# The economic contribution of commercial fishing to the New Zealand economy

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MAKING SENSE OF
THE NUMBERS

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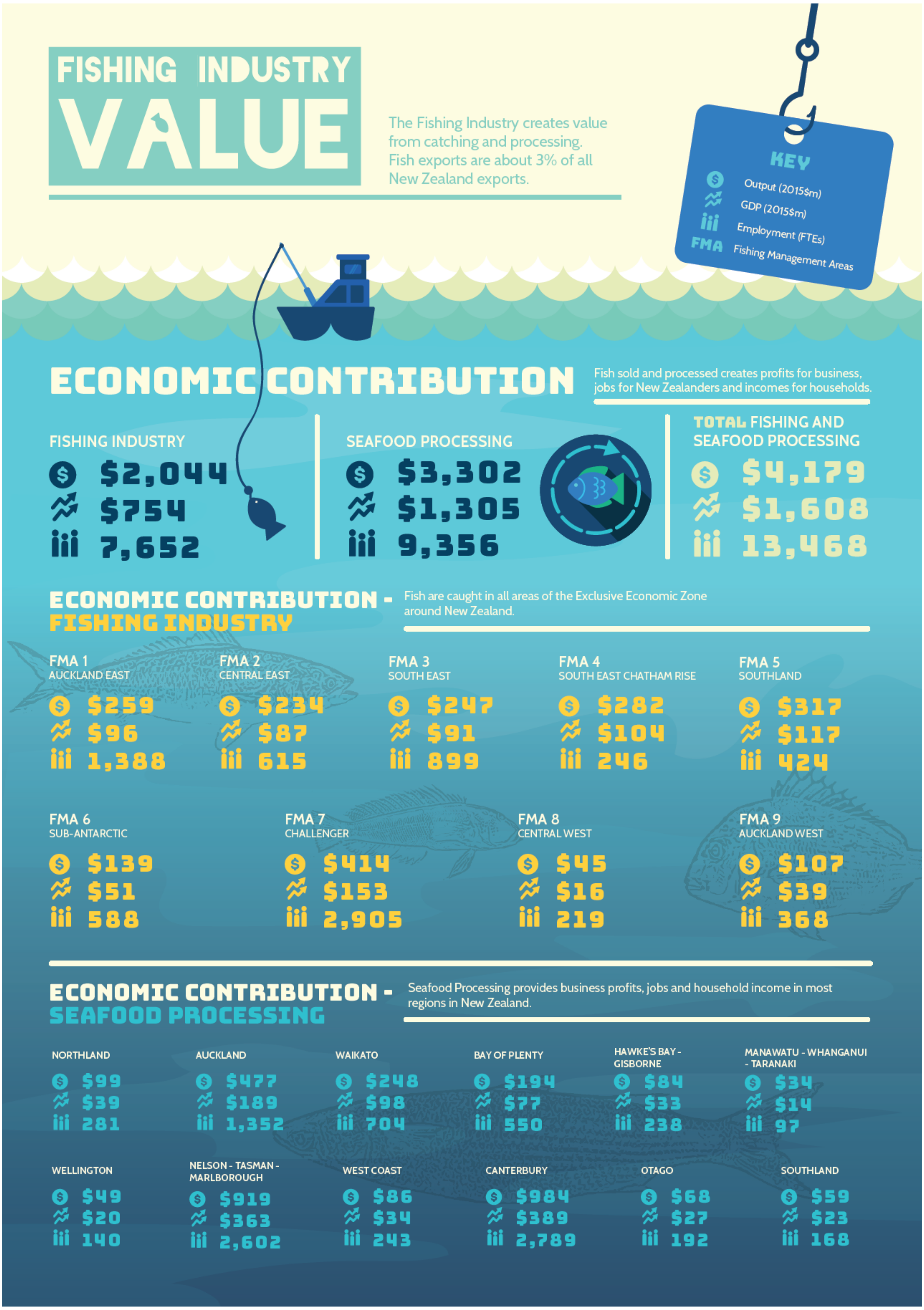
FISHING INDUSTRY
VALUE
The Fishing Industry creates value from catching and processing. Fish exports are about 3% of all New Zealand exports.
KEY
Output (2015$m)
GDP (2015$m)
Employment (FTEs)
FMA Fishing Management Areas
ECONOMIC CONTRIBUTION
Fish sold and processed creates profits for business, jobs for New Zealanders and incomes for households.
FISHING INDUSTRY
$2,044
$754
7,652
SEAFOOD PROCESSING
$3,302
$1,305
9,356
TOTAL FISHING AND SEAFOOD PROCESSING
$4,179
$1,608
13,468
ECONOMIC CONTRIBUTION - FISHING INDUSTRY
Fish are caught in all areas of the Exclusive Economic Zone around New Zealand.
FMA 1
AUCKLAND EAST
$259
$96
1,388
FMA 2
CENTRAL EAST
$234
$87
615
FMA 3
SOUTH EAST
$247
$91
899
FMA 4
SOUTH EAST CHATHAM RISE
$282
$104
246
FMA 5
SOUTHLAND
$317
$117
424
FMA 6
SUB-ANTARCTIC
$139
$51
588
FMA 7
CHALLENGER
$414
$153
2,905
FMA 8
CENTRAL WEST
$45
$16
219
FMA 9
AUCKLAND WEST
$107
$39
368
ECONOMIC CONTRIBUTION - SEAFOOD PROCESSING
Seafood Processing provides business profits, jobs and household income in most regions in New Zealand.
NORTHLAND
$99
$39
281
AUCKLAND
$477
$189
1,352
WAIKATO
$248
$98
704
BAY OF PLENTY
$194
$77
550
HAWKE'S BAY - GISBORNE
$84
$33
238
MANAWATU - WHANGANUI - TARANAKI
$34
$14
97
WELLINGTON
$49
$20
140
NELSON - TASMAN - MARLBOROUGH
$919
$363
2,602
WEST COAST
$86
$34
243
CANTERBURY
$984
$389
2,789
OTAGO
$68
$27
192
SOUTHLAND
$59
$23
168

## Commercial Fishing a Significant Contributor to New Zealand Economy

Commercial fishing plays a significant part in the New Zealand economy. This report, prepared for the New Zealand commercial fishing industry, concludes that on average, in the five years to 2015, commercial fishing provided:

- a direct output value of $1,727 million and a total output value of $4,179 million;
- a direct contribution to gross domestic product (GDP) of $544 million and a total GDP contribution of $1,609 million, being 0.7% of New Zealand GDP,
- direct employment of 4,305 full time equivalents (FTEs) and total employment of 13,468 FTEs, being 0.7% of NZ employment; and
- exports of $1,500 million, being New Zealand's fifth largest export commodity by value and representing 3.2 percent of total exports.

Commercial fishing comprises both capture fishing and seafood processing activities. Fishing activities made up about 50 percent of the output value and the GDP contribution of commercial fishing.

The Fishing industry provides raw products for processing, and relies on the Seafood Processing industry to purchase its harvest. The Fishing industry and the Seafood Processing industry are strongly connected and a number of New Zealand companies operate in both. Consequently, important synergies are exploited in their fishing, processing and marketing. Our valuations account for this overlap.

The commercial fishing industry valuations in this report are unique and given in terms of economic contributions:

- for fishing sectors: Deepwater; Inshore; Highly Migratory Species (HMS); and Shellfish
- for fishing gear and species
- for the Fishing industry and the Seafood Processing industry, separately as well as combined
- derived from catch data from the Ministry for Primary Industries
- for "capture" fishing and so excludes the contribution of the aquaculture industry

In the five years to 2015, on average:

- Deepwater fishing produced a total output value of $1,762 million, total contribution to GDP of $679 million and total employment of 5,679 FTEs
- HMS produced a total output value of $197 million, total contribution to GDP of $76 million and total employment of 637 FTEs
- Inshore fishing produced a total output value of $1,197 million, total contribution to GDP of $460 million and total employment of 3,861 FTEs
- Shellfish produced a total output value of $1,022 million, total contribution to GDP of $394 million and total employment of 3,291 FTEs

The species that underpin the catch value of the fishing sectors are:

- Deepwater: Hoki (38 percent); Ling (13 percent); Arrow Squid (11 percent)
- HMS: Southern Bluefin Tuna (32 percent); Albacore Tuna (23 percent); Skipjack Tuna (20 percent)
- Inshore: Snapper (15 percent); Blue Cod (9 percent); Tarakihi (6 percent)
- Shellfish: Rock Lobster (63 percent) and Paua (28 percent)

The trawling, seining and netting gear sub-industry is the most significant contributor of value, providing just over 60 percent of the fishing value and economic contribution.

FMA 7 Challenger has the largest average catch value, at $164 million over the five years to 2015, followed by FMA 5 Southland ($149 million) and FMA 1 Auckland East ($120 million). FMA1 has the largest catch value for a North Island FMA. Employment in the Fishing sector is similar in magnitude to that of Beef Cattle Farming. Within the Fishing sector, the Seafood Processing industry has greater employment than the Fruit and Vegetable Processing industry and has similar employment to the Apple and Pear Growing industry.

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# 1 Introduction

The focus of our research is marine fishing, excluding aquaculture.

This report was commissioned by Fisheries Inshore New Zealand Limited (FINZ) to provide an evidence base of the value of commercial fishing to the New Zealand economy in order to inform fisheries management decisions. FINZ is a non-profit organisation that was established by quota owners, annual catch entitlement (ACE) holders and fishers to work together to advocate for their interests in inshore finfish, pelagic and tuna fish stocks. FINZ ensures that New Zealand gains the maximum economic yields from its inshore fisheries resources, managed within a long-term sustainable framework.

This report is unique in that we provide estimates of catch value and economic contribution for segments of the commercial fishing industry by:

- sector - Deepwater, Highly Migratory Species (HMS), Inshore, and Shellfish
- geographic location
- method of catch
- species

We have done this on the basis of the catch data held by the Ministry for Primary Industries (MPI).

In this report, "economic contribution" is defined as the gross change[1] in a nation's existing economy that can be attributed to a given industry. It is expressed in three different ways:

- gross output contribution
- gross domestic product (GDP) contribution
- employment contribution

Economic contributions occur from transactions in a market setting. Commercial fishing refers to commercial (profit-oriented businesses) fishing for the capture (non-farmed) and processing of marine (non-freshwater) fish. The economic contribution of the commercial fishing industry is set in a historical context as well as a global context.

Our study reported here differs in important ways from previous studies of other authors on economic contributions of the commercial fishing industry. In particular, this study:

- estimates direct output for the fishing sector that is specifically designed to cover capture fishing and to exclude aquaculture (in either seafood processing or fishing industries).
- uses a five year average catch and value data, which covers the five years up to 2014/15.
- makes use of the latest version of Statistics New Zealand Input-Output tables, whereas previous studies could not.

Chapter 2 provides an overview of the evolution of the commercial fishing industry. Chapter 3 presents the conceptual and empirical methodologies of the study. Chapter 4 presents catch volumes and value. Chapter 5 reports the economic contribution resulting from catch value. Chapter 6 explains the scale and scope of employment in the commercial fishing industry.

[1] Where the change is often measured in terms of output, value added, and employment.

Key themes presented here are:

- Sector:

  A fundamental difference of this report compared with other previous reports is that it provides sector valuations. Such valuations clearly show the impact on the economy that would arise from fisheries management decisions including variations in the total allowable commercial catch.

- Species

  This report reveals the considerable value that is concentrated in a limited number of species. It reveals the risk to economic value should the catch of those species be reduced by fisheries management decisions.

- Region

  This report highlights the importance of different fishing areas to overall economic value. Value by region is influenced by sector and species. Reduction in fishing activity in one geographical area is not compensated by increased fishing in other areas.

- Employment

  This report shows that employment in the fishing sector is comparable to employment in other sectors important to the economy including for export revenue.

- Methodology

  This study uses a transparent input/output multiplier methodology to calculate economic contribution. The results are easily verifiable and reproducible.

# 2 Overview

We begin our discussion with descriptive statistics on fisheries resources and the fishing industry including for species, exports and quota.

## 2.1 Fisheries management in New Zealand

New Zealand's fisheries resources in the territorial sea and the wider Exclusive Economic Zone (EEZ) are managed under the Fisheries Act and the Treaty of Waitangi Settlement Act. The Fisheries Act embodies the concepts of sustainable utilisation of our fisheries resource and ensuring the long-term viability and bio-diversity of the aquatic environment. Environmental considerations are also managed under other enactments such as the Wildlife Act, the Marine Mammals Protection Act, the Marine Reserves Act, and the Resource Management Act. The main environmental impacts are managed under the Fisheries Act. This allows for the resource to be utilised within the limits of ensuring for utilisation of the resources by future generations.

The Quota Management System (QMS) sets the harvest levels of fish species within the EEZ and the Territorial Sea. The main provisions of the QMS are to: maintain fisheries at a sustainable level through the Total Allowable Catch (TAC); allocate that TAC to sectors; allocate the commercial allocation to commercial stakeholders; provide economic incentives and enable rational industry participation; enable quota to be tradable and leasable; track catch against quota via a government monitoring system; and allow quota owners to catch their entitlement. New Zealand currently has 97 fish species or groups of species subject to the QMS. Each species has separate Quota Management Areas (QMA) that are based on biological boundaries. The species are managed as 637 separate fish stocks, a stock being a species within a QMA.

Through the QMS, the Minister for Fisheries sets the annual total allowable catch (TAC) and total allowable commercial catches (TACCs) within this area. The TAC is the total quantity of fishing-related mortality allowed for a QMS stock in a given fishing year. Effectively, the TACs for fish stocks are set so that enough fish remain for breeding at a sustainable level for the future. According to MPI, 83.2 percent of New Zealand's fish stocks are at a healthy status. From the TAC an allowance is made to provide for recreational fishing and customary uses before the TACC is set. The TACC is the total quantity of each fish stock that the commercial fishing industry can catch for that year. Once the TACC is set, the fishing rights are distributed as Annual Catch Entitlement (ACE) to quota owners proportional to their quota shareholdings in that stock. Quota is a right in perpetuity to a share of the available TACC. Both quota and ACE can be traded.

Some components of the QMS are reviewed annually, including the TACCs, deemed values and government levies.

In addition to the species in the QMS, there are a number of other species that are managed outside the QMS. These are stocks that are perceived not to be targets for commercial targets or have no sustainability or utilisation concerns that would warrant their inclusion in the QMS.

The Ministry for Primary Industries (MPI) manages New Zealand's fisheries resources, policy development and fisheries management, including science, monitoring and compliance roles. Strategic and operational fisheries plans are developed for each of New Zealand's fisheries. These give rise to stock assessment and aquatic environment research.

## 2.2 The fishing industry

Approximately 450,000 tonnes of wild fish are sustainably harvested each year through the Quota Management System (QMS). The export value of this harvest ranges from $1.2 to $1.5 billion per annum. In addition to this, the aquaculture industry contributes about $350 million per annum. There are 1,178 commercial fishing vessels registered in New Zealand, and 239 licensed fish receivers and processors.[2]

In the 2014 year – the latest year available - there were 309 enterprises engaged in the Fish Trawling, Seining and Netting industry, 348 in the Line Fishing industry, 366 in Other Fishing enterprises, and 246 enterprises in the Rock Lobster and Crab Potting industry. In the 2014 year there were 132 business units in the Seafood Processing industry.

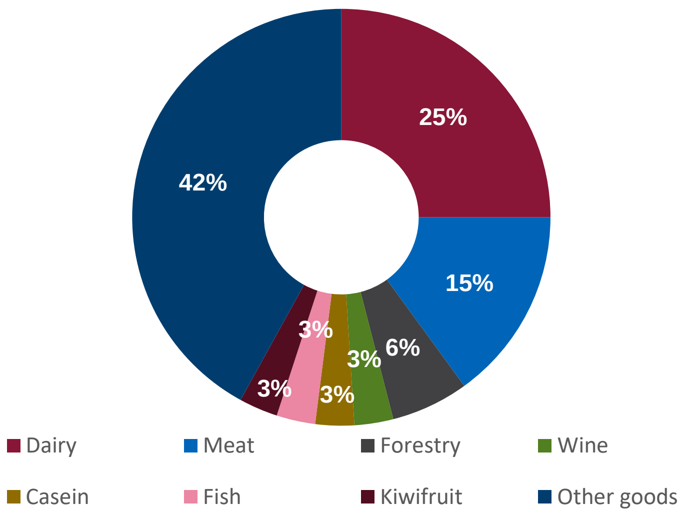
Some 2,200 individuals and companies now own quota as part of the QMS, and this quota is estimated to be worth $3.5 billion. Companies or organisations with large quota ownership in inshore finfish stocks include Te Ohu Kai Moana Trustee Limited, Sanford Limited, Aotearoa Fisheries Limited, Sealord Limited, Talley's Fisheries Limited and Ngai Tahu Fisheries Settlement Limited.

Today the interests of the fishing industry - including rock lobster, paua, deepwater, aquaculture and inshore finfish - are represented by Sector Representative Entities (SREs).[3] Fisheries Inshore New Zealand also represents inshore finfish, pelagic and Tuna quota owners, ACE holders, and commercial fishers. Seafood New Zealand operates as a peak body for the commercial fishing sector.

## 2.3 Exports

In the March 2016 year, fish exports at $1.5 billion are New Zealand's fifth largest export commodity by value. This represents 3.2% of total exports of $46.6 billion, as shown in Figure 1 below. Of this $205 million are exports of frozen Hoki and $302 million are exports of live rock lobster. Processed seafood makes up a substantial proportion of our fish exports.

Figure 1 Exports, selected merchandise, year to March 2016




Source: *Statistics* New Zealand

[2] For further information see, www.fishserve.co.nz.

[3] For further information see, www.seafoodnewzealand.org.nz/industry/our-sectors/

# 3 Methodology

In this chapter we present the conceptual framework and empirical methodology used to estimate the economic contribution of commercial fishing to the New Zealand economy. We compare our methodology to those for previous studies, to explain differences in methods that produce different results.

## 3.1 Definition of the commercial fishing

In this report "commercial fishing" means the industrial activity of the combination of certain sub-groups of the Fishing industry and the Seafood Processing industry. These are described fully in Appendix A. The relevant sub-groups of the Fishing industry are: (i) Fish Trawling, Seining and Netting; (ii) Line Fishing; (iii) Rock Lobster and Crab Potting; Other Fishing. We refer to the combination as the combined Fishing and Seafood Processing industry.

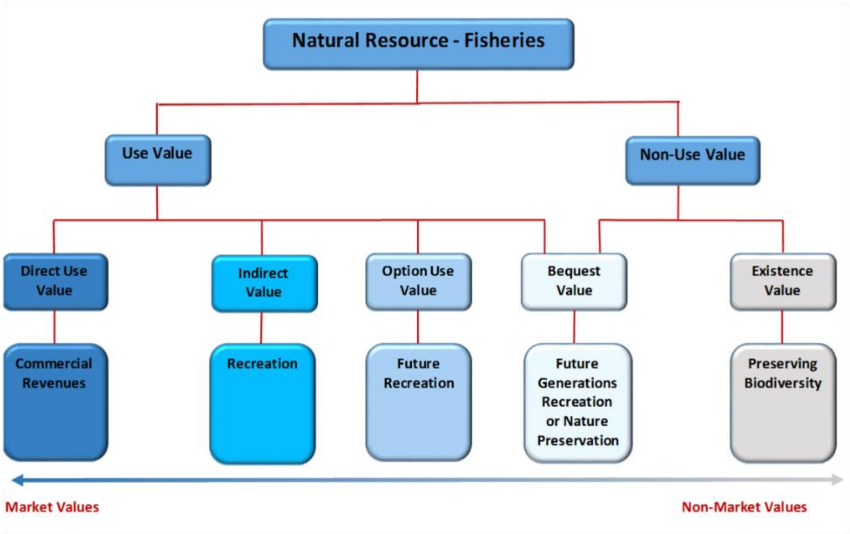
## 3.2 Economic contribution and economic value

In order to derive the economic contribution of the combined Fishing and Seafood Processing industry (in Chapter 5), we first establish the respective gross output values (in Chapter 4) of each of the Fishing industry (as we has defined it) and the Seafood Processing industry. Notably, these are both only concerned with capture marine fishing. These gross output values are calculated using estimates of greenweight catch data multiplied by estimates of port prices in the case of the Fishing industry and by estimates of export prices in the case of the Seafood Processing industry. The output of the Fishing industry is largely an input of the Seafood Processing industry. We account for this overlap in deriving the economic contribution of the combined Fishing and Seafood Processing industry.

In its simplest terms, economic contribution from an economic activity is the cost to the nation if the economic activity stops. More precisely, an economic contribution is defined as the gross changes in a nation's existing economy that can be attributed to a given industry. Economic contributions occur from transactions in a market setting.

Economic contribution is one part of the suite of the total economic value of a fishery resource, as shown in Figure 2.

Figure 2 Total economic value of a fisheries resource



In general, the total economic value of a natural resource is comprised of:

- Use values derived from the actual use of the resource together with other factors in production, including:
    - direct use - actual use resulting in a marketed output
    - indirect use - recreational use resulting in a non-marketed output
    - option use - the right to use the resource in the future for direct or indirect uses
    - bequest use - the conferring of a right to another to use in the future.
- Non-use values where the values are independent of the individual's present use, including:
    - bequest value - the conferring of a right on another to enjoy in the future
    - existence value – the enjoyment or displeasure in the present of knowing that a resource exists.[4]

The use value from commercial fishing can be measured with the associated market-based transactions. The economic contribution is the measure of the use value.

As a comparison, the non-market use value of recreational fishing is not part of the measure of its economic contribution. The non-market use value can be estimated by the willingness of recreational fishers to pay for their enjoyment. This is not easily measured and will differ for different people.

Option values are linked to potential future uses. They can change with changes in future conditions. In the present if few substitutes exist for a use, then the option value is high. In the future if many substitutes are likely to be available, then the future option value is likely to be low.

Bequest values can have either "use" or "non-use" values. This depends on whether the future recipient is able to "use" or simply "enjoy" the natural resource.

Existence values are personal and not objective. They can be simultaneously beneficial and detrimental to different people. Hence changes in them can result in an increase or decrease in value to each person. For example, one person may enjoy rainfall, while another may take displeasure in it.

## 3.3 Components of economic contribution

Since the economic contribution of an activity is measured in a market setting, the process for its measurement is well-defined and there are a number of useful guiding principles. These include the following:[5]

- the definition of the activity should correspond with the industry classification of an official statistics agency. This means that there is a clear link to the impact of this activity on the national accounts in terms of output, GDP, wages and employment
- the share of the activity that is directly relevant should be determined because not all industry activities are solely concerned with one type of output. For example, not all boat building is marine-based
- multiple counting of the impact of an activity must be avoided
- land-based processing/distribution of resources should be included, where the resource does not undergo drastic transformation. For example, seafood marketing and processing should be included.

[4] SACES. (1999).

[5] GSGislason (2007).

Commercial fishing is a collection of market-based activities. These activities are set within the industries that make-up the combined Fishing and Seafood Processing industry. As noted above, in this study we define the Fishing and Seafood Processing industry as consisting of five sub-industries: (i) Fish Trawling Seining and Netting; (ii) Line Fishing; (iii) Other Fishing; (iv) Rock Lobster and Crab Potting; and (v) Seafood Processing.

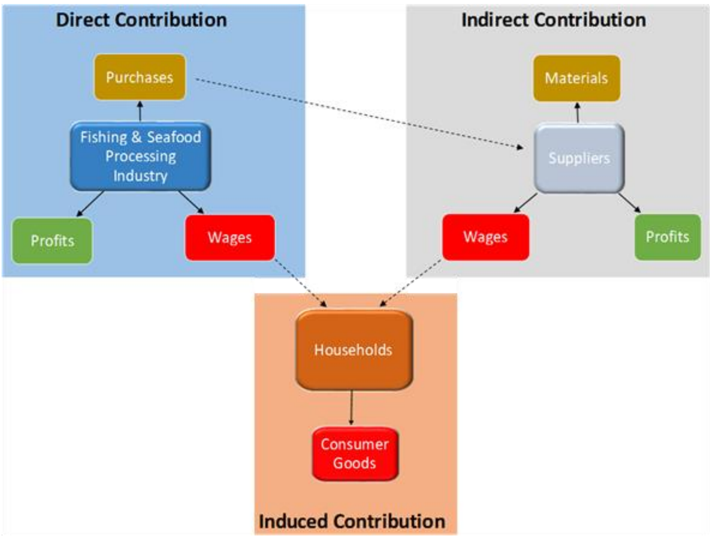
Commercial fishing generates revenues (outputs) and it has associated costs. It requires capital investment in vessels, and the wages it pays and the number of people employed are well-defined. Firms in this industry purchase goods and services and create revenue in closely associated firms, such as Ship Building and Repairs, and in more distantly related firms, such as in Road Transportation.

The economic contributions of the combined Fishing and Seafood Processing industry are made up by (refer Figure 3):

- a direct contribution resulting from revenue earned by the combined Fishing and Seafood Processing industry
- an indirect contribution resulting from revenue earned by firms supplying goods and services to commercial fishers
- an induced contribution resulting from income earned by employees of commercial fishing firms and supplier firms

Throughout this report, we refer to these direct, indirect and induced economic contributions. We also refer to them in the aggregate as the total economic contribution.

Figure 3 Economic contribution of the Fishing and Seafood Processing industry




## 3.4 Measuring economic contribution

We use multiplier analysis using multipliers derived from inter-industry input-output tables to measure the direct, indirect and induced effects of additional[6] industrial activity or expenditure. There are three different and complementary measures: gross output, GDP; and full-time equivalent (FTE) employment.

[6] Industrial activity and expenditure is “additional” in the sense that its impact does not displace an existing impact.

### 3.4.1 Measures

#### Gross Output Multiplier

Gross output is a measure of the value of production, built up through the national accounts as a measure, in most industries, of gross sales or turnover.

#### GDP (Value added) Multiplier

The GDP (value added) multiplier measures the increase in value generated along the production chain, which, in national aggregate, totals Gross Domestic Product (GDP). Value added is made up of the sum of:

- compensation of employees (i.e. salaries and wages) and self-employed
- income from self-employment
- taxes on production and imports less subsidies
- gross operating profit (accounting for operating expenses and depreciation).

#### Employment Impact Multiplier

The employment impact multiplier measures the number of FTE roles that are created by industrial activity. It provides a measure of total labour demand associated with gross output.

An FTE is an estimate of numbers employed assuming full-time positions equal one employee and part-time positions equal 0.5 of an employee.

### 3.4.2 Overview of output calculation

We calculated the output values of the catch for use with the input-output multipliers. Our method is fully explained in chapter 5. In summary:

- MPI commercial catch data by greenweight (kg) is assembled by species, fishing management area (FMA), method and sector. Such data exclude records where any one of these categories is missing. Hence the corresponding greenweight of the aggregate is less than the total of all commercial catch
- accordingly greenweight data are scaled up to reconcile with the total catch greenweight
- output value (catch value) corresponding to the fishing sector is calculated by multiplying port process by greenweight
- output value (catch value) corresponding to the seafood processing sector is calculated by multiplying export prices by greenweight
- output value (catch value) corresponding to the combined Fishing and Seafood Processing industry is calculated using revised multipliers to account for the overlap between them due to Fishing industry outputs being inputs to the Seafood Processing industry.

### 3.4.3 Impacts

#### Direct, indirect and induced effects

The underlying logic of multiplier analysis is relatively straightforward. An initial expenditure (direct effect) in an industry creates flows of expenditures that are magnified, or "multiplied", as they flow on to the wider economy.

This flow occurs in two ways (refer Figure 3):

- the industry purchases materials and services from supplier firms, who in turn make further purchases from their suppliers. This generates an indirect (upstream) effect
- people employed in the direct development and in firms supplying services earn income (mostly from wages and salaries, but also from profits) which, after tax is deducted, is then spent on consumption. There is also an allowance for saving by households. These are the induced (downstream) effects.

Hence, for any amount spent in an area (direct effect), the actual output generated from that spend is greater once the flow-on activity generated (indirect and induced effects) is taken into account.

#### Leakages

Generally the more developed, or self-sufficient an industry in a region (for regional analysis) or country is, the higher the multiplier effects. Conversely, the more reliant an industry is on supply inputs from outside the region or country, the lower the multipliers. These outside factors can be referred to as “leakages”.

For example, if a house was purchased in the Taranaki region, and all the materials and labour were sourced in the Taranaki region, and all the materials and labour that went into making the housing materials were made in the Taranaki region, and then the labour spent their wages or salaries in the Taranaki region, again on goods or services produced solely in the Taranaki region, then all the multiplier effects would be captured by the Taranaki region. Where inputs or outputs come from outside the Taranaki region, leakages are said to exist, and the multiplier effect is reduced.

### 3.4.4 Limitations of multiplier analysis

#### Partial equilibrium analysis

Multiplier analysis is only a “partial equilibrium” analysis, assessing the direct and indirect effects of the development being considered, without analysing the effects of the resources used on the wider national and regional economy.

In particular, it assumes that the supply of capital, productive inputs and labour can expand to meet the additional demand called forth by the initial injection and the flow-on multiplier effects, without leading to resource constraints in other industries. These constraints would lead to price rises and resulting changes in the overall patterns of production between industries.

To assess inter-industry impacts in full would require economic modelling within a “general equilibrium” framework. Applying such models becomes more relevant where the particular development is considered significant within the overall economy.

#### Additionality

Related to “partial equilibrium”, using multipliers for economic impact assessments assumes that economic impact is caused by the industrial activity and that it will not displace existing activity. That is, the event is additional to existing activity. If there limited causation and partial additionality, the economic impact is less than that measured by the multiplier and this must be accounted for in the calculation.

#### Impact

Again related to “partial equilibrium”, multiplier analysis assumes that an industrial activity will not have an impact on relative prices. However, in a dynamic environment, it can be assumed that a large industrial activity would have an impact on demand and supply and hence prices. Hence, the larger the industrial activity and the more concentrated it is in a single industry or region, the more likely it is that the multipliers would give an inaccurate analysis of impacts. For example, if multiplier analysis was used to determine the effect of residential building construction nationally it would likely be inaccurate as residential building construction accounts for over six percent of GDP.

### Aggregation

Industries outlined in input-output tables are aggregates of smaller sub-industries. Each sub-industry has unique inputs and outputs. The higher the level of aggregation the less accurate is the recognition of these inputs and outputs. Thus, if determining the multiplier effect of a very specific industrial activity using highly aggregated data, there will be a lower level of accuracy. Similarly, if an industrial activity encompasses a range of industries but are measured using multipliers from a single industry the accuracy level will also diminish.

### Regions and boundaries

The smaller or less defined a region and its boundaries, the less accurate the multiplier analysis will be. Similarly, the easier it is to move across boundaries, the less accurate the analysis will be. For example, at the national level, the multipliers will be very accurate as it is easy to determine the inputs and outputs crossing through a countries borders.

Similarly, accuracy diminishes when locations of industrial activities and households are not identical. As smaller regions without obvious geographic boundaries are selected, more assumptions need to be made and the multipliers become less accurate. For example, an individual could work in the Auckland region but live in the Waikato region.

## 3.4.5 Industry multipliers

Input-Output tables produced by Statistics New Zealand have 106 industries representing the total economy. This means that there is one multiplier industry that covers the entire fishing and aquaculture catching and harvesting industries. It was impractical for this project to develop individual multipliers for the fishing industry separately from the aquaculture industry. Hence we have used “fishing and aquaculture” multipliers for our data concerned with only “fishing”. We have used the latest 2013 Input-Output tables produced by Statistics New Zealand in April 2016, to generate national level multipliers for the fishing and aquaculture, and the seafood processing industries, as shown in Table 1.

Table 1 Multipliers by industry

| Multiplier Industry | Indirect | Induced | Total |
|---|---|---|---|
| Fishing and aquaculture | | | |
| Output | 0.99 | 0.27 | 2.26 |
| Value Added | 1.46 | 0.50 | 2.96 |
| Employment | 1.52 | 0.49 | 3.01 |
| Seafood processing | | | |
| Output | 1.14 | 0.39 | 2.54 |
| Value Added | 1.35 | 0.61 | 2.96 |
| Employment | 1.46 | 0.60 | 3.07 |

The above multipliers were used to calculate our estimates for the national economic impact of the fishing and seafood processing industries separately. For our estimates of the combined economic value of the joint fishing and processing industries, we created overall multipliers for each of the calculations in the report. These were developed in a way that seeks to eliminate the impact of any double counting between the fishing and the seafood processing industries.

## 3.5 Prior Studies

In February 2016, the New Zealand Institute of Economic Research (NZIER, 2016) produced a report for the Ministry of Primary Industries on the *Economic impact of the seafood sector*. This report looked to update estimates of direct and flow-on impacts of the seafood sector (aquaculture, capture fishing and seafood processing) on the New Zealand economy and each regional council area. This report was for the 2013/14 year and updated an earlier report produced by Market Economics in 2008.

Our economic impact estimates are not directly comparable to those produced by NZIER, because of the following reasons:

- this report's estimate of direct output for the combined Fishing and Seafood Processing industry is specifically designed to cover capture marine fishing and to exclude aquaculture. The NZIER report includes aquaculture in its estimates
- this report uses a five year average catch and value data, which covers the five years up to 2014/15. This means that we use different base data to the NZIER report which uses the 2013/14 year. This means that even if BERL included aquaculture estimates into the calculations, we would have different direct outputs for the fishing and seafood processing industries different to NZIER's. To illustrate this: we would estimate a BERL fishing output at $903 million and this would compare with an estimate at $1,110 million, calculated using the NZIER approach. Similarly, we would estimate BERL Seafood

Processing output at $1,302 million and this would compare with $1,947 million calculated using the NZIER approach

- the NZIER estimates were based on data for the seafood sector including both fishing and aquaculture obtained by the Statistics New Zealand's Annual Enterprise Survey. The information is only available on an aggregate basis and cannot be disaggregated to sector or species outputs
- while the NZIER report was published in February 2016, a new 2013 version of the Input-Output Tables produced by Statistics New Zealand was released in April 2016. BERL is making use of the latest version of Statistics New Zealand Input-Output tables, while NZIER used the previous 2006 version of the Input-Output tables. As a result, multipliers for the Fishing and Seafood Processing industries in our calculations are different to those used by NZIER. For example, NZIER have a type II multiplier for fishing and aquaculture output of 2.42, while for BERL the multiplier is now 2.26. That change results in lower values for the BERL analysis when compared to the earlier NZIER analysis
- NZIER estimates do not account for the interdependency between the Fishing industry and the Seafood Processing industry when producing their aggregate seafood sector numbers. One of the main input industries into seafood processing is fishing and aquaculture, and one of the main output industries from fishing and aquaculture is seafood processing. This means that the individual total economic impacts for each industry (Gross output, GDP and Employment) overlap those from the other industry. BERL has estimated that the approximate overlap between the industries is around 22 percent. We have therefore removed this portion when merging the industries into a combined Fishing and Seafood Processing industry to avoid double counting and therefore potentially inflating our estimate of the economic contribution.

Table 2 below shows that the data from the different studies are not comparable.

**Table 2 GDP for Seafood Sector, NZIER and BERL reports**

| | NZIER (incl Aquaculture) | BERL (excl Aquaculture) |
|---|---|---|
| Direct ($m) | 896 | 544 |
| Indirect ($m) | 1,345 | 756 |
| Induced ($m) | 282 | 308 |
| **Total ($m)** | **2,524** | **1,608** |

# 4 The volume and value of the commercial catch

This section of our report discusses the commercial catch values from which the economic contribution of commercial fishing was estimated.

The commercial catch values for the economic contribution of the Fishing industry are based on port prices and catch volumes supplied by MPI. We have adjusted up the port prices and catch volumes to account for missing catch volume data in the detailed MPI dataset; and to reconcile the total output calculated using port prices to the gross output reported for the Fishing industry in the Annual Enterprise Survey of Statistics New Zealand. These methodologies are explained further below.

The commercial catch values for the economic contribution of the Seafood Processing industry are based on export volume, and export prices. These may be subject to some imprecision or uncertainty but accepted, in absence of any other information, to be indicative of relative value. Port prices are also accepted by the industry in respect of levy allocation between stocks. It would not be acceptable to use port prices to determine the value of the Seafood Processing industry, because export prices include value added by processing and marketing. Port prices are believed to be better indicators of revenue to the Fishing industry, which catches and harvests the fish. Again, this methodology is explained in more detail below.

## 4.1 Commercial catch data

MPI supplied commercial catch volumes in kilograms (total greenweight) by year, month, species, fishing management area, statistical area, fishing method, distance from shore, vessel length and 2014/15 port prices by species and fishing management area, for all target species, caught within the 200 nautical mile EEZ.

This dataset covered five fishing seasons from October 2010 to September 2015. We therefore calculated a five year average to smooth out annual fluctuations.

## 4.2 Commercial catch volumes

The MPI data comprised about 92 percent of the total commercial catch data. As noted above, this was a consequence of missing data at the level of detail we requested. By comparison, MPI report a higher aggregate catch volume when the data is segmented by fish stock and FMA only. We therefore adjusted our catch data to reconcile species totals with those reported by MPI.

To do this we adjusted our total catch per year to match: (i) the total reported commercial catch per year for these species and (ii), the total reported commercial catch numbers for each fishing year for 54 of the main species caught in New Zealand. These 54 species include: Hoki, Snapper, Ling, Arrow Squid, Southern Blue Whiting, Orange Roughy, Tarakihi, Flatfish, Jack Mackerel, Southern Bluefin Tuna, Barracouta, SkipJack Tuna, Blue Mackerel, Silver Warehou, Hake and Spiny Red Rock Lobster.

These 54 species represented around 93 percent of the total catch across the five fishing years. For example, as a result of the adjustment, the largest catch species Hoki went from a reported catch in our detailed dataset of 157 thousand tonnes in the 2014/15 fishing year to an adjusted total catch of 162 thousand tonnes in the 2014/15 fishing year.

For the remaining fish species, we allocated the balance of the total reported catch to their respective proportions. For example, Sunfish had a reported catch in the 2014/15 fishing year of 205 thousand tonnes in the initial dataset. This represented 6.9 percent of the remaining fish catch after the 54 main species were removed. This percentage was then multiplied by 29.94 thousand tonnes, being the balance in 2014/15 data after the 54 main species were removed. Consequently, the adjusted total for Sunfish in the 2014/15 fishing year was 251 thousand tonnes.

Overall these adjustments raised the total average catch over the five fishing years from 400.79 thousand tonnes to 434.34 thousand tonnes.

## 4.3 Commercial catch volumes by FMA

Table 3 shows the distribution of the adjusted catch by FMA. A map showing the FMAs is provided in Appendix B. In total across all 10 FMAs an average of 434.3 thousand tonnes of fish is caught annually.

FMA 7 Challenger had the largest average catch of 104 thousand tonnes over the five years analysed. The second largest catch was in FMA 3 South East Coast, with 66 thousand tonnes, and the third was FMA 6 Sub-Antarctic with 60 thousand tonnes. These three FMAs are fished from South Island ports.

The largest catch volume for a North Island FMA is the 39 thousand tonnes caught in FMA 1 Auckland East.

Table 3 Commercial catch volume by FMA

| Fishing Management Area | Total Commercial Fish Catch (tonnes) | | | | | |
|---|---|---|---|---|---|---|
| | 2010-11 | 2011-12 | 2012-13 | 2013-14 | 2014-15 | Average |
| 1 Auckland East | 38,287 | 37,320 | 39,160 | 37,626 | 43,138 | 39,106 |
| 2 Central East | 28,990 | 27,049 | 31,846 | 31,241 | 31,533 | 30,132 |
| 3 South East Coast | 70,148 | 65,104 | 68,120 | 65,753 | 62,129 | 66,251 |
| 4 South East Chatham Rise | 38,084 | 45,105 | 37,912 | 42,463 | 47,315 | 42,176 |
| 5 Southland | 49,198 | 56,588 | 53,010 | 44,196 | 45,403 | 49,679 |
| 6 Sub-Antarctic | 71,572 | 60,444 | 58,319 | 59,555 | 52,388 | 60,456 |
| 7 Challenger | 86,681 | 97,111 | 97,281 | 115,579 | 123,484 | 104,027 |
| 8 Central West | 24,880 | 25,613 | 26,795 | 24,739 | 18,562 | 24,118 |
| 9 Auckland West | 18,486 | 17,340 | 18,617 | 16,202 | 21,227 | 18,375 |
| 10 Kermadec | 43 | 26 | 1 | 11 | 7 | 18 |
| **Grand Total** | **426,369** | **431,699** | **431,061** | **437,365** | **445,187** | **434,336** |

*Source: Ministry for Primary Industries & BERL*

## 4.4 Commercial catch values by FMA

Port prices paid by licenced fish receivers in the 2014/15 fishing season were used to estimate the value of the adjusted fish catch. This value is an estimate of the revenue of the Fishing industry for the detailed segments of the dataset.

These detailed values were then aggregated by the four methods of fishing within the Fishing industry: (i) Trawling, Seining and Netting; (ii) Line Fishing; Other Fishing; and Rock Lobster and Crab Potting. The detailed values making up each aggregate value were then adjusted so that the aggregate reconciled with the corresponding values for the same industries, as reported in the Annual Enterprise Survey (AES) of Statistics New Zealand.

Only information on total revenue and total expenditure is available from the AES. More detailed information on the make-up of the revenue and expenditure is available at the "division" level of the AES. However, at this higher level of aggregation, all the fishing industries are merged. In addition they are merged with aquaculture industries. This is not useful because we have specifically excluded aquaculture from our analysis.

Overall this industry value adjustment sees the average value of the commercial fish catch increase from our initial estimate of $646 million to $903 million, as shown in Table 4.

Table 4 Commercial catch value (adjusted by FMA)

| Fishing Management Area | Estimated value of fish ($millions) | | | | | |
|---|---|---|---|---|---|---|
| | 2010-11 | 2011-12 | 2012-13 | 2013-14 | 2014-15 | Average |
| 1 Auckland East | 125 | 122 | 121 | 116 | 116 | 120 |
| 2 Central East | 108 | 97 | 109 | 110 | 105 | 106 |
| 3 South East Coast | 114 | 108 | 110 | 105 | 110 | 110 |
| 4 South East Chatham Rise | 109 | 117 | 107 | 120 | 126 | 116 |
| 5 Southland | 148 | 159 | 154 | 140 | 142 | 149 |
| 6 Sub-Antarctic | 87 | 73 | 68 | 71 | 62 | 72 |
| 7 Challenger | 146 | 161 | 155 | 171 | 185 | 164 |
| 8 Central West | 23 | 23 | 24 | 23 | 20 | 23 |
| 9 Auckland West | 43 | 43 | 46 | 44 | 48 | 45 |
| 10 Kermadec | 0.3 | 0.2 | 0.0 | 0.1 | 0.0 | 0.1 |
| **Grand Total** | **904** | **904** | **895** | **900** | **914** | **903** |

FMA 7 Challenger continues to have the largest average catch value, at $164 million over the five year period. The second largest catch is in FMA 5 Southland, at $149 million and the third is FMA 1 Auckland East, at $120 million. Again, this is the largest catch value for a North Island FMA.

## 4.5 The value of outputs from the Seafood Processing industry

The value of the catch to the Fishing industry (the catcher of the fish) is different to the value to the Seafood Processing industry, which purchases the catch at port process from the Fishing industry and then adds further value through processing and export marketing. To illustrate this with examples, we compare the following catch and export revenues:

Spiny Red Rock Lobster: average catch revenue of $202 million, using port price of $72 per kg and average export revenue of $286 million, using export prices of $102.22 per kg.

Scampi: average catch revenue of $11 million, using port price of $13.8 per kg and average export revenue of $21 million, using export prices of $27.6 per kg.

Paua: average catch revenue of $15 million, using port price of $16.5 per kg and export revenue of $23 million, using export prices of $24.75 per kg.

Snapper: average catch revenue of $40 million, using port price of $6.24 per kg and export revenue of $59 million, using export prices of $9.34 per kg.

The output values from the Seafood Processing industry are likely to reflect export prices rather than port prices. Export volume and value data for the 2013, 2014 and 2015 years were provided by Seafood New Zealand, which sourced the data from Statistics New Zealand.

These data showed the average export volume and average export price per kilogram for 50 species. These 50 species included Hoki, Snapper, Rock Lobster and others that represent approximately 80 percent of the total commercial catch. For example, this dataset showed that around 90 percent of the Hoki caught annually is exported. It also showed that the average price per kilogram for exported Hoki in 2015 was 2.4 times the 2014/15 port price.

As part of our calculations to determine the average export price per kilogram, we converted the export weights to greenweight. This allowed us to assess and compare the price per kilogram across the different export products on the same basis.

Of the 50 species, only four species had less than 10 percent of their annual total catch exported. Of the remaining 46 species, another five species had between 10 and 20 percent of their total annual catch exported, and 33 species had more than 50 percent of their total annual catch exported. On average across these 50 species, the export price was around 170 percent higher than the port price.

We estimated a price per kilogram in order to estimate the Seafood Processing output value. To do this we assumed:

- for the 46 fish species that had more than 10 percent of their total catch exported, every kilogram caught per year would attract the export price when sold by the Seafood Processing industry, irrespective of it being exported
- all other species attracted a mark-up of 150 percent on their port price, given that the 50 species had an average mark up of 170 percent when exported, irrespective of it being exported.

National aggregates of data provided by the AES are not useful in this study. This is because the AES revenue data for the Seafood Processing industry includes revenue for the aquaculture industry that is not identifiable. At best we can use the total revenue data from the AES as a guide as to the maximum value of the Seafood Processing industry dealing with the fishing industries. In the 2014/15 fishing year, the Seafood Processing industry in total had an annual revenue of $1.9 billion.

### 4.5.1 Deepwater and inshore fishing catch volumes and values

Across the deepwater and inshore fisheries, there are four sectors: Deepwater, Highly Migratory Species (HMS), Inshore, and Shellfish. There are a variety of species of fish that comprise these sectors. To provide an understanding on the main species of fish that are included in each sector, we provide Tables 5, 6, 7, and 8 for the average catch volumes and values, for the five years to 2015. Note that the values reported are values to the catcher, based on port prices. Hence they do not include any value attributable to processing or export marketing.

As shown in Table 5, the top commercial fish species for deepwater fishing is Hoki, followed by Ling and Arrow Squid. The bulk of the value of the deepwater fishery is tied to its three main species, in particular Hoki. This fish by itself accounts for 38 percent of the deepwater fisheries value, despite having an annual average catch of 138 thousand tonnes, or 45 percent of the total catch of the fishery.

The top 10 fish species account for 92 percent of the total value of the deepwater fishery, and 82 percent of the volume of the commercial catch.

Table 5 Catch and value of deepwater commercial catch, 2010-2015

| Fish Species | Total Commercial Deepwater Fish Catch (tonne) Average (2010-2015) | Estimated value of fish ($millions) Average (2010-2015) |
|---|---|---|
| Hoki | 137,672 | 145 |
| Ling | 13,125 | 51 |
| Arrow Squid | 25,702 | 43 |
| Southern Blue Whiting | 33,175 | 26 |
| Orange Roughy | 6,603 | 22 |
| Oreo | 12,159 | 15 |
| Scampi | 758 | 15 |
| Hake | 6,807 | 11 |
| Silver Warehou | 8,168 | 9 |
| Alfonsino | 2,695 | 8 |
| **Sub Total** | **246,864** | **346** |
| Other Fish species | 56,000 | 32 |
| **Grand Total** | **302,755** | **377** |

*Source: Ministry for Primary Industries & BERL*

As shown in Table 6, the top commercial fish species for inshore fishing is Snapper followed by Blue Cod and Tarakihi.

The top 10 fish species account for 50 percent of the total value of the inshore finfish fishery and 50 percent of the volume of the commercial catch. The bulk of the value of the inshore finfish fishery is tied to its three main species, in particular Snapper. This fish by itself accounts for 15 percent of the inshore finfish fisheries value, despite having an annual average catch of just 6.3 thousand tonnes.

Table 6 Catch and value of inshore finfish commercial catch, 2010-2015

| Fish Species | Total Commercial Inshore Catch (tonne) Average (2010-2015) | Estimated value of fish ($millions) Average (2010-2015) |
|---|---|---|
| Snapper | 6,342 | 60 |
| Blue Cod | 2,232 | 36 |
| Tarakihi | 5,701 | 23 |
| Flatfish | 2,652 | 20 |
| Hapuku & Bass | 1,428 | 11 |
| Bluenose | 1,263 | 11 |
| School Shark | 3,231 | 11 |
| Jack Mackerel | 25,036 | 11 |
| Gurnard | 3,625 | 10 |
| Trevally | 3,382 | 8 |
| **Sub Total** | **54,892** | **201** |
| Other Fish species | 54,000 | 203 |
| **Grand Total** | **109,317** | **404** |

*Source: Ministry for Primary Industries & BERL*

As shown in Table 7, the top commercial fish species by value within HMS fishing is Southern Bluefin Tuna, followed by Albacore Tuna and Skipjack Tuna. The annual catch of these three species combined is worth more than $30 million to the Fishing industry.

The top 8 fish species account for 99 percent of the total value of the HMS fishery, and 94 percent of the volume of the commercial catch. The bulk of the value of the HMS fishery is tied to its three main species, in particular Southern Bluefin Tuna. This fish accounts for 32 percent of the HMS fisheries value, despite having an annual average catch of just 766 tonnes.

Table 7 Catch and value of Highly Migratory Species (HMS) commercial catch, 2010-2015

| Fish Species | Total Commercial HMS Fish Catch (tonne) Average (2010-2015) | Estimated value of fish ($millions) Average (2010-2015) |
|---|---|---|
| Southern Bluefin Tuna | 766 | 14 |
| Albacore Tuna | 2,847 | 10 |
| SkipJack Tuna | 12,021 | 9 |
| Swordfish | 704 | 6 |
| Bigeye Tuna | 131 | 3 |
| Pacific Bluefin Tuna | 19 | 1 |
| Ray's Bream | 394 | 1 |
| Moonfish | 75 | 0.2 |
| **Sub Total** | **16,957** | **44** |
| Other HMS species | 1,000 | 0.5 |
| **Grand Total** | **17,953** | **44** |

*Source: Ministry for Primary Industries & BERL*

As shown in Table 8, Rock Lobster is the top commercial fish species by value within Shellfish, followed by Paua and Kina. There are seven species consistently caught in this fishery, with just 820 kilograms of other shellfish caught annually. The bulk of the value of the shellfish fishery is provided by Rock Lobster and Paua. These shellfish account for 91 percent of the shellfish fisheries value.

Rock lobster is comprised entirely of three species: the spiny red rock lobster, packhorse rock lobster, and the Spanish lobster. Of these three species, the spiny red rock lobster is worth $130.5 million a year on average, while the packhorse rock lobster is worth $1.2m a year on average, and Spanish lobster has an insignificant value. The spiny red rock lobster comprises 99 percent of the overall value of the rock lobster fishery by itself.

Table 8 Catch and value of Shellfish and Rock Lobster commercial catch, 2010-2015

| Fish Species | Total Commercial Shellfish Catch (tonne) Average (2010-2015) | Estimated value of fish ($millions) Average (2010-2015) |
|---|---|---|
| Rock Lobster | 2,839 | 132 |
| Paua | 926 | 58 |
| Kina | 853 | 7 |
| Scallops | 101 | 6 |
| Cockles | 1,107 | 4 |
| Sea Lettuce | 384 | 0.7 |
| Paddle Crab | 115 | 0.5 |
| **Sub Total** | **6,325** | **209** |
| Other shellfish species | 820 | 1 |
| **Grand Total** | **7,149** | **210** |

*Source: Ministry for Primary Industries & BERL*

# 5 The economic contribution of commercial fishing

As noted in Chapter 3, economic contribution is measured in three complementary ways using: gross output; GDP (value added); and employment. In this chapter economic contribution of the combined Fishing and Seafood Processing industry is reported for the four sectors: Deepwater; HMS; Inshore; and Shellfish. Economic contribution is calculated as described in section 3.3.2, using input-output multipliers. The multipliers of the combined Fishing and Seafood Processing industry adjust for the input-output overlap between the Fishing industry and the Seafood Processing industry. The output values used in the multiplier calculation are the values of the catch to each of the Fishing industry and the Seafood Processing industry calculated using estimates of port prices and export prices respectively as described above.

Table 9 Economic contribution of commercial fishing, 2015

| Sector | Measure | Direct | Indirect | Induced | Total |
|---|---|---|---|---|---|
| Deepwater (excl HMS) | Output (2015$m) | 728 | 785 | 249 | 1,762 |
| | GDP (2015$m) | 230 | 319 | 130 | 679 |
| | Employment (FTEs) | 1,813 | 2,796 | 1,070 | 5,679 |
| HMS | Output (2015$m) | 82 | 88 | 28 | 197 |
| | GDP (2015$m) | 26 | 36 | 14 | 76 |
| | Employment (FTEs) | 204 | 313 | 119 | 637 |
| Inshore (Finfish only) | Output (2015$m) | 496 | 533 | 168 | 1,197 |
| | GDP (2015$m) | 156 | 217 | 88 | 460 |
| | Employment (FTEs) | 1,242 | 1,898 | 721 | 3,861 |
| Shellfish | Output (2015$m) | 421 | 456 | 145 | 1,022 |
| | GDP (2015$m) | 133 | 185 | 76 | 394 |
| | Employment (FTEs) | 1,045 | 1,622 | 624 | 3,291 |
| **Grand Total** | **Output (2015$m)** | **1,727** | **1,862** | **590** | **4,179** |
| | **GDP (2015$m)** | **544** | **756** | **308** | **1,608** |
| | **Employment (FTEs)** | **4,305** | **6,630** | **2,534** | **13,468** |

The total economic contribution of commercial fishing, represented by the combined Fishing and Seafood Processing industry, as an average for the five years to 2015 was comprised of:

- output of $4,179 million
- GDP (value added) of $1,608 million
- Employment (FTEs) of 13,468.

Deepwater and HMS fishing together have a similar impact on total GDP contribution as do Inshore and Shellfish fishing together. Rock Lobster makes up about 79 percent of the total GDP contribution of the Shellfish sector. Snapper contributes about 19 percent of the total GDP contribution of the Inshore sector.

The following section 5.1 provides separate tables of economic contribution for each of:

- the Fishing industry, which catches the fish
- the Seafood Processing industry which processes the catch
- the combined Fishing and Seafood Processing industries seen as one integrated industry.

Then sections 5.2 and 5.3 provide tables of economic contribution by fishing sector and fishing method respectively.

In the appendices to this report, to complement this chapter, we provide:

- Appendix A: definitions of industry classification
- Appendix B: a fishing management area map
- Appendix C: economic contribution of the Fishing industry by FMA
- Appendix D: economic contribution of the Seafood Processing industry by region.

## 5.1 The economic contribution, fishing, seafood processing, and combined

Over the five years to 2015, on average the Fishing industry (harvesting of fish only) earned $903 million in gross revenue and directly employed approximately 2,544 full-time equivalents (FTEs).[7] This means that the Fishing industry contributed a total of $754 million in GDP to the New Zealand economy, and employed approximately 7,652 FTEs. A detailed breakdown of this economic impact by FMA is shown in Appendix C.

Table 10 Economic contribution of the Fishing industry

| | Direct | Indirect | Induced | Total |
|---|---|---|---|---|
| Output (2015$m) | 903 | 897 | 244 | 2,044 |
| GDP (2015$m) | 255 | 372 | 127 | 754 |
| Employment (FTEs) | 2,544 | 3,860 | 1,248 | 7,652 |

[7] A full-time equivalent is defined differently to a count of a person employed and so the employment numbers here differ from the Annual LEED data, even though they are derived from the same database.

The Seafood Processing industry (processing of fish only) purchases raw fish and seafood from the Fishing industry. It then adds value by processing these raw products for export or domestic consumption. Over the five years to 2015, on average, the Seafood Processing industry earned a gross revenue of $1.3 billion and employed approximately 3,051 FTEs. A detailed breakdown of this economic impact by FMA is shown in Appendix D.

Table 11 Economic contribution of the Seafood Processing industry

| | Direct | Indirect | Induced | Total |
|---|---|---|---|---|
| Output (2015$m) | 1,302 | 1,486 | 514 | 3,302 |
| GDP (2015$m) | 442 | 595 | 268 | 1,305 |
| Employment (FTEs) | 3,051 | 4,466 | 1,839 | 9,356 |

A large amount of seafood processing occurs in land-based factories. Employment counts by region (Annual LEED employment data) were used to allocate the direct output values of the Seafood Processing industry to regional council areas within New Zealand. This allocation is based on the assumption that number employed are proportional to revenue earned.

The three regional council areas with the highest output are Canterbury with $388 million (or 30 percent); Nelson-Tasman-Marlborough with $362 million; and Auckland with $188 million. Combined these three regional councils generated $938 million or around 72 percent of the overall estimated revenue of the Seafood Processing industry.

There is a high degree of dependency between the Fishing and the Seafood Processing industries. The fishing industry provides the raw products for processing, and relies on the Seafood Processing industry to purchase its harvest. A number of New Zealand companies operate in both of these sectors because of this high degree of dependency. This allows them to exploit synergies in their fishing, processing and marketing.

This high dependency also has implications in terms of estimates of measurement of economic contribution. In particular, the overall economic contribution of these two sectors combined needs to account for the overlap between them, where the output of one industry is an input into the other.

This means that we cannot simply add together the total economic contribution of both of these sectors, as that would double count some of the output, GDP and employment generated by the Fishing industry.

To account for this overlap, we have treated the two industries as a single industry. In this way our multiplier methodology, using the input-output tables generated by Statistics New Zealand, allows us to eliminate the double-counted economic impact that would otherwise have resulted.

As shown in Table 12, in the five years to 2015, on average, the combined Fishing and Seafood Processing industry contributed a direct output of $1.73 billion, $544 million in direct GDP and employment of 4,305 FTEs.

Table 12 Economic contribution of combined Fishing & Seafood Processing

| | Direct | Indirect | Induced | Total |
|---|---|---|---|---|
| Output (2015$m) | 1,727 | 1,862 | 590 | 4,179 |
| GDP (2015$m) | 544 | 756 | 308 | 1,608 |
| Employment (FTEs) | 4,305 | 6,630 | 2,534 | 13,468 |

Using multiplier analysis we estimate that this combined industry contributes an estimated $1.61 billion in GDP to the New Zealand economy, and supports the employment of 13,468 FTEs.

## 5.2 The economic contribution by fishing sector

### 5.2.1 The economic contribution of Deepwater fishing

Table 13 shows that in the five years to 2015, on average, the share for Deepwater fishing, of the combined fishing and seafood sector's total economic contribution to the New Zealand economy, was made up by total output of $1,762 million, GDP of $679 million and employment of 5,679 FTEs.

Table 13 Economic contribution of Deepwater fishing

| | Direct | Indirect | Induced | Total |
|---|---|---|---|---|
| Output (2015$m) | 728 | 785 | 249 | 1,762 |
| GDP (2015$m) | 230 | 319 | 130 | 679 |
| Employment (FTEs) | 1,813 | 2,796 | 1,070 | 5,679 |

### 5.2.2 The economic contribution of Highly Migratory Species fishing

Table 14 shows that in the five years to 2015, on average, the share for HMS, of the combined Fishing and Seafood Processing industry's total economic contribution to the New Zealand economy, was made up by output of $197 million, GDP of $76 million and employment of 637 FTEs.

Table 14 Economic contribution of Highly Migratory Species fishing

| | Direct | Indirect | Induced | Total |
|---|---|---|---|---|
| Output (2015$m) | 82 | 88 | 28 | 197 |
| GDP (2015$m) | 26 | 36 | 14 | 76 |
| Employment (FTEs) | 204 | 313 | 119 | 637 |

### 5.2.3 The economic contribution of inshore fishing

Table 15 shows that in the five years to 2015, on average, the share for Inshore species, of the combined Fishing and Seafood Processing industry's total economic contribution to the New Zealand economy, was made up by output of $1,197 million, GDP of $460 million and employment of 3,861 FTEs.

Table 15 Economic contribution of Inshore fishing

| | Direct | Indirect | Induced | Total |
|---|---|---|---|---|
| Output (2015$m) | 496 | 533 | 168 | 1,197 |
| GDP (2015$m) | 156 | 217 | 88 | 460 |
| Employment (FTEs) | 1,242 | 1,898 | 721 | 3,861 |

Snapper is the highest valued inshore species and Rock Lobster and Paua are the highest valued Shellfish species. Any reduction in the commercial catch of this species would have significant impacts on GDP and employment. Such a reduction could arise from a reduction in the total allowable commercial catch, or a depletion of stocks from an environmental hazard.

Table 16 shows that in the five years to 2015, on average, the share for Snapper, of the combined Fishing and Seafood Processing industry's total economic contribution to the New Zealand economy, was made up by output of $226 million, GDP of $86 million and employment of 731 FTEs.

Table 16 Economic contribution of inshore fishing, Snapper

| | Direct | Indirect | Induced | Total |
|---|---|---|---|---|
| Output (2015$m) | 95 | 100 | 31 | 226 |
| GDP (2015$m) | 29 | 41 | 16 | 86 |
| Employment (FTEs) | 240 | 357 | 133 | 731 |

Fishing Management Area 1 provides the largest source of commercially caught Snapper. On average over the last 5 years, 4,530 tonnes of Snapper was commercially caught in FMA1. This amounts to 71 percent of the total annual catch. In total this 4,530 tonnes of Snapper represents $69 million in direct gross output. The average gross output per kilogram of catch is therefore $15.20, which in turn directly generates $4.70 per kilogram in GDP.

As an indication of the impact on GDP of a reduction in Snapper catch in FMA 1, a 50 percent reduction of the 2,265 tonne catch will result in a loss of $34 million in direct output and a loss of $11 million in direct GDP.

### 5.2.4 The economic contribution of Shellfish (including Rock Lobster) fishing

Table 17 shows that in the five years to 2015, on average, the total economic contribution of Shellfish (including Rock Lobster) to the New Zealand economy was an estimated $394 million in GDP and total employment of approximately 3,291 FTEs.

**Table 17 Economic contribution of Shellfish (including Rock Lobster)**

| | Direct | Indirect | Induced | Total |
|---|---|---|---|---|
| Output (2015$m) | 421 | 456 | 145 | 1,022 |
| GDP (2015$m) | 133 | 185 | 76 | 394 |
| Employment (FTEs) | 1,045 | 1,622 | 624 | 3,291 |

**Error! Reference source not found.**Table 18 shows that in the five years to 2015, on average, the total economic contribution of Rock Lobster to the New Zealand economy was an estimated $311 million in GDP, and total employment of approximately 2,569 FTEs.

**Table 18 Economic contribution of inshore fishing, Rock Lobster**

| | Direct | Indirect | Induced | Total |
|---|---|---|---|---|
| Output (2015$m) | 326 | 358 | 117 | 800 |
| GDP (2015$m) | 105 | 145 | 61 | 311 |
| Employment (FTEs) | 796 | 1,273 | 500 | 2,569 |

The $326 million in total gross output comes from average annual catch of 2,839 tonnes of Rock Lobster. This means an average gross output of $114.60 per kilogram of catch, which in turn directly generates $37 per kilogram in GDP.

As an indication of the impact on GDP of a reduction in Rock Lobster catch, a reduction of 100 tonnes will result in a loss of $11 million in direct outputs, and a loss of $4 million in direct GDP.

Table 19 below shows that in the five years to 2015, on average, the total economic contribution of Paua was an estimated $58 million in GDP and total employment of approximately 502 FTEs.

Table 19 Economic contribution of inshore fishing, Paua

| | Direct | Indirect | Induced | Total |
|---|---|---|---|---|
| Output (2015$m) | 66 | 68 | 20 | 154 |
| GDP (2015$m) | 20 | 28 | 10 | 58 |
| Employment (FTEs) | 176 | 242 | 84 | 502 |

## 5.3 The economic contribution by fishing method

In this section we present the total economic contribution for the combined Fishing and Seafood Processing industry by method, based on the average gross output across the five years to 2015.

The largest of the four fishing industries is the Trawling, Seining and Netting Fishing industry. This industry averages $1,085 million per season in gross revenue or output. This is over five times as large as the next largest industry, Other Fishing.

The Trawling, Seining and Netting Fishing industry includes fish caught using methods such as bottom trawl, Danish Purse Seine, set net, ring net, Purse Seine, and mid-water trawl. Hoki, Ling, Orange Roughy and Snapper are the most commonly caught fish in this industry.

As shown in Table 20, the Trawling, Seining and Netting Fishing industry causes the direct employment of an estimated 2,697 FTEs across Fishing and Seafood Processing and generates approximately $343 million in GDP. Using multiplier analysis, this industry in total contributes $1.01 billion in GDP and the employment of 8,478 FTEs throughout the New Zealand economy.

Table 20 Economic contribution of Trawling, Seining and Netting Fishing

| | Direct | Indirect | Induced | Total |
|---|---|---|---|---|
| Output (2015$m) | 1,085 | 1,173 | 374 | 2,632 |
| GDP (2015$m) | 343 | 476 | 195 | 1,014 |
| Employment (FTEs) | 2,697 | 4,177 | 1,603 | 8,478 |

The Line Fishing industry includes methods such as all bottom longline, hand line, dropline, squid jigging, surface longline, and troll fishing methods. Snapper and Ling are the two main species caught using Line Fishing. This industry averages $169 million in output per season. As shown in Table 21, the industry contributes a total of $154 million in GDP and 1,308 FTEs to the economy from the combined Fishing and Seafood Processing industry.

Table 21 Economic contribution of Line Fishing

| | Direct | Indirect | Induced | Total |
|---|---|---|---|---|
| Output (2015$m) | 169 | 180 | 56 | 404 |
| GDP (2015$m) | 52 | 73 | 29 | 154 |
| Employment (FTEs) | 430 | 640 | 238 | 1,308 |

Fishing methods used in the Other Fishing industry include catch by cod pots, octopus pots, hand gathering, fish traps, dredging, and diving. Blue Cod and Paua are the two main species commercially caught in this industry. This industry averages $159 million per season in direct revenue or output.

As shown in Table 22 below, the Other Fishing Industry directly contributes the employment of approximately 960 FTEs and generates approximately $70 million in GDP across its fishing and seafood processing activities. Using multiplier analysis, the total economic contribution of this industry is an estimated $164 million in GDP and the employment of approximately 1,836 FTEs throughout the New Zealand economy.

Table 22 Economic contribution of Other Fishing

| | Direct | Indirect | Induced | Total |
|---|---|---|---|---|
| Output (2015$m) | 159 | 139 | 66 | 364 |
| GDP (2015$m) | 70 | 60 | 35 | 164 |
| Employment (FTEs) | 960 | 591 | 285 | 1,836 |

The Rock Lobster and Crab Potting industry averages $323 million in direct output per season. As shown in Table 23, the Fishing and Seafood Processing economic contribution generated by this industry directly contributes $104 million in GDP and 787 FTEs. Because not all Rock Lobster is caught using Rock Lobster Pots, the output value of this group is lower than reported above for the economic contribution of the Fishing industry by species. Other catch methods are commercial diving and hand gathering, and in bycatch with set netting, fish traps, dredging etc.

The total economic contribution of the Rock Lobster and Crab Potting industry is an estimated $308 million in GDP and the employment of approximately 2,546 FTEs throughout New Zealand.

Table 23 Economic contribution of Rock Lobster and Crab Potting

| | Direct | Indirect | Induced | Total |
|---|---|---|---|---|
| Output (2015$m) | 323 | 355 | 116 | 793 |
| GDP (2015$m) | 104 | 143 | 60 | 308 |
| Employment (FTEs) | 787 | 1,262 | 497 | 2,546 |

# 6 Employment

In this chapter we provide insights into employment in the Fishing industry[8]. The following discussion focuses on employment in the Fishing industry and its associated sub-industries, including Shipbuilding and Repair and Fish and Seafood Wholesaling. This discussion is broken down by industry and regional council areas. Annual employment counts in the Fishing sector are for the March years from 2000 to 2014.

## 6.1 Employment in the Fishing sector

Employment in the Fishing sector is dominated in New Zealand by the Seafood Processing industry. Overall, the Fishing sector includes the following industries:

- Seafood Processing
- Fish Trawling, Seining and Netting
- Line Fishing
- Other Fishing
- Rock Lobster and Crab Potting
- Shipbuilding and Repair Services
- Fish and Seafood Wholesaling.

Between 2000 and 2014, the fishing sector has seen a slight decline in employment, from 11,919 people in 2000 to 10,734 people in 2014, as shown in Table 24.

Table 24 Employment in the Fishing sector, by industry, 2000-2014

| Industries within the Fishing sector | 2000 | 2005 | 2010 | 2014 | Change between 2000 and 2014 (% per annum) |
|---|---|---|---|---|---|
| Shipbuilding and Repair Services | 753 | 771 | 582 | 885 | 1.2% |
| Seafood Processing | 6,951 | 7,026 | 5,883 | 5,928 | -1.1% |
| Fish and Seafood Wholesaling | 447 | 648 | 687 | 789 | 4.1% |
| Fish Trawling, Seining and Netting | 2,088 | 1,800 | 1,773 | 1,692 | -1.5% |
| Line Fishing | 870 | 792 | 612 | 573 | -2.9% |
| Other Fishing | 225 | 219 | 375 | 468 | 5.4% |
| Rock Lobster and Crab Potting | 585 | 441 | 402 | 399 | -2.7% |
| **Total Fishing sector** | **11,919** | **11,697** | **10,314** | **10,734** | **-0.7%** |

*Source: Statistics New Zealand*

As shown in the table and in Figure 4, across the 14 year period, three of the seven industries have seen an overall increase in employment. These are Shipbuilding and Repair Services; Fish and Seafood Wholesaling; and Other Fishing. Other Fishing and Fish and Seafood Wholesaling have seen increases across the entire 14 year

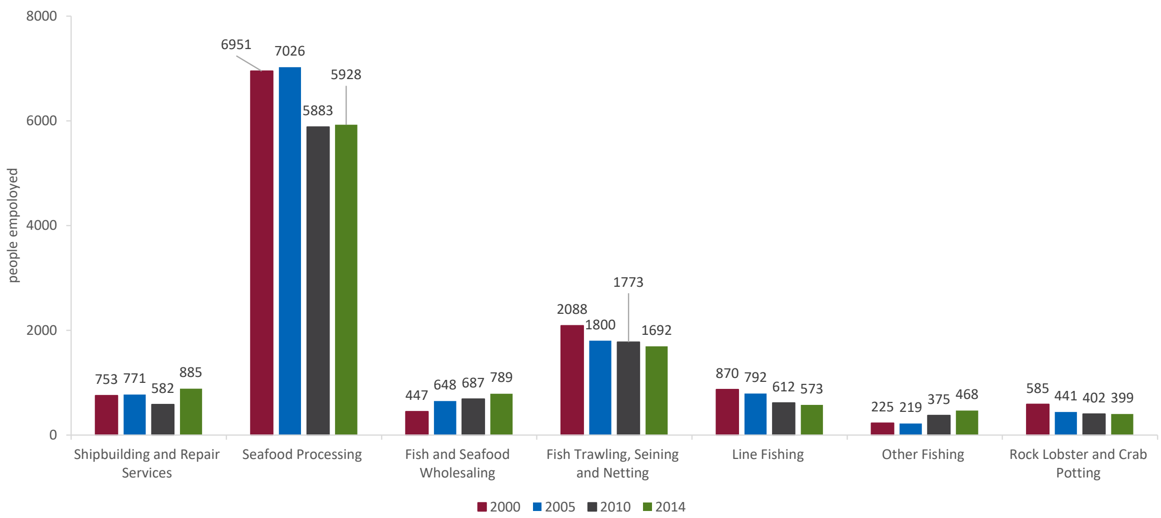
[8] The data in this section is annual LEED data from Statistics New Zealand. This data is actual employment counts derived from the PAYE and IR3 taxation returns of individuals. The geographic location is defined as the location of the business unit where the individual is employed and so the data accurately reflects business activity for each location and not the residence of the individual for each location (as for other types of LEED data).

period, while Shipbuilding and Repair Services after a large drop in employment between 2005 and 2010, have seen a substantial rebound in employment numbers across the four years from 2010 to 2014.

Of the remaining four industries the largest decline in absolute employment has come from the Seafood Processing industry, which after seeing a small increase of around 70 people between 2000 and 2005, has seen almost 1,100 people leave the industry between 2005 and 2014. For the second largest industry, Fish Trawling, Seining and Netting, there has been a steady decline in employment numbers across the 14 year period. Employment numbers for this industry are down almost 400 between 2000 and 2014.

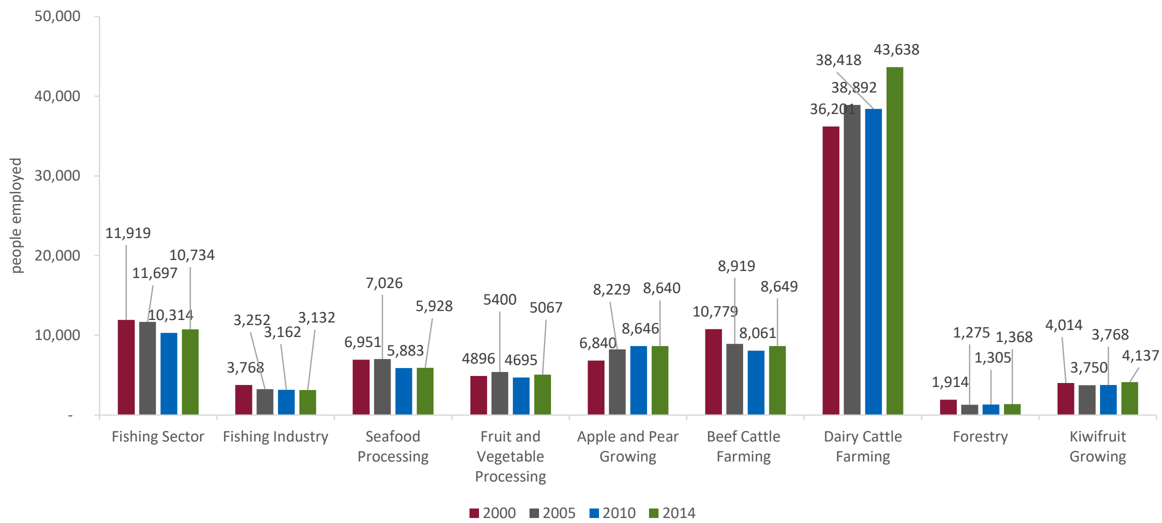
As shown in Figure 4, fishing sector employment is dominated by Seafood Processing (including on-vessel processing).

Figure 4 Fishing sector employment, New Zealand, 2000-2014



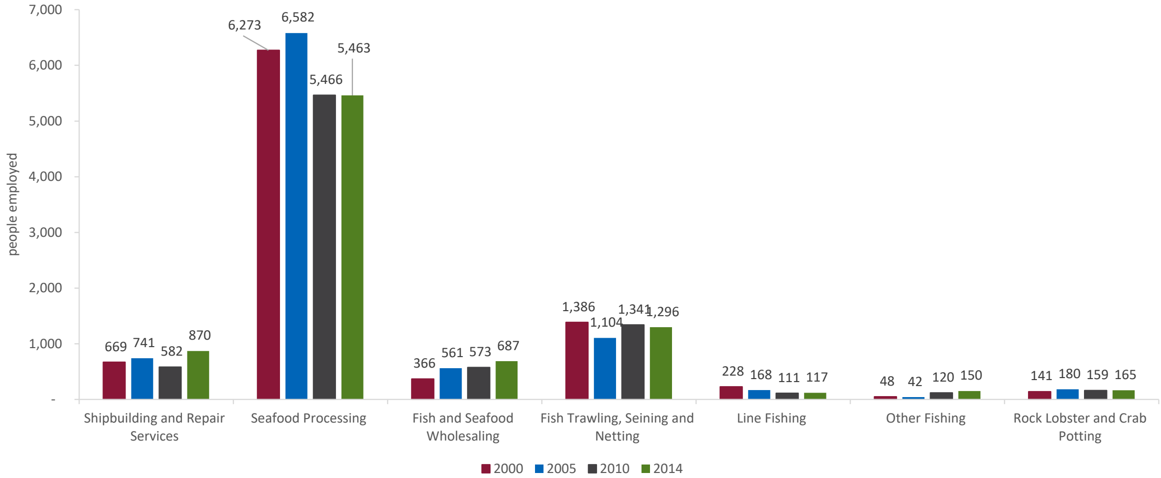

As a comparator, employment in the Fishing sector is similar in magnitude to that of Beef Cattle Farming. In turn, employment in the Seafood Processing industry is somewhat larger than employment in the Fruit and Vegetable Processing industry and similar in size to the Apple and Pear Growing industry.

Figure 5 Fishing sector employment compared to other industries, New Zealand, 2000-2014



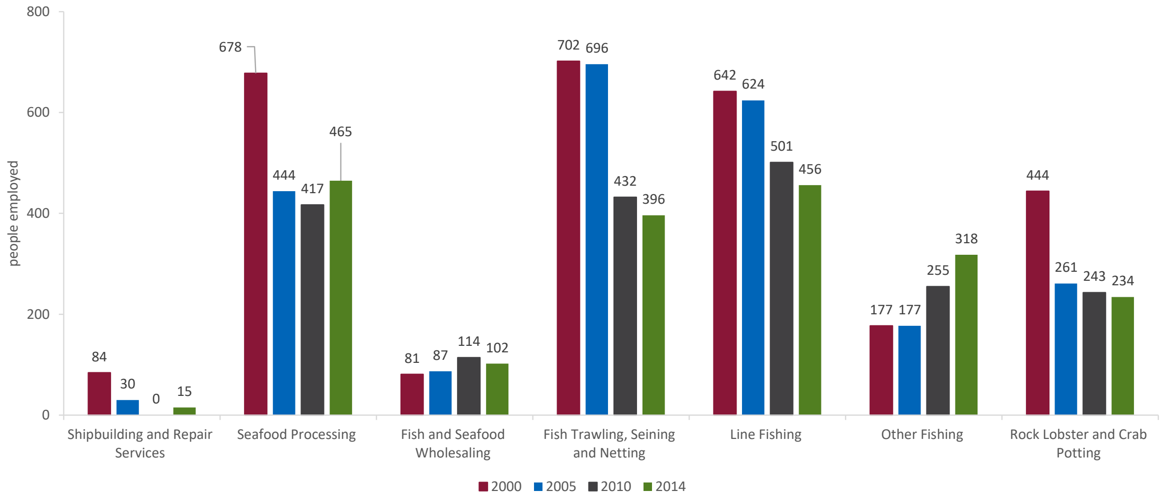
In wage and salary employment, numbers have fallen in Fish Trawling, Seining, and Netting and in Line Fishing. A noticeable feature of these two industries, and for Rock Lobster and Crab Potting, is that self-employment declines have been larger than for wage and salary employment. By comparison, Other Fishing employment has increased for both wage and salary employment and self-employment. This is consistent with a consolidation of businesses in these industries.

Figure 6 Fishing sector wage and salary employment, New Zealand, 2000-2014




Self-employment in Seafood Processing was 31 percent lower in 2014 compared to 2000. Again, this is consistent with consolidation and rationalisation of effort. Interestingly, Fish and Seafood Wholesaling employment has risen both for wage and salary workers and for self-employed workers. By comparison, wage and salary employment in Shipbuilding and Repair Services has increased since 2000.

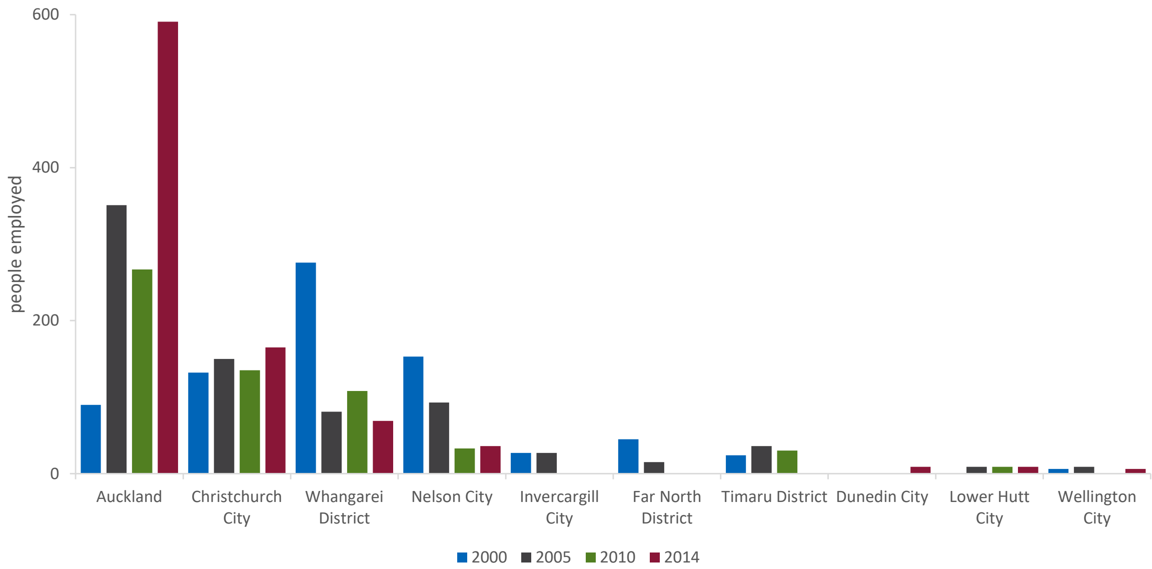
Figure 7 Fishing sector self-employment, New Zealand, 2000-2014




## 6.2 Employment changes by location

Across the fishing sector between 2000 and 2014, two industries have shown substantial changes in the location of employment in New Zealand. These two industries are Shipbuilding and Repair Services, and Seafood Processing. The 753 people employed in 2000 in Shipbuilding and Repair Services (Figure 8) have become more concentrated in urban areas between 2000 and 2014, shifting from regional locations. In 2000, employment was largely located in Whangarei (276 people employed), Nelson (153 people employed) and Christchurch (132 people employed). Interestingly, Invercargill, Far North District, and Timaru all had a small amount of employment in this industry in 2000, showing the rural location of the shipbuilding industry and the dominance of the Northland region (43 percent of total employment) in this industry. In 2014, the main employment numbers have concentrated in Auckland (591 people employed) and Christchurch (165 people employed) out of total employment in the industry of 885. In 2014, there were no people employed in this industry in Invercargill, Far North District, and Timaru.

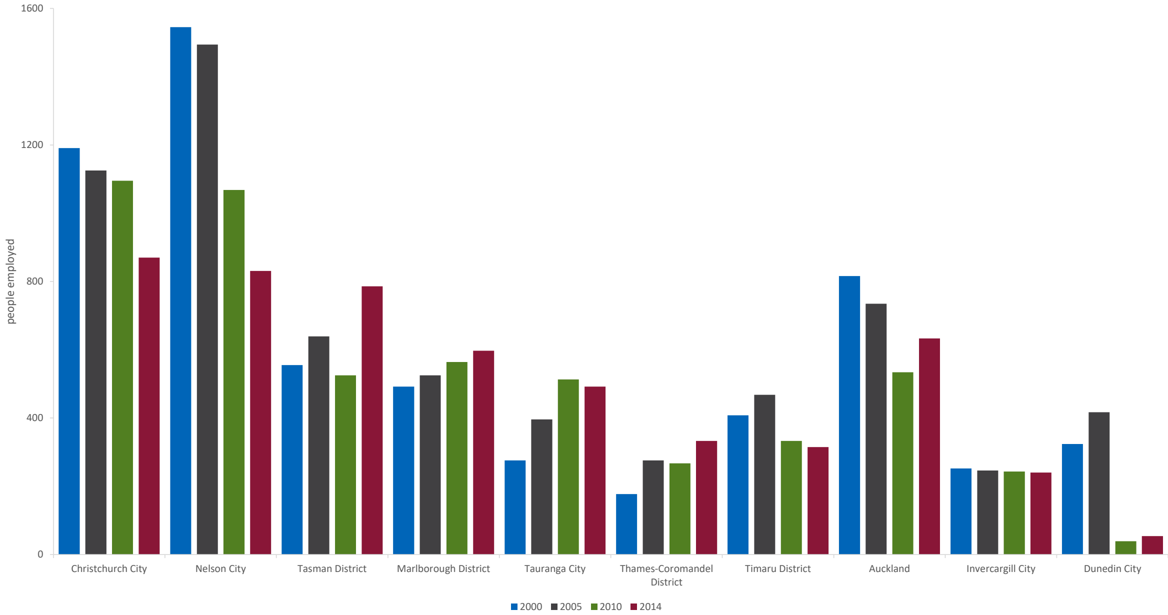
Figure 8 Shipbuilding and Repair employment by top 10 local authority, 2000 - 2014




The Seafood Processing Industry which employed 6,951 people in 2000 (Figure 9), has since 2000 shown a small number of large changes in employment by location. This has been due in large part to relocation of processing activity around New Zealand. In 2000, Nelson (1,545 people employed), Christchurch (1,191 people employed), and Auckland (816 people employed) had the largest number of people employed in the industry. These three areas employed just over half of all people employed in this industry.

From 2005 to 2014, employment in this industry has fallen from 7,026 to 5,928. Along with this fall in employment, the industry has seen employment moved out of the three dominant areas of Seafood Processing to other locations, which have seen the industries employment more evenly spread. This relocation of employment has seen rises in employment to 2014, in Tasman (786 people employed), Marlborough (597 people employed), Tauranga (492 people employed) and Thames-Coromandel (333 people employed). At the same time the employment has heavily fallen in Nelson (831 people employed in 2014), Auckland (633 people employed in 2014) and Christchurch (870 people employed in 2014.

Figure 9 Seafood Processing industry employment by top 10 local authority, 2000 – 2014



# Appendix A Definitions of industry classifications

## Fish Trawling, Seining and Netting

This class consists of units mainly engaged in trawling, seining or netting in mid-depth to deep ocean or coastal waters using a variety of net fishing methods. Trawling methods involve one or two boats towing a very large bag net, either on the sea bed or in mid-depth waters. Seining methods include purse, Danish or beach seining. Netting methods include surface or bottom gill netting.

*Primary activities*

- Beach seining, fishing
- Bottom gill netting, fishing
- Danish seining, fishing
- Finfish trawling
- Pair trawling
- Purse seining
- Set netting, fishing
- Surface netting, fishing.

*Exclusions/References*

Units mainly engaged in:

- line fishing are included in Class 0413 Line Fishing
- hatching or farming fish in controlled environments are included in the appropriate classes of Group 020 Aquaculture
- wholesaling fresh or frozen finfish are included in Class 3604 Fish and Seafood Wholesaling.

## Line Fishing

This class consists of units mainly engaged in Line Fishing in inshore, mid-depth or surface waters. This class includes units engaged in several fishing methods, including surface or bottom long lining, trolling, or hand or powered-reel fishing.

*Primary activities*

- Bottom long line fishing
- Line fishing
- Ocean trolling
- Squid jigging
- Surface long line fishing

*Exclusions/References*

Units mainly engaged in: trawling, seining or netting are included in Class 0414 Fish Trawling, Seining and Netting.

### Rock Lobster and Crab Potting

This class consists of units mainly engaged in catching rock lobsters or crabs from their natural habitats of ocean or coastal waters, using baited pots.

*Primary activities*

- Crab fishing or potting
- Rock lobster fishing or potting
- Saltwater crayfish fishing

*Exclusions/References*

Units mainly engaged in:

- wholesaling fresh or frozen rock lobsters are included in Class 3604 Fish and Seafood Wholesaling; and
- farming crustaceans in tanks or ponds onshore are included in Class 0203 Onshore Aquaculture.

### Other Fishing

This class consists of units mainly engaged in fishing not elsewhere classified or in other types of marine life gathering.

*Primary activities*

- Abalone/paua fishing
- Freshwater eel fishing
- Freshwater fishing n.e.c.
- Marine water fishery product gathering
- Oyster catching (except from cultivated oyster beds)
- Pearling (except pearl oyster farming)
- Seaweed harvesting
- Spat catching
- Turtle hunting

*Exclusions/References*

Units mainly engaged in:

- hatching or farming seaweed, fish, crustaceans or molluscs in controlled environments are included in the appropriate classes of Group 020 Aquaculture; and potting for rock lobster or crabs are included in Class 0411 Rock Lobster and Crab Potting.

### Shipbuilding and Repair Services

This class consists of units mainly engaged in manufacturing or repairing vessels of 50 tonnes and over displacement, submarines or major components for ships and submarines not elsewhere classified.

*Primary activities*

- Drydock operation

- Hull cleaning
- Ship repairing
- Ship wrecking
- Shipbuilding
- Submarine constructing

*Exclusions/References*

Units mainly engaged in: building boats are included in Class 2392 Boatbuilding and Repair Services.

## Fish and Seafood Wholesaling

This class consists of units mainly engaged in wholesaling fresh or frozen fish or other seafood (except canned).

*Primary activities*

- Crustacean wholesaling (including processed, except canned)
- Fish wholesaling
- Mollusc wholesaling (including processed, except canned)
- Seafood, fresh or frozen, wholesaling

*Exclusions/References*

Units mainly engaged in:

- operating vessels which both catch and process fish or other seafood are included in the appropriate classes of Group 041 Fishing;
- cleaning, cooking or freezing crustaceans or molluscs (including shelling and bottling oysters) or in freezing filleted fish (including whole fin fish) are included in Class 1120 Seafood Processing; wholesaling canned fish or seafood are included in Class 3609 Other Grocery Wholesaling; and wholesaling fish or seafood in conjunction with a wide variety of other grocery items are included in Class 3601 General Line Grocery Wholesaling.

## Seafood Processing

This class consists of units mainly engaged in processing fish or other seafoods. Processes include skinning or shelling, grading, filleting, boning, crumbing, battering and freezing of the seafood. This class also includes units mainly engaged in operating vessels which gather and process fish or other seafoods.

*Primary activities*

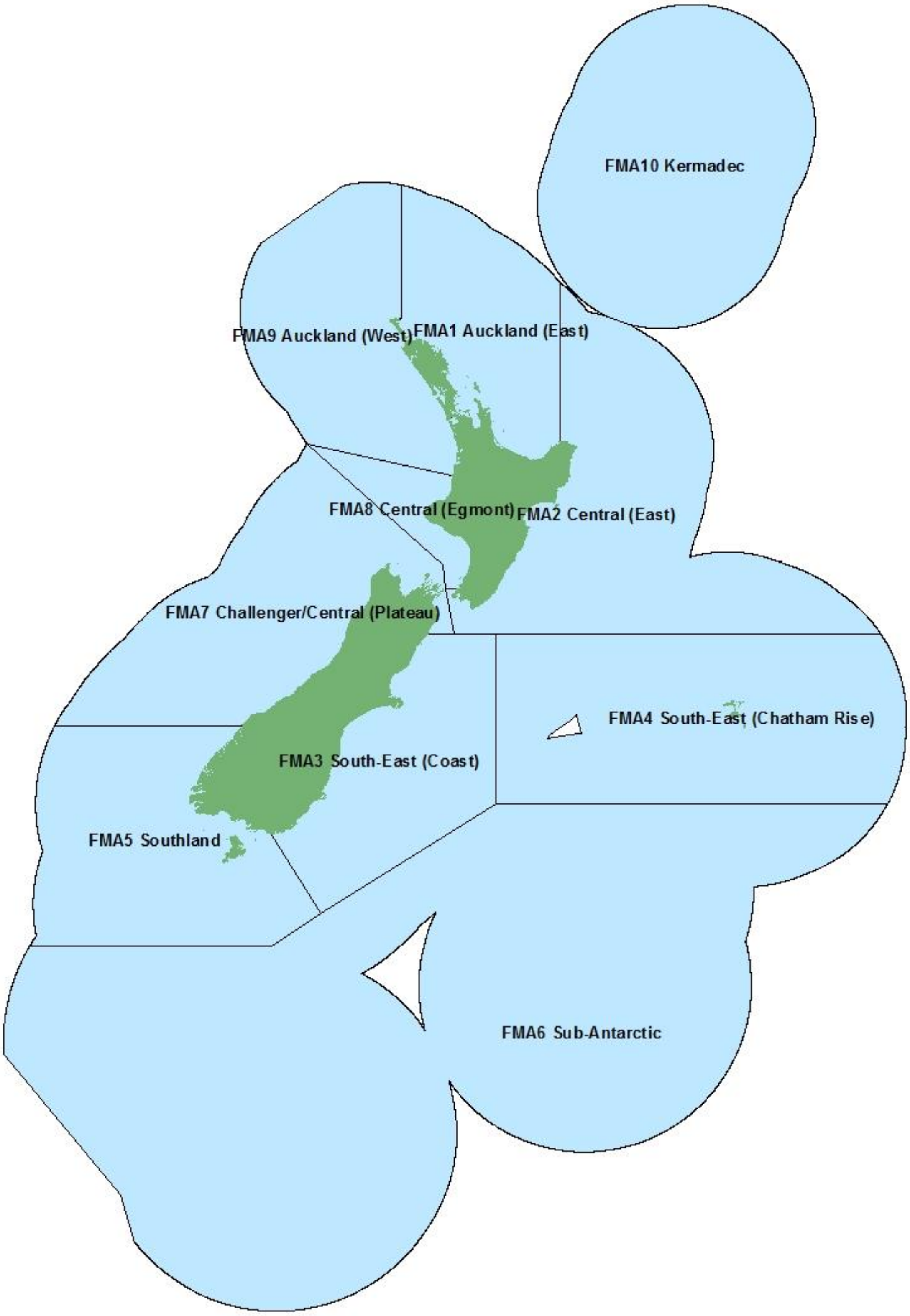
- Crustacean, processed, manufacturing (including cooked and/or frozen) n.e.c.
- Fish cleaning or filleting
- Fish fillet manufacturing
- Fish loaf or cake manufacturing
- Fish paste manufacturing
- Fish pate manufacturing
- Fish, canned, manufacturing

- Fish, dried or smoked, manufacturing
- Mollusc, processed, manufacturing (including shelled)
- Oyster, shelling, freezing or bottling in brine
- Scallop, preserved, manufacturing
- Seafood, canned, manufacturing
- Seafood, preserved, manufacturing
- Whole fin fish freezing

*Exclusions/References*

Units mainly engaged in gathering fish or other seafoods are included in the appropriate classes of Group 041 Fishing.

# Appendix B Fishing Management Area (FMA) map



# Appendix C Economic contribution of the Fishing industry by FMA

Table 25 FMA1

| | Direct | Indirect | Induced | Total |
|---|---|---|---|---|
| Output (2015$m) | 115 | 114 | 31 | 259 |
| GDP (2015$m) | 32 | 47 | 16 | 96 |
| Employment (FTEs) | 462 | 700 | 226 | 1,388 |

Table 26 FMA2

| | Direct | Indirect | Induced | Total |
|---|---|---|---|---|
| Output (2015$m) | 104 | 103 | 28 | 234 |
| GDP (2015$m) | 29 | 43 | 15 | 87 |
| Employment (FTEs) | 205 | 310 | 100 | 615 |

Table 27 FMA3

| | Direct | Indirect | Induced | Total |
|---|---|---|---|---|
| Output (2015$m) | 109 | 108 | 29 | 247 |
| GDP (2015$m) | 31 | 45 | 15 | 91 |
| Employment (FTEs) | 299 | 453 | 147 | 899 |

Table 28 FMA4

| | Direct | Indirect | Induced | Total |
|---|---|---|---|---|
| Output (2015$m) | 125 | 124 | 34 | 282 |
| GDP (2015$m) | 35 | 51 | 18 | 104 |
| Employment (FTEs) | 82 | 124 | 40 | 246 |

Table 29 FMA5

| | Direct | Indirect | Induced | Total |
|---|---|---|---|---|
| Output (2015$m) | 140 | 139 | 38 | 317 |
| GDP (2015$m) | 40 | 58 | 20 | 117 |
| Employment (FTEs) | 141 | 214 | 69 | 424 |

Table 30 FMA6

| | Direct | Indirect | Induced | Total |
|---|---|---|---|---|
| Output (2015$m) | 61 | 61 | 17 | 139 |
| GDP (2015$m) | 17 | 25 | 9 | 51 |
| Employment (FTEs) | 195 | 297 | 96 | 588 |

Table 31 FMA7

| | Direct | Indirect | Induced | Total |
|---|---|---|---|---|
| Output (2015$m) | 183 | 182 | 49 | 414 |
| GDP (2015$m) | 52 | 75 | 26 | 153 |
| Employment (FTEs) | 966 | 1,465 | 474 | 2,905 |

Table 32 FMA8

| | Direct | Indirect | Induced | Total |
|---|---|---|---|---|
| Output (2015$m) | 20 | 20 | 5 | 45 |
| GDP (2015$m) | 6 | 8 | 3 | 16 |
| Employment (FTEs) | 73 | 110 | 36 | 219 |

Table 33 FMA9

| | Direct | Indirect | Induced | Total |
|---|---|---|---|---|
| Output (2015$m) | 47 | 47 | 13 | 107 |
| GDP (2015$m) | 13 | 19 | 7 | 39 |
| Employment (FTEs) | 122 | 186 | 60 | 368 |

# Appendix D Economic contribution of the Seafood Processing industry by region

Table 34 Northland

| | Direct | Indirect | Induced | Total |
|---|---|---|---|---|
| Output (2015$m) | 39 | 45 | 15 | 99 |
| GDP (2015$m) | 13 | 18 | 8 | 39 |
| Employment (FTEs) | 92 | 134 | 55 | 281 |

Table 35 Auckland

| | Direct | Indirect | Induced | Total |
|---|---|---|---|---|
| Output (2015$m) | 188 | 215 | 74 | 477 |
| GDP (2015$m) | 64 | 86 | 39 | 189 |
| Employment (FTEs) | 441 | 645 | 266 | 1,352 |

Table 36 Waikato

| | Direct | Indirect | Induced | Total |
|---|---|---|---|---|
| Output (2015$m) | 98 | 112 | 39 | 248 |
| GDP (2015$m) | 33 | 45 | 20 | 98 |
| Employment (FTEs) | 230 | 336 | 138 | 704 |

Table 37 Bay of Plenty

| | Direct | Indirect | Induced | Total |
|---|---|---|---|---|
| Output (2015$m) | 77 | 87 | 30 | 194 |
| GDP (2015$m) | 26 | 35 | 16 | 77 |
| Employment (FTEs) | 179 | 263 | 108 | 550 |

Table 38 Hawke's Bay – Gisborne

| | Direct | Indirect | Induced | Total |
|---|---|---|---|---|
| Output (2015$m) | 33 | 38 | 13 | 84 |
| GDP (2015$m) | 11 | 15 | 7 | 33 |
| Employment (FTEs) | 78 | 114 | 47 | 238 |

Table 39 Manawatu – Taranaki – Whanganui

| | Direct | Indirect | Induced | Total |
|---|---|---|---|---|
| Output (2015$m) | 14 | 15 | 5 | 34 |
| GDP (2015$m) | 5 | 6 | 3 | 14 |
| Employment (FTEs) | 32 | 46 | 19 | 97 |

Table 40 Wellington

| | Direct | Indirect | Induced | Total |
|---|---|---|---|---|
| Output (2015$m) | 20 | 22 | 8 | 49 |
| GDP (2015$m) | 7 | 9 | 4 | 20 |
| Employment (FTEs) | 46 | 67 | 28 | 140 |

Table 41 Nelson – Tasman – Marlborough

| | Direct | Indirect | Induced | Total |
|---|---|---|---|---|
| Output (2015$m) | 362 | 413 | 143 | 919 |
| GDP (2015$m) | 123 | 166 | 75 | 363 |
| Employment (FTEs) | 849 | 1,242 | 512 | 2,602 |

Table 42 West Coast

| | Direct | Indirect | Induced | Total |
|---|---|---|---|---|
| Output (2015$m) | 34 | 39 | 13 | 86 |
| GDP (2015$m) | 11 | 15 | 7 | 34 |
| Employment (FTEs) | 79 | 116 | 48 | 243 |

Table 43 Canterbury

| | Direct | Indirect | Induced | Total |
|---|---|---|---|---|
| Output (2015$m) | 388 | 443 | 153 | 984 |
| GDP (2015$m) | 132 | 177 | 80 | 389 |
| Employment (FTEs) | 909 | 1,331 | 548 | 2,789 |

Table 44 Otago

| | Direct | Indirect | Induced | Total |
|---|---|---|---|---|
| Output (2015$m) | 27 | 31 | 11 | 68 |
| GDP (2015$m) | 9 | 12 | 6 | 27 |
| Employment (FTEs) | 63 | 92 | 38 | 192 |

Table 45 Southland

| | Direct | Indirect | Induced | Total |
|---|---|---|---|---|
| Output (2015$m) | 23 | 27 | 9 | 59 |
| GDP (2015$m) | 8 | 11 | 5 | 23 |
| Employment (FTEs) | 55 | 80 | 33 | 168 |

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