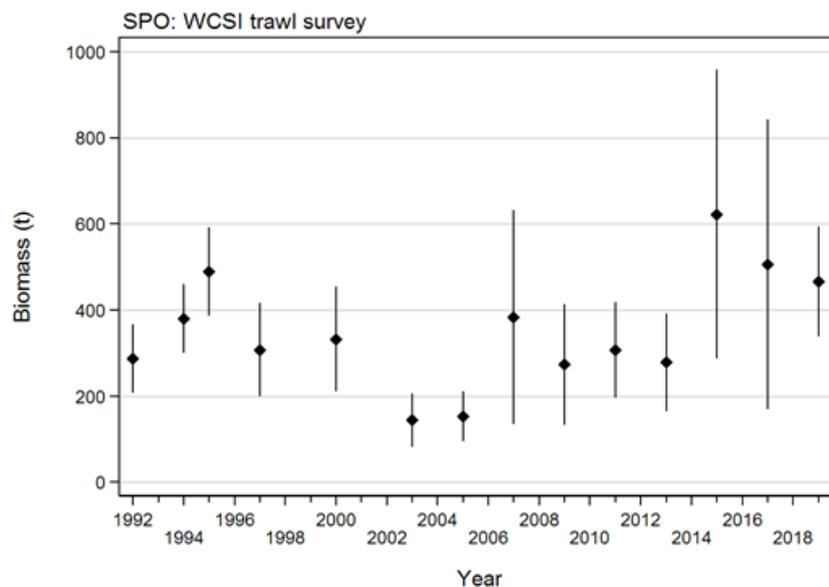


Figure 4: Total biomass estimates (t) for rig from the WCSI trawl survey by year. The 2019 survey index is preliminary.

### 7.3 JDO 7

Fisheries New Zealand considers JDO to be very likely (>90% probability) to be at or above target levels.

John dory is principally a bycatch species. Maximum constant yield estimates based on catch data are therefore uncertain, and it is difficult to determine whether changes in reported catches indicate changes in stock abundance or changes in target species. However, the WCSI trawl survey for JDO 7 provides a time series of relative abundance for this stock. The commercial catch trends have largely mirrored those of the trawl survey biomass estimates.

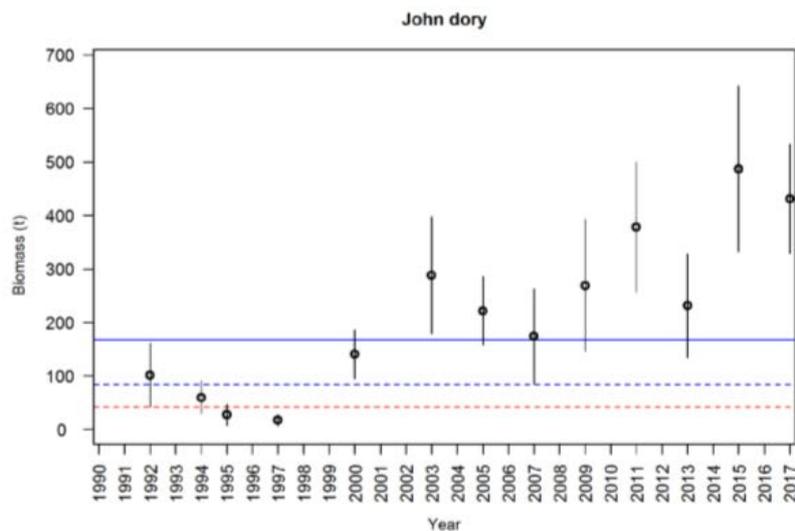


Figure 5: Biomass trends from the WCSI trawl survey time series. The solid blue line represents the interim target and the dashed blue and red lines the soft and hard limits, respectively.

The stock is currently at a relatively high level, and previous high catches appear to have been sustained by intermittent high recruitment. Preliminary results from the 2019 WCSI trawl survey, however, indicate a decline in relative biomass. This decline is not statistically different from the last survey in 2017, and JDO 7 may therefore still be above the interim target biomass level. Nevertheless the confidence intervals are large for the last survey, crossing well over the target line, and the scientific basis for an increase in utilisation is weaker than for GUR 7 and SPO 7.

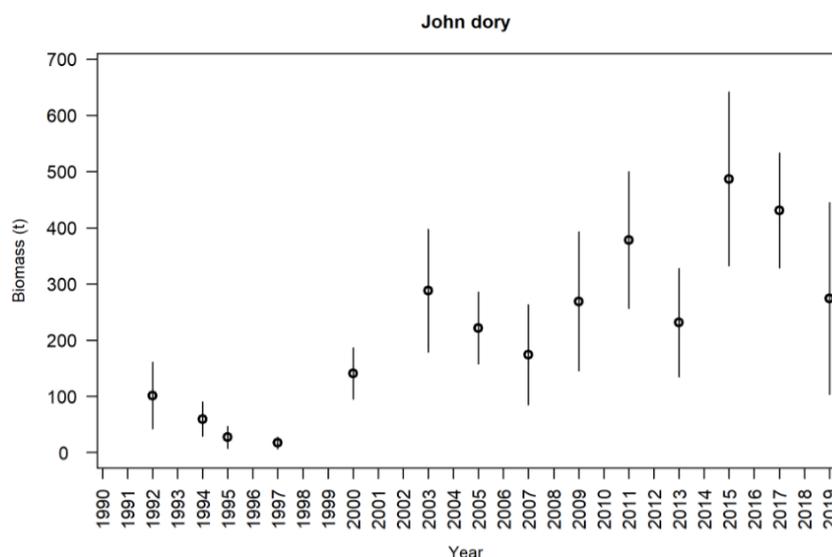


Figure 6: Preliminary biomass estimates from the 2019 WCSI trawl survey. Coefficient of variation is 31.1%.

## 7.4 ELE 7

Fisheries New Zealand considers ELE 7 is about as likely as not (40-60% probability) to be at or above  $B_{MSY}$ .

The key indicator used to monitor and inform management for ELE 7 is catch per unit effort (CPUE) from the commercial fishery. Standardised CPUE is considered a credible measure of abundance for this fishery. The WCSI trawl survey biomass trends for this stock are considered less reliable.

An ELE 7 tow-by-tow standardised CPUE analysis was recently completed (Starr & Kendrick, 2019); and was reviewed and accepted by the Southern Inshore Working Group. The working group agreed that the mean (2007/08 to 2017/18) index of abundance series could serve as a  $B_{MSY}$  proxy target for the stock. The soft limit is 50% of the target, and the hard limit is 25% of the target.

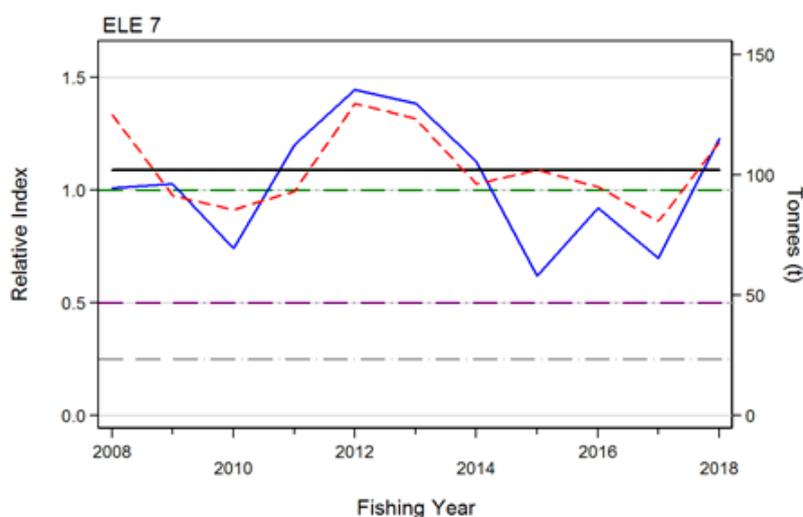


Figure 7: Comparison of the ELE 7 (bottom trawl) CPUE, along with the TACC (black line) and landings (red dashed line). The agreed  $B_{MSY}$  proxy (green line); the soft limit (purple line); the hard limit (grey line) (Starr & Kendrick, 2019).

No TAC has been set for elephant fish in ELE 7. This is a relatively low knowledge stock, with a TACC set at 102 tonnes when the QMS was introduced in 1986.

## 7.5 FLA 7

There has been no stock assessment completed for FLA 7, and no estimates of current and reference biomass are available.

Flatfish populations generally consist of one or two years classes at any time. The size of the populations depend on the strength of the year classes and are usually highly variable.

A CPUE analysis and characterisation of FLA 7 is proposed for 2019/2020. The results of this work will help inform any decisions on FLA 7 as stage 2 of this review next year.

## 7.6 SNA 7

In the most recent stock assessment (Langley, 2018) SNA 7 was assessed to be at about the interim target biomass (40%  $SB_0$ ).

Snapper stocks are characterised by highly variable recruitment with strong recruitment periods every 7-10 years. The most recent stock assessment (2018) attributes the increase in stock abundance in SNA 7 to two strong year classes (2007/08 and 2010/11). This is supported by a large increase in the trawl CPUE indices. As snapper recruitment is known to be associated with warm water temperatures,

it is possible that the number of years between strong recruitment could reduce with increasing sea temperatures.

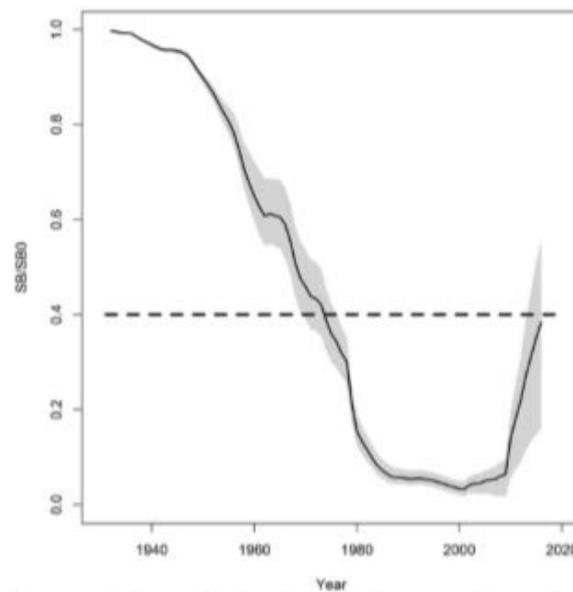


Figure 8: Annual trend in spawning biomass relative to the 40%  $SB_0$  interim target biomass level for the base model. The line represents the median and the shaded area represents the 90% credible interval. The dashed line represents the interim target level (Fisheries assessment plenary May 2018)

Preliminary results of the 2019 WCSI trawl survey series suggest estimated biomass continues to increase for this fish stock. Even so, the magnitude of the recent increase in biomass is uncertain. Fisheries New Zealand will therefore bring forward a stock assessment from 2021 to 2020 to assess the current status of this fish stock to support a review of SNA 7 in stage two of this review.

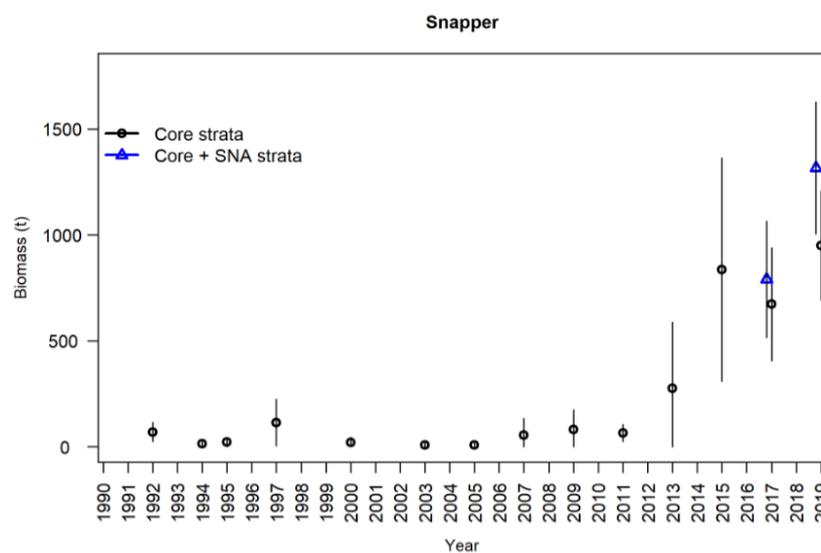


Figure 9: Preliminary biomass estimates from the 2019 WCSI trawl survey. Coefficient of variation is 11.8%

## 8 Recent catch levels and trends

Overall, the stocks in the Top of the South trawl fishery are performing well, although the status of flatfish is unknown. Catches of flatfish have not approached the TACC since a series of high catches (approximately 1,200 tonnes to 1,400 tonnes) from 2004/05 to 2007/08.

## 8.1 Customary

The current level of Māori customary catch for finfish in QMA 7 is uncertain. Rig (*pioke, makō, mango*), elephant fish (*reperepe*), snapper (*tamure, kouarea*) and flatfish have been reported under the South Island customary fishing regulations in past years. However, there is no recent recorded customary catch for any of the review species. Tangata whenua north of Kahurangi Point and in the Marlborough Sounds and Tasman/Golden Bays area are still operating under regulation 50 of the Fisheries (Amateur Fishing) Regulations 2013, which do not require that customary permits or catches be reported. The absence of customary reporting may also reflect that tangata whenua are using recreational fishing regulations for their harvest.

## 8.2 Recreational trends

Anecdotal information and reports from recreational fishers suggest the abundance of snapper in Tasman and Golden Bays is positive for the recreational sector. Recreational fishers advise the likelihood of catching snapper has seen greater participation in the Tasman and Golden Bays recreational fishery, resulting in increases in the harvest of other important recreational species such as red gurnard. The latest National Panel Survey of Marine Recreational Fishers results are consistent with this feedback.

Table 1: Summary of the National Panel Survey of Marine Recreational Fishers results from QMA 7 for red gurnard, rig, John dory, elephant fish, flatfish and snapper

| Fish stock | 2011/12 Estimated harvest (tonnes)                 | 2017/18 Estimated harvest (tonnes) |
|------------|--|------------------------------------|
| GUR 7      | 12.48  | 37.59                              |
| SPO 7      | 20.76  | 18.58                              |
| JDO 7      | 1.79   | 0.83                               |
| ELE 7      | Not enough catch to make estimates in either year. |                                    |
| FLA 7      | 4.7  | 5.27                               |
| SNA 7      | 89   | 147.41                             |

The National Panel Survey of Marine Recreational Fishers is a snapshot of fishing activity over a fishing year, and it is not appropriate to draw robust conclusions around increases or reductions in recreational harvest solely from this information. Factors such as weather, wind, swell, water temperature and fuel prices all determine how much fishing occurs in any given year.

## 8.3 Commercial trends

Snapper and flatfish are key fish stocks in the Top of the South mixed trawl fishery. Reports from commercial fishers are that the abundance of snapper is proving problematic, noting they are modifying headlines and changing target species to avoid over-catching snapper. Changes in fishing practices to avoid snapper is resulting in fishing effort being shifted to other fish stocks, and potentially constraining the catch of flatfish. Assessment of catch reporting data is consistent with the reports from commercial fishers with gurnard, rig, John dory, elephant fish and snapper frequently over caught, but flatfish under caught (see Appendix 1).

## 9 Current management controls

Table 2: Current controls on commercial and recreational fisheries by stock

| Fish stock | Commercial controls other than TACC  | Recreational controls  |
|------------|--|--|
| GUR 7      | Standard regulatory 100mm trawl mesh size applies. No specified minimum fish length  | Minimum fish length 25 cm  |
| SPO 7      | Standard regulatory 100mm trawl mesh size applies. No specified minimum fish length<br><br>Farwell spit SPO voluntary set netting and trawling closure for pupping females   |  |
| JDO 7      | Standard regulatory 100mm trawl mesh size applies. No specified minimum fish length  |  |
| ELE 7      | Standard regulatory 100mm trawl mesh size applies. No specified minimum fish length  |  |
| FLA 7      | Standard regulatory 100mm trawl mesh size applies<br><br>Minimum fish length 25cm (except sand flounder, which is 23 cm)   | Minimum fish length (except sand flounder) 25 cm<br><br>Minimum fish length sand flounder 23 cm  |
| SNA 7      | Standard regulatory 100mm trawl mesh size<br><br>Minimum fish length 25cm<br><br>Tasman Bay voluntary trawl closure from 1 November to 30 April to protect juvenile snapper  | <b>Outside of Marlborough Sounds</b><br><br>Minimum fish length 25 cm<br><br>Maximum daily limit (per fisher) 10<br><br><b>Within Marlborough Sounds</b><br><br>Minimum fish length 25 cm<br><br>Maximum daily limit (per fisher) 3<br><br>Set net bans apply  |
| All        | Numerous area and method restrictions, as set out in the Fisheries (Challenger Area Commercial Fishing) Regulations 1986 and Fisheries (Commercial Fishing) Regulations 2001 | Unless otherwise stated, minimum net mesh size of 100 mm applies<br><br>A combined maximum daily bag limit of 20 finfish (of any combination) listed on Fisheries New Zealand's website ( <a href="https://www.fisheries.govt.nz/travel-and-recreation/fishing/fishing-rules/challenger-region-fishery-management-area/#twistie">https://www.fisheries.govt.nz/travel-and-recreation/fishing/fishing-rules/challenger-region-fishery-management-area/#twistie</a> )<br><br>Numerous methods and area restrictions apply as set out in the Fisheries (Amateur Fishing) Regulations 2013 |

## 10 Options – Varying or setting the TAC, TACCs and allowances

Table 2 below shows the proposed TAC, TACC and allowances for red gurnard, rig, John dory and elephant fish. No changes to settings are being proposed for October 2019 for flatfish and snapper. These will be considered as stage two of the review.

This is the first time a TAC has been set for elephant fish in the ELE 7 fishery; therefore, customary, recreational, and other sources of mortality allowances are required to be set.

Table 3: Current and proposed TACs, TACCs and allowances in tonnes for red gurnard, rig, John dory and elephant fish.

| Stock | Option                         | Total Allowable Catch (t) | Total Allowable Commercial Catch (t) | Allowances          |                  |   |
|-------|--------------------------------|---------------------------|--------------------------------------|---------------------|------------------|---|
|       |                                |                           |                                      | Customary Māori (t) | Recreational (t) | All other mortality caused by fishing (t) |
| GUR 7 | Option 1 ( <i>Status quo</i> ) | 1,065                     | 975                                  | 15                  | 25               | 50  |
|       | Option 2                       | 1,176 ↑                   | 1073 ↑ (10%)                         | 15                  | 38 ↑ (50%)       | 50  |
|       | Option 3                       | 1,273 ↑                   | 1170 ↑ (20%)                         | 15                  | 38 ↑ (50%)       | 50  |
| SPO 7 | Option 1 ( <i>Status quo</i> ) | 346                       | 271                                  | 15                  | 33               | 27  |
|       | Option 2                       | 373 ↑                     | 298 ↑ (10%)                          | 15                  | 33               | 27  |
|       | Option 3                       | 400 ↑                     | 325 ↑ (20%)                          | 15                  | 33               | 27  |
| JDO 7 | Option 1 ( <i>Status quo</i> ) | 226                       | 209                                  | 2                   | 4                | 11  |
|       | Option 2                       | 247 ↑                     | 230 ↑ (10%)                          | 2                   | 4                | 11  |
| ELE 7 | Current setting                |                           | 102                                  |                     |                  |   |
|       | Option 1                       | 127                       | 102                                  | 5                   | 10               | 10  |

## 11 Analysis of options for varying or setting the TAC, TACC and allowances

### 11.1 Options for varying TAC

The best available information suggests the biomass for red gurnard and John dory is very likely to be at or above target, although the preliminary 2019 WCSI trawl survey results for JDO 7 suggest a decline in biomass. Rig is likely to be at or above the target biomass. Elephant fish is about as likely as not to be at target. This information suggests that there is an opportunity to increase catch limits for some of these stocks.

Therefore, Fisheries New Zealand is proposing increases to the current TACs for red gurnard, rig and John dory, and that a TAC be set for elephant fish for the first time.

These proposals will contribute towards the achievement of the Te Waipounamu Iwi Forum Fisheries Plan management objectives. Particularly objective 3, to supporting environmentally responsible, productive, sustainable and culturally appropriate commercial fisheries that create long-term commercial benefits and economic development opportunities for South Island iwi.

Fisheries New Zealand considers the proposals in this paper will not impact on, or be impacted by, the taiāpure of Whakapuaka (Delaware Bay), or the mātaihai reserves of Okuru/Mussel Point, Tauperikaka, Mahitahi/Bruce Bay, Manakiaua/Hunts Beach, Okarito Lagoon, Te Tai Tapu (Anatori), and Te Tai Tapu (Kaihoka). Commercial fishing is prohibited in the mātaihai reserves; and the large area of QMA 7 in combination with the modest TAC increases proposed, means there is unlikely to be any change in fishing patterns or the abundance of these stocks.

Two TAC increase options are proposed for red gurnard and rig, based on either a 10% or 20% increase in the TACC and, in the case of gurnard, an increase to the recreational allowance as well. An increase in the TACC of 10% is proposed for John dory. These options take into account the uncertainty associated with the scientific and other available information on these stocks. No increase

in the TACC is proposed for ELE 7. However, a TAC and allowances will be set for this species which is caught as part of the Top of the South trawl fishery.

Changes to the TAC and TACC for one stock in this multispecies fishery will likely have effects on the other stocks that are caught with it, potentially influencing the choice of options. These effects are considered in more detail below.

## 11.2 Setting TAC for ELE 7

This is the first time a TAC has been set for the ELE 7 fishery. In setting a TAC for elephant fish, customary, recreational, and other sources of mortality allowances are also required. When introduced into the QMS, a TACC was based on the historic commercial catch levels, and there was no requirement to set a TAC or allowances.

There is little information available on the importance of elephant fish (*reperere*) to customary and recreational fishers. The National Panel Survey of Marine Recreational Fishers for both 2011/12 and 2017/18 did not obtain enough data to provide a reasonable estimate of recreational harvest, suggesting recreational catch is low. There is little customary catch of *reperere* reported. Allowances of 10 tonne for recreational fishing and 5 tonnes for customary fishing are proposed for ELE 7, which aligns with the allowance for other stocks in this fishery. Fisheries New Zealand will be meeting with tangata whenua during consultation for their input on the customary allowance. We also seek submissions and further information from recreational fishers on the recreational allowance.

The allowance for other sources of fishing-related mortality of 10 tonne is consistent with elephant fish settings in other QMAs and, as a proportion of the TAC, with other stocks in this fishery.

As more information becomes available on this low information stock, these settings may be further adjusted.

## 11.3 Options for setting and varying the TACC

Based on the above analysis, the three options for the TACC for red gurnard and rig are; the status quo (Option 1); a cautious increase to the TACC of 10% (Option 2); an increase of 20% (Option 3). Two options are proposed for John dory, the status quo (Option 1); a cautious increase in the TACC of 10% (Option 2). Only one TACC option is proposed for ELE 7 (Option 1).

Options 2 and 3 provide greater economic benefits, are likely to better reflect the abundance of these stocks, and will assist commercial fishers to access a more comprehensive ACE package. However, they may also potentially present greater sustainability risk.

Fisheries New Zealand has estimated the value of the Tasman and Golden Bays commercial fisheries for the 2017/18 fishing year, based on port prices. Overall the Tasman and Golden bay fisheries generate approximately \$2.3 million. Gurnard, rig, John dory, and elephant fish equate to approximately \$1.4 million of this total. It is important to note that port price is what the commercial fisher receives, not what the fish is worth at market (which is higher). Nor does it reflect the income for Licensed Fish Receivers (including, wholesalers and/or processors) and retailers.

### Multi-species effects

With this review Fisheries New Zealand is moving towards more explicit consideration of interactions within a fisheries complex and within an ecosystem. To test the wider impacts of the proposed TAC and TACC options across the multiple stocks in the Top of the South trawl fishery, Fisheries New Zealand has analysed the following (see Appendix 1):

- catch proportions across the six stocks
- percentage of TACC caught per fishing year for each stock
- the target and bycatch relationship between the six stocks over the last five years

- biological information
- stock status and when it was last assessed.

This analysis suggests the following:

- When targeting snapper, the typical bycatch mix (greatest to lowest proportion) is red gurnard, flatfish and rig
- When targeting flatfish, the typical bycatch mix (greatest to lowest proportion) is red gurnard, snapper and John dory
- When targeting red gurnard, the typical bycatch mix (greatest to lowest proportion) is snapper, John dory and rig.

Elephant fish is not a target species but does occur as bycatch, typically in the red gurnard and John dory target trawls. It was a relatively significant bycatch in the rig target trawls in the 2015/16 fishing year.

There appear to be three tiers of interdependency within the fishery. One with gurnard, flatfish and snapper, the second with gurnard, snapper and John dory, and the third with gurnard and rig. These fish stocks have a range of productivities. For example, snapper is a low productivity stock (it is long-lived and has low natural mortality) while gurnard and John dory are higher productivity stocks as they are shorter lived and have relatively high natural mortality. Elephant fish is an elasmobranch, and therefore has very low productivity.

Species with high productivities are more resilient to fishing pressure and take less time to rebuild from a depleted state than those with low productivity. An appropriate management strategy for species such as red gurnard in GUR 7 and John dory in JDO 7 is to be responsive to fluctuations in stock biomass (for example, to increase catches at times of high stock biomass and reduce catches at times of low biomass). Conversely, an appropriate management approach for snapper in SNA 7 is to set a longer-term, more stable TAC.

Fisheries New Zealand is proposing options to increase the TACC for gurnard, rig and John dory. An increase in the TACC for red gurnard may result in an increase in bycatch of John dory and rig. An increase in the TAC and TACC of rig is likely to see an increase in the catch of red gurnard, which in turn may influence the bycatch of John dory.

Elephant fish catch appears to be more independent of catch of other species in this fishery, although based on catches in 2015/16, under certain circumstances an increase in the TACC for rig may result in increased catch of elephant fish.

Flatfish has adequate headroom in its TACC to cover increases in catch in response to an increase in gurnard TACC. There is a risk the proposed increase in gurnard TACC will increase the catch of snapper until a decision is made on this fish stock following the results of the proposed stock assessment. Given the relatively high deemed value setting, the evidence of increasing snapper biomass, and the success industry has had in modifying fishing patterns to avoid snapper to-date, this risk may be low.

Overall, Fisheries New Zealand considers the proposed increases in gurnard, rig and John dory, and the proposed TAC for elephant fish, are sustainable in the context of high biomass trends and/or stocks that are above target levels of abundance. This is particularly the case, given that these stocks are regularly monitored and the increases will be re-evaluated during stage 2 of this review.

## 11.4 Customary, recreational and other sources of fishing-related mortality allowances

When setting a TAC, the Minister is required to make allowances for Māori customary non-commercial fishing interests, recreational fishing interests, and all other mortality to the stock caused by fishing.

Recreational and customary harvests are relatively low compared to the commercial catch, but may be increasing due to the increased abundance of these stocks.

In 2017, the customary allowance for GUR 7 was increased from 10 tonnes to 15 tonnes in response to feedback from the Te Waka a Māui me Ōna Toka Iwi Forum that an increase was required to accommodate any future pataka, and the roll out of the amendment of the Fisheries (South Island Customary Fishing) Regulations 1999. Amendment to these regulations has not yet occurred; in the interim Fisheries New Zealand considers the current allowance should be retained.

Fisheries New Zealand has no new information to support changing customary allowances for rig, John dory and elephant fish. Should new information be provided through further input from iwi or during the consultation process, Fisheries New Zealand will consider this information and may recommend a change in customary allowances in advice to the Minister for his decision.

Based on the results of the 2017/18 National Panel Survey of Marine Recreational Fishers, recreational catch of red gurnard, snapper and flatfish is estimated to have increased since the last survey in 2012. The information for snapper and flatfish will be considered as part of stage two of this review.

Recreational catch of red gurnard (estimated at 38 tonnes) may be exceeding the current recreational allowance for GUR 7 (25 tonnes). Under Options 1 and 2, Fisheries New Zealand proposes a 50% increase in the recreational allowance from 25 tonnes to 38 tonnes, noting that recreational catch remains small relative to the TAC.

Rig and John dory estimates from the National Panel Survey of Marine Recreational Fishers are stable, and remain within the current recreational allowances. No changes are proposed for these stocks.

Fisheries New Zealand considers the current settings for other sources of fishing-related mortality are appropriately set and notes that they are at or above 5% of the TAC, which was considered to be an appropriate minimum level for species in this fishery in previous decisions.

## 12 Environmental interactions

When considering the impact of the proposed increases, the environmental interactions described below are relevant.

### Marine mammals

Hector's dolphins occur around most of the South Island in three recognised subpopulations. The fisheries risk to Hector's dolphins for the north coast South Island is moderate; it is estimated that commercial fishing is currently responsible for on average around one Hector's dolphin death per year (range 0.36-2.2). Of these, commercial trawls are estimated to be responsible for around 30% of the deaths. However, the estimated population size and spatial distribution that underlie this estimate are both uncertain.

The Maui and Hector's Dolphin Threat Management Plan (the plan) guides management approaches for addressing both non-fishing and fishing-related impacts on Maui and Hector's Dolphins. The plan includes a range of measures designed to reduce interaction with Hector's dolphins in the bottom trawl fisheries, and is currently being reviewed with public consultation on options due soon.

Fisheries New Zealand considers the increases to catch limits proposed are modest and are not likely to significantly increase trawl effort, as they reflect increased fish abundance and CPUE. Therefore, the risk of the proposed options increasing the adverse effects on marine mammals is considered low.

## Seabirds

Seabird interactions with New Zealand's commercial fisheries are managed under the 2013 National Plan of Action to Reduce the Incidental Captures of Seabirds in New Zealand Fisheries (NPOA Seabirds). Tasman and Golden Bays are not areas of high abundance for at-risk ocean going seabirds that typically have interactions with trawl vessels and associated gear. Due to the low abundance of seabirds, these areas are considered low risk for seabird interactions.

The NPOA Seabirds has established a risk-based approach, targeting management actions at the species most at risk, but also aiming to minimise captures of all species to the extent practicable. The NPOA Seabirds is currently being reviewed.

Fisheries New Zealand considers the increases to catch limits proposed are modest and are not likely to significantly increase trawl effort, as they reflect increased fish abundance and CPUE. Therefore, the risk of the proposed options increasing seabird interactions is considered low.

## Biological diversity and benthic impact

Trawling can directly impact on biological diversity; however, the proposed increases are modest and are not likely to significantly increase trawl effort as they reflect increased fish abundance and CPUE. Trawling in this fishery is also typically confined to areas that have been consistently fished over time (rather than areas of high biodiversity).

Research has characterised both New Zealand's benthic environment and the level of benthic impact from fisheries activity (Aquatic Environment and Biodiversity Annual Review 2017). The environmental impacts of fishing are summarised annually by Fisheries New Zealand. Fisheries New Zealand will continue to monitor the bottom trawl footprint of fisheries.

## 13 Stage two of review: Snapper and flatfish

TACCs were set high for flatfish when the QMS was introduced in 1986 to allow fishers to take advantage of times of high abundance. The TACC for FLA 7 was originally set at 1,840 t, then a number of small annual increases occurred up to 1989 to bring it to the current TACC of 2,066 t. This TACC has never been fully caught.

Over time TACCs have been reduced to address sustainability concerns in some flatfish stocks (eg, FLA 3 and FLA 1). We invite initial submissions on whether the relatively low catch in FLA 7 indicates a potential sustainability concern for some or all the species that make up the FLA 7 grouping (flounders, sole and turbot).

SNA 7 is at about the interim target biomass. However, anecdotal feedback from fishers, catch reporting, and the preliminary results from the 2019 WCSI trawl survey suggest biomass is continuing to increase for this fish stock. Fisheries New Zealand will bring forward the next scheduled SNA 7 stock assessment from 2021 to 2019/2020. This stock assessment, combined with a new SNA 7 catch-at-age study scheduled for 2019/2020, will inform a review of SNA 7. However, further engagement and consultation with all sectors will occur before any decisions on the TAC and allowances in this important fishery are made.

## 14 Questions for submitters on options for varying TACs, TACCs and allowances

Fisheries New Zealand seeks your input and views on preferred options and the reasons for those. We are particularly interested in:

- Which option(s) do you support for revising the TACs, TACCs and allowances? Why?
- If you do not support any of the options listed, what alternative should be considered? Why?

The table in Appendix 1 provides a summary, which you may find useful to formulate your feedback.

Fisheries New Zealand also invites initial feedback and input from iwi and stakeholders on preferred engagement and management options for snapper and flatfish, and whether catch reporting indicates a potential sustainability concern for flatfish.

## 15 Referenced reports

Aquatic Environment and Biodiversity Annual Review 2018 is accessible at <https://www.mpi.govt.nz/dmsdocument/34854-aquatic-environment-and-biodiversity-annual-review-aebar-2018-a-summary-of-environmental-interactions-between-the-seafood-sector-and-the-aquatic-environment>

Draft National Inshore Finfish Fisheries Plan (2011) is accessible at <https://www.fisheries.govt.nz/dmsdocument/20816/send>

Fisheries (Amateur Fishing) Regulations 2013 is accessible at <http://www.legislation.govt.nz/regulation/public/2013/0482/latest/DLM3629901.html?src=qs>

Fisheries (Challenger Area Commercial Fishing) Regulations 1986 is accessible at <http://www.legislation.govt.nz/regulation/public/1986/0218/latest/DLM107955.html?src=qs>

Fisheries (Commercial Fishing) Regulations 2001 is accessible at <http://www.legislation.govt.nz/regulation/public/2001/0253/latest/DLM76407.html?src=qs>

Fisheries New Zealand (2018). Fisheries assessment plenary May 2018 – Volumes 1-3 are accessible at <https://www.mpi.govt.nz/growing-and-harvesting/fisheries/fisheries-management/fish-stock-status/>

Fisheries Assessment Plenary May 2019: <https://www.fisheries.govt.nz/news-and-resources/science-and-research/fisheries-research/>

Harvest Strategy Standard for New Zealand Fisheries, (2008) is accessible at <https://fs.fish.govt.nz/Doc/16543/harveststrategyfinal.pdf.ashx>

National Panel Survey of Marine Recreational Fishers 2011/12, (2014) is accessible at <https://www.mpi.govt.nz/dmsdocument/4719-far-201467-national-panel-survey-of-marine-recreational-fishers-201112-harvest-estimates>

Wynne-Jones, J; Gray, A; Heinemann, A; Hill, L; Walton, L (2019). National Panel Survey of Marine Recreational Fishers 2017–2018. Draft New Zealand Fisheries Assessment Report held by Fisheries New Zealand.

Quota Management System information is accessible at <https://www.fisheries.govt.nz/law-and-policy/legal-overviews/fisheries/quota-management-system/>

Stevenson, M.L; MacGibbon, D.J (2018). Inshore trawl survey of the west coast South Island and Tasman and Golden Bays, March-April 2017 (KAH1703). New Zealand Fisheries Assessment Report 2018/18 is accessible at <https://fs.fish.govt.nz/Page.aspx?pk=113&dk=24603>

Stock status table for fish stocks (2018) <https://www.mpi.govt.nz/dmsdocument/17653-stock-status-table-for-fish-stocks>

The NPOA Sharks 2013 is accessible at: <https://www.mpi.govt.nz/dmsdocument/1138-national-plan-of-action-for-the-conservation-and-management-of-sharks-2013>.

## 16 How to get more information and have your say

Fisheries New Zealand invites you to make a submission on the proposals set out in this discussion document. We must receive your submission by 5pm on 26 July 2019. Please see the Fisheries New Zealand sustainability consultation webpage (<https://www.fisheries.govt.nz/news-and-resources/consultations/review-of-sustainability-measures-for-1-october-2019>) for related information, a helpful submissions template, and information on how to submit your feedback. If you cannot access the webpage or require hard copies of documents or any other information, please email [FMSubmissions@mpi.govt.nz](mailto:FMSubmissions@mpi.govt.nz).



## Appendix 1: Characterisation of the Tasman and Golden Bays mixed-trawl fishery, using gear that is configured for the flatfish trawl mix.

| Stock | Total Allowable Catch (t) | Total Allowable Commercial Catch (t) | Allowances      |              |  | Catch  |       |       |       |                                   |       |       |       |  |       | Biological info |       |       |       |  |                        | Stock status |  |
|-------|---------------------------|--------------------------------------|-----------------|--------------|--|--|-------|-------|-------|-----------------------------------|-------|-------|-------|--|-------|-----------------|-------|-------|-------|--|------------------------|--------------|--|
|       |                           |                                      | Customary Māori | Recreational | All other mortality to the stock caused by fishing | Catch proportions (%) across the six stocks only |       |       |       | % of TACC caught per fishing year |       |       |       | Percentage of catch mix associated with each stock's target trawls (descending down the rows for each stock from 2017/18 for each fishing year).<br>Bycatch species in the following columns and target species in the stock column. |       |                 |       |       |       | Harvest (t)  | At or above target?    | Date         |  |
|       |                           |                                      |                 |              |  | 14/15  | 15/16 | 16/17 | 17/18 | 14/15                             | 15/16 | 16/17 | 17/18 | JDO  | GUR   | SPO             | ELE   | FLA   | SNA   |  |                        |              |  |
| GUR 7 | 1,065                     | 975                                  | 15              | 25           | 50   | 39   | 39    | 35    | 37    | 109                               | 101   | 107   | 90    | 7.98   | 31.03 | 3.96            | 0.06  | 4.85  | 8.01  | Fast growth/short life, large fluctuations in stock biomass  | Very likely            | 2018         |  |
|       |                           |                                      |                 |              |  |  |       |       |       |                                   |       |       |       | 5.53   | 24.21 | 4.23            | 0.01  | 1.87  | 14.74 |  |                        |              |  |
|       |                           |                                      |                 |              |  |  |       |       |       |                                   |       |       |       | 5.01   | 27.06 | 3.37            | 0.02  | 2.71  | 6.41  |  |                        |              |  |
|       |                           |                                      |                 |              |  |  |       |       |       |                                   |       |       |       | 4.16   | 23.30 | 3.81            | 0.07  | 1.49  | 8.74  |  |                        |              |  |
|       |                           |                                      |                 |              |  |  |       |       |       |                                   |       |       |       | 4.68   | 22.28 | 3.24            | 0.07  | 4.89  | 11.56 |  |                        |              |  |
| SPO 7 | 346                       | 271                                  | 15              | 33           | 27   | 11   | 11    | 10    | 10    | 106                               | 101   | 105   | 100   | 6.20   | 12.40 | 25.19           | 0     | 0.39  | 14.34 | Lifespan uncertain but likely to live for 20+ years.   | Likely                 | 2016         |  |
|       |                           |                                      |                 |              |  |  |       |       |       |                                   |       |       |       | 8.33   | 29.17 | 16.67           | 0     | 12.5  | 0     |  |                        |              |  |
|       |                           |                                      |                 |              |  |  |       |       |       |                                   |       |       |       | 4.67   | 32.96 | 19.5            | 12.63 | 2.61  | 0     |  |                        |              |  |
|       |                           |                                      |                 |              |  |  |       |       |       |                                   |       |       |       | 3.25   | 10.13 | 54.39           | 0     | 4.65  | 8.97  |  |                        |              |  |
|       |                           |                                      |                 |              |  |  |       |       |       |                                   |       |       |       | 1.53   | 5.93  | 14.75           | 0     | 3.05  | 56.78 |  |                        |              |  |
| JDO 7 | 226                       | 209                                  | 2               | 4            | 11   | 7  | 7     | 7     | 9     | 100                               | 101   | 93    | 107   | 18.39  | 18.30 | 4.07            | 0     | 3.9   | 7.63  | Serial spawners, max observed age 12 years. Relatively high natural mort. Fluctuating biomass.   | Very likely            | 2018         |  |
|       |                           |                                      |                 |              |  |  |       |       |       |                                   |       |       |       | 16.99  | 23.78 | 4.74            | 0.08  | 6.13  | 5.21  |  |                        |              |  |
|       |                           |                                      |                 |              |  |  |       |       |       |                                   |       |       |       | 15.29  | 18.02 | 4.32            | 0.77  | 2.42  | 4.91  |  |                        |              |  |
|       |                           |                                      |                 |              |  |  |       |       |       |                                   |       |       |       | 16.37  | 11.11 | 1.68            | 0.05  | 1.78  | 5.61  |  |                        |              |  |
|       |                           |                                      |                 |              |  |  |       |       |       |                                   |       |       |       | 13.37  | 13.05 | 5.30            | 0     | 1.27  | 10.44 |  |                        |              |  |
| ELE 7 | 101.8                     | 101.8                                | 0               | 0            | 0  | 5  | 4     | 3     | 5     | 100                               | 93    | 79    | 111   | -  | -     | -               | -     | -     | -     | Invalidated aging suggests max. age 19+ years – medium productivity stock, potential vulnerable to fishing pressure                          | About as Likely as Not | 2019         |  |
| FLA 7 | 2,065.6                   | 2,065.6                              | 0               | 0            | 0  | 29   | 30    | 34    | 27    | 31                                | 32    | 42    | 31    | 5.08   | 22.59 | 4.06            | 0     | 27.64 | 8.61  | Some flats: fast-growing & short-lived (generally 3-4 years).<br>Brill & turbot are longer lived (21 & 16 years respectively) – invalidated. | unknown                |              |  |
|       |                           |                                      |                 |              |  |  |       |       |       |                                   |       |       |       | 4.85   | 24.38 | 4.31            | 0     | 31.74 | 9.18  |  |                        |              |  |
|       |                           |                                      |                 |              |  |  |       |       |       |                                   |       |       |       | 4.54   | 27.31 | 4.37            | 0.01  | 29.65 | 8.26  |  |                        |              |  |
|       |                           |                                      |                 |              |  |  |       |       |       |                                   |       |       |       | 2.84   | 24.83 | 3.09            | 0     | 33.56 | 8.74  |  |                        |              |  |
|       |                           |                                      |                 |              |  |  |       |       |       |                                   |       |       |       | 3.97   | 27.66 | 3.35            | 0     | 26.92 | 12.29 |  |                        |              |  |
| SNA 7 | 545                       | 250                                  | 20              | 250          | 25   | 10   | 9     | 10    | 11    | 105                               | 95    | 105   | 105   | 3.58   | 17.27 | 5.21            | 0     | 12.63 | 40.47 | Serial spawners (summer and spring). Maturity @ 3-4 years. Live 60+ years  | About as likely as not | 2018         |  |
|       |                           |                                      |                 |              |  |  |       |       |       |                                   |       |       |       | 2.11   | 9.70  | 4.40            | 0     | 5.95  | 65.68 |  |                        |              |  |
|       |                           |                                      |                 |              |  |  |       |       |       |                                   |       |       |       | 3.35   | 10.98 | 3.69            | 0     | 6.91  | 61.69 |  |                        |              |  |
|       |                           |                                      |                 |              |  |  |       |       |       |                                   |       |       |       | 1.79   | 11.88 | 4.25            | 0     | 11.88 | 57.41 |  |                        |              |  |
|       |                           |                                      |                 |              |  |  |       |       |       |                                   |       |       |       | 3.37   | 12.48 | 5.56            | 0     | 9.03  | 55.68 |  |                        |              |  |

### Table key:

- % caught per fishing year (shading represents changes to TACC and duration between changes);
- Target vs bycatch relationships % (orange = highest proportion; green = 2<sup>nd</sup> highest; blue = 3<sup>rd</sup> highest).

The above table provides an overview of the TAC settings, catches, biological and stock status information of the multiple stocks included in this review. The information is intended to guide consideration of the interdependencies between the fish stocks described in section 11.3 of this paper. Fisheries New Zealand seeks feedback on the implications that changing the TAC and TACC for one fish stock will have on the others.