



The Status of New Zealand's Fisheries 2019

February 2020

Introduction

This report summarises the status of New Zealand's fish stocks relative to the requirements of the Harvest Strategy Standard (HSS) for New Zealand Fisheries (2008).¹

Summary

By far the majority of New Zealand's fish stocks are performing well

As of December 2019:

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| <ul style="list-style-type: none">• 81.9% of assessed stocks were above the <i>soft limit</i>• 94.7% were above the <i>hard limit</i>• 72.3% were below the <i>overfishing threshold</i>, and• 73.9% were above their <i>management targets</i>. | <ul style="list-style-type: none">• 94.3% of the assessed landings was made up of stocks above the <i>soft limit</i>• 99.5% was made up of stocks above the <i>hard limit</i>• 90.2% was made up of stocks below the <i>overfishing threshold</i>, and• 92.2% was made up of stocks above their <i>management targets</i>. |
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Background

Managed stocks

Fisheries New Zealand actively assesses and manages 388 species, species complexes, stocks or sub-stocks through the Quota Management System (QMS).

There are currently 642 fish stocks representing 98 species or species complexes in the Quota Management System (QMS). Of these, 297 stocks are considered to be *nominal* stocks, which are species-area combinations (Fishstocks) that do not have a demonstrated significant commercial or non-commercial potential.

For stock assessment purposes and this evaluation, some of the remaining 345 QMS stocks are further sub-divided. An additional five non-QMS Antarctic and Highly Migratory Species (HMS), which are managed via international regional fisheries management organisations, are also included, bringing the total to 388 assessment units.

How we assess stock status

Each year, Fisheries New Zealand convenes a large number of Fisheries Assessment Working Group meetings that produce or update assessments of the status of New Zealand's fish stocks. The Working Groups, led by qualified Fisheries New Zealand scientists, evaluate presentations made by contracted research providers who combine the results of scientific research vessel surveys and other fisheries-independent information with catch and effort reports from commercial fisheries, data from

¹ <http://fs.fish.govt.nz/Page.aspx?pk=113&dk=16543>

our on-board observer programme, and other relevant information. These integrated analyses are summarised in two annual Fisheries Assessment Plenary Reports, currently published in a 2,200+ page document comprising four volumes, available on-line. Fisheries managers subsequently respond to these assessments with Total Allowable Catch (TAC) and Total Allowable Commercial Catch (TACC) increases if warranted, or corrective management actions if needed.

Performance measures

The HSS² specifies four performance measures that are used to evaluate the status of New Zealand's fish stocks and fisheries.

- the *soft limit* – a biomass³ level below which a stock is deemed to be “overfished” or depleted and needs to be actively rebuilt;
- the *hard limit* – a biomass level below which a stock is deemed to be “collapsed”, and fishery closures should be considered in order to rebuild a stock at the fastest possible rate;
- the *overfishing threshold* – a rate of extraction (percentage of a stock removed each year) that should not be exceeded as it will ultimately lead to stock biomass declining below *management targets* and/or biomass limits, if this hasn't already happened; and
- the *management target* – usually a biomass level,⁴ but sometimes a fishing mortality rate,⁵ that stocks are expected to fluctuate around, with at least a 50% probability of achieving the target.

Note the difference between overfished and *overfishing*, which are two different but related concepts: overfished is a state (the stock is below the *soft limit*; i.e. depleted), whereas *overfishing* is an action (fishers are taking a higher than optimal proportion of the stock each year).

Evaluations relative to the *soft limit*, the *hard limit* and the *overfishing threshold* have been undertaken since 2009, while those relative to the *management target* have been conducted since 2008.

Performance measures and corrective management actions

Management targets provide guidance on how well stocks are being managed. For well-managed fisheries, at any given point in time, approximately half of stocks can be expected to be above their *management targets* and half to be below. This is because fish stocks are expected to fluctuate around their *management targets* with at least a 50% probability of achieving the *target*. A stock that is simply below its *management target* does not mean it is overfished or in danger of extinction. However, stocks that are below *management targets* should not be near or below biomass limits.

Fish stocks are expected to fluctuate around their *management targets* ... this means that at any given point in time approximately 50% of stocks should be above their *management targets* and 50% below (but not too far below).

Stocks that are in greater need of corrective management action are those that are below the biomass limits (i.e., *soft* and *hard limits*), or where *overfishing* is occurring. Fisheries New Zealand gives the highest priority to *soft limits* and *hard limits* when making management decisions.

² The HSS aligns with the Fisheries Act 1996, which alongside various Fisheries Plans guide the management of our fish stocks.

³ The biomass of a fish stock is the total weight, in kilograms or tonnes, of a particular species of fish in a defined geographic area.

⁴ Biomass targets are usually related to, or higher than, the biomass associated with the maximum sustainable yield (B_{MSY}).

⁵ A fishing mortality target is usually the fishing mortality (rate of extraction) associated with maximum sustainable yield (F_{MSY}) or a related reference point.

Adjusting the Total Allowable Catch (TAC) or the Total Allowable Commercial Catch (TACC) is the most common corrective management action used by Fisheries New Zealand. When a fish stock is sufficiently high performing, a TAC or TACC may increase. On the other hand, when a fish stock is not meeting its performance measures, a reduction in TAC or TACC can be used to mitigate sustainability risks.

Figure 1 shows the relationship between the *management target* and the biomass limits (i.e., *soft* and *hard limits*) for a stock that is fished perfectly at an optimal constant rate that tracks fluctuations in stock size (i.e., no *overfishing* occurring).

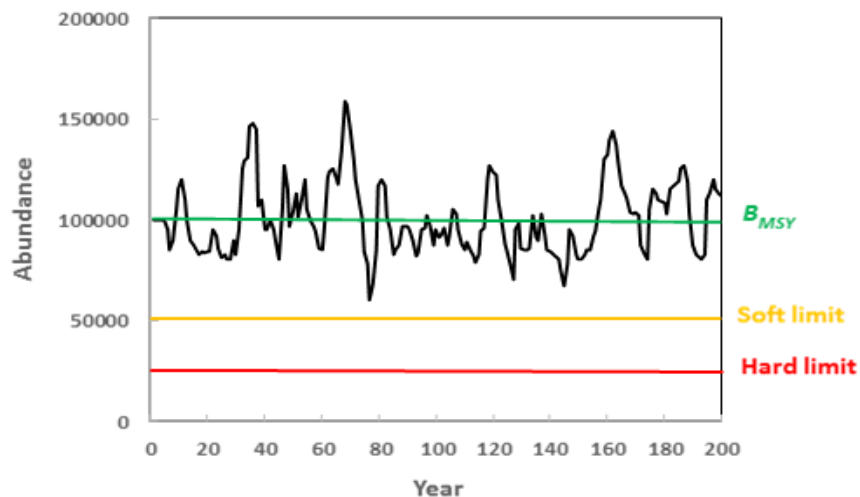


Figure 1. The relationship between the *management target* and the *soft* and *hard limits* for a stock that is fished perfectly at an optimal constant rate that tracks fluctuations in stock size.

2019 evaluations

Analysis

New results for 2019 and recent trends for each of the four performance measures were compiled in terms of six variables:

- i) the number of fish stocks falling above and below each of the four performance measures, in terms of raw numbers;
- ii) the number of fish stocks falling above and below each of the four performance measures, as a percentage of the total number of assessed fish stocks;
- iii) the weight of landings of the fish stocks falling above and below each of the four performance measures, in terms of total tonnes;
- iv) the weight of landings of the fish stocks falling above and below each of the four performance measures, as a percentage of the total tonnes of assessed stocks;
- v) the value of landings (port price in \$ per kg multiplied by total kg caught) of the fish stocks falling above and below each of the four performance measures in terms of total dollars; and

- vi) the dollar value of landings (port price in \$ per kg multiplied by total kg caught) of the fish stocks falling above and below each of the four performance measures, as a percentage of the total dollar value of assessed stocks.

The resulting graphs are set out in **Figures 2, 3 and 4** in Attachment 1. Fish stocks were evaluated against each of the performance measures and categorised and colour coded according to their stock status. This is set out in Table 1 below.

Colour code	Status	Management action
Green	Meets or exceeds performance measures	Continue to monitor
Yellow	Below <i>management target</i>	Continue to monitor
Stippled orange	Above <i>overfishing threshold</i>	Reduce fishing rate
Orange	Below <i>soft limit</i>	Develop formal rebuilding plan
Red	Below <i>hard limit</i>	Consider closure

When summarising overall stock status in terms of the actual numbers (or percentages) of stocks, a large number of small fish stocks are expected to have a disproportionate influence on the overall result. For this reason, it is probably more appropriate to consider stock status in terms of the contribution to the landings (or value of the landings). However, in the latter instances, a single stock with very high landings (or value) can be highly influential. For example, the large reduction from 2008 to 2009 in the percentage of landings made up of stocks below the *management target* is the result of the abundance of the western hoki stock increasing from below to above the *management target* (Figure 3, bottom right).

Results

The number of assessed stocks relative to the four performance measures varies because, for example, while it may not be possible to determine where a stock is relative to its *management target*, it may be clear that it is above the *hard limit*. In 2019, relative to the *soft limit* (the key fisheries management performance measure), assessed stocks accounted for 68% of the total landings by volume and 84% of the total landings by dollar value,⁶ representing most of the main commercial fish species.

Overall, the 2019 evaluation indicates that by far the majority of New Zealand's fisheries are performing well. The majority of New Zealand's fish stocks are meeting or exceeding their performance measures, with relatively few stocks failing to do so (Figures 2, 3, and 4).

Our knowledge of New Zealand's fish stocks is growing as the number of assessed fish stocks has increased over the last decade (Figure 2, top row).

Corrective management actions have a notable effect on mitigating sustainability risks for fish stocks that are not meeting their performance measures. In 2019, there was a low percentage of landings for fish stocks below the *hard limit*, as most of these fish stocks were closed or had previously had their TACs reduced considerably (Figure 3, bottom row).

It is also evident, for all graphs in Figures 2, 3 and 4, that the amount of green far outweighs any other colour. In particular, there is relatively little orange and even less red.

Following early improvements in stock status, improvements appear to be plateauing for most performance measures in recent years.

⁶ This excludes squid, which has a life cycle that is not amenable to management relative to the maximum sustainable yield benchmarks in the Fisheries Act 1996.

Highlights from recent stock assessments and corrective management actions

The following examples represent some of the success stories in terms of stock assessments and/or improved status due to corrective management actions.

Deepwater stocks

The **Puysegur sub-stock of orange roughy** was assessed in 2017 and found to have fully rebuilt since its closure in 1997. Two **Chatham Rise** sub-stocks were re-assessed in 2018 and found to be performing well relative to all performance measures. The **Challenger** stock was also shown to be performing well when it was re-assessed in 2019.

A 2018 assessment of a **smooth oreo** stock demonstrated strong status relative to all performance measures.

Sub-Antarctic ling was re-assessed in 2018 and shown to continue to have excellent status relative to all performance measures. **Chatham Rise ling** was re-assessed in 2019 and also continues to be in excellent condition.

Two **scampi** stocks were re-assessed in 2016, and another was re-assessed in 2018, with all three found to be performing near or above the favourable levels indicated at the time of their previous assessments. Another scampi stock, assessed for the first time in 2017, was also found to be performing exceptionally well against all performance measures.

Highly migratory species

Skipjack tuna was reassessed in 2019 and found to be performing extremely well relative to all management measures.

Inshore finfish stocks

A 2018 assessment for **snapper** along the north and west coasts of the South Island showed that it has increased substantially in size in recent years and is now well above its biomass limits and is at or above its *management target*.

Assessments enabling determination of the status of five **school shark** stocks or sub-stocks were conducted in 2018 and showed that four of these were at or above *management targets* and well above biomass limits, although *overfishing* was occurring. For the other stock, it was determined that it was above its biomass limits, but below its *management target* with *overfishing* occurring.

Three **rig** stocks were successfully assessed in 2019 and all were found to be at or above their *management targets* and well above the *soft* and *hard limits*, although *overfishing* was identified in one instance.

Three **barracouta** stocks were assessed in 2016, 2017 and 2018, indicating that all are well above the *soft* and *hard limits* with one also being above the *management target*.

Stock assessments for six **red gurnard** stocks from 2015-19 show that they are at or above their *management targets* in virtually all areas where they occur, although *overfishing* may be occurring in two areas.

Two **blue cod** stocks were assessed in 2019 and found to be above their *management targets*, although some amount of *overfishing* may be occurring.

Three **stargazer** stocks assessed during 2017–19 were found to be above their *management targets*, although *overfishing* was possible for two of these.

Two **flatfish** stocks were assessed in 2018–19 and found to be at or above their *management targets* and well above their biomass limits.

Two **gemfish** stocks were assessed in 2019 and found to be above the *hard limit*, with no overfishing occurring.

Four **John Dory** stocks or sub-stocks were assessed in 2018 and all were above both the *soft* and *hard limits*, although three of the four were below *management targets* and *overfishing* was occurring for two.

Eels

Four sub-stocks of North Island **longfin eels** were assessed in 2017 and found to be at or above their *management targets* with no evidence of *overfishing*.

Rock lobsters

The first ever successful assessment for **Chatham Islands rock lobster** was completed in 2018 and showed that the stock is above biomass limits, but below the *management target*. Stock status was updated for six other stocks in 2019, with five being above their *management targets* and well above the soft and hard limit, with evidence of *overfishing* for one stock. The sixth stock was well above the *soft* and *hard limits*, but below the *management target* with *overfishing* most likely occurring.

Other shellfish

Two paua stocks assessed in 2018 and 2019 were determined to be well above both the *soft* and *hard limits*, and also above their *management targets*.

Overfished stocks

At the time of their most recent assessment, 29 stocks were considered to be below the *soft limit* (and therefore overfished), out of a total of 160 stocks evaluated relative to the *soft limit* (Figure 2):

- **southern bluefin tuna, Pacific bluefin tuna** and **striped marlin**, which are highly migratory species that are seasonally present in New Zealand waters and are managed by Regional Fisheries Management Organisations
- three stocks of black **cardinalfish**
- two stocks or sub-stocks of **orange roughy**
- one stock of **hake**
- five stocks or sub-stocks of **bluenose**
- three stocks or sub-stocks of **tarakihi**
- two stocks or sub-stocks of **snapper**
- two stocks or sub-stocks of **scallops**
- two stocks or sub-stocks of **oysters**, and
- one stock or sub-stock each of **flatfish, John dory, rock lobster, paua, pipi** and **freshwater eels**.

Nine of these 29 stocks were also considered to be below the *hard limit* (collapsed).

Overfishing was documented for 39 stocks. (For further details see the Status of Stocks page at <https://www.fisheries.govt.nz/protection-and-response/sustainable-fisheries/the-health-of-new-zealands-fisheries/fish-stock-status/>).

Corrective management actions

In all cases where stocks are below the *soft* or *hard limit*, corrective management action has been, or is being, put in place to rebuild the stocks. These changes demonstrate the responsiveness of New Zealand's fisheries management system to the intrinsic fluctuating nature of wild fish stocks and the influence of fishing on stock size, as well as our contributions to the management of international fish stocks.

Three stocks or sub-stocks of **tarakihi** were assessed in 2018 and found to be below the *soft limit*. Initial reductions in TACs and TACCs were implemented in that year, with further management measures implemented in 2019.

The fishery on one **orange roughy** sub-stock has been effectively closed, with a TACC of one tonne, to maximise the rate of rebuilding (another was declared to be rebuilt in 2017). A TACC reduction was implemented for the orange roughy sub-stock on the mid-east coasts of the North and South Islands in 2014.

The Tasman Bay **scallop** fishery has been voluntarily closed to all commercial fishing since 2006, with the Golden Bay scallop commercial fishery following in 2011. Both of these sub-areas, along with the Marlborough Sounds sub-area have been formally closed to both commercial and recreational fishing since 2016.

Bluenose stocks were identified as being in need of rebuilding in May 2008, and four TACC reductions have subsequently been implemented in 2008, 2011, 2012 and 2016 to ensure that the stocks are restored to target levels. A new stock assessment was undertaken in 2016 and another is currently underway.

The Commission for the Conservation of **Southern Bluefin Tuna** (CCSBT) has adopted a management procedure designed to rebuild the stock to interim and long-term target levels. New Zealand is an active member of this Commission. The stock appears to be in the process of rebuilding at present.

STOCK AND FISHERY STATUS INFORMATION BY NUMBER OF STOCKS: 2008-19

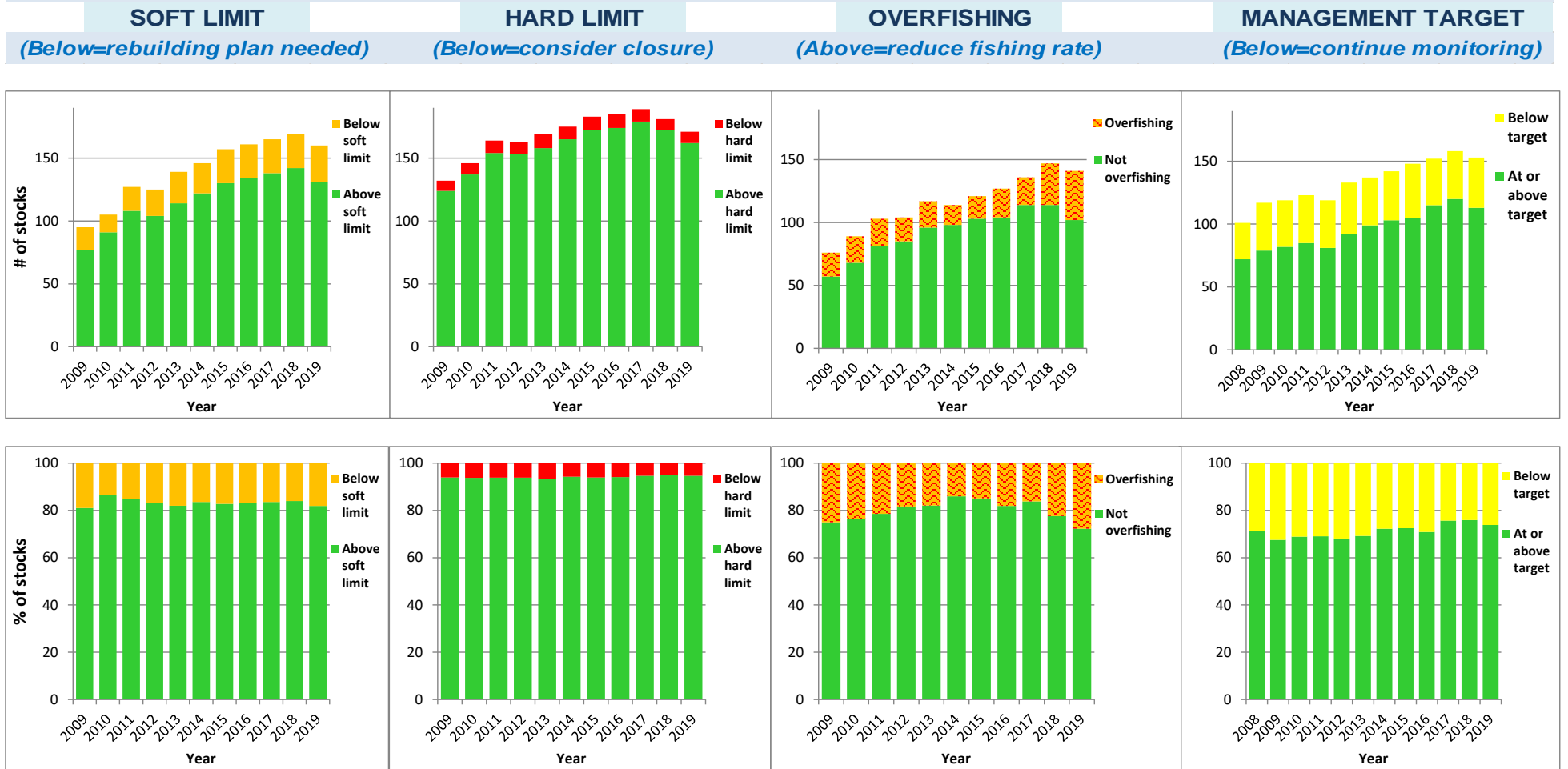


Figure 2. Stock and fishery status by number of stocks and percentage of stocks, 2008-19.

STOCK AND FISHERY STATUS INFORMATION BY VOLUME OF LANDINGS: 2008-19

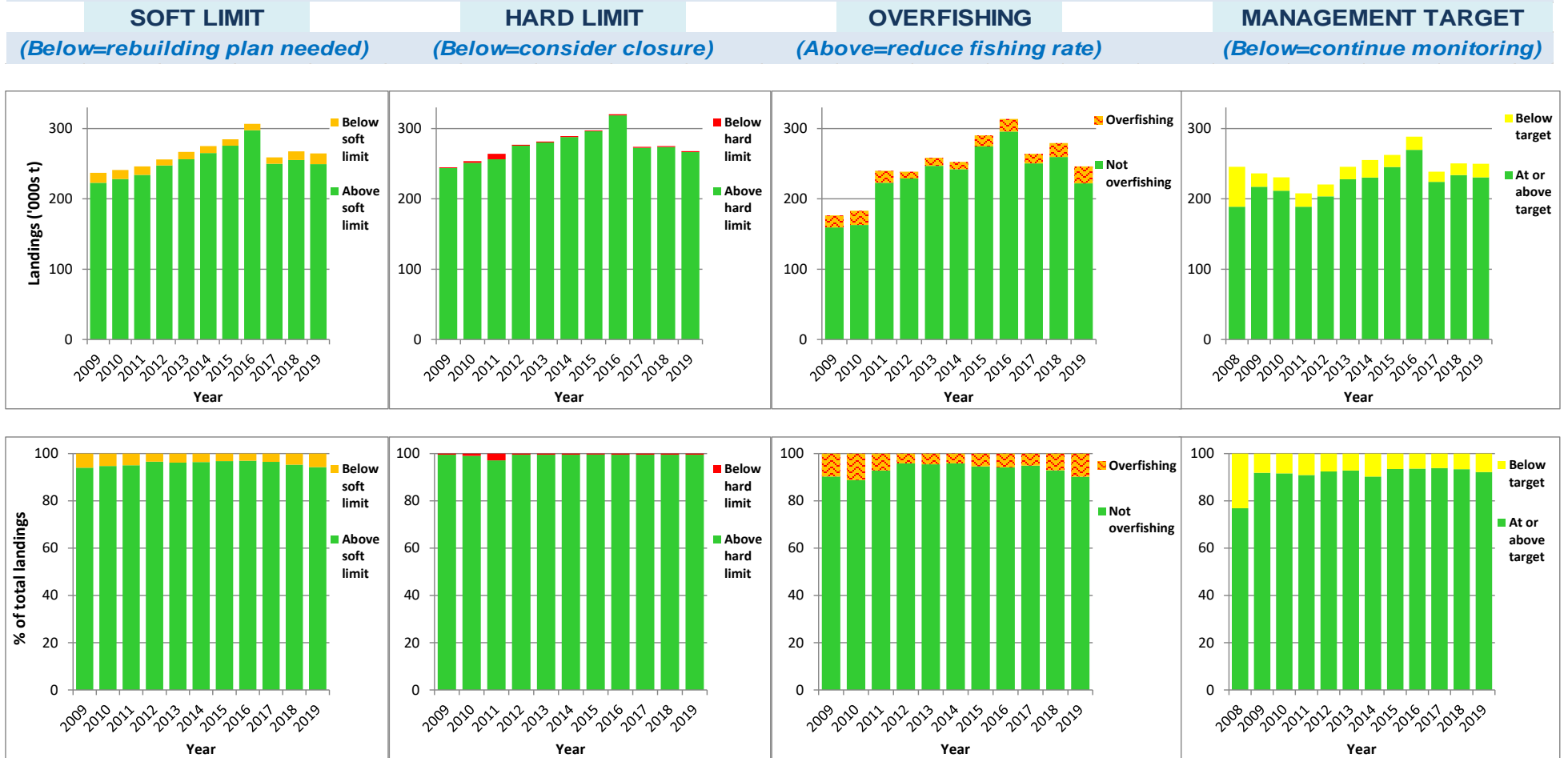


Figure 3. Stock and fishery status by volume of landings (in thousands of tonnes) and percentage of total volume of landings, 2008-19.

STOCK AND FISHERY STATUS INFORMATION BY VALUE OF LANDINGS: 2008-19

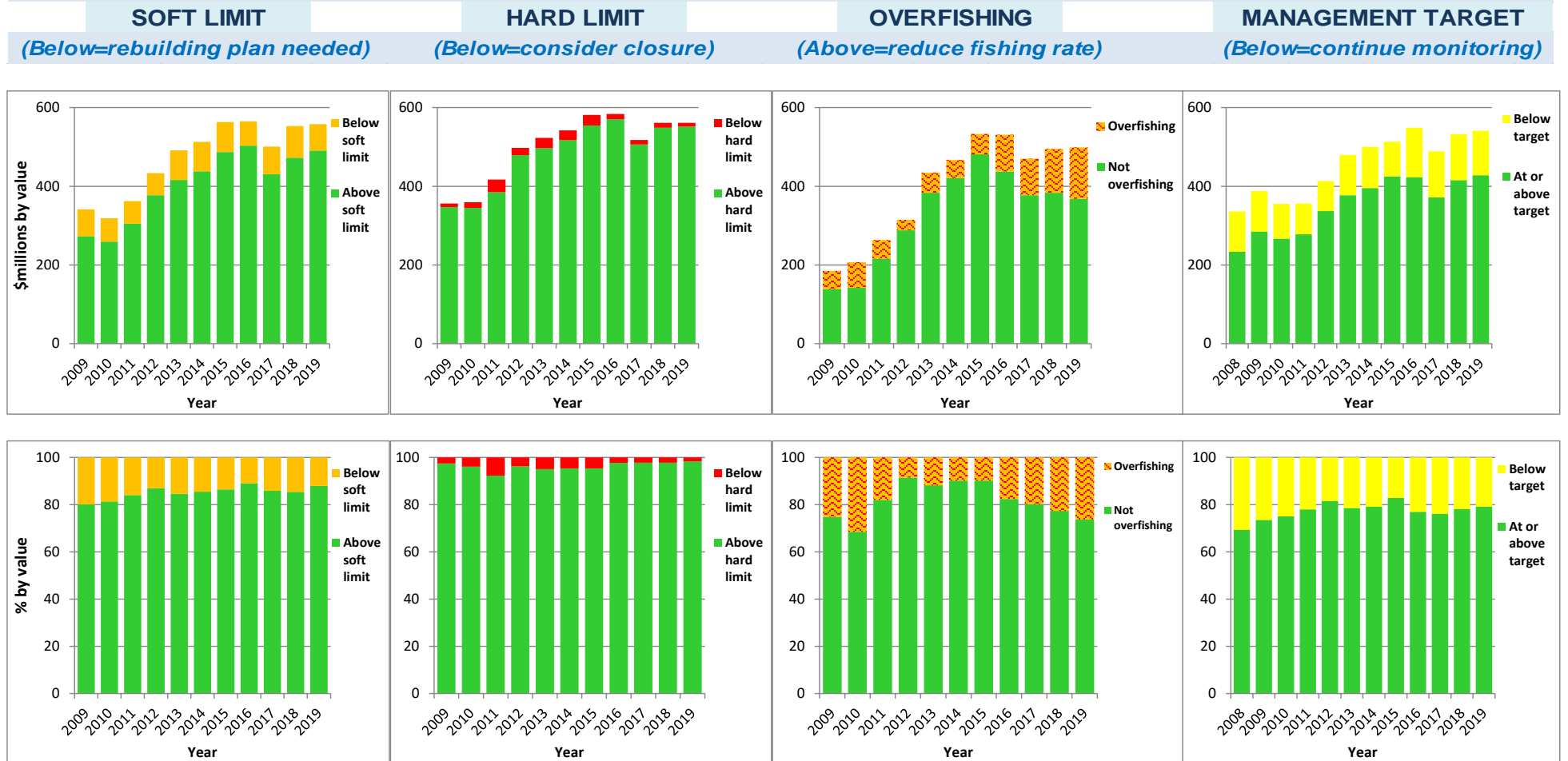


Figure 4. Stock and fishery status by value of landings (\$millions, based on port price information) and percentage of total value of landings, 2008-19.