Food & Beverage Information Project 2011
Depth Sector Stream – Seafood

Final Report

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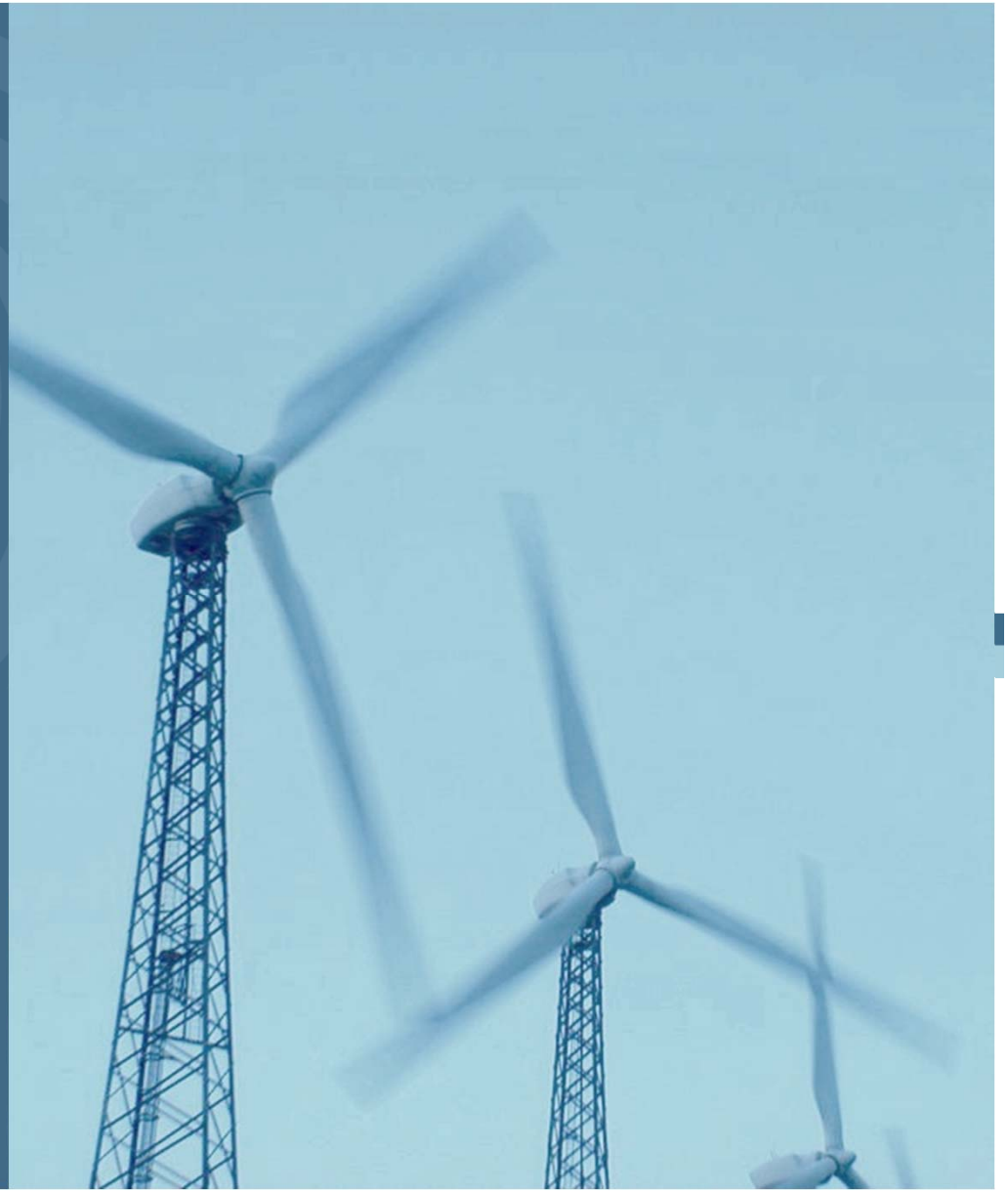

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The objective of this report is to provide a **factual** source of high quality **information** on the current situation in the New Zealand **seafood** sector for four audiences:

- **Investors** (domestic or international)
- **Industry** participants (firms & individuals)
- **Government** (across all roles and responsibilities)
- **Scientific researchers** (academic, government & firm)

It creates a common set of **facts** and **figures** on the current situation in the industry.

It draws conclusions on potential industry **strategic directions** and highlights **opportunities** for further **investment**.

It forms a part of the wider Food & Beverage Information Project and will be updated annually.

The opinions expressed in this report represent those of the industry participants interviewed and the authors. These do not necessarily represent those of Coriolis Limited or the New Zealand Government.

Note: Sectors analysed in more depth on a rotating schedule, in 2011 this included Seafood and Nutraceuticals

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GLOSSARY OF TERMS

This report uses the following acronyms and abbreviations

A$/AUD	Australian dollar
ABS	Absolute change
ANZSIC	AU/NZ Standard Industry Classification
AU	Australia
Australasia	Australia and New Zealand
b	Billion
CAGR	Compound Annual Growth Rate
C/S America	Central & South America (Latin America)
CRI	Crown Research Institute
CY	Calendar year (ending Dec 21)
E Asia	East Asia
EBITDA	Earnings before interest, tax, depreciation and amortization
FAO	Food and Agriculture Organisation of the UN
FY	Financial year (of firm in question)
£/GBP	British pounds
JV	Joint venture
m	Million
n/a	Not available/not applicable
NA/ME/CA	North Africa / Middle East / Central Asia
Nec/nes	Not elsewhere classified/not elsewhere specified
N.H	Northern Hemisphere
NZ	New Zealand
NZ$/NZD	New Zealand dollar
R&D	Research and Development
S Asia	South Asia (Indian Subcontinent)
SE Asia	South East Asia
S.H	Southern Hemisphere
SS Africa	Sub-Saharan Africa
T/O	Turnover
US/USA	United States of America
US$/USD	United States dollar
UK	United Kingdom
YE	Year ending
YTD	Year to date

Sources

AR	Annual report
Ce	Coriolis estimate
Ci	Coriolis interview
K	Kompass
Ke	Kompass estimate

METHODOLOGY & DATA SOURCES

Data was from a variety of sources, and has a number of identified limitations

- This report uses a range of information sources, both qualitative and quantitative.

- The numbers in this report come from multiple sources. While we believe the data are directionally correct, we recognise the limitations in what information is available.
  - In many cases different data sources disagree (e.g. Statistics New Zealand vs. FAO vs. UN Comtrade).
  - Many data sources incorporate estimates of industry experts.
  - As one example, in many cases, the value and/or volume recorded as exported by one country does not match the amount recorded as being received as imports by the counterparty [for understood reasons].

- In addition, in some places, we have made our own clearly noted estimates.

- Coriolis has not been asked to independently verify or audit the information or material provided to it by or on behalf of the Client or any of the data sources used in the project.
  - The information contained in the report and any commentary has been compiled from information and material supplied by third party sources and publicly available information which may (in part) be inaccurate or incomplete.
  - Coriolis makes no representation, warranty or guarantee, whether express or implied, as to the quality, accuracy, reliability, currency or completeness of the information provided in the report.

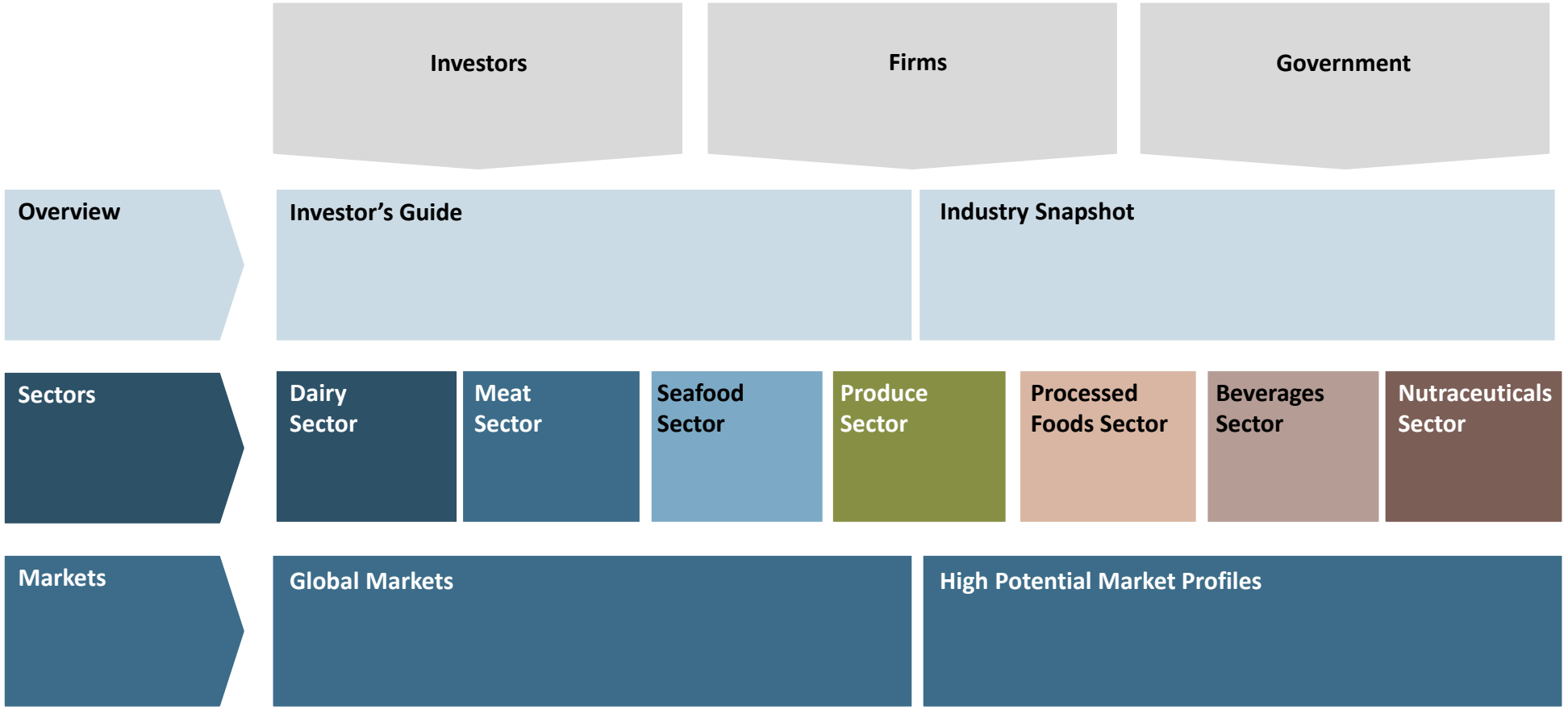
- All trade data analysed in all sections of the F&B Information project are calculated and displayed in US$. This is done for a range of reasons:
  1. It is the currency most used in international trade
  2. It allows for cross country comparisons (e.g. vs. Denmark)
  3. It removes the impact of NZD exchange rate variability
  4. It is more comprehensible to non-NZ audiences (e.g. foreign investors)
  5. It is the currency in which the United Nations collects and tabulates global trade data

- If you have any questions about the methodology, sources or accuracy of any part of this report, please contact Tim Morris, the report's lead author at Coriolis, on +64 9 623 1848

F&B INFORMATION PROJECT

The New Zealand Food & Beverage Information Project is designed to be the foundation of facts and figures on which a range of audiences can build

Structure of the New Zealand Food & Beverage Information Project
(2011)

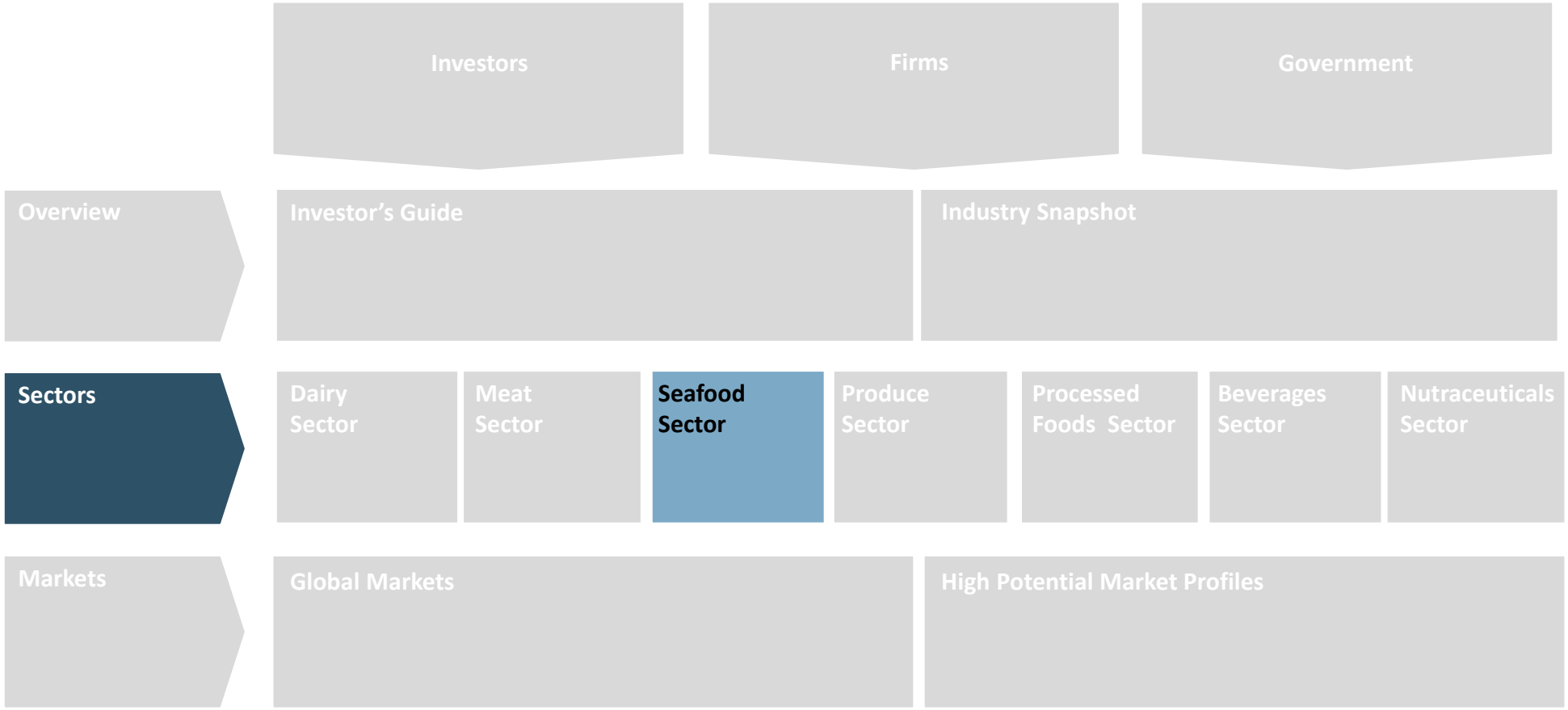


Note: Every year two subsectors are completed in more detail. Seafood and Nutraceuticals in 2011

SEAFOOD SECTOR ANALYSIS

This analysis of the New Zealand seafood sector forms a part of the wider Food & Beverage Information Project

Structure of the New Zealand Food & Beverage Information Project
(2011)



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SEAFOOD – SITUATION – WILD CATCH

While New Zealand has a large and sustainably managed wild catch fishery, there is little likelihood of volume or throughput increases going forward

New Zealand

- New Zealand has access to a strong set of natural resources
  - Isolated island nation in the middle of the South Pacific, 2,100 kilometres from Australia
  - Sixth largest exclusive fishing area (EEZ) of any country
  - 10th longest coastline of any country in the world
- New Zealand's fisheries are arguably the most sustainable fisheries in the world (on a par with Alaska and Iceland); uses effectively the same catch management system as Iceland
  - However as a result no growth in wild catch
- New Zealand has an efficient, modern seafood industry with large modern boats, in particular the deep sea freezer trawlers
  - NZ has 7% share of S. Hemisphere (S.H.) wild catch
  - 130 species commercially fished in New Zealand's EEZ.[1.]
  - Similar species mix to Australia, Chile, Argentina, etc.
  - Main catch by volume is hoki, followed by orange roughy
- There are five major (+$100m) firms in the wild catch sector and a range of secondary firms
  - Reasonably consolidated (though more possible)
  - Mixture of ownership (foreign, Maori, privately and listed)

Competitors

- New Zealand competes in the first instance with other colder water S.H. countries: Australia, Chile, Argentina, South Africa
- Secondarily, S.H. fisheries compete with N.H. colder water fisheries: Norway, Canada, Iceland, USA/Alaska, UK/Scotland
- Globally the seafood industry is highly fragmented with a huge number of medium to small sized firms competing.
  - In-shore fishing is highly fragmented and primarily local around the world
  - Deepwater fishing is more consolidated due to capital requirements for large boats, but still fragmented globally

Consumers/Markets

- Consumption of seafood is increasing globally
  - Growing income in key seafood consuming countries (e.g. South East Asia (SEA), China)
  - Increased public awareness around the benefits of increasing seafood consumption
- Seafood is highly perishable and the highest value products are often fresh
- NZ exported seafood to 108 countries in 2010; broadly speaking Western markets accounted for about half and the growing Asian market the other half
  - Bulk fish for further processing a key channel for NZ
  - Majority of fish consumption globally occurs in restaurants and other foodservice outlets
  - Supermarkets underperform in seafood *(relative to other proteins)*; significant sales occur in more traditional channels (e.g. fishmongers and wet markets)
- Demand for sustainable varies by market
  - Increasing demand for sustainable in Western markets (Europe/North America); often driven by retailers
  - Currently low/no demand in Asian and developing markets

1. EEZ = Exclusive Economic Zone; Source: Coriolis

SEAFOOD – SITUATION – AQUACULTURE

Aquaculture has huge growth potential for New Zealand, however significant further growth will require building and developing new markets

New Zealand

- New Zealand farms three species in any quantity (mussels, salmon and oysters); these make up 99% of the total exports (valued at $275m in 2010)
  - Green lipped mussels (production 86%, export value 63%)
  - King Salmon (production 12%, export value 31%)
  - Pacific Oyster (production 3%, export value 6%)
- Aquaculture is more consolidated than wild catch; the top 5 companies account for approximately 75% of the industry
- New Zealand has the 10th longest coastline of any country in the world; currently only a tiny fraction of this is farmed
- Aquaculture is a global growth story
  - Globally aquaculture has increased its share of total seafood volume to 55%; In New Zealand this is 21%
- To date Government has been the biggest impediment to the growth of the industry; recent aquaculture reform aims to provide a stabile platform to enable further growth

Competitors – Shellfish

- On a global basis, most shellfish are produced and consumed locally and very little crosses borders
- 12% of global mussel production crosses borders; New Zealand competes with a wide range of regional players by market; Chile is an emerging multi-regional threat
- 1% of global oyster production crosses borders; global production is flat except for China which is increasing production massively

Competitors – Salmon

- Salmon aquaculture is highly consolidated globally
  - Top 3 firms = 38% of global production; top 10 = 63%
  - None of the top 25 global salmon producers in NZ
- Consolidation is driven by clear economies of scale in production systems, marketing, processing, skills, genetics and capital
- Effectively all[1] other salmon aquaculture in the world farm Atlantic salmon due to its faster growth rates
- New Zealand biosecurity prevents imports of fresh salmon into New Zealand; over the past decade the majority of New Zealand salmon production has been consumed domestically

Consumers/Markets

- ***As per wild capture plus***
- A handful of markets account for the majority of NZ aquaculture exports: Australia, Japan and the USA (plus S. Korea, Hong Kong & Spain)
- High levels of biosecurity in Australia (Salmon, Mussels & Oysters) and Japan (Mussels) benefit NZ firms
  - e.g. NZ the only supplier of imported whole salmon to AU
- Recent increases in salmon exports to USA, may in part be due to ISA (Infectious Salmon Anaemia) effecting Chilean salmon supply

1. 93% Atlantic/ 6% Coho/Chinook 1%; Source: Coriolis

SEAFOOD – QUANTITATIVE SCORECARD

The New Zealand seafood industry is achieving limited growth

Key metrics	# (2010)	CAGR (00-10)	CAGR (09-10)	ABS (09-10)
Turnover (08-09)	NZ$3,011m[2]	3%	5%	+$156m
Exports	US$1,017	5%	18%	US$154m
Enterprises	1,851	-3%	-4%	-70
Employment	8,860	-2%	-2%	-190
Turnover per employee	NZ$339,795[2]	n/a[1]	n/a[1]	n/a[1]

Key markets	% exports (2010)	US$m (2010)	CAGR (00-10)	CAGR (09-10)	ABS (09-10)
East Asia	41%	$421	4%	21%	+$72
SE Asia	5%	$48	2%	19%	+$8
Europe	15%	$151	3%	3%	+$4
North America	13%	$132	0%	20%	+$22
Australia/PI	21%	$215	9%	18%	+$33
Other	5%	$48	21%	44%	+$15
Total		US$1,015	5%	18%	+US$154

Key export products	NZ$m (2010)	CAGR (00-10)	CAGR (09-10)	ABS (09-10)
Rock Lobster	$229m	6%	24%	$45m
Hoki	$172m	-2%	13%	$20m
Mussels	$171m	0%	-15%	-$31m
Squid	$89m	9%	19%	$14m
Salmon	$86m	11%	41%	$25m
Paua	$63m	0%	31%	$15m
Other	$682m	-1%	-2%	-$17m
Total	NZ$1,493	1%	5%	$70m

Key firms	Employ (#; 10)	Turnover (NZ$m; 10)
Sealord	1,100	$531m
Sanford	2,000	$421m
Talleys	600	$220m
Aotearoa Fisheries	300	$158m
NZ King Salmon	440	$108m
KiwiLobster	25	$100m

Key competitors Country	Key firms
Argentina	Pesantar, San-Arawa, Yuken
Chile	Toralla, Aqua Chile
South Africa	Oceana Group, I&J
Norway	Marine Harvest, Austevol
Iceland	Icelandic
Denmark	Royal Greenland
USA/Canada	Trident, High Liner
Japan	Maruha, Nissui, Uoichi
Thailand	Thai Union

1. Cannot be calculated due to Statistics NZ data issues; will be calculated in future years; 2. includes some amount of double counting due to Statistics NZ data issues; Source: SNZ; various company annual reports; various company websites; Kompass; Coriolis analysis

SEAFOOD: WILD CAPTURE – SWOT ANALYSIS

While there are some opportunities for New Zealand wild capture going forward, there are also challenges

Strengths	Weaknesses
- Clean water and generally healthy aquatic environment - Unsubsidised industry - Quota management system preventing collapse of stocks through overfishing - Stocks generally at sustainable levels or rebuilding - Regularly ranked highly sustainable relative to other producers - Efficient, modern industry with large modern boats, in particular the deep sea freezer trawlers - Stable, long-term ownership in place across most major firms	- Most industry growth metrics negative - Wild catch volume has fallen -34% since 1998 leading to reduced throughput - Relatively small producer on a global scale - Supply fluctuates year-to-year with availability of fish - Most EEZ space low productivity deep water - Bulk supply driven rather than specialised/consumer focused - Firms primarily small/sub-scale with limited access to capital - Highly regulated - Lack of market integration, not capturing in-market value - Limited in-market knowledge - Lack of capital
Opportunities	**Issues/Threats/Risk**
- Consumer perceptions of health benefits of seafood - Over half the fish body currently going to meal and waste - Use of byproducts for nutraceuticals /cosmetics sector - Growing interest by some more wealthy consumers in Western markets for ecolabelling and environmental certification (driven by retailers) - Growing middle class in China and SE Asia - Gradual removal of global fishing subsidies - Ongoing removal of trade barriers and negotiation of new free trade agreements - Streamline regulations - New/improved supply chain technology	- New Zealand wild catch continues to decline going forward (for whatever reason) - Other countries “catching up” on sustainability (e.g. Argentina) - Low cost competitors in low wage/low regulation/higher productivity warm waters - Single variable special interest groups driving domestic regulatory agenda - Rising costs of airfreight reducing feasibility of fresh exports

Source: various company annual reports; various company websites; interviews; Coriolis analysis

SEAFOOD: AQUACULTURE – SWOT ANALYSIS

Aquaculture faces both opportunities and threats

Strengths	Weaknesses
- Clean water and generally healthy aquatic environment - Unsubsidised industry - Strong food safety regulations - Predictable supply - Concentrated resources in three key species - Only country farming green lipped mussels (Perna canaliculus); other farm other green shelled (perna viridis, etc.) or blue mussels (*mytilus sp.)* - Limited presence of disease - Unique access to some biosecure markets (particularly Australia & Japan) - Parts of domestic industry protected from imports by biosecurity measures	- Small producer of mussels on a global scale; very small producer of other two species - Mussels and oysters have low value per hectare; salmon development limited by red tape (change in use and landuse consent difficult) - Reliance on biosecure markets and a handful of flat to declining others (e.g. USA) - Constrained regulatory environment which is semi-constantly changing - Relatively low government support for fledgling industry (e.g. vs. Norway loan guarantees in early days of salmon industry development) - Competing users of coastal space - No competitive advantage around feed production due to low scale - Disconnect between scientific research into new species and needs of industry; research appears to be constrained to primarily research native species
Opportunities	**Issues/Threats/Risk**

- Consumer perceptions of health benefits of seafood
- Growing middle class in China and SE Asia
- On-going removal of trade barriers and free trade agreements
- Preferential access to Australia due to access through phyto-sanitary barriers
- New species
- Development of land based plants for use in aquaculture (e.g. soy)
- Industry co-operation
	- Low cost competitors in low wage/low regulation higher productivity warm waters
	  - Chile
	  - China (future)
	- Beach, bach and boat (the 3 b's), NIMBY (not in my back yard) user population limiting industry activity
	- Disease outbreaks (e.g. oysters recently)
	- Reliance on a small number (3) of species (risk if disease outbreak); no significant new species has emerged since 1976
	- Single variable special interest groups driving domestic regulatory agenda

Source: various company annual reports; various company websites; interviews; Coriolis analysis

SEAFOOD – POTENTIAL STRATEGIC DIRECTIONS

Six potential strategic directions are identified for the seafood sector

Situation creating opportunity	Resulting potential strategic direction	Opportunity	Challenges
- New Zealand has strong experience with sustainable fisheries systems	1. Horizontal integration into other countries with emerging QMS systems	- Transfer skills and systems into less developed markets	- Inexperience - Capital - Political and economic risk
- Constraints on volume going forward; growth through increasing value/kg - Significant export volume of frozen block as container quantities	2. Further investment into branded consumer products	- Grow share of value-added, consumer products - Develop sales and marketing capabilities - Establish in-market operations	- Lack of marketing and brand capabilities - Lack of capital
	3. Export more fish in a live/fresh higher quality un-damaged form	- Improved catch technology and systems	- Cost - Changing attitudes and behaviour
- New Zealand industry still relatively fragmented; in particular the inshore fisheries	4. Co-ordination and/or consolidation of inshore fisheries	- Opportunity to work together	- Geographic spread of existing fisheries and firms - Personalities
- Retailers and consumers demanding sustainable seafood in western markets - New Zealand wild catch highly sustainable but not marketed as such	5. Collective program branding New Zealand as sustainable supplier of seafood	- Grow share in high value western markets	- Cost of compliance in western markets - Trade barriers and tariffs on seafood into Europe
- Low absolute levels of water space currently used for aquaculture - Most aquaculture space currently allocated to relatively low value per hectare species	6. Increase production of salmon	- Significant increase in salmon area	- Space conflicts - Regulatory burden and cost

Source: Coriolis

SEAFOOD – POTENTIAL AREAS FOR INVESTMENT

Limited opportunities for new external investment in wild capture; however regulatory change and fundamental drivers may result in opportunities in aquaculture

Wildcatch

- Limited entry vehicles in wild catch, ownership locked up by:
  - Maori interests (unlikely to sell),
  - Cornerstone shareholdings by large international companies (Nissui and RH Group)
  - Cornerstone shareholding of publicly listed Sanford,
  - Many family businesses: Talleys, United, Independent, Solander, Vela, Amalgamated unlikely to sell without generational change

- Limited growth potential; no volume growth in wild catch
  - No new species to discover
  - Strong sustainability management means catch will be flat to down in the foreseeable future

- Main source of value creation in wild is in cost reductions via consolidation
  - Consolidation ongoing but slow progress due to the ownership issues discussed above

Aquaculture

- Pacific oysters have low/no growth potential, due to viral breakout and global market structure/situation

- Mussel industry is mature and consolidating rapidly. Mussels are relatively low value use of space. Returns over the past five years have ben mixed to poor, particularly for smaller operators (driving industry consolidation)
- Mussel breeding program likely to deliver constant incremental gains for foreseeable future. However these are likely to maintain New Zealand's relative competitiveness (e.g. vs. Chile) rather than translate into increased profitability

- Theoretically New Zealand has huge potential in salmon aquaculture; in practice regulations/red tape will limit success

New Species

- While New Zealand scientists are working on a wide range of new species these are all highly speculative and unproven commercially

- Only investors with transferable capabilities or strong appetite for risk should participate

Further Processing

- Opportunities for investments in further processing of New Zealand bulk ingredients into consumer ready products
  - Greenfields by firm with transferrable skills

- Clear opportunity for investment in seafood derived nutraceuticals (discussed in nutraceuticals document)

1. NA/ME/CA = North Africa/Middle East/Central Asia

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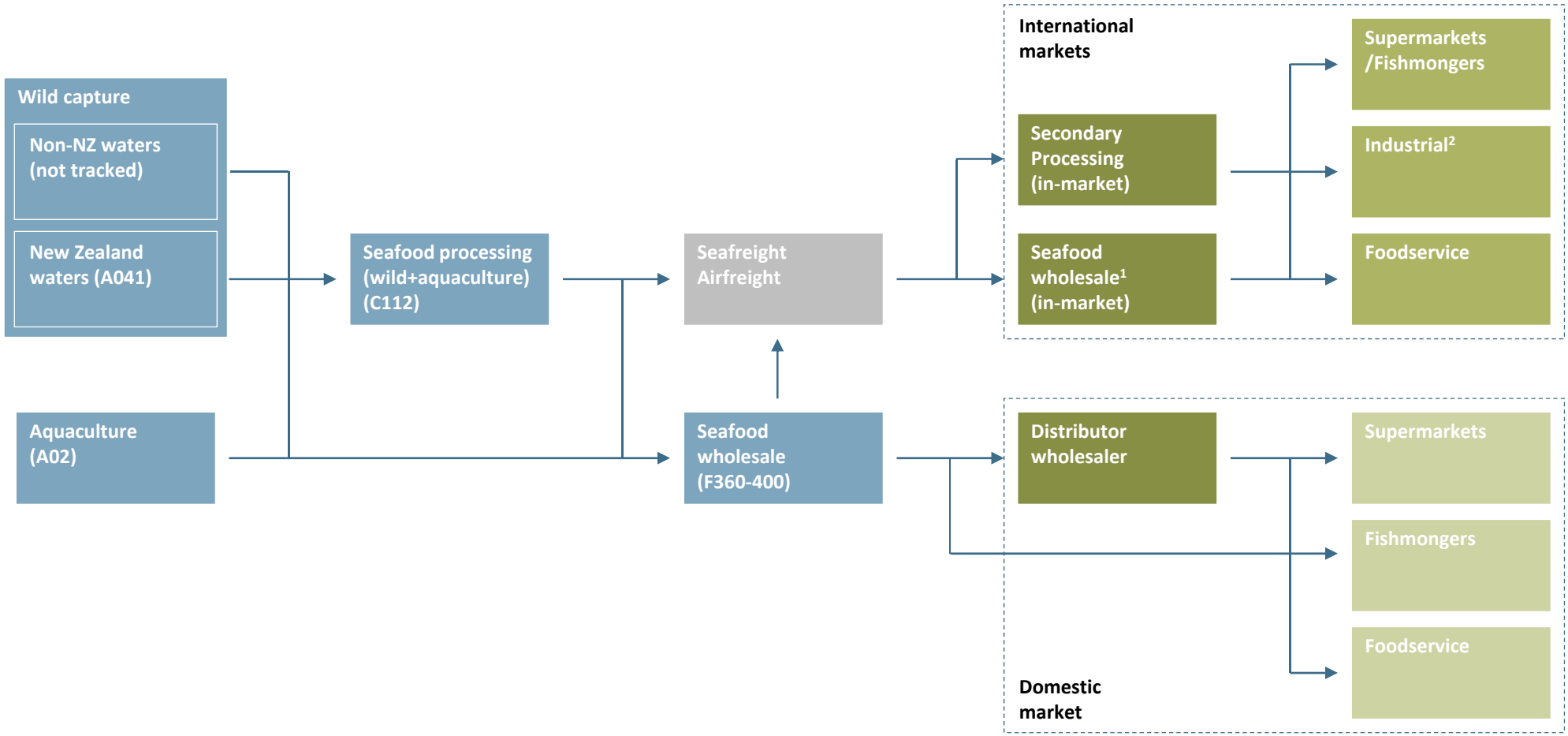
SEAFOOD – SUPPLY CHAIN

New Zealand seafood has a relatively straight forward supply chain, driven in part by the perishable nature of the product in many cases

Simplified model of New Zealand seafood supply chain
(model; ANZSIC codes as available))

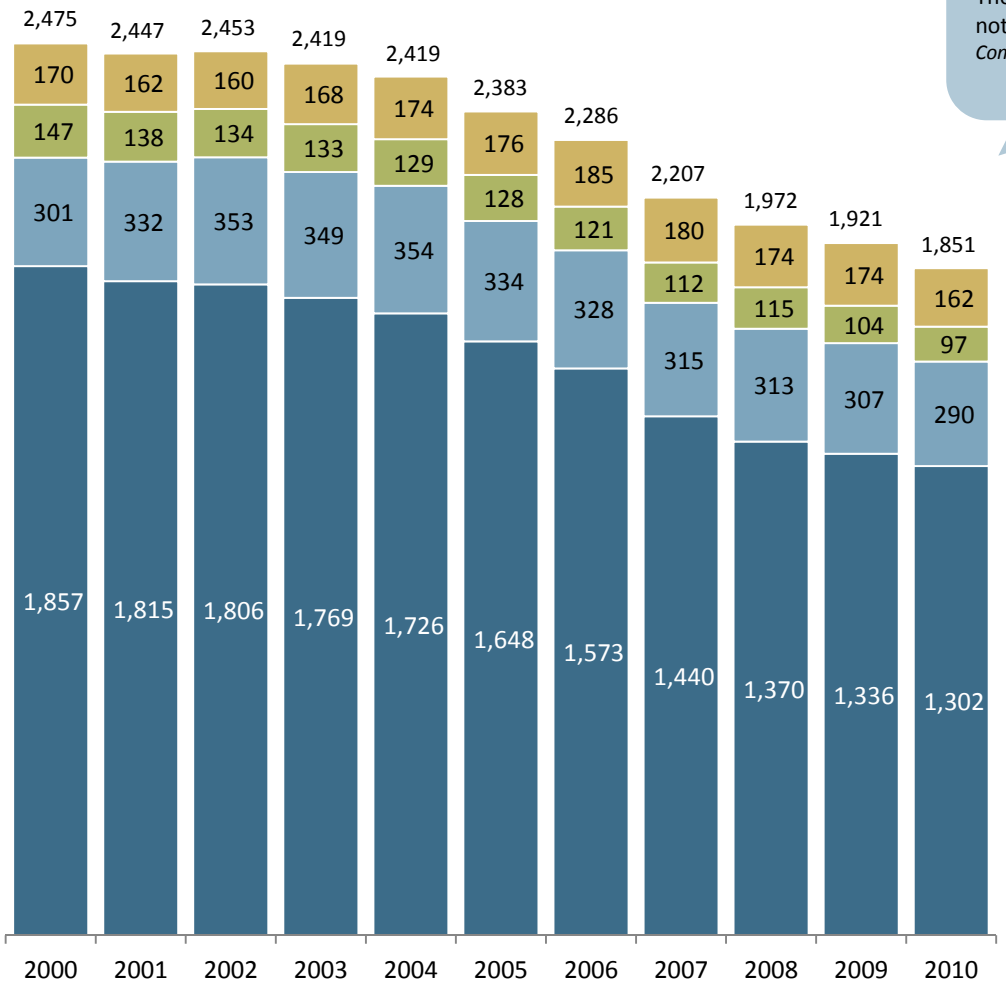


1. There may be one or more layers of wholesaling, depending on product or market; some wholesale functions maybe captive inside retailers or foodservice operators; 2. Includes product for housebrands, canners, fish meal manufacturers, Source: Coriolis

SEAFOOD – # OF ENTERPRISES

The number of enterprises involved in the seafood industry is declining

Number of enterprise units in the seafood industry in New Zealand[1]
(enterprises; 2000-2010)



"These figures reflect the aging population of the small fisherman. They are leaving the industry and not being replaced." *CEO Seafood Company, large, 2011*

	CAGR (00-10)	CAGR (09-10)
Seafood wholesaling	-0.5%	-7%
Seafood processing	-4%	-7%
Aquaculture	-0.4%	-6%
Wild capture	-3%	-3%

Comments

- Likely a mixture of increasing industry productivity through:
  - Consolidation (fewer/larger)
  - Automation (replacing labour with machines in mussel industry)
- Note: many of these firms have no employees (either shell companies or sole trader/owner/operator/shareholder) (e.g. GST registered contractors)

Notes/Definitions

- Wild capture (A041), Aquaculture (A02)
- Seafood processing (C112000)
- Seafood wholesaling (F360400)
- Statistics New Zealand calculates its statistics based on predominant business activity; firms are classified by their predominant activity. For example, a firm that was 60% wild capture and 40% aquaculture would be classified as wild capture or a seafood processor that also has aquaculture activities would be classified as a seafood processor.

1. Uses persons employed by enterprise unit; Source: SNZ business demographics (detailed industry for enterprise units) and (detailed industry for geographic units); Coriolis analysis

SEAFOOD – DRIVERS OF DECLINE

Declining industry metrics were seen as driven by (1) declining wild catch, particularly hoki and (2) market pressures leading to restructuring to control costs

1. Declining wild catch

   - "The decline in revenue is due primarily to the decline in hoki catch. With a dramatic decrease in the hoki quota we saw a big decline in our revenue." *Seafood Company, large, 2011*

   - "Hoki was the biggest influence on those figures. Sales really reduced." *Seafood Company, large, 2011*

2. Restructuring

   - "Companies couldn't compete with onshore processing; they had to take processing offshore or die." *Seafood Industry representative, 2011*

   - "Companies have had to restructure due to the lower [US] dollar." *CEO, Seafood Company, large, 2011*

   - "We have restructured and reduced the number of plants we have and consolidated in some areas. Our profit is up. We have good species." *CEO, Seafood Company, medium, 2011*

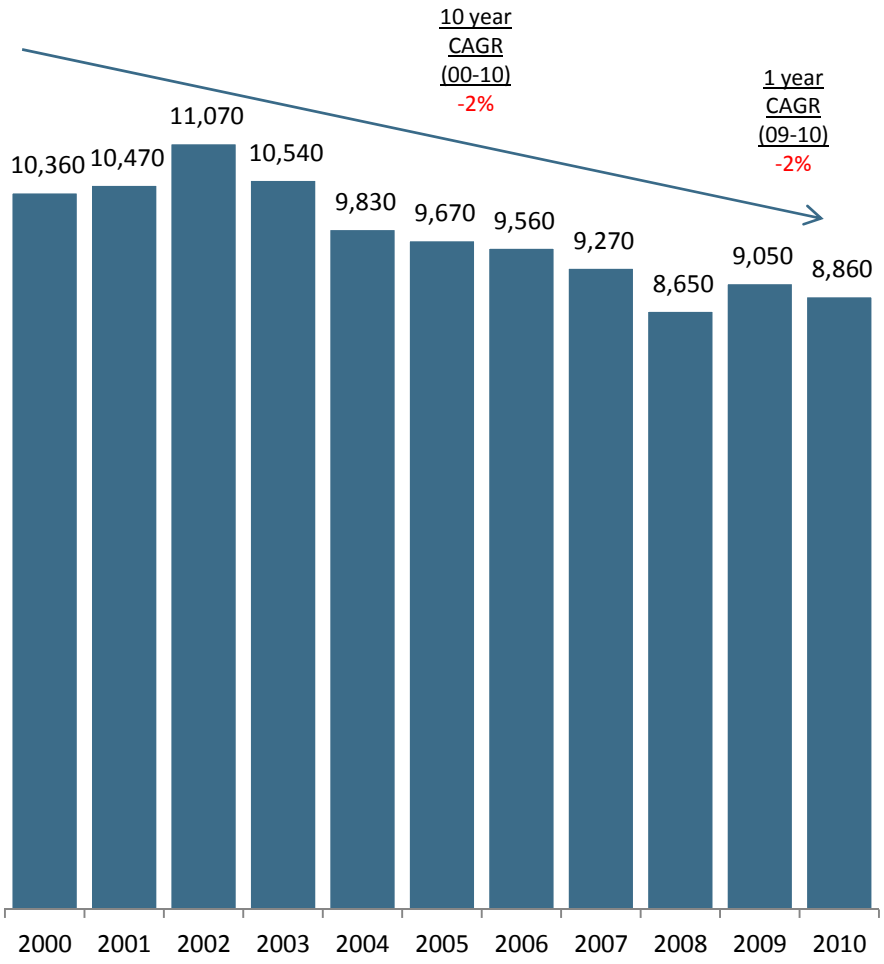
   - "There is consolidation of the inshore operations and mussels but not deepwater and not salmon. It had to happen in mussels. When the US dollar was at 45 cents everyone was making money, but when it was over 65 cents there was no money to be made. The industry stalled and had to restructure due to lack of funds." *CEO, Seafood Company, large, 2011*

   - "The economies of scale are with the sizes of the boats. Boat size matches the size of the fisheries. Small boats in-shore and large boats offshore. This hasn't really changed in the last decade." *CEO, Seafood Company, large, 2011*

SEAFOOD – EMPLOYMENT

The number of people employed in the seafood industry is declining

Number of persons employed in the seafood industry in New Zealand
(people; 2000-2010)



"There has been a massive decline in the Total Allowable Catch (TAC) for both hoki and orange roughy and this is what you are seeing in this chart. There are less people employed because there are less fish coming out of the water." *CEO Seafood Company, large, 2011*

Comments

- Likely a mixture of increasing industry productivity through consolidation (fewer/larger) and responding to market prices.

Notes/Definitions

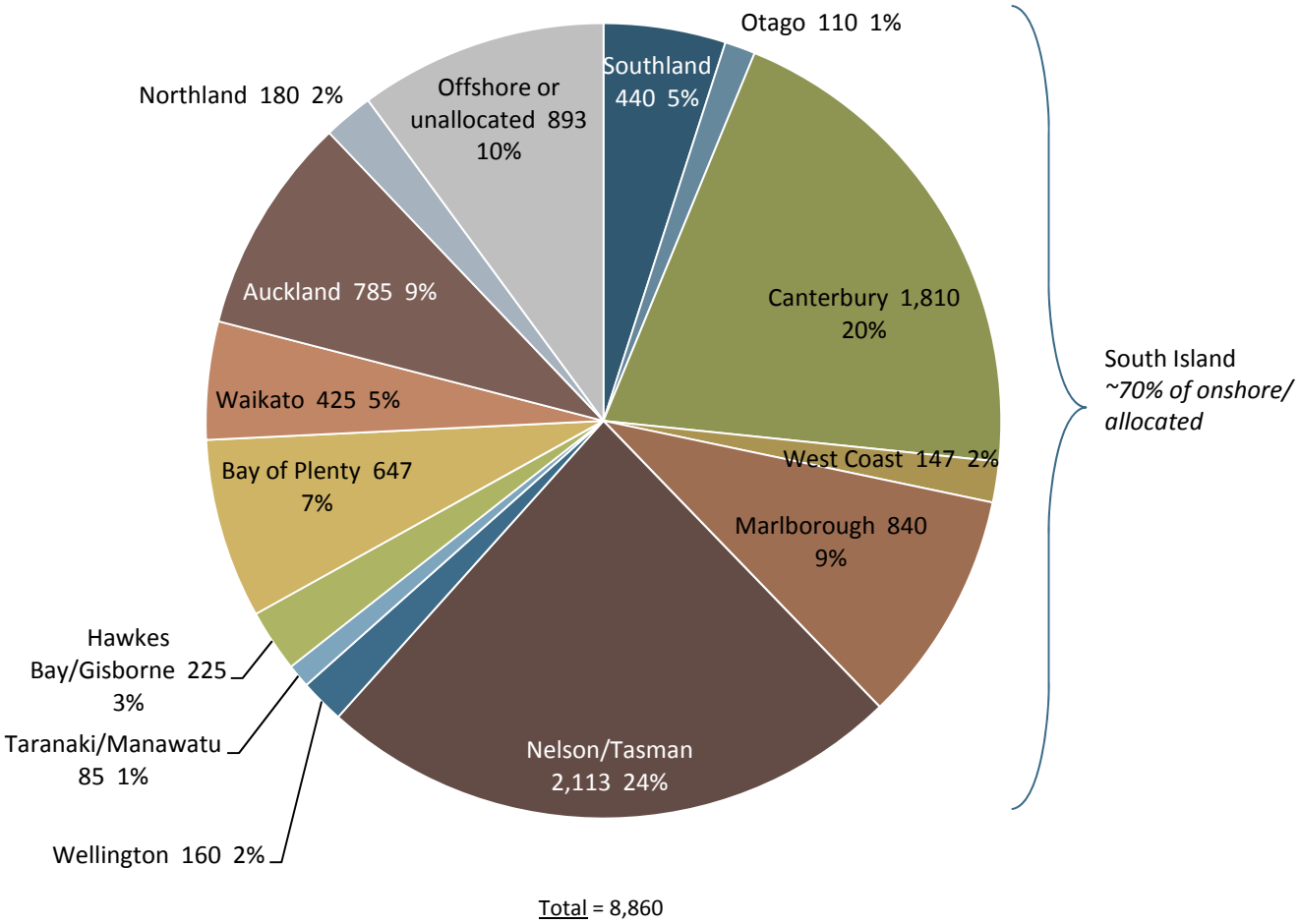
- This data aggregates fishing, aquaculture, seafood processing and wholesaling.
- Statistics New Zealand calculates its statistics based on predominant business activity; firms are classified by their predominant activity. For example, a firm that was 60% wild capture and 40% aquaculture would be classified as wild capture
- Therefore the breakdowns by categories as calculated by Statistics New Zealand do not reflect how industry thinks ("industry reality") Charts showing SNZ breakdown are included in the appendix
- Data for 2000 adjusted to include offshore and unallocated as included in other years in data

Source: SNZ business demographics detailed industry for enterprise units; Coriolis analysis

SEAFOOD – EMPLOYMENT BY REGION

Industry employment is spread across the regions; overall the South Island accounts for ~70% of employment; Nelson/Tasman and Canterbury the two largest regions

Number of persons employed in the seafood industry in New Zealand by region
(people; 2010)



Total = 8,860

Comments/Notes

- North Island/South Island employment ratio has remained constant last decade

Notes/Definitions

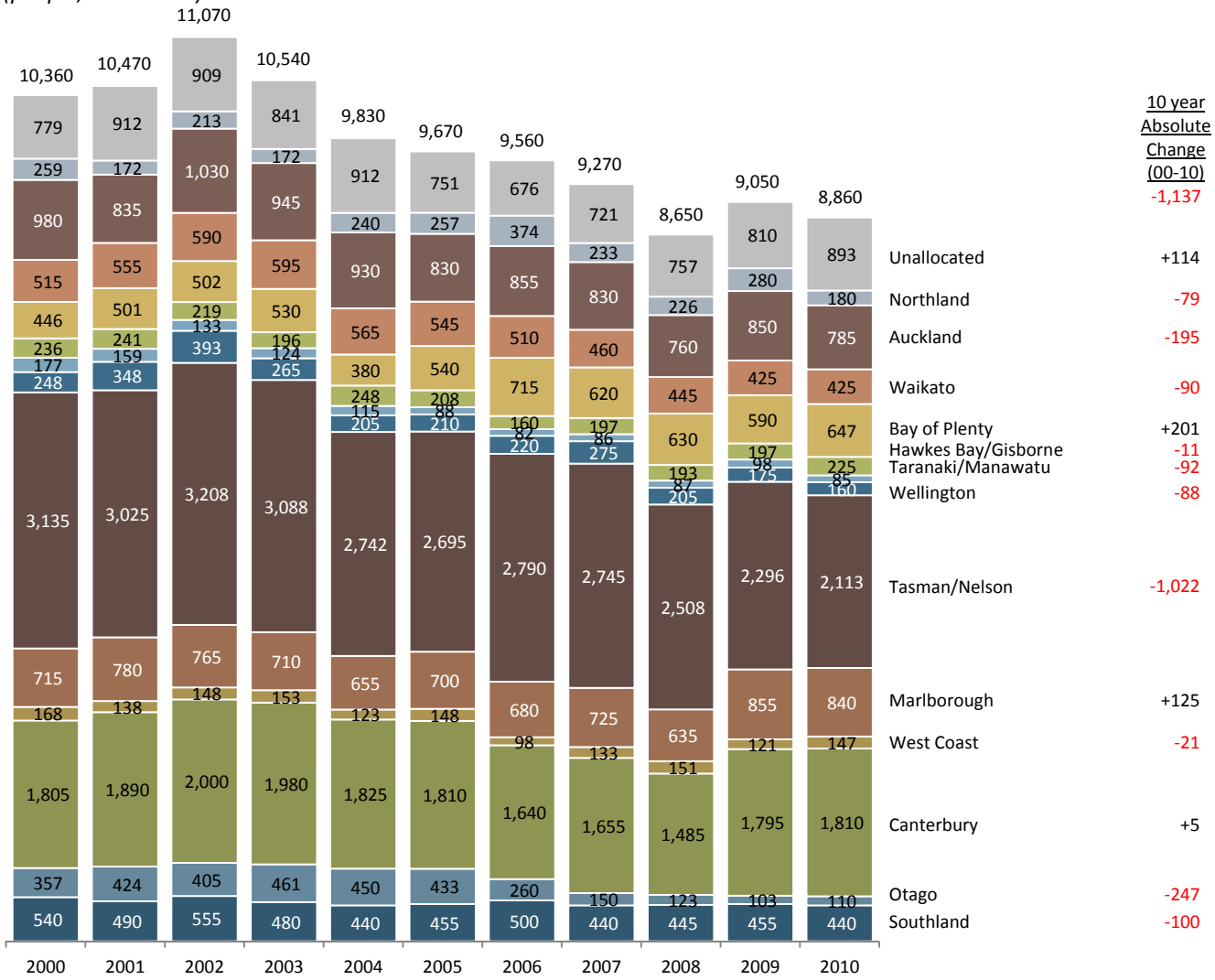
- Statistics New Zealand calculates its statistics based on the predominant business activity of the enterprise
- A firm that is defined as "beverage manufacturing" at the enterprise level may have a subsidiary at the geographic level that is classified as "grape growing"
- Data here is "geographic" units not "enterprise" units (pages prior)
- "Unallocated" is the difference between geographic unit employees and enterprise unit employees; it represents firm subsidiaries not involved in "beverage manufacturing," for example those classified as "grape growing" or "beverage wholesaling"

Source: SNZ business demographics (detailed industry for geographic units); Coriolis analysis

SEAFOOD – EMPLOYMENT BY REGION

Employment is declining across most regions – particularly Nelson/Tasman – with BOP and Marlborough being the only large gainers

Number of persons employed in the seafood industry in New Zealand
(people; 2000-2010)



	10 year Absolute Change (00-10)
Unallocated	+114
Northland	-79
Auckland	-195
Waikato	-90
Bay of Plenty	+201
Hawkes Bay/Gisborne	-11
Taranaki/Manawatu	-92
Wellington	-88
Tasman/Nelson	-1,022
Marlborough	+125
West Coast	-21
Canterbury	+5
Otago	-247
Southland	-100

Comments

- Likely a mixture of decreasing catch, increasing industry productivity through consolidation (fewer/larger) and responding to market prices.

Notes/Definitions

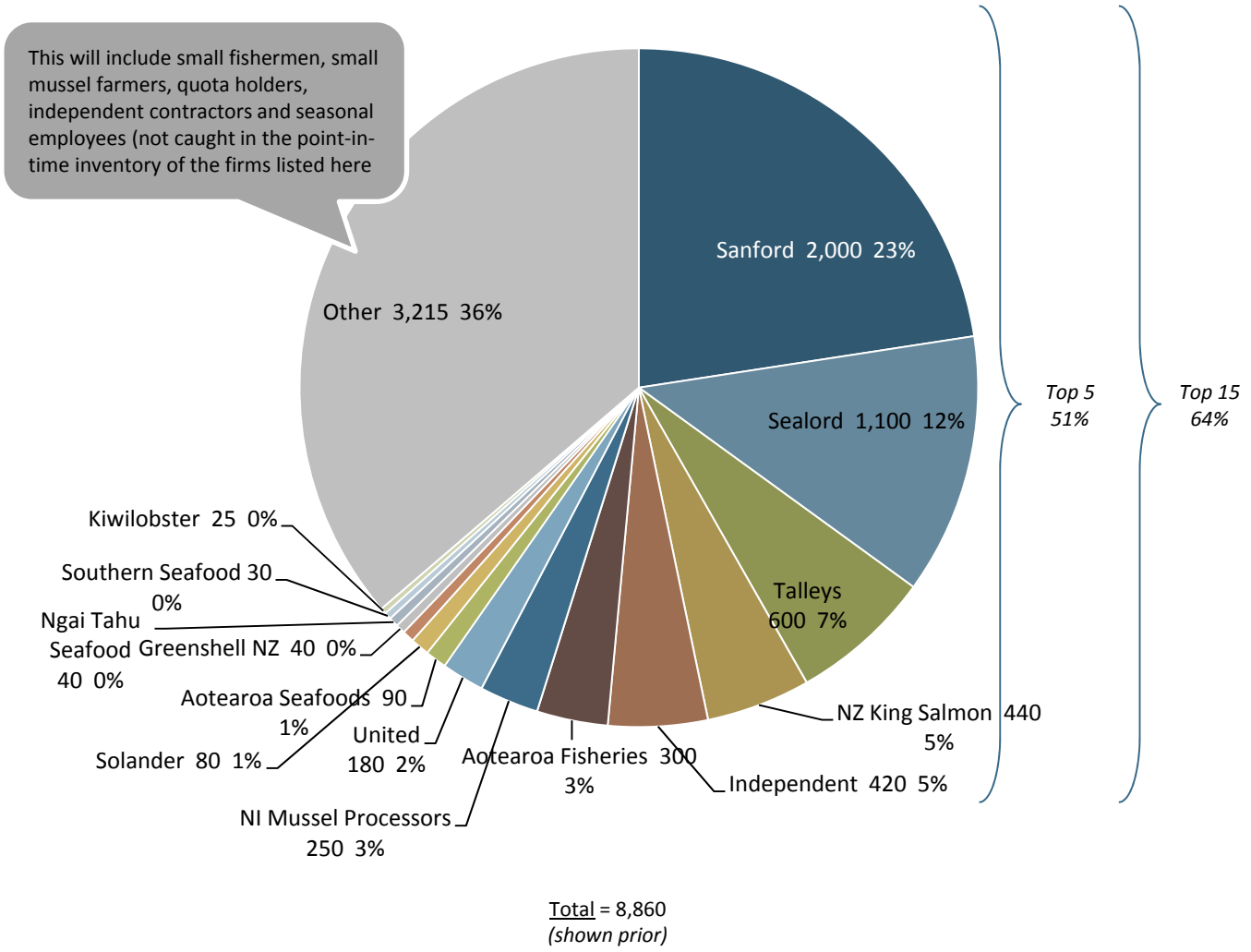
- This data aggregates fishing, aquaculture, seafood processing and wholesaling.
- Statistics New Zealand calculates its statistics based on predominant business activity; firms are classified by their predominant activity. For example, a firm that was 60% wild capture and 40% aquaculture would be classified as wild capture
- Therefore the breakdowns by categories as calculated by Statistics New Zealand do not reflect how industry thinks ("industry reality") Charts showing SNZ breakdown are included in the appendix
- Data for 2000 adjusted to include offshore and unallocated as included in other years in data
- *"Unallocated" see note prior page*

Source: SNZ business demographics (detailed industry for geographic units); Coriolis analysis

SEAFOOD – EMPLOYMENT BY FIRM

Industry employment is spread across a range of firms – the top 5 firms account for 51% – however small operators and "other" still account for about a third of industry employment

Number of persons employed in the seafood industry in New Zealand by key firm
(people; 2010)



Total = 8,860
(shown prior)

Comments/Notes

- Data should be treated as indicative or directional
- Employee numbers data comes from a mixture of sources and includes significant estimates; treat as indicative/directional
- We welcome any comments or corrections from any reader of this report
- Details provided in pages following
- Seafood operations of companies only
- Other will include small operators, independent contractors, quota holders and other industry related employment
- Other may also include some amount of seasonal employment not captured in point-in-time firm employment inventory and foreign crews (unclear at Statistics NZ source)

Notes/Definitions

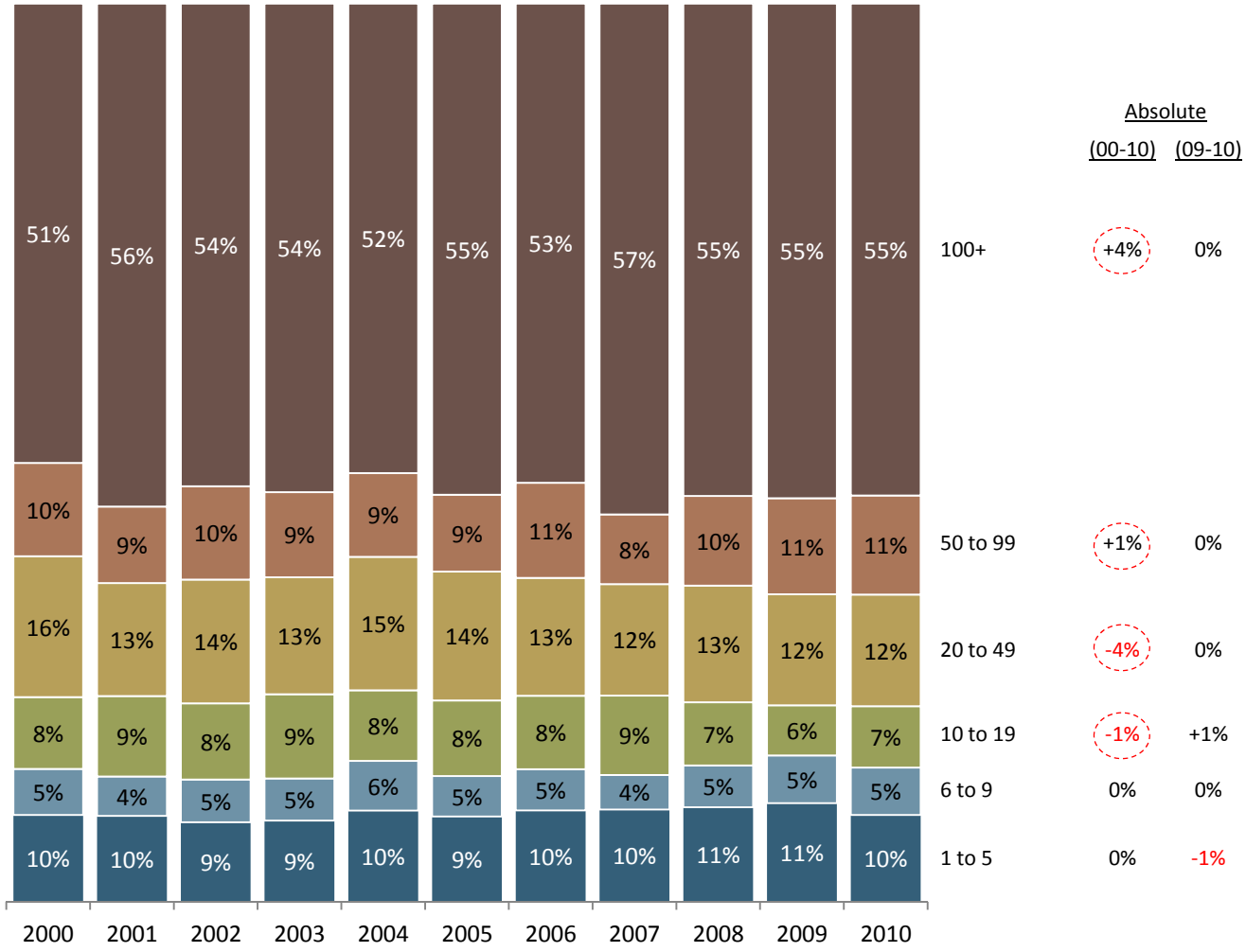
- Firm employment is point-in-time inventory; many firms have seasonal surges and/or employ significant numbers of independent contractors

Note: Uses persons employed by enterprise unit; Source: SNZ business demographics ; Kompass; various firm websites; published articles; Coriolis interviews

SEAFOOD – EMPLOYMENT BY FIRM SIZE

Large firms (50+ employees) are growing their share of industry employment

% of employment by firm employment size in the seafood industry in New Zealand[1]
(people; 2000-2010)



Comments

- Likely a mixture of increasing industry productivity through:
  - Consolidation (fewer/larger)
  - Automation (replacing labour with machines)
- Question: How strong are economies of scale in the seafood sector?

Notes/Definitions

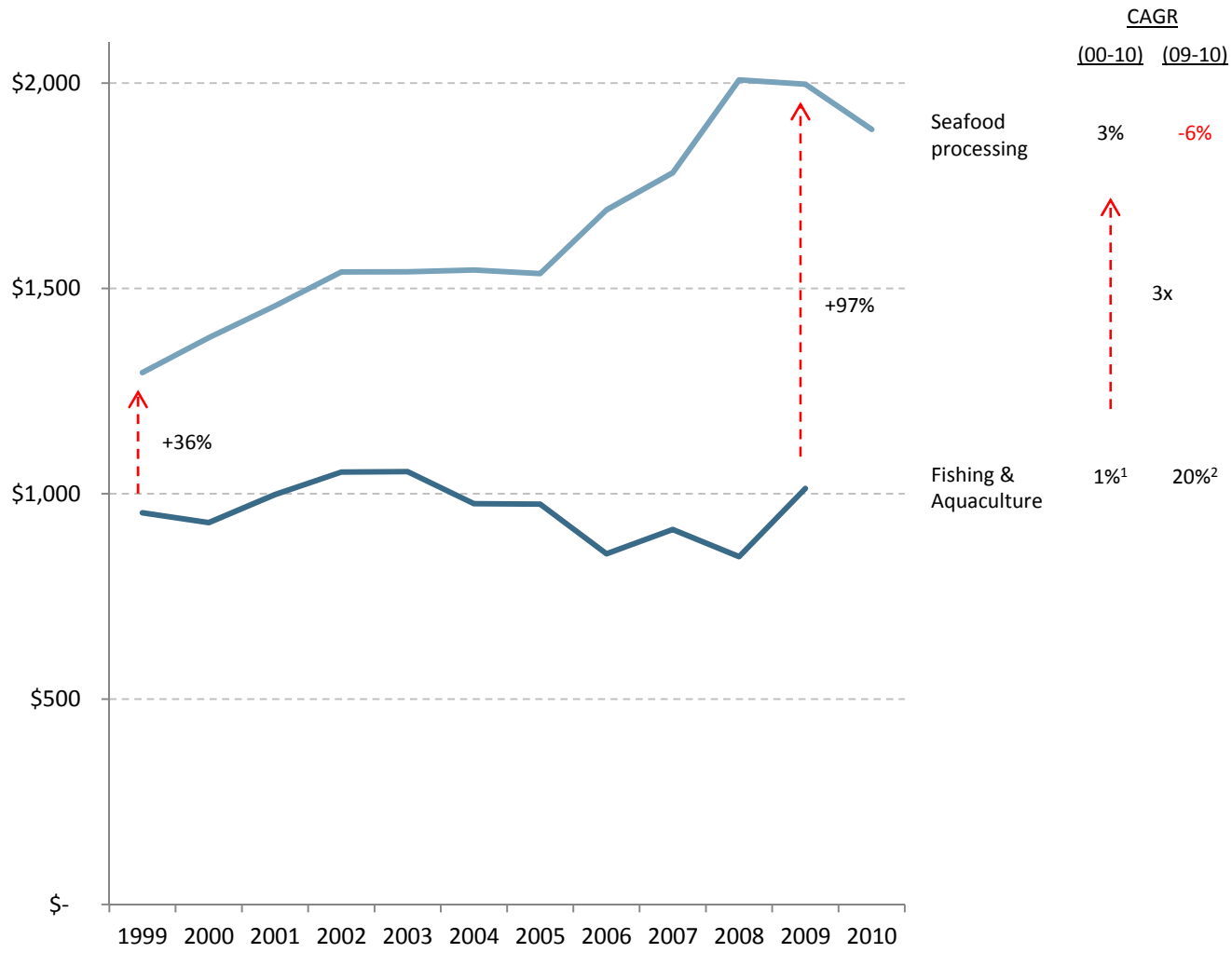
- Aggregates…
  - Wild capture (A041)
  - Aquaculture (A02)
  - Seafood processing (C112000)
- Data excludes wholesaling (F360400) as data not available

Source: SNZ business demographics (detailed industry for enterprise units) and (detailed industry for geographic units); Coriolis analysis

SEAFOOD – INDUSTRY AGGREGATE TURNOVER

The seafood industry is achieving limited turnover growth

Aggregate seafood industry turnover/total income
(NZ$; m; nominal, non-inflation adjusted; 1999-2010)



	CAGR (00-10)	CAGR (09-10)
Seafood processing	3%	-6%
Fishing & Aquaculture	1%[1]	20%[2]

Comments

- Caution with data… some double counting of inter-industry sales
- At 3%, processing is only at or around inflation and fishing/aquaculture is shrinking in real terms
- Seafood processing growing three times faster than primary fishing/farming
- Data should be read with caution due to nature of SNZ classification methodology (firms defined by primary activity)
- 2010 data not yet available for Fishing/Aquaculture from Annual Enterprise Survey until Oct 2011
- Data not available for seafood wholesaling
- Question: Why is seafood processing growing faster than the primary component?
- Question: How much of the growth of seafood processing is due to increased value added?

Notes/Definitions

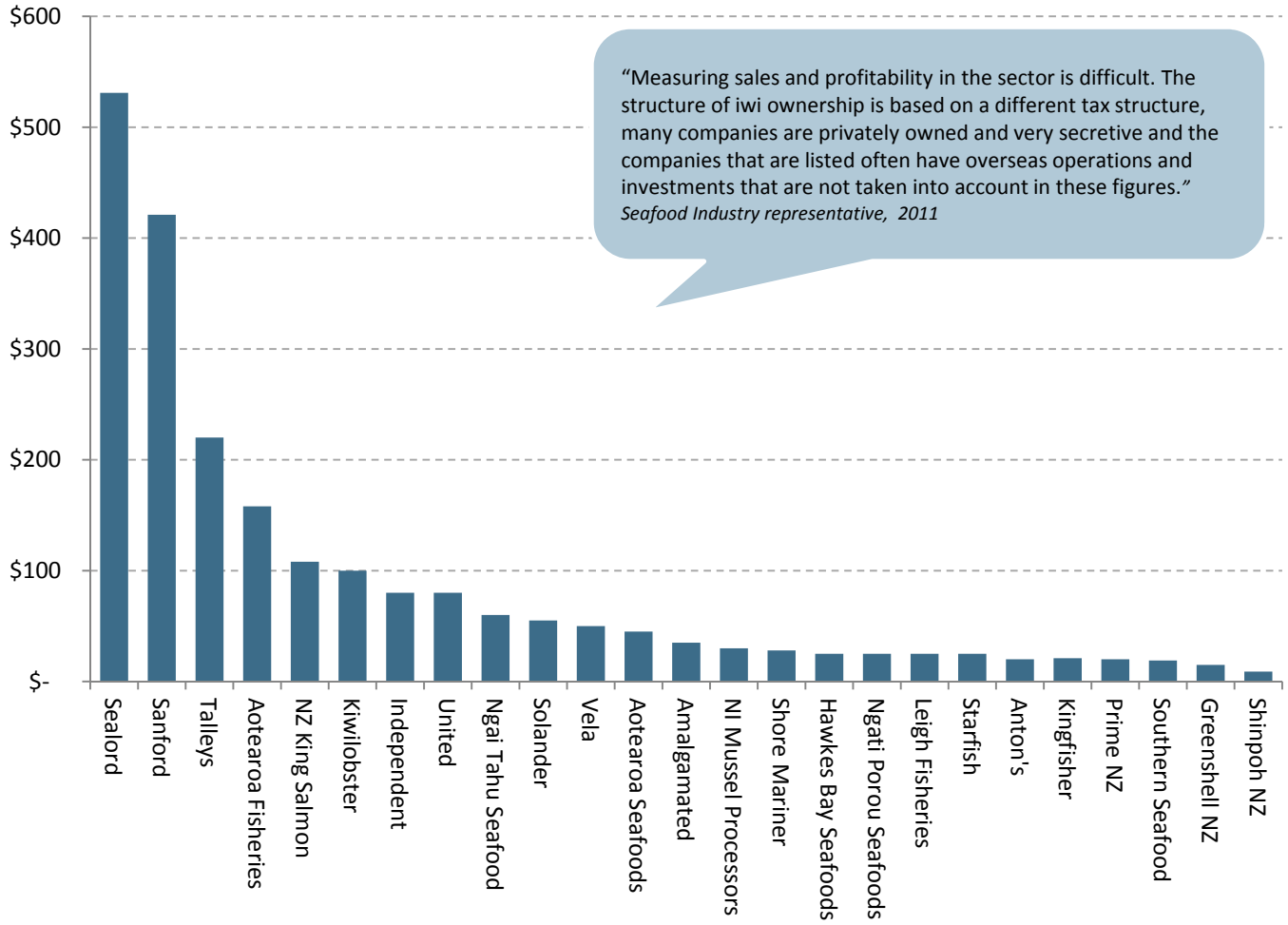
- Available data aggregates…
  - Wild capture (A041)+ Aquaculture (A020)
  - Seafood processing (C112000)

1. Uses last available 10 years (99-09); 2. uses last available year (08-09); Source: SNZ Infoshare (Manufacturing Survey (ANZSIC06) - MFG); (Table: Industry by variable (Qrtly-Mar/Jun/Sep/Dec)); "MFG001AA"; SNZ Annual Enterprise Survey (supplementary tables [table 08 or 4.08]); Coriolis analysis

SEAFOOD – TOP 25 BY TURNOVER

New Zealand has a strong and diversified seafood sector with a range of large and medium sized firms

Top 25 New Zealand seafood firms by turnover
(NZ$m; 2010 or as available)



"Measuring sales and profitability in the sector is difficult. The structure of iwi ownership is based on a different tax structure, many companies are privately owned and very secretive and the companies that are listed often have overseas operations and investments that are not taken into account in these figures."
Seafood Industry representative, 2011

Comments/Notes

- Turnover data comes from a mixture of sources and includes significant estimates (both by Coriolis and others); treat as indicative/directional
- We welcome any comments or corrections from any reader of this report
- Details provided in pages following

Source: various company annual reports, industry experts, Kompass, select articles, Coriolis

SEAFOOD – KEY FIRMS

There are three key firms – Aotearoa/Sealord, Sanford & Talley's – and a range of secondary firms in the New Zealand seafood sector…

Key firms in the New Zealand seafood sector
(2010 or as available)

	Turnover	% Export	Employees	Ownership	Year founded	Notes
AOTEAROA fisheries limited	$158m (2010)		300 (Ce)	NZ; tribal (various iwi/tribal holdings)	2004	www.afl.maori.nz www.pacificmarine.co.nz www.pfl.co.nz www.moanapacific.com www.opcolumbia.co.nz
SEALORD	$531m (2010)	90%+ (K)	1,100 (Ci)	50% NZ; 50% Japan Aotearoa Fisheries 50% Nippon Suisan Kaisha 50% (listed Japan)	1974	www.sealord.co.nz www.afl.maori.nz www.nissui.co.jp
SANFORD LIMITED SUSTAINABLE SEAFOOD	$421m (2010)	85% (AR)	2,000 (Ci)	NZ; public (NZX: SAN) (37% Amalgamated/Goodfellow Family)	1881	www.sanford.co.nz www.amalmark.co.nz
Talley's	~$220m (Ce)[1] (2010)		600 (Ce)	NZ; private (Talley family)	1936	www.talleys.co.nz
New Zealand King Salmon	$108m (2010)		440 (Ci)	Foreign controlled 53% RH Group (Malaysia) 13% Direct Capital	1985	www.kingsalmon.co.nz www.rhg.com.my en.wikipedia.org/wiki/Tiong_Hiew_King
Fiordland Lobster Co. Ltd Kinglobster New Zealand	$100m (Ci)	98% (article)	5-49 (ws)	The Fiordland Lobster Co. NZ; mixed (Hutchins/Wilson 25%; iwi; other)	1987	www.lobster.co.nz Primary markets China (96%?) and Japan Export pack factories in North and South Island Exports 800 tonnes

1. Excludes Open Country Dairy and AFFCO; Source: various company annual reports (AR) ; various company websites (ws) ; Kompass (K) ; interviews (Ci) ; Coriolis analysis and estimates (Ce)

SEAFOOD – KEY FIRMS

… Mid-sized firms in the sector are primarily private/family owned or Maori…

Key firms in the New Zealand seafood sector
(2010 or as available)

	Turnover	% Export	Employees	Ownership	Year founded	Notes
UNITED	$80m (CI)	50%	180 (K)	NZ; private (Kotzikas family)	1974	www.unitedfisheries.co.nz
Independent	$80m (Ce)	80% (article)	420 (K)	NZ; private (Shadbolt family; others)	1959	www.indfish.co.nz 30,000t/annually
NGĀI TAHU SEAFOOD	$60m (2010)	80%	35-55 (Ce)	NZ; tribal (Ngai Tahu Charitable Trust)	1989	www.ngaitahuseafood.com
Solander	~$55m (Ce)		320 (pa)	NZ; private (Hufflett family)	~1929 /1981	www.solander.co.nz www.solander.com.fj
VELA FISHING LTD	~$70m ($50-100m) (Ce)		10* (Ci)	NZ; private (Vela family)	1929	Owns quota; no vessel operations; export marketing www.velafishing.co.nz
Aotearoa Seafoods Ltd	$45m (Ce) (excludes wine ~50%)		~90 (x wine) (Ci)	Wakatu Incorporation (Maori ownership)		www.aotearoaseafoods.co.nz www.wakatu.org www.horoirangi.co.nz Greenshell mussels, lobster/crayfish to 27 countries Fully integrated ; 35% own farms; Supply UK and Costco
Amalgamated MARKETING	$35m (K)		5 (K)	NZ; private (Goodfellow family)	1974	Parent is Amalgamated Dairies (diversified) Turnover here is non-Sanford; markets fish other catch www.amalmark.co.nz/
north island mussel processors ltd	$30m (Ke)		280 (Ci)	NZ; JV Sealord 33%; Sanford 33%; Greenshell Investments 33%	2005	"Toll processing facility" for industry www.nimpl.co.nz/

* Does not include independent contractors, joint-ventures, etc.; ; Source: various company annual reports (AR) ; various company websites (ws) ; Kompass (K) ; interviews (Ci) ; Coriolis analysis and estimates (Ce)

SEAFOOD – SECONDARY FIRMS

… continued

Key firms in the New Zealand seafood sector
(2010 or as available)

	Turnover	% Export	Employees	Ownership	Year founded	Notes
	$20-30 (Ce)			NZ; private (D'Esposito family)	1997	www.hawkesbayseafoods.co.nz Vertically integrated
	$20-30 (Ce)		16 (ws)	NZ; Tribal (Te Runanga O Ngati Porou)	2002	www.npsl.co.nz Vertically integrated (does not own boats) Branded as Readlnz
	$20-30 (Ce)		35 (ws)	NZ; private (Dermot Cunningham & others)	1958	www.leefish.ch Independent fishing boats (~100)
	$20-30m (Ce)		14 (K)	NZ; private Tony (Ante) Barbarich	1973	Owns three trawlers; charters trawlers & squid jiggers Formed JV with Aotearoa Fisheries (Dec 2005) JV owns 35,000sqft plant (8,000t capacity) www.antons-seafoods.co.nz
	$28m (2009)		20	AU; private Competitive Foods (Jack Cowin)	1995	www.shore-mariner.co.nz www.markwellfoods.com.au Ultimate parent is Competitive Foods Group (Hungry Jack's and other fast food in Australia) owned by Jack Cowin
	$25m (K)		50 (K)	NZ; private (Claudatos family)	1964	www.star-fish.co.nz 800t of quota in various fish stocks
	$21m (2009)	50% (K)	50 (Ce)	Foreign owned 50% Thai; 50% Japan 100% Kingfisher (Thailand) Itself 51% Maruha Nichiro (Japan)	1992	50% owner Maruha is #1 Japanese seafood company www.kingfisher.co.nz www.maruha-nichiro.co.jp

Source: various company annual reports (AR) ; various company websites (ws) ; Kompass (K) ; interviews (Ci) ; Coriolis analysis and estimates (Ce)

SEAFOOD – SECONDARY FIRMS

… continued

Key firms in the New Zealand seafood sector
(2010 or as available)

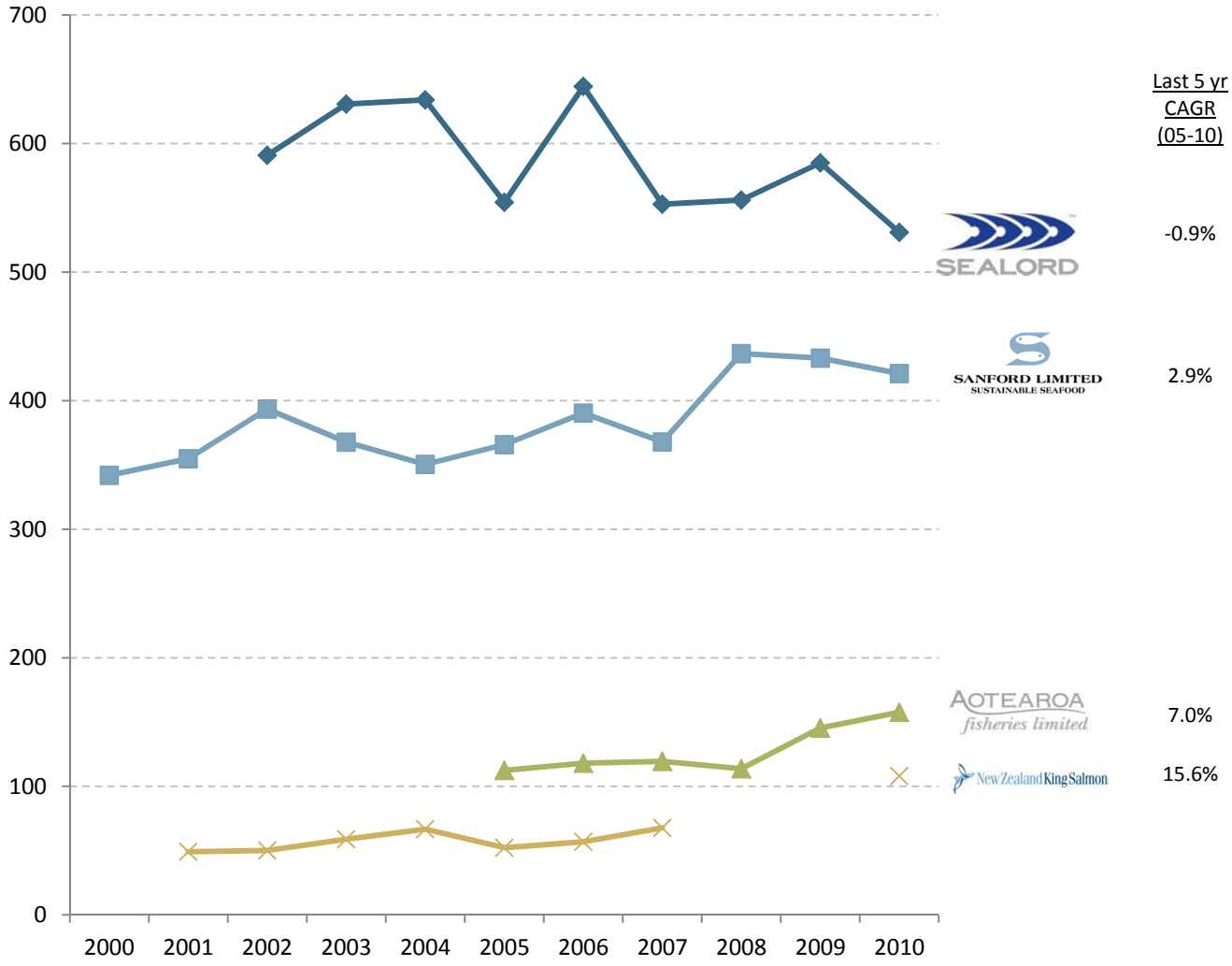
	Turnover	% Export	Employees	Ownership	Year founded	Notes
	$20m (Ce)	20% (article)	50	50% NZ; 50% Philippines Alliance Tuna Intl. 50% Studholme family 50%	1993	www.primefoodsnz.co.nz Prime Smoke brand; buy fresh salmon from Sanford
Southern Seafood Ltd.	$19m (Ke)		30	NZ; private (Cave family)	1992	www.seafoodnz.co.nz (not working)
	$15m (Ci)		40 (Ci)	NZ; Private: (Peter Vitasovich)	1990	www.greenshellnewzealand.com 10,000 tonnes harvested in 2010 30% share in NI Mussel Processors Ltd
	$9m (2009)	100%	3	Japan; private (?)		Shinpoh NZ Ltd (Symposium on Foods Inc) www.shinpoh.com Japanese importer of gourmet foods (incl. NZKS salmon)
	N/A	n/a	TBD	NZ; private (Bull family)	1998	www.seaproducts.co.nz Greenshell mussels, pacific oysters, Cockles, Pipis , scallops

Source: various company annual reports AR) ; various company websites (ws) ; Kompass (K) ; interviews (Ci) ; Coriolis analysis and estimates (Ce)

SEAFOOD – TURNOVER OF KEY FIRMS

Leading firms are achieving limited turnover growth other than through acquisition

Turnover of select large seafood industry firms
(NZ$m; 2000-2010 as available)



	Last 5 yr CAGR (05-10)
Sealord	-0.9%
Sanford	2.9%
Aotearoa	7.0%
New Zealand King Salmon	15.6%

Comments

- All firms shown here driving growth through acquisition
- Sealord uses Kura Limited; full year data not available prior to 2002; firm has made a number of major divestitures

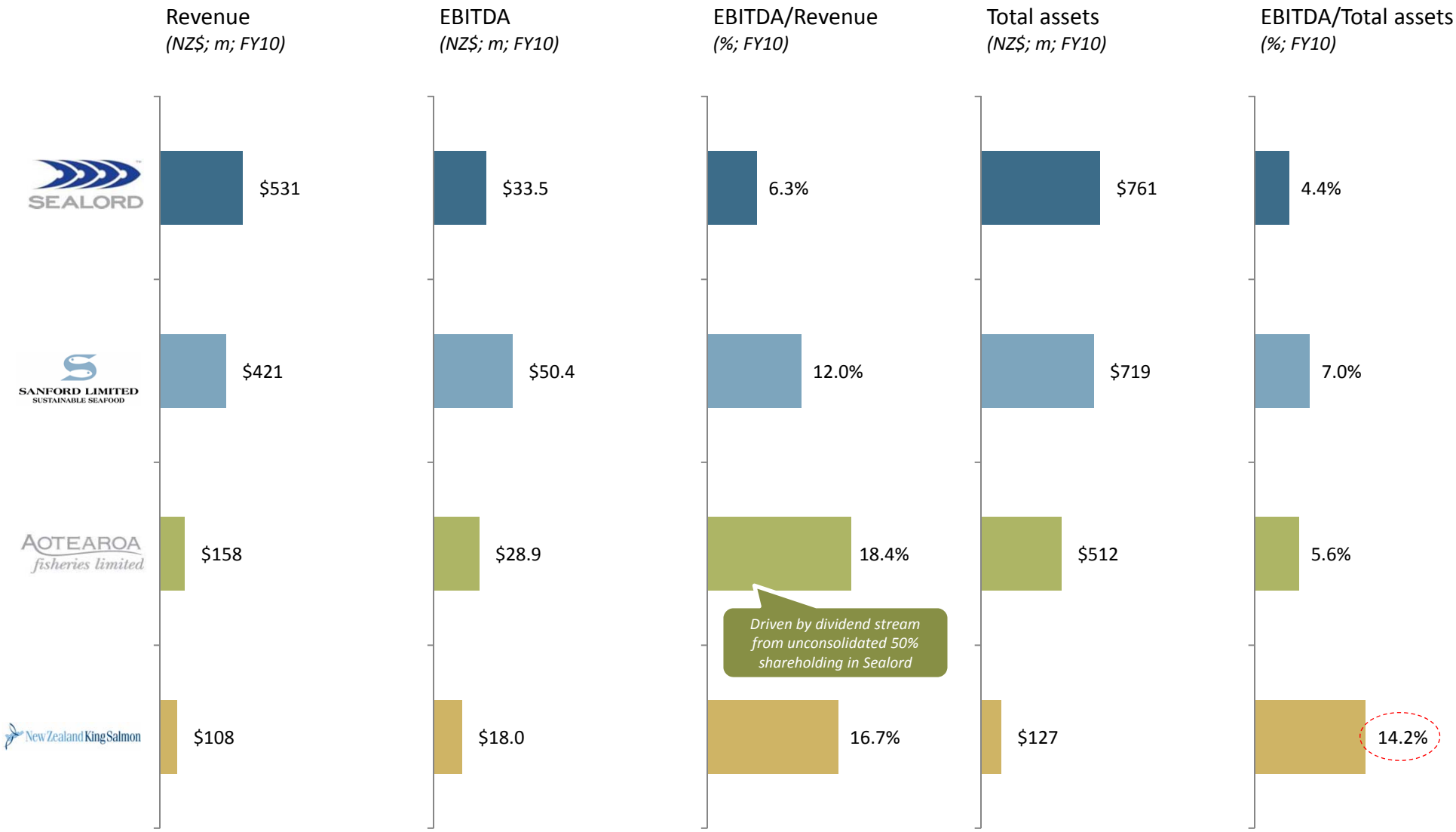
Notes/Definitions

- Aotearoa Fisheries does not include 50% ownership of Sealord (unconsolidated)
- New Zealand King Salmon turnover unclear in annual reports 2008-2009 due to changing ownership
- Data is as filed with New Zealand Companies Office (Kura, Sanford and Oregon Group/NZKS); Aotearoa uses financial report as available on Aotearoa website

Source: various companies annual financial statements (as filed with NZ Companies Office or available company website); Coriolis analysis

SEAFOOD – FIRM PROFITABILITY BENCHMARKING

Financial performance of key firms varies

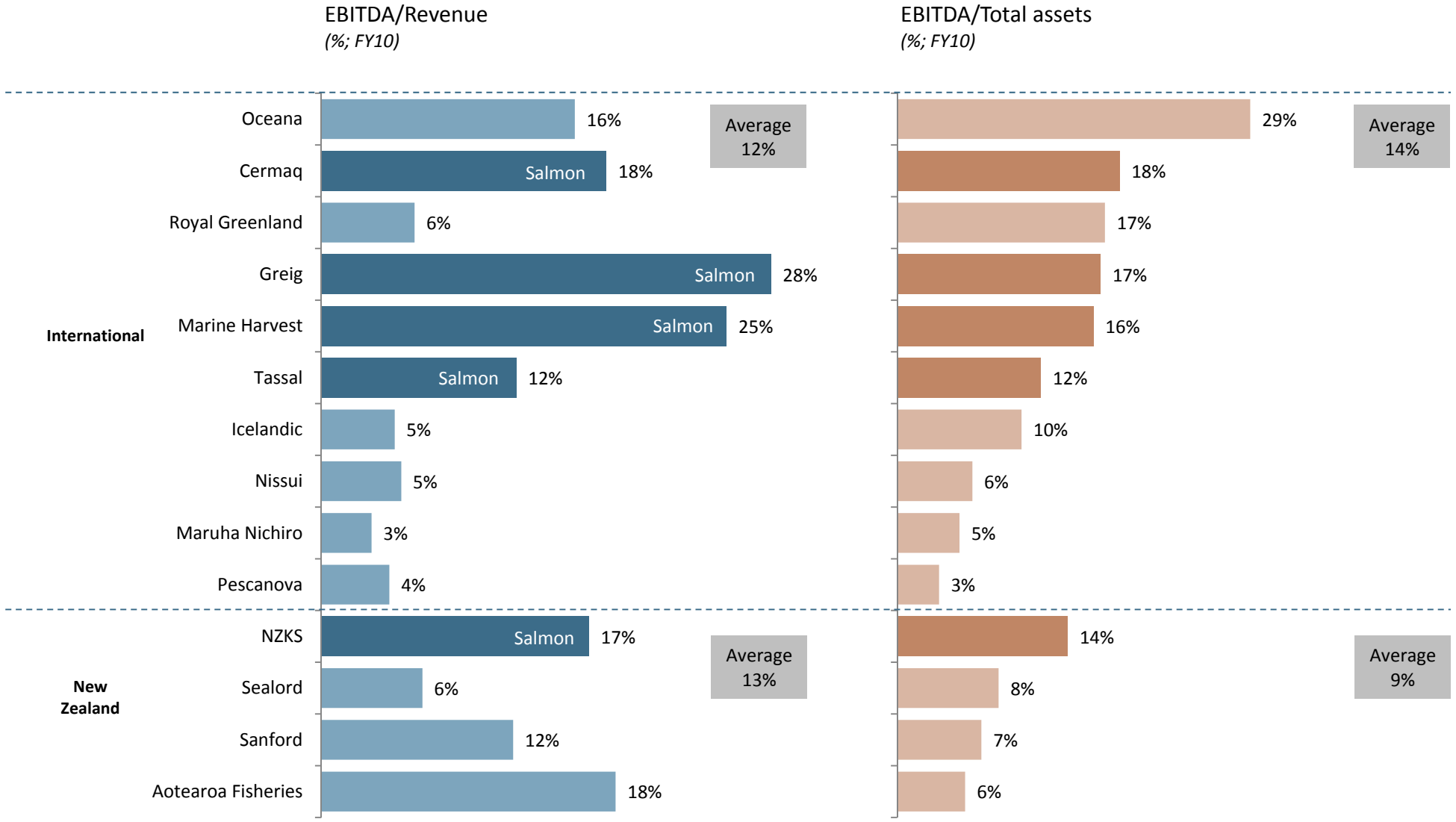


Note: EBITDA is as given or calculated as OPBIT + depreciation; we are not accountants; data should be treated as directional; Note 2: Source: various annual reports as published; Coriolis analysis

CORIOLIS

SEAFOOD – FIRM PROFITABILITY BENCHMARKING

New Zealand firms generally perform in line with global peers on return on sales but low in return on assets; interestingly salmon focused firms more profitable than wild catch or diversified

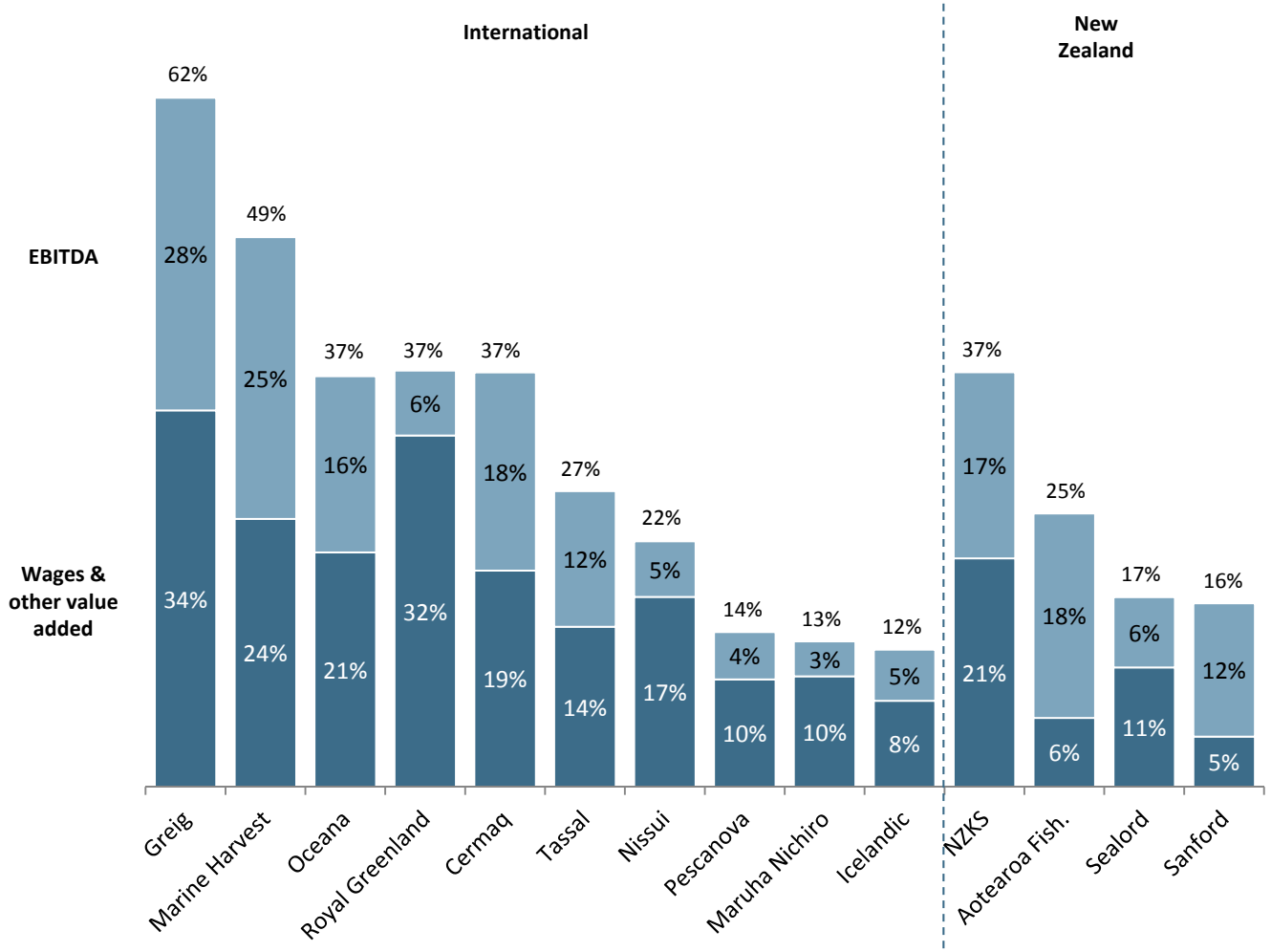


Note: EBITDA is as given or calculated as OPBIT + depreciation; we are not accountants; data should be treated as directional; firms chosen by Coriolis from past research with additions and subtractions suggested by NZ firm interviewees; Source: various annual reports as published; Coriolis analysis

SEAFOOD – VALUE ADDED

Peers indicate there may be more opportunities to add value

Benchmarking value added: key New Zealand firms vs. select global seafood companies
(% of sales; FY10)



Notes/Definitions

- To economists value-added is the "difference between the cost of materials purchased by a firm and the price for which it sells those goods"; this is almost/ effectively gross profit (which is what we use here) [or effectively what firms pay GST on]
- Gross profit itself is then paid out as a return on labour (wages), other non-COGS and a return on capital (EBITDA)
- Gross domestic profit (GDP) is a measure of the gross value added; when we propose increasing New Zealand's GDP, we are effectively proposing to increase the amount of value added

Limitations:

- "You are comparing a period when the NZ dollar is at significantly above average, yet international salmon prices have been at record highs due to the collapse of the Chilean Salmon Farming because of ISA disease. Therefore the Norwegian companies have been enjoying record profit levels." *Seafood Company (large), 2011*

Note: we are not accountants; data should be treated as directional; Source: various annual reports as published; Coriolis analysis

SEAFOOD – TRANSACTIONS

Recent transactions show the industry is undergoing consolidation

Recent major seafood industry transactions
(2008-2010)

Date	Acquirer	Target	Price	Details
Nov 2010	Sanford	Pacifica Seafood (mussel and oyster aquaculture operations) from Skeggs Group	NZ$85m	- Acquisition of #2 mussel producer by #1 mussel producer (industry consolidation) - Ownership of 70+ marine farms, 400 hectares of water space and 800 mussel longlines together with lease, share and contract farming operations that include a further 130 hectares of space and 300 mussel longlines - 40% interest in an approved 2,695 hectare mussel farm development opportunity in Pegasus Bay , Canterbury - A large and modern mussel and salmon processing facility in Christchurch.
Aug 2010	Nissui	35% share of Nordic Seafood (Denmark) from Sealord Group	NZ$23.3m	- Sealord was 35% shareholder in Nordic Seafood (Denmark) with 50% owner Nissui - Sold Nordic to Nissui for $23.3m. Sealord retaining an equity position in Nordic
Dec 2009	Select Iwi	Aquaculture marine areas	N/A	- Takutai Trust facilitating the marine aquaculture assets back to relevant mandated iwi organisations
Oct 2009	Aotearoa Fisheries	Pacific Catch from Ngai Tahu		- Ngai Tahu retail fish business in Wellington
Aug 2009	Sealord Group (Kura Limited)	King Reef Seafoods (Queensland, Australia)	N/A	- Farm barramundi in river-based operation in Northern Queensland; on site factory - “A fully integrated barramundi breeding, growing and processing business “ producing 1,500t/year
Aug 2009	Sealord Group (Kura Limited)	33.34% of Yuken from Pesel (Alfredo Pott)	NZ$26m[1]	- Already 50% owner since 2000; acquired +33.34% - 2 ships at sea; 170 staff; 20,000t annual catch of hoki, hake and other species - Argentinian deep water fishing company including hoki and hake; Argentina being MSC certified for Hoki
July 2009	Sealord Group (Kura Limited)	50% of Petuna Aquaculture Pty Ltd. (Tasmania, Australia) from Rockcliffe family	N/A	- Already had 50% ownership of Petuna Sealord Deepwater JV - Acquired 50% ownership of Tasmanian aquaculture operation - Operate deep-sea fishing vessels and raise Ocean Trout, Atlantic Salmon and Saltwater Charr at aquaculture sea farms “in the unspoilt cool wild waters of Tasmania” - http://www.petuna.com/
July 2009	Sanford	240ha of mussel farms from Sealord Group	NZ$24.3m	- 240 hectares of aquaculture water space producing 5,000t/annum of mussels in Marlborough Sounds - Note: Sealord keeps mussel farms in Tasman Bay and the Coromandel
Apr 2009	Sanford Ltd	Weihai Dong Won Foods (China) from minority partner	N/A	- Increased share to 50% by acquiring minority owner; JV is with Dongwon Fisheries (South Korea) - Sept 2004 25% of seafood processing company in China
2009	Salmon Smolt NZ Ltd	Silverstream Hatchery, NIWA	N/A	- JV group to produce eggs and smolt for South Island salmon farms
2008	Sanford	Jones Group	N/A	- Assets and quota of bluff oyster fisheries
Oct 2008	Aotearoa Fisheries	Ocean Ranch (New Zealand) Limited from Focas family	N/A	- Was JV partner in Prepared Foods; also acquired paua quota, making AFL NZ’s largest paua processor
Oct 2008	Alliance Tuna International	50% of Prime Foods NZ from Studholme family	NZ$1.3m	- Half of smoked salmon producer in Darfield from founding family - Firm then forms venture in Mindanao to process NZ salmon into smoked forms

1. AR09 p37 + AR10 p36; Including acquisition costs; Source: various companies annual financial statements (as filed with NZ Companies Office or available company website); various press releases and news articles; Coriolis analysis

SEAFOOD – TRANSACTIONS

Consolidation is an on going long-term process in the industry, as these older transactions demonstrate

Older major seafood industry transactions
(2004-2008)

Date	Acquirer	Target	Price	Details
Sep 2008	Direct Capital	45% of NZKS from Tiong family	N/A	- Direct Capital and management acquire partial share in NZ leading farmed salmon producer
Mar 2007	Aotearoa Fisheries	OPC Fish and Lobster	N/A	- Inshore wetfish, lobster and scallops business and quota
Feb 2007	Aotearoa Fisheries	Kia Ora Seafoods	N/A	- Processing and marketing of pacific oysters; factory in Manukau - Provides +50% increase to existing oyster volume to 1.2m dozen
Jan 2007	TBD	70% of Pesquera San Arawa SA and 100% of Pesquera Sanford SA (Argntina) by Sanford	NZ$14.5m	- Exited fish catching and processing JV in Argentina
2007	Aotearoa Fisheries	South Pacific International (SPI)	N/A	- Crayfish quota with “strong position in CRA2 fishery area/region”
2006	Talley’s	AFFCO from other shareholders	N/A	- Increased stake from 16% to 50.1%; diversification of #3 seafood firm away from seafood
Jun 2006	Sealord	50% of Elaine Bay Aquaculture from co-owner Rob Pooley	N/A	- Marine farm servicing company which is responsible for co-ordinating the supply of mussels to factory - Was 50/50 JV
Apr 2005	Paramount Foods (So Natural Foods)	Brunswick (in NZ and AU)	N/A	- Ambient Seafood business for $11m
Feb 2005	Talley’s	Amaltal Fishing Co from Amalgamated Dairies	N/A	- Acquired other 50% of joint-venture formed in 1983 from Amalgamated Dairies (NZ)
Jan 2005	Sanford	Simunovich scampi quota	N/A	- Increases Sanford share of lobster (scampi) quota (following Commerce Commission clearance)
Oct 2004	Sanford	Simunovich Fisheries	NZ$137m	- Fishing assets, including 4 inshore vessels, 6 scampi vessels , & 3 vessel Ocean Fresh Fisheries (Australia) in $137m deal (ex-Scampi quota)
Sep 2004	Sanford	25% of Weihai Dong Won Foods from minority Korean shareholder	N/A	- Acquired 25% of Weihai Dong Won Foods based in Weihai in the north-east of Shandong province - Sanford & Dong Won operate San Won cool storage in Timaru; Sanford charters Don Won vessels
Apr 2004	Sealord/Sanford	Merger talks called off	N/A	- Negotiation breakdown was because of "board issues not operational issues“ - Nissui stake of 25% implies 50/50 merger (due to high Sealord debt)
Jan 2004	Aotearoa Fisheries	Sealord (50%) Prepared Foods Ltd (50%) 100% Moana Pacific Fisheries, Chatham Processing, Pacific Marine Farms, Prepared Foods Processing	N/A	- Maori Fisheries mega-corporation formed - Equity value of resulting company is $350m

Source: various companies annual financial statements (as filed with NZ Companies Office or available company website); various press releases and news articles; Coriolis analysis

SEAFOOD – CONSOLIDATION

Industry consolidation is expected to continue, though at a limited pace

- "There has been a buyout of smaller players, increased ownership is in the hands of fewer players. There has been a consolidation of the top 10 companies." *GM, Seafood Company, medium, 2011*

- "Consolidation will continue, but it will be opportunistic not strategic. The industry is family dominated, with families being active in the business. Only when there is a generational change, then there might be a sale. Companies with Maori ownership won't sell." *CEO, Seafood Company, large, 2011*

- "Seafood companies Sanford Limited, Sealord Group Limited and Kiwigreen Investments Limited have announced they have formed North Island Mussel Processors Limited (owned equally by the three parties) to consolidate their mussel processing requirements for Greenshell Mussels grown in the Coromandel region…The new joint venture focuses on processing scale efficiencies made possible by the increased volumes of mussels farmed from the shareholder interests in the expanded Wilsons Bay sites approved over 2 years ago. The Kiwigreen facility in Tauranga was chosen as the most suitable site for this expansion because of its export port location and access to a larger labour pool." *Just-food, online article, August 2005*

SEAFOOD – THEMES

An analysis of firm level behaviour showed a range of activity or investment themes around cost savings

Identified firm level activity or investment themes – cost savings
(2010)

Theme	Details	Examples
Cost savings		
Industry consolidation	Fewer, larger firms within sectors	- Sanford acquisition of mussel farms from Sealord and Skeggs/Pacifica increasing its share of the sector - Aotearoa acquisition of Abalone/Paua quota (2008) - Sealord closure of Nelson mussel processing factory (320 workers laid off) [2008]
Automation	Replacing labour with machines	- Sanford mussel opening machine in Havelock North $17m - NI Mussel Processors $23m new factory extenstion with 28 NZ-developed mussel opening machines - Aotearoa Fisheries upgrade of Kia Ora factory
International outsourcing	Use lower cost labour from other countries to reduce costs	- Widespread use of foreign charters by major wild catch operators - Prime Foods NZ creates JV with Alliance Tuna Int. of the Philippines to build smokehouse operation in Mindanao (near existing Alliance Tuna canning facility) increasing capacity from 300t to 1,200t - Sanford investment in San Won in China "to allow for cheaper processing of goods"
Processing joint-ventures	Creation of processing joint-venture to maximise use of capacity	- Sealord, Sanford and Greenshell form North Island Mussel Processors 2nd plant in Tauranga opened in June 2010 - Aotearoa Fisheries and Anton's form processing JV to use capacity of plant (which was at 50%) - Aotearoa Fisheries/Prepared Foods and Multi Pack Ltd. created Prepack Ltd. JV (FY09) to use additional capacity and capabilities to produce army rations for export - Processing and marketing of Ngai Tahu abalone through Aotearoa/PFL
In-market joint-ventures	Creation of in-market joint ventures by competing firms to share costs and sell product	- Sealord, Sanford, Aotearoa Seafoods and Greenshell Investments creation of "Pure New Zealand Greenshell Mussels General Partner" to set up "single brand seller" in the Chinese market (2010) - Creation of Jemco by Aotearoa Fisheries, Clevedon Coast Oysters, Biomarine and Absolute Foods to market NZ oysters in Japan (2000) - Sealord JV with Kailis Brothers in Australian market (2010)

Source: Coriolis; interviews

SEAFOOD – THEMES

Firm behaviour also shows a range of activities revolving around searching for growth, the challenge is to increase value in a volume constrained environment

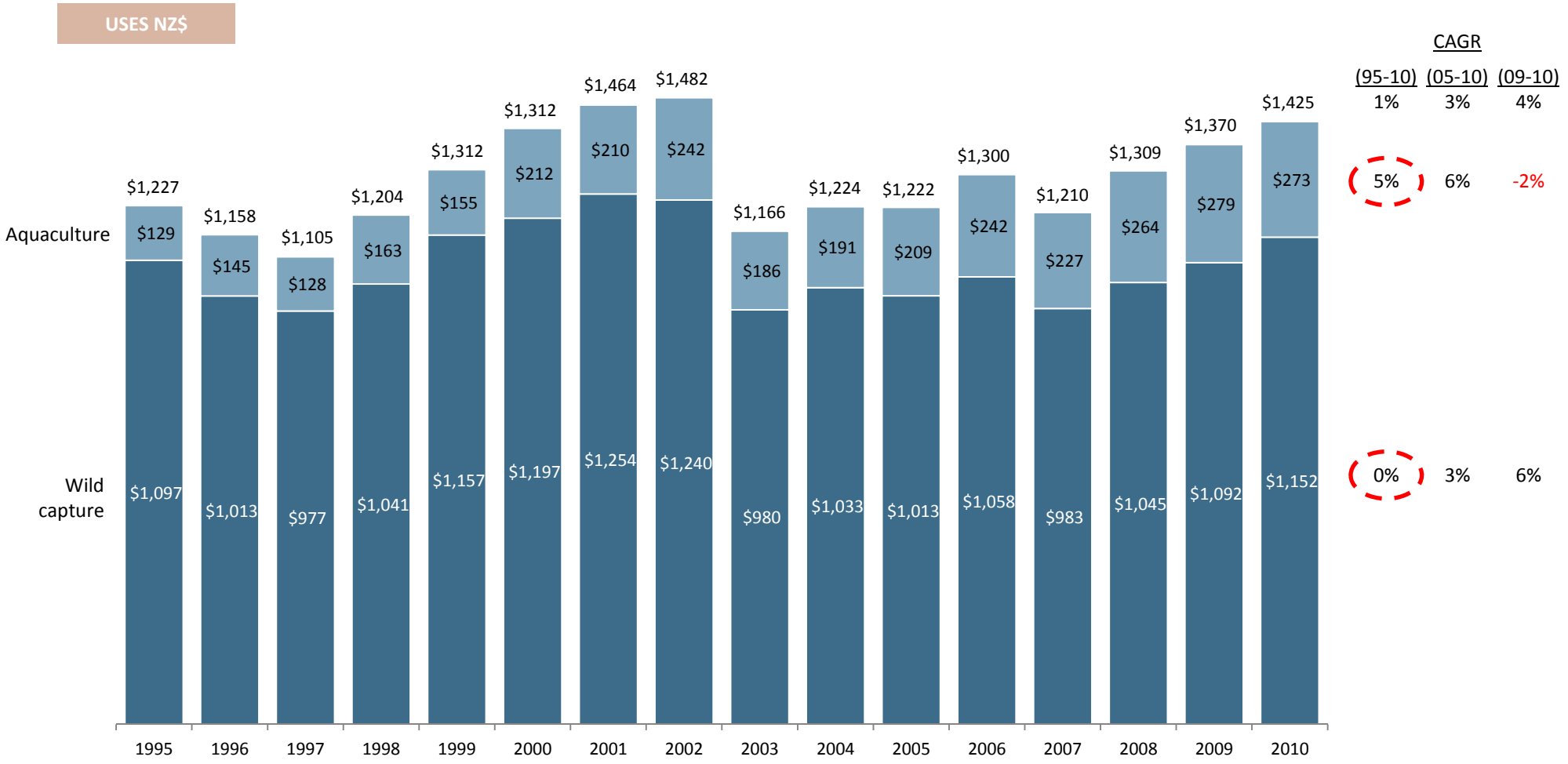
Identified firm level activity or investment themes – search for growth
(2010)

Theme	Details	Examples
Search for growth		
Pushing sustainability	Leveraging New Zealand quota management system for market advantage	- Sanford develops "Sustainability Policy" (2008) - 1 NZ species Marine Stewardship Council (MSC) approved [Hoki 2001]; 5 in process (6 of 183 global) - Investigating opportunity for National Sustainability system, similar to Iceland, Alaska
Outward direct investment	NZ based firms investing in seafood operations in other countries	- Sealord investment in Nordic (Denmark), Yuken (Argentina), Petuna (Tasmania) & King Reef (Queensland); Nordic later sold 2010 - Sanford in Weihai Dong Won Foods (China)
Diversification	Expansion from core business into new areas	- Talley's (seafood) acquisition of AFFCO (meat) and Open Country (dairy) - Wakatu (owner of Aotearoa Seafoods) launch of Kono branded wine - Sanford wine tourism JV with The Big Picture Wine (Dec 2008)
Higher value-added products	Developing higher value-added products from low value inputs	- Sealord launched 18 new frozen seafood product lines in Australia doubling market share in seafood meal category (2007)
New species	Developing new species	- NIWA developing kingfish, hapuka (JV with Sealord) and abalone (paua) - OceanzBlue investment in onshore abalone/paua operation - Greenshell/Vitasovich proposed kingfish venture off Coromandel
Regulatory environment		
Sector change driven by legislation	Change in the sector is driven in part by legislative change	- Quota Management System introduced by Government in 1986 - Resource Management Act 1991 - Maori Commercial Fisheries Settlement in 1992 - Maori Fisheries Act 2004 leading to formation of Aotearoa Fisheries - Current Aquaculture Legislation Amendment Bill (multiple amendments)

SEAFOOD – EXPORT VALUE BY PRODUCTION TYPE

Limited seafood export growth being driven by aquaculture over the medium term; wild capture flat (down in real terms)

New Zealand seafood export value: wild capture vs. aquaculture
(NZ$m; nominal non-inflation adjusted; FOB; 1995-2010)



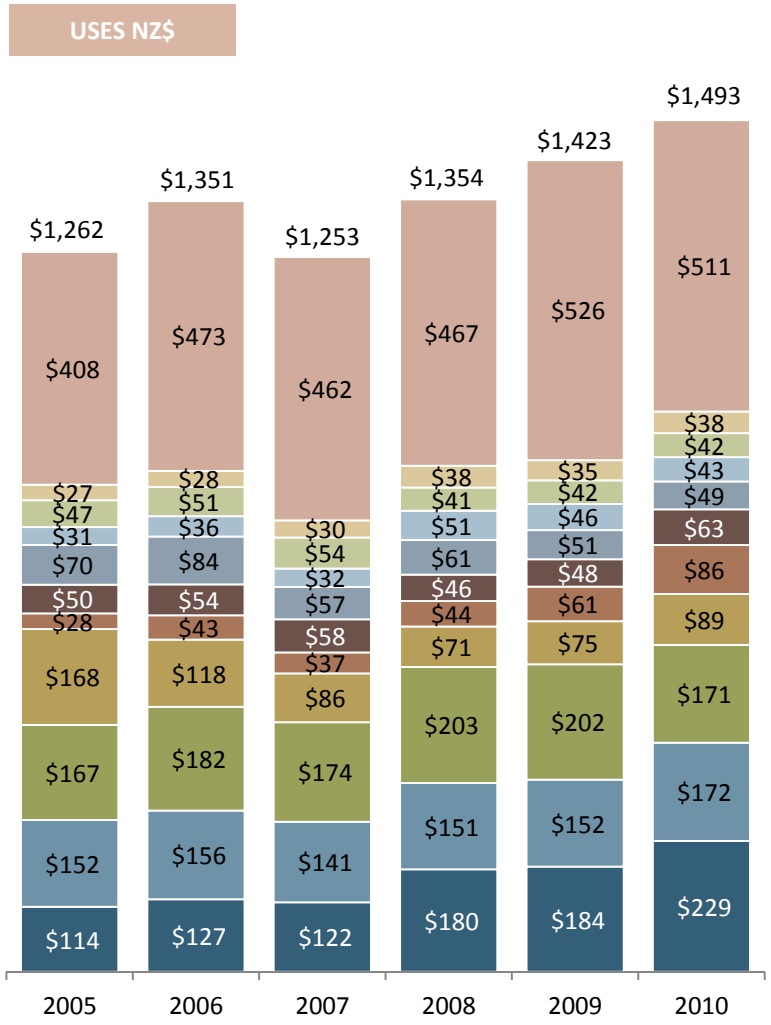
Source: SNZ Infoshare (Exports); see appendix for aquaculture HS codes; Coriolis analysis

CORIOLIS

SEAFOOD – EXPORT VALUE BY SPECIES

There has been limited export growth of the core species over the medium term; rock lobster has been showing strong double digit growth

New Zealand Top 10 seafood export species by value
(NZ$m; nominal non-inflation adjusted; FOB; 2005-2010)



	CAGR (05-10)	CAGR (09-10)	Absolute (05-10)
	3%	5%	$231
Other	5%	-3%	$103
Tuna	7%	7%	$11
Ling	-2%	1%	$5
Jack mackerel	6%	-7%	-11
Orange roughy	-7%	-5%	-$21
Pāua	5%	31%	$12
Salmon	25%	41%	$58
Squid	-12%	19%	-$79
Mussels	1%	-15%	$5
Hoki	3%	13%	$20
Rock lobster	15%	24%	$115

Comments

- Export value growth more positive in US$
- Fishmeal (unfit for human consumption) had exports in 2010 of $49.3m, approximately the same size as orange roughy
- Low in-market price in mussels

Notes/Definitions

- Note: Total values vary from previous pages due to different time periods
- All forms included
- Seafood includes wild catch and aquaculture

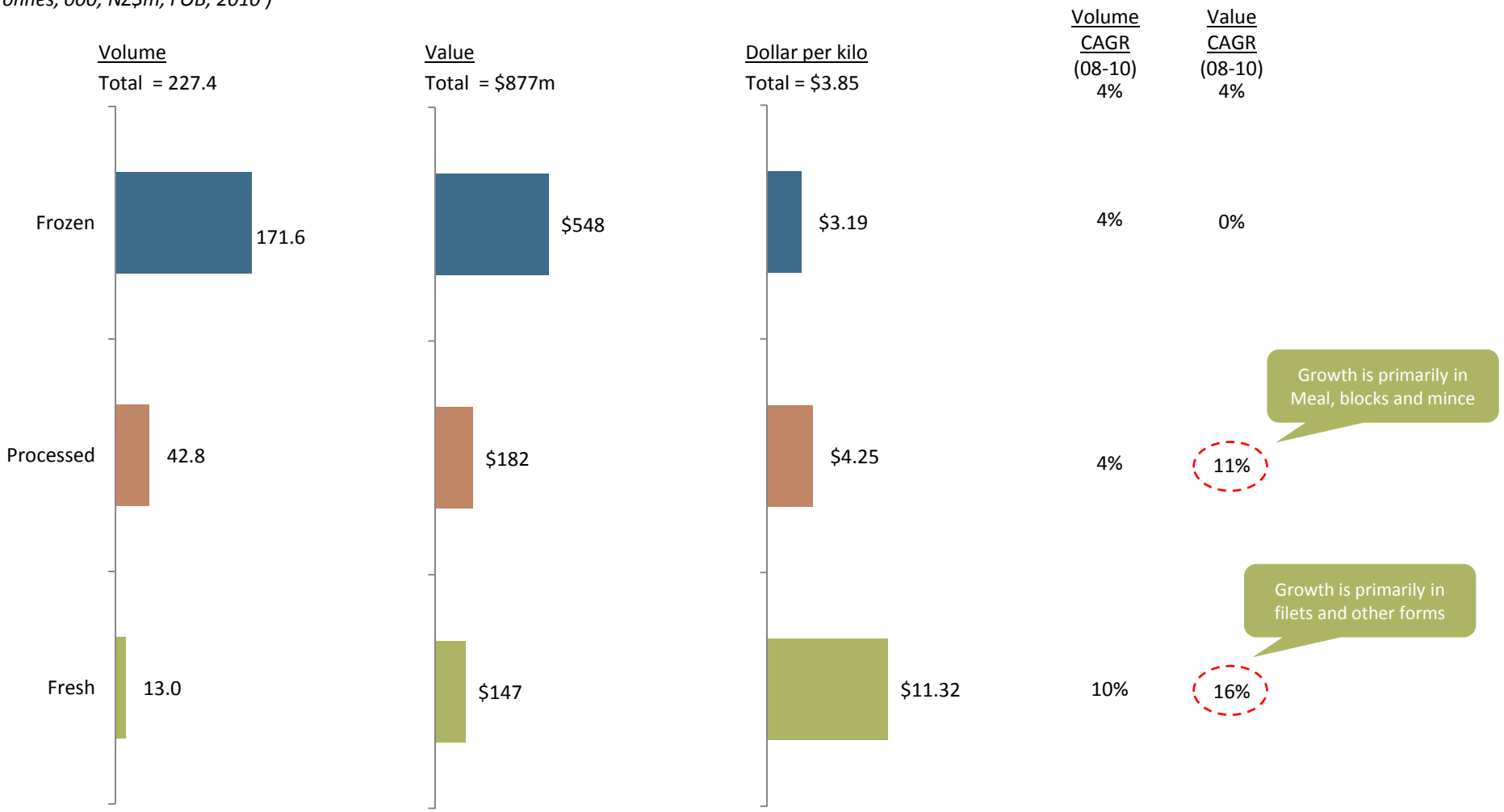
Source: SeaFIC; Coriolis analysis

SEAFOOD – EXPORT VALUE BY FORM

Taking finfish as an example, frozen is clearly the predominant form, but dollar per kilo is significantly more, and growing, in fresh forms

New Zealand Finfish exports by form

(Tonnes, 000; NZ$m; FOB; 2010)



Note: Export value growth more positive in US$; Source: SeaFIC; Coriolis analysis

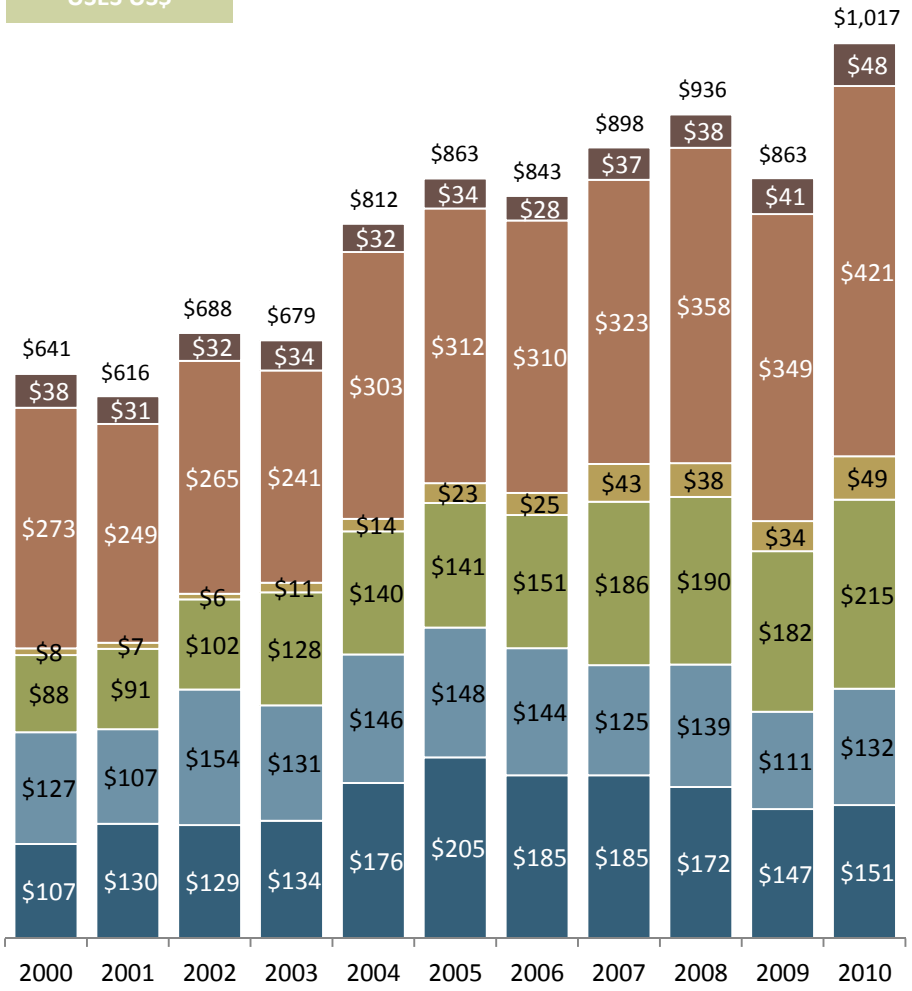
SEAFOOD – EXPORT VALUE BY DESTINATION REGION

Export value growth is being driven by Australia/Pacific Islands and East Asia

New Zealand seafood export value by global mega-region

(US$m; nominal non-inflation adjusted; FOB; 2000-2010)

USES US$



	CAGR (00-10)	CAGR (09-10)	Absolute (00-10)
	5%	18%	+$376
S/E Asia	2%	19%	+$10
East Asia	4%	21%	+$147
Other	21%	44%	+$42
Australia /Pacific	9%	18%	+$127
North America	0%	20%	+$5
Europe	3%	3%	+$44

Comments

- Export value growth more positive in US$
- North America not a growth market; Question: Are we losing out in that market to Chile? (like we have previously in other sectors)
- Exported to a total of 108 countries in 2010
- Growth in East Asia driven by China

Notes/Definitions

- Seafood defined as HS03, HS1603 & HS1604

Source: UN Comtrade database; Coriolis analysis

SEAFOOD – SALES BY DESTINATION

Asia and Australia are identified as opportunities going forward

- "The big mover is rock lobster. Live and fresh are growing, lobster, snapper, paua. Growth in sales to Australia. Australia is a growing live and fresh market, we airfreight it over." *Seafood company, large, 2011*

- "Asia is a huge opportunity for aquaculture, we just need to send the right product." *Manager, Seafood company, medium, 2011*

- "We have started new operations in Australia - we have a new resource and are closer to the markets." *CEO, Seafood company, 2011*

- "We will see a surging demand from Asia in competition with a surging demand from the EU and US on sustainability grounds. Seafood is so important to the Asian diet, coupled with the growth in the economies and the standard of living, it will all come to a head. The EU and the USA will look around and say, "Where did all our fish go?" This is an opportunity we can exploit." *CEO, Seafood Company, large, 2011*

- "There are trade barriers in Europe. Some of our species are very similar to ones in Chile and Argentina but we have between a 7-15% tariff into the EU. Our neighbours have zero. That gives them an instant advantage." *GM, Seafood Company, medium, 2011*

- "The EU has strong demand but it is closing down its borders." *GM, Industry representative, 2011*

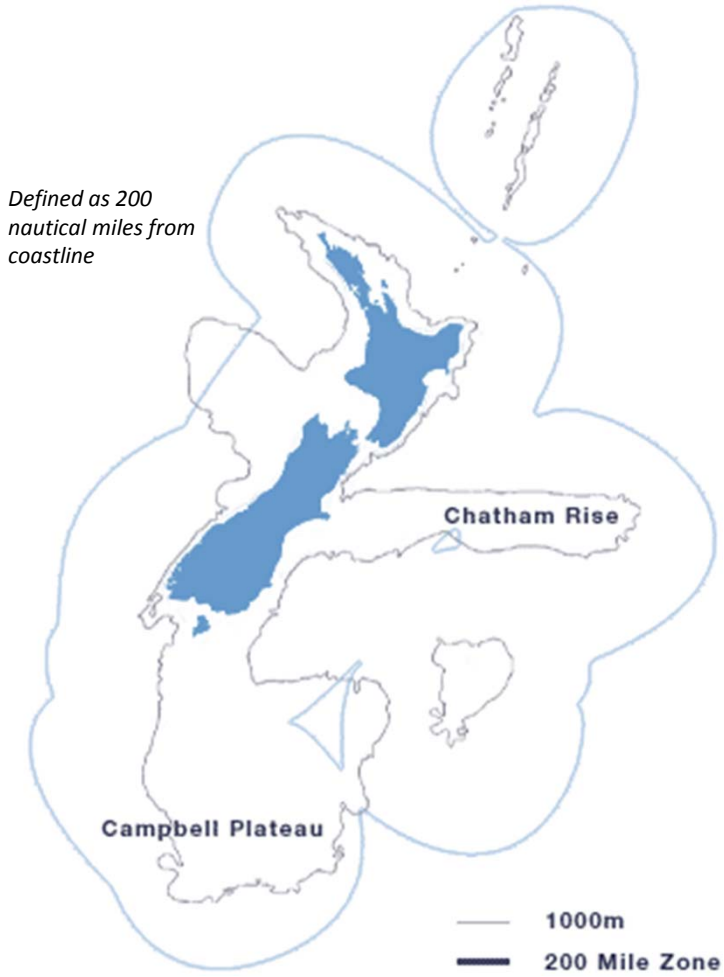
- "New Zealand seafood companies have minimal in-market offices. In North America there is really only Sealord and King Salmon. We have limited knowledge about the in-market needs. Declines in the USA have been caused by stagnant mussel sales and declining supply of hoki and orange roughy." *Seafood company, large, 2011*

TABLE OF CONTENTS

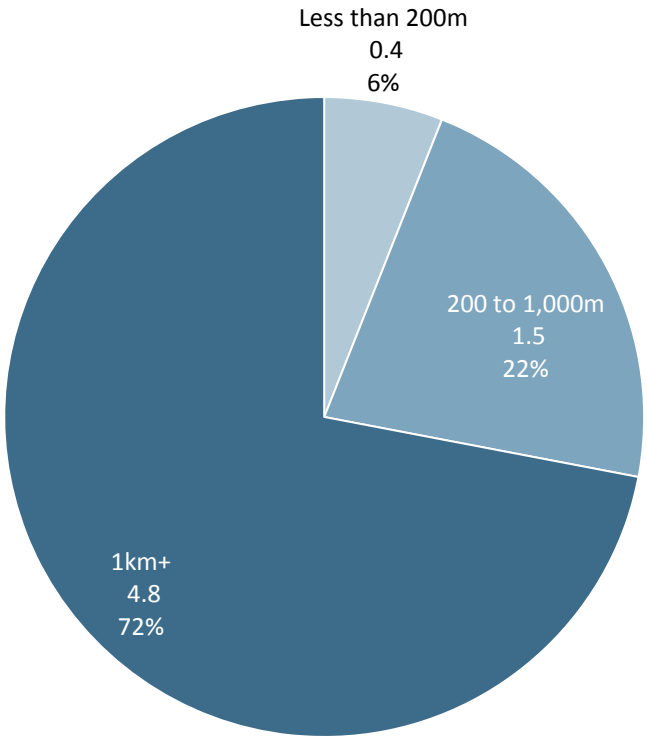
FISHING AREA – NEW ZEALAND

New Zealand has 6.7m square kilometres of controlled ocean space (15 times the land area); unfortunately much of this is relatively unproductive water over a kilometre deep

Limit of Exclusive Economic Zone (EEZ)
(area, depth, 2010)



Area of EEZ by water depth
(km²; % of area; 2010)



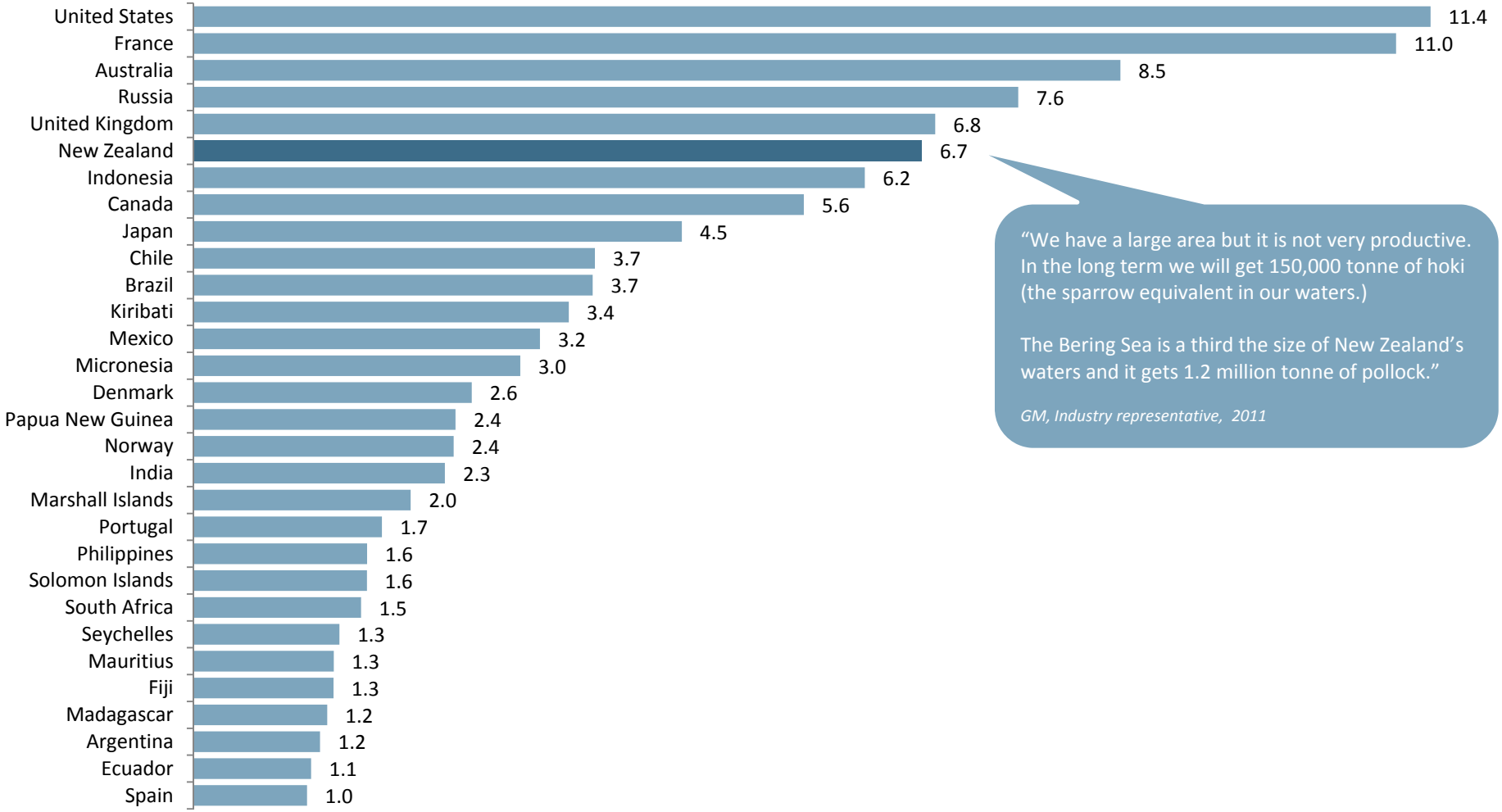
Total = 6.7m km²

Note: a nautical mile is 1,852 metres; Source: Wikipedia (http://en.wikipedia.org/wiki/Exclusive_Economic_Zone); Sealord; Coriolis analysis

FISHING AREA – TOP 30 GLOBAL

New Zealand has the sixth largest area of claimed/controlled ocean space of any country in the world

Top 30 exclusive zones (EEZ) by claimed area
(km^2; m; 2010 or most recent available)



"We have a large area but it is not very productive. In the long term we will get 150,000 tonne of hoki (the sparrow equivalent in our waters.)

The Bering Sea is a third the size of New Zealand's waters and it gets 1.2 million tonne of pollock."

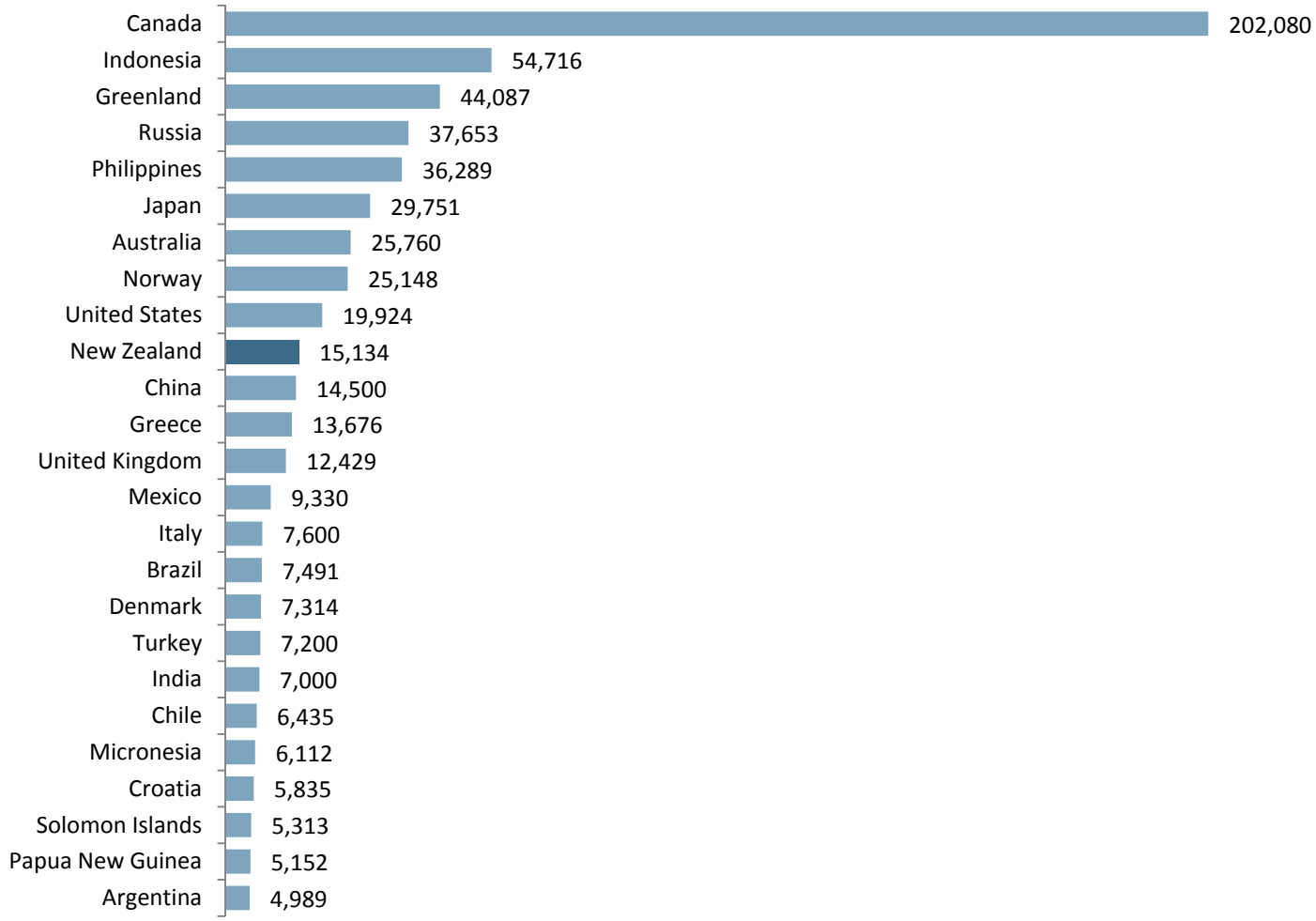
GM, Industry representative, 2011

Note: data is generally claimed; some areas are disputed; Source: Wikipedia (from other sources) [http://en.wikipedia.org/wiki/Exclusive_Economic_Zone]

COASTLINE – NEW ZEALAND

New Zealand has the 10th largest coastline of any country of the world; smaller than the USA but larger than China

Length of coast by top 25 countries
(km)

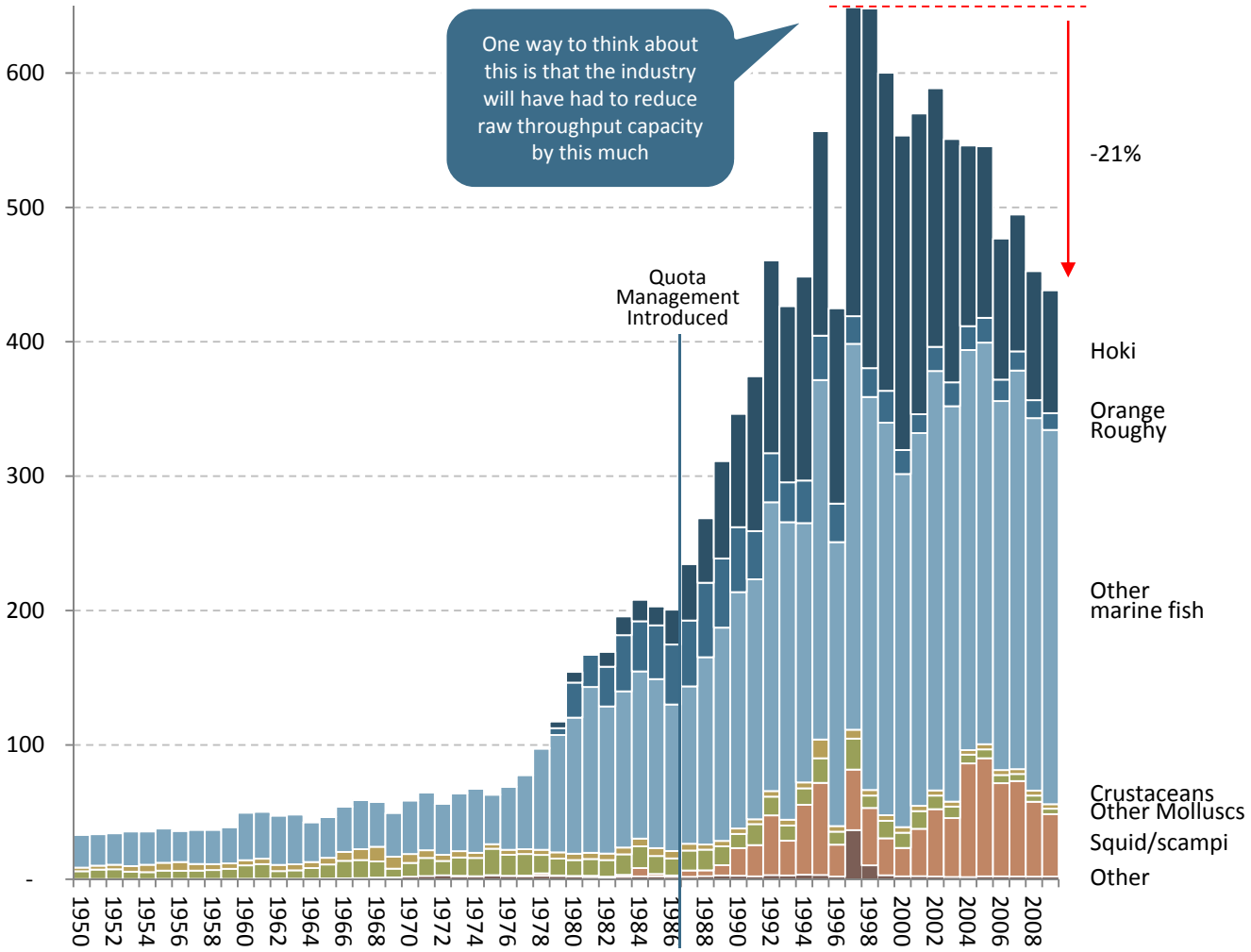


Source: CIA World Fact Book; Coriolis analysis

WATER – WILD CATCH

Wild catch has fallen driven by reductions in the allowed catch – particularly for hoki – but including other fish as well

Wild capture production volume of fish/seafood in New Zealand waters
(t; 000; 1950-2009)



Comments/notes

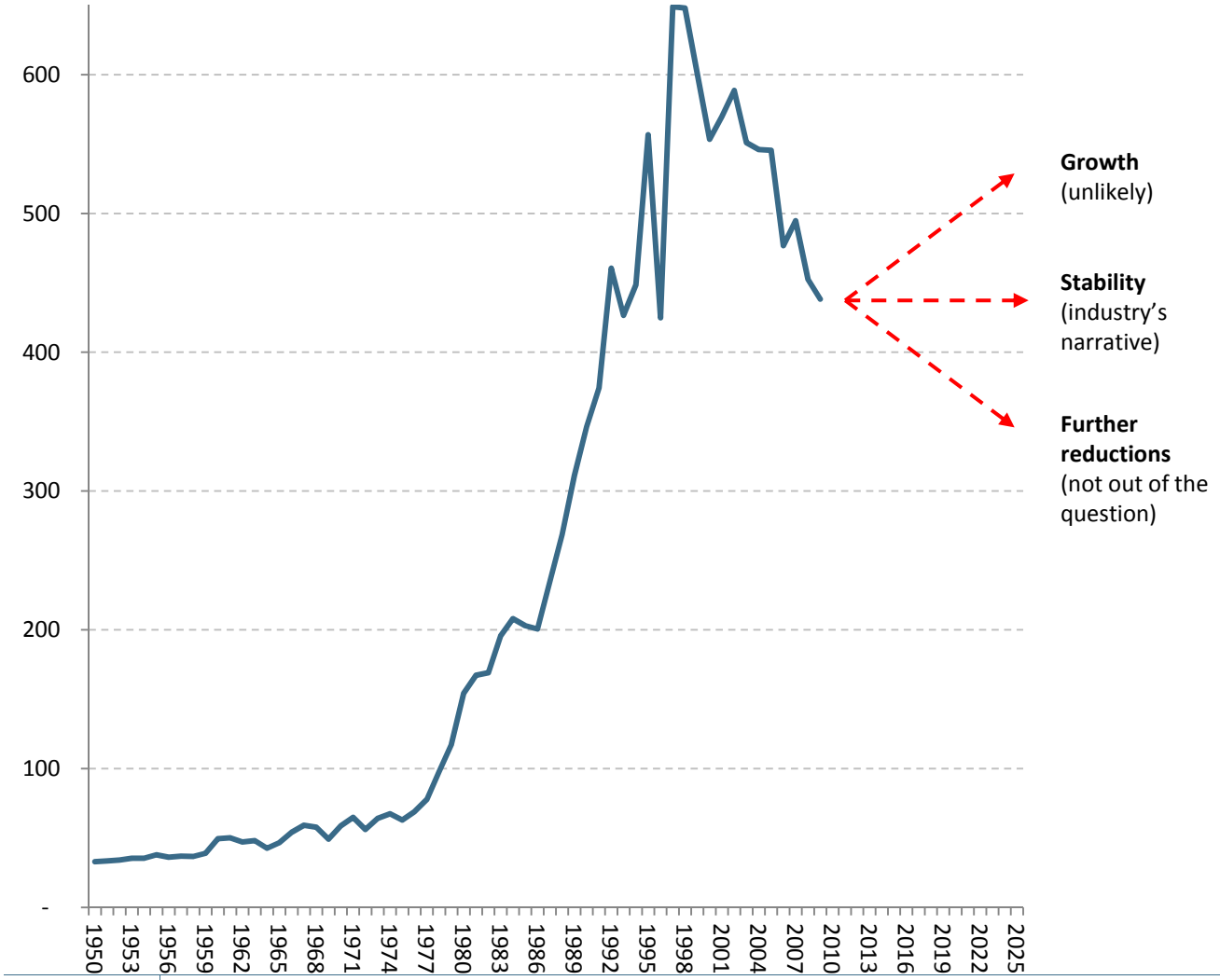
- Data is volume not value; crustaceans, particularly lobster/crayfish, are highly valuable but not large in volume
- One way to read the -21% is this is the amount that industry capacity (boats, employees, processing lines) has needed to shrink
- NZ has identified 16,000 marine species of which 130 species are commercially fished and 97 are within the Quota Management System (QMS)

Source: UN FAO FishStat FIGIS database; Coriolis analysis

WILD CATCH – FUTURE DIRECTION FOR VOLUME?

The direction for wild catch volumes over the next 15 years is unclear, but is unlikely to be up

Wild capture production volume of fish/seafood in New Zealand waters
(t; 000; 1950-2009)



Comments/notes

- Opinions vary on whether wild capture has stabilised or will continue to fall
- Industry participants, particularly firms, consistently articulated that the decline has stopped/stabilised.
- However we were told it had stabilised 5 years ago, so we take stabilisation projections with a "grain of salt"
- Given our relatively limited scientific understanding of what is happening "under the sea", further reductions are not out of the question

Source: UN FAO FishStat FIGIS database; Coriolis analysis

WILD CATCH

Interviewees did not see any major opportunities for growing wild catch

- "We can get a few more gains from utilising some stock, but there is not a lot of growth out there." *CEO, Seafood Company, large, 2011*

- "There are no more fish out there, no major undiscovered fisheries. But there are some species that we are not fully utilising, like swordfish." *CEO, Seafood Company, large, 2011*

- "We can't triple the wild catch industry. There are no new wild species out there, and we certainly can't triple volume of any. It's damn hard." *CEO, Seafood Company, medium, 2011*

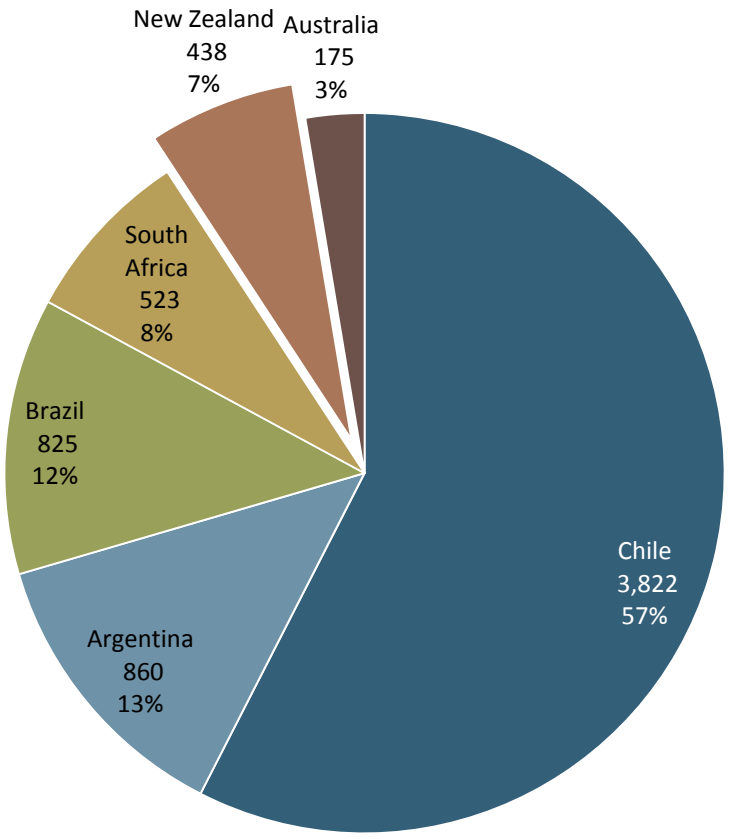
- "There is the opportunity to gain more from the inshore stocks, but not a huge opportunity." *CEO, Seafood Company, large, 2011*

- "This curve is a typical curve of a wild catch stock curve. It was decided we were taking too much hoki and the reductions in the quota helped manage the stock levels. They are slowly going back up and will be at 120 next year. This is why the quota management system works." *Seafood Company, large, 2011*

S.H. – WILD CATCH VOLUME

New Zealand wild catch is 7% of the temperate southern hemisphere catch, Chile dominates with 57% of the wild catch

Wild capture seafood production volume by select Southern Hemisphere country
(t; 000; 2009)



Total = 6,643
thousand tonnes

Comments

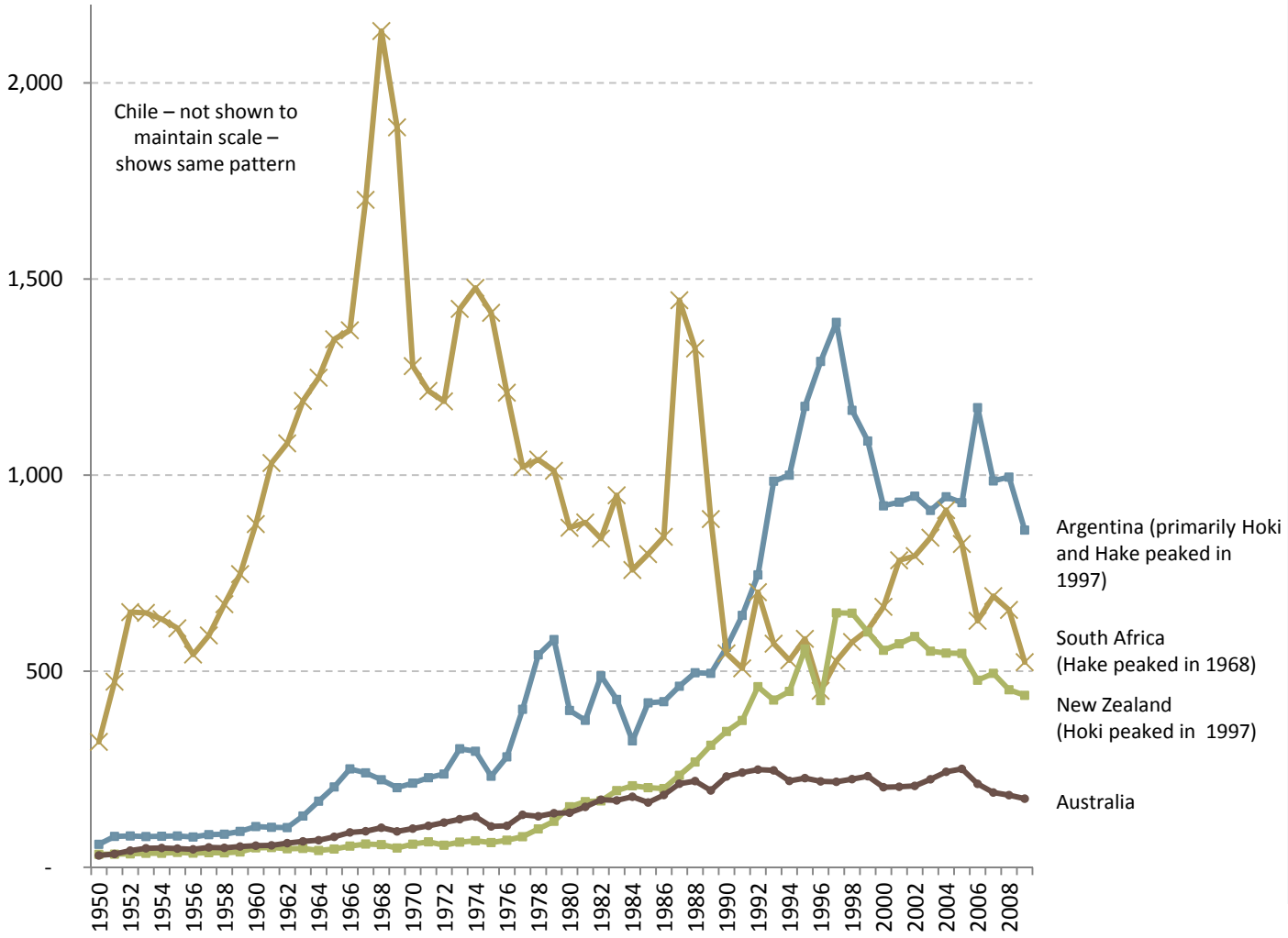
- Data is wild catch by select nominated temperate waters Southern Hemisphere countries, not all countries or waters south of the equator (i.e. vs. close peers)
- Data is volume not value; cross country wild catch value data not available

Source: UN FishStat (wild capture); Coriolis analysis

S.H. PEERS – WILD CATCH VOLUME

Similar pattern of peak and declining production across Southern Hemisphere peers

Wild capture seafood volume by key category/species: NZ vs. other Southern Hemisphere peers
(t; 000; 1950-2009)



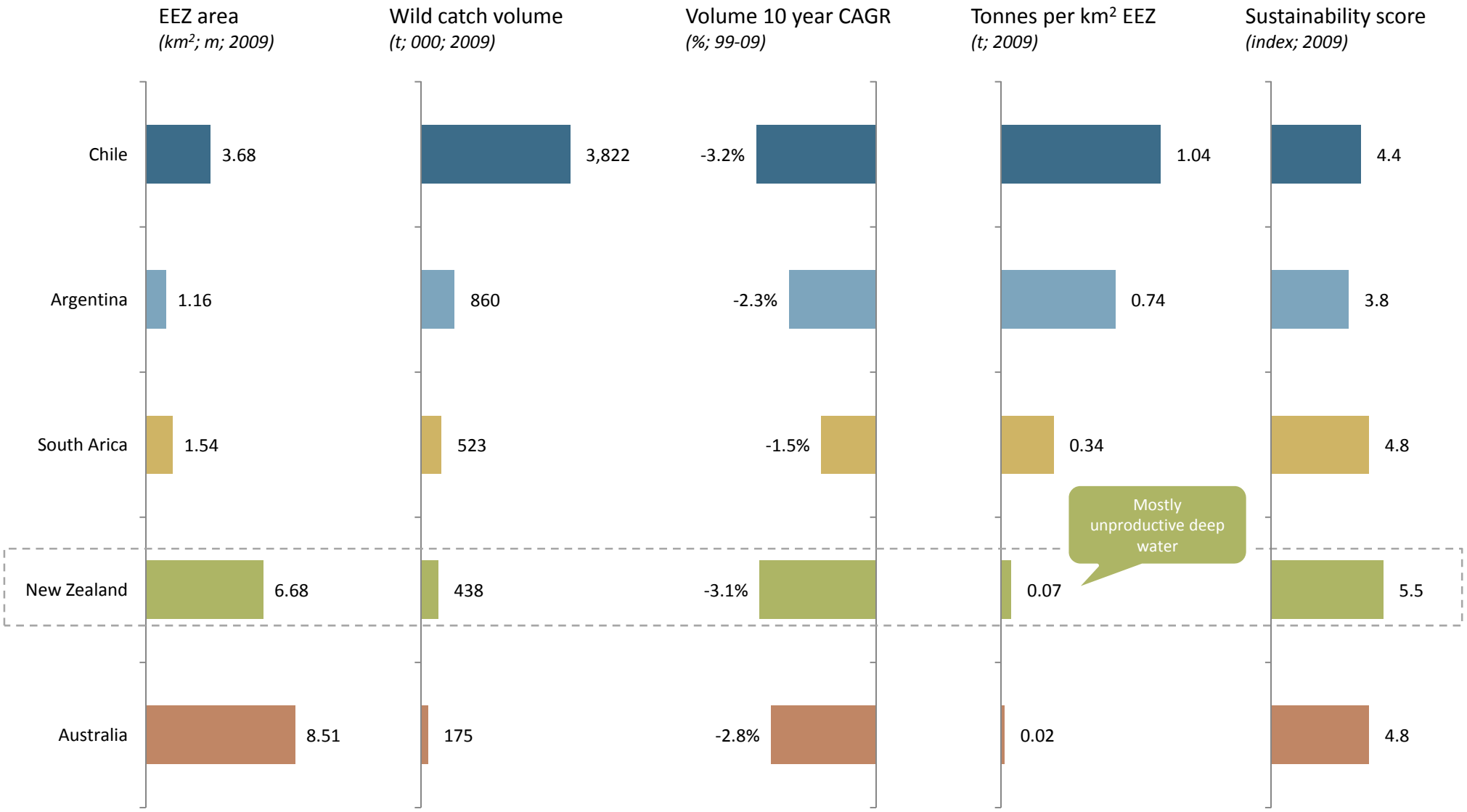
Comments

- Some part of this will be driven by technological innovation (e.g. better fish detection)
- New Zealand and Argentina peak at same time
- Data is volume not value; cross country wild catch value data not available
- Each country (except for Australia) shows a typical fisheries development curve

Source: UN FishStat (wild capture)

S.H. PEERS – BENCHMARKING

Benchmarking with Southern Hemisphere peers highlights common issues and the relative low productivity of New Zealand waters, given similar sustainability scores



Source: UN FishStat (wild capture); Wikipedia (EEZ area); J. Alder et al. / MarinePolicy 34 (2010) 468–476 (sustainability score); Coriolis analysis

CORIOLIS

WILD CATCH - OBSERVATIONS

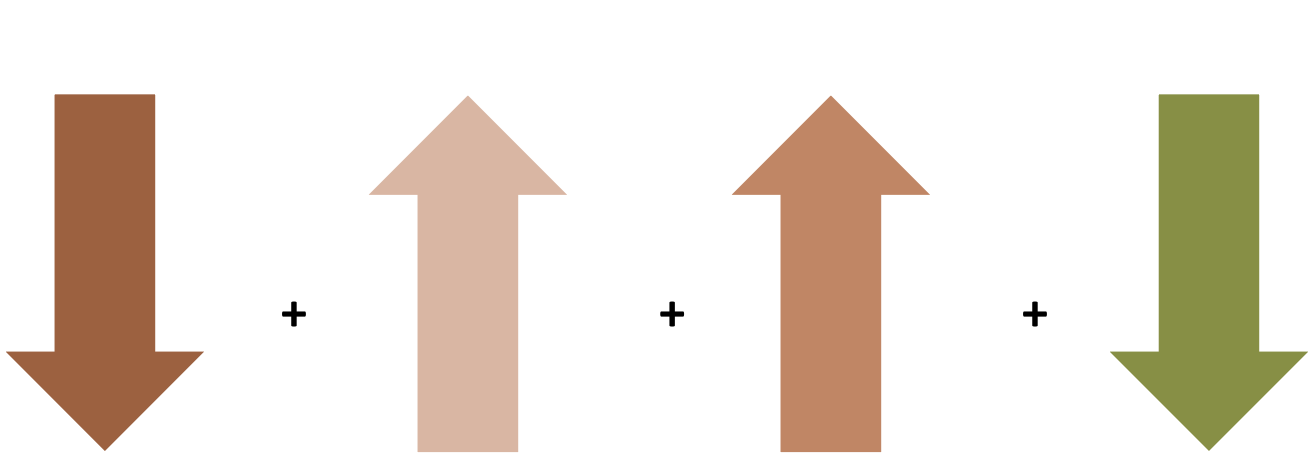
Based on our interviews, we make five observations to assist in the future success and development of the wild catch sector; the first is for all stakeholders to control costs

	Observations
1	Control costs
2	Improve quality
3	Sell our sustainable story
4	Better utilisation
5	More high value species

1. CONTROL COSTS

In the current global environment constant cost control and improvement – by all stakeholders – is required just to stand still

Proposed key drivers of wild catch industry profitability
(model; 2011)



An industry facing (at best) flat volume going forward must have flat or falling costs to stay competitive

= **Constant improvement is required**

Flat to falling wild catch

- Falling allowed catch
- Fewer fish in the sea

Increasing externally imposed costs

- Levies
- Paperwork
- NZ government imposed compliance costs
- Foreign government imposed compliance costs
- Retailer-imposed compliance costs

Operational Costs

- Petrol
- Labour
- Quota

Market prices after inflation

- Competition from low income/low cost countries
- Competition from high income/efficient/ high scale countries

1. CONTROL COSTS – IMPOSED

The government must play its part by (1) continuously improving its efficiency and (2) holding or maintaining imposed overhead as a percent of industry turnover

- "We have to control costs. There are increasing costs of compliance, its out of control. The change of government has seen a control of costs. Internal costs with NZFSA[1] conditions, they copy draconian standards from the EU." *GM, Industry representative, 2011*

- "The biggest barrier to our industries growth is the amount of regulation. There is so much regulation that we have to adhere to, on so many levels. We want to change the industry toward more self management. This will save huge amounts of money and time. We have a concept called "Managing our own ship" *Seafood Industry Council representative, May 2011*

- "Our industry is definitely over-regulated… However I don't think we will be trusted (or should be) to run our own ship. To have credibility we need to be managed externally." *CEO, Seafood Company, large, 2011*

- "As an industry, we are over regulated. There are thousands of regulations relating to fisheries. They have accumulated over the years and they certainly add up. For wild catch we are held back by the rigidity of the QMS, but we need to work with government carefully and address issues step by step. The deepsea group work together really well, we just need to move in that direction for inshore fisheries groups. Regulation is an issue for stifling innovation." *CEO, Seafood Company, large, 2011*

- "Reducing wild catch tonnages inevitably lead to lower returns based on a model of cutting costs and producing more. Did anyone say the words "commodity price slaves"? *Manager, Seafood Research Industry, 2011*

1. CONTROL COSTS – THE ALTERNATIVE

If costs are not controlled, the industry will continue to move overseas

- "When the cost gets too high, we move our business." *GM, Industry representative, 2011*

- "If the cost of manufacturing gets too high, we will just move." *MD, Seafood Company, large, 2011*

- "We looked at offshore processing to decrease costs, and gravitate toward a more economic model. Canning in Spain and chuck with others, we couldn't get the flavouring cost effective. We are now looking at quotes in Asia." *Manager, Seafood company, medium, 2011*

- "In the medium term - 10-15 years - we need to become less reliant on white frozen block, and more focused on value added. That probably won't happen in New Zealand, its too hard to do it here and make money. There are high labour costs, low brand presence and a huge distance to market." *CEO, Seafood Company, large, 2011*

WILD CATCH - OBSERVATIONS

The second observation is to continue to focus on quality improvement

	Observations
1	Control costs
2	Improve quality
3	Sell our sustainable story
4	Better utilisation
5	More high value species

2. IMPROVE QUALITY

Interviewees indicated there were opportunities to improve quality

- “Our failure to gain higher prices is a failure in value chain management. It starts with a failure to manage the quality of produce to meet high value consumer needs (we strive to meet minimum standards). It continues with an abrogation of market responsibility (“give me the best price on the beach”). *Manager, Research industry body, 2011*

- "The fishermen are revolting against bleached and canned paua. The returns for live paua to China are so much greater than for canned, and still so much goes canned." *CEO, Medium Seafood Company, 2011*

- "We need a species that fits into the white table cloth. The magic US$5/pound, that's the magic spot for white fish." *Manager, Seafood representative, 2011*

2. IMPROVE QUALITY – PGP INVESTMENT

The recent "precision harvesting" Primary Growth Partnership (PGP) has committed to investing up to $52.6m in developing better wild catch technology

- "PSH has developed a prototype harvesting system that can be set to target specific species and fish size, allowing other animals, fish species and undersize fish to escape. The harvesting system would also be able to keep fish immersed in seawater, keeping them alive for longer and in better condition. The two key benefits will be increased sustainability of inshore and deepwater commercial fishing, and increased quality of catch." *PGP, Media statement, Feb 2011*

- "A partnership between the Crown, Aotearoa Fisheries, Sanford and Sealord Group - called Precision Seafood Harvesting - plans to develop new wild fish harvesting technology that will allow more precise catches and fish to be landed fresher and in better condition. The partnership would be worth up to $52.6 million over six years, with half the funding coming from the Primary Growth Partnership. The technology aims to improve revenue by an estimated $100 million a year by 2029." *New Zealand Herald, Feb 2011*

- "One hope with precision harvesting is that we will only catch the fish that we are fishing for, that should help preserve other species." *Seafood Company, large, 2011*

WILD CATCH - OBSERVATIONS

The third observation is to sell our sustainable story

	Observations
1	Control costs
2	Improve quality
3	Sell our sustainable story
4	Better utilisation
5	More high value species

3. SELL SUSTAINABLE – WE ARE SUSTAINABLE

There was general agreement that New Zealand has a great fisheries management system

- "We will fish ourselves out of existence if we aren't sustainable." *CEO, Seafood Company, large, 2011*

- "Our biggest advantage is the QMS. Those countries with a sustainable fishery will be better positioned in the future. With a growing global population and increased demand for fish, and healthy food, we are in a great position." *CEO, Seafood Company, medium, 2011*

- "Our biggest strength is the fact that we have a sustainable resource. We manage the resource for now and for future generations. There are a lot of family businesses in the seafood sector and they want to make sure there is still a family business in the future." *GM, Seafood Company, medium, 2011*

- "The QMS is a non-political mechanism. In other countries they may have legislation that states a catch can't be reduced more than 15% a year. In NZ that doesn't happen, if the scientists decide that the stock need to be protected, like in Hoki, then the quota is dropped as much as was needed. In the case of Hoki a 40% reduction. This keeps things off the political agenda." *Manager, Seafood Company, large, 2011*

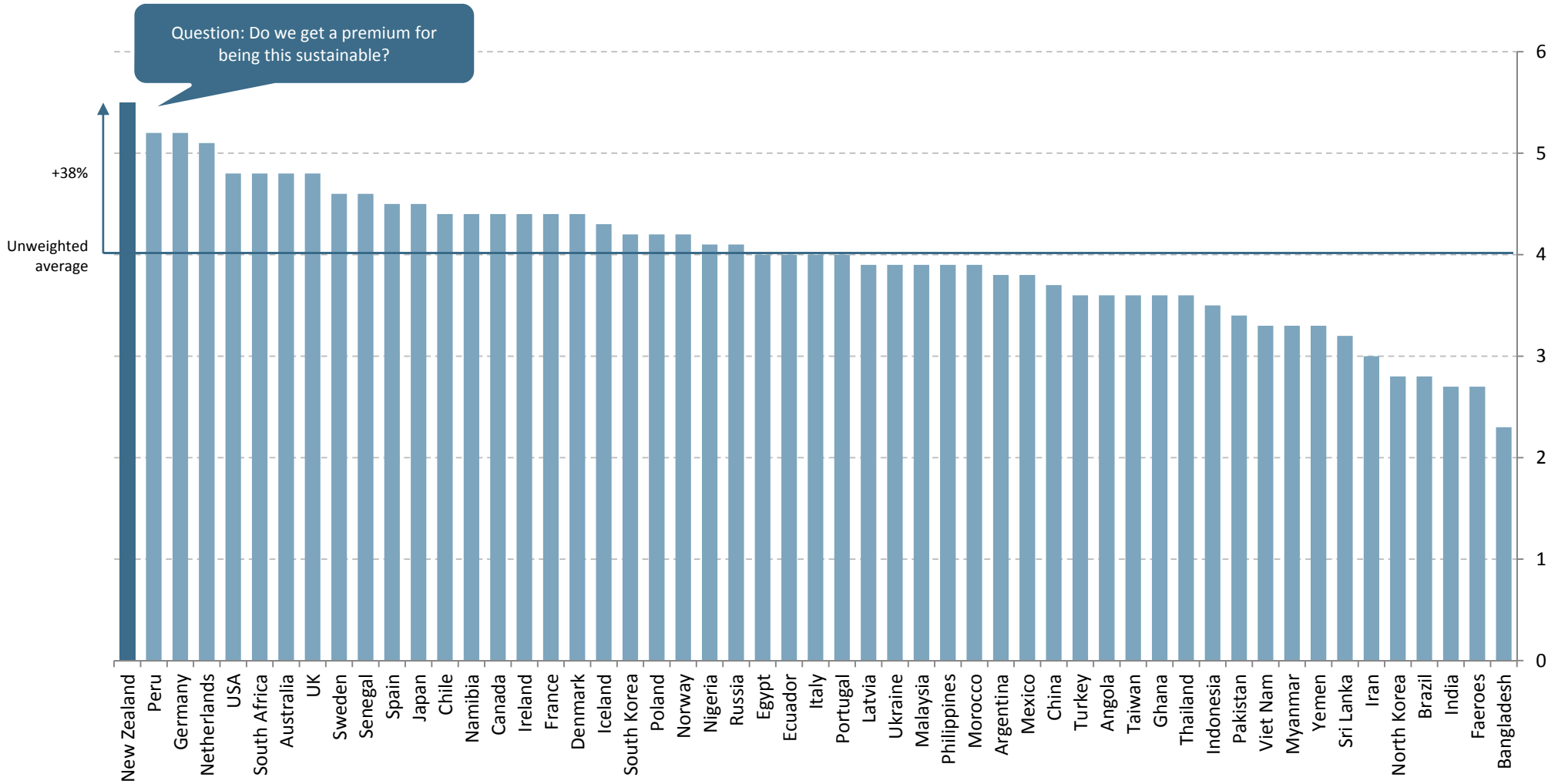
- "The future is sustainable fisheries. The only way to access retail markets in Europe and North America is with sustainable fisheries. The growth is in premium seafood and to be premium you have to be sustainable. Asia will very quickly, 10-15 years catch up to Europe once the affluence levels increase." *CEO, Seafood Company, large, 2011*

- "There is huge growth in sustainability. We have a reputation in the market that we are good to deal with, that we have integrity." *Seafood Company, medium, 2011*

3. SELL SUSTAINABLE – GLOBAL RANKING

One study last year ranked New Zealand as the most sustainable wild catch fishery globally in terms of marine resource management; New Zealand was +38% more sustainable than average

Ranking of select countries by "marine resource management performance"
(aggregate index score of 14 indicators; 2010)

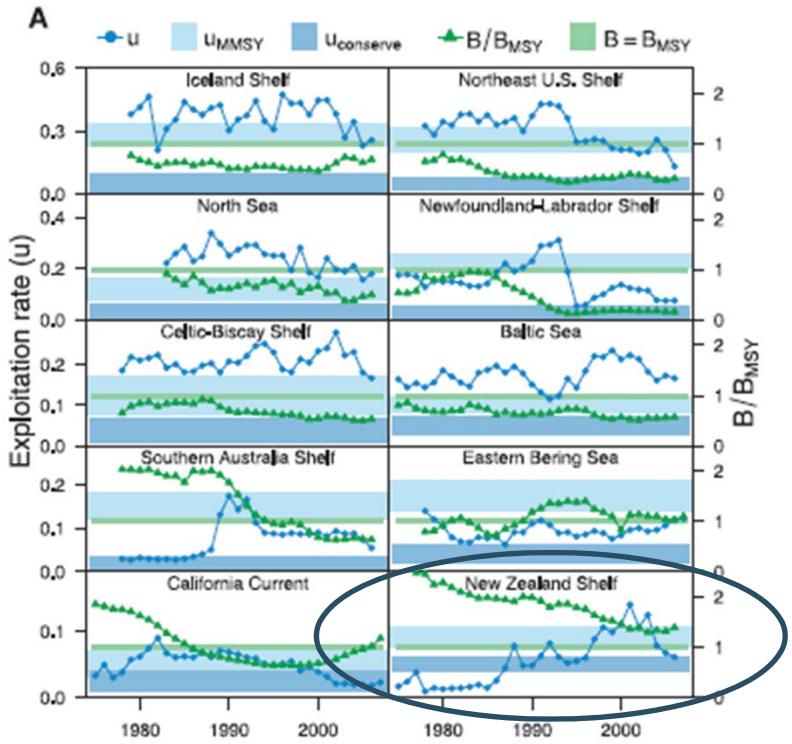


Source: J. Alder et al. / MarinePolicy 34 (2010) 468–476

3. SELL SUSTAINABLE – GLOBAL FISHERY COMPARISONS

Another research project published in Science (*magazine*) in 2009 highlighted the superior management of New Zealand and Alaskan fisheries

- "We found that only Alaska and New Zealand seemed to have acted with such foresight (to avoid over exploitation), whereas other regions experienced systemic overexploitation…. Only in the California Current and in New Zealand are current exploitation rates predicted to achieve a conservation target of less than 10% of stocks collapsed. Declining exploitation rates have contributed to the rebuilding of some depleted stocks, whereas others remain at low abundance." *Boris and Worm, Science, Vol 325, July 2009*



"Exploitation rate and biomass in large marine ecosystems and individual stocks. Time trends of biomass (green triangles) are shown relative to the B_{MSY} (green band), exploitation rates (blue circles) relative to the U_{MMSY} (light blue band), and a hypothetical conservation objective at which less than 10% of species are collapsed ($U_{conserve}$, dark blue band). In each ecosystem, stock assessments were used to calculate average biomass relative to B_{MSY} and exploitation rate (total catch divided by total biomass) for assessed species."

Source: Boris and Worm, 2009

3. SELL SUSTAINABLE – WE MARKET OUR SUSTAINABILITY POORLY

There was general agreement that New Zealand was sustainable but did **not** do a good job of marketing that fact

- "Industry and Government need to get a consistent message out around our sustainable resource and practices. We don't tell the story well enough. We only ever react to negative press around trawling or Greenpeace species issues. We don't push the positive stories or press." *CEO, Seafood company, large, 2011*

- "People in the industry know that we have a sustainable system with the QMS, but I don't think we do a good job of selling that to the public." *Seafood Company, medium, 2011*

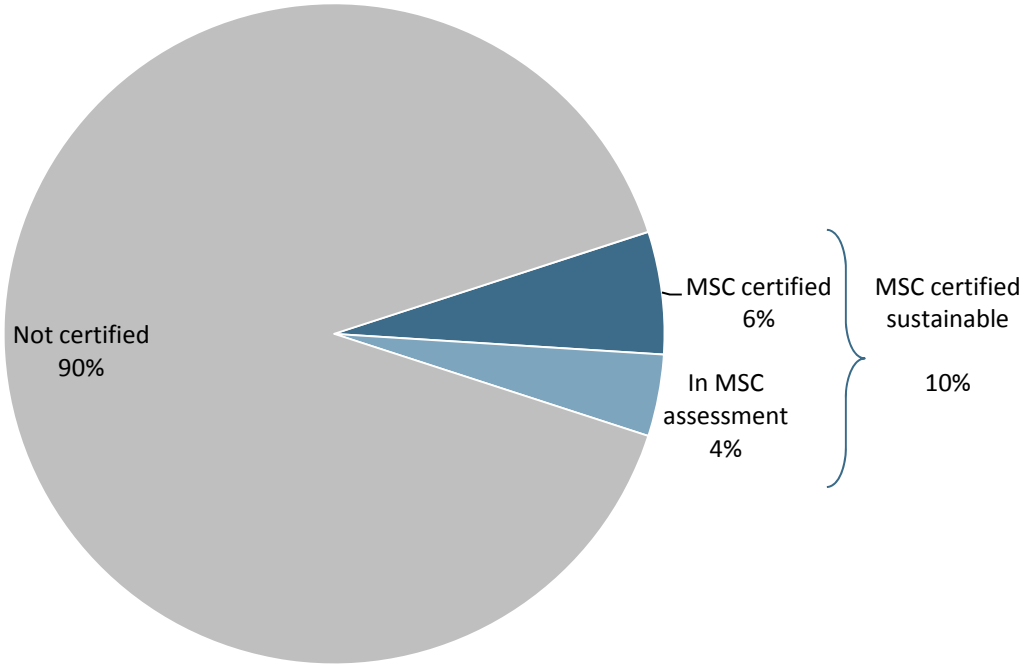
- "We have a great system but do not manage our image well. We need to forward integrate into the market and get the story out there." *Seafood Company, large, 2011*

- "An opportunity for the New Zealand seafood sector is to reach levels of sustainability that are recognised in Iceland. All their seafood and fisheries are recognised as sustainable. Alaska, Iceland and NZ are recognised in the industry as the best managed resources, but we don't do a good job managing that image. The Marine Stewardship certification gets us a 7.5% premium in hoki, but its very expensive to get that certification. If we didn't have the certification we would be shut out of many markets in the UK and EU." *Seafood Industry Council representative, May 2011*

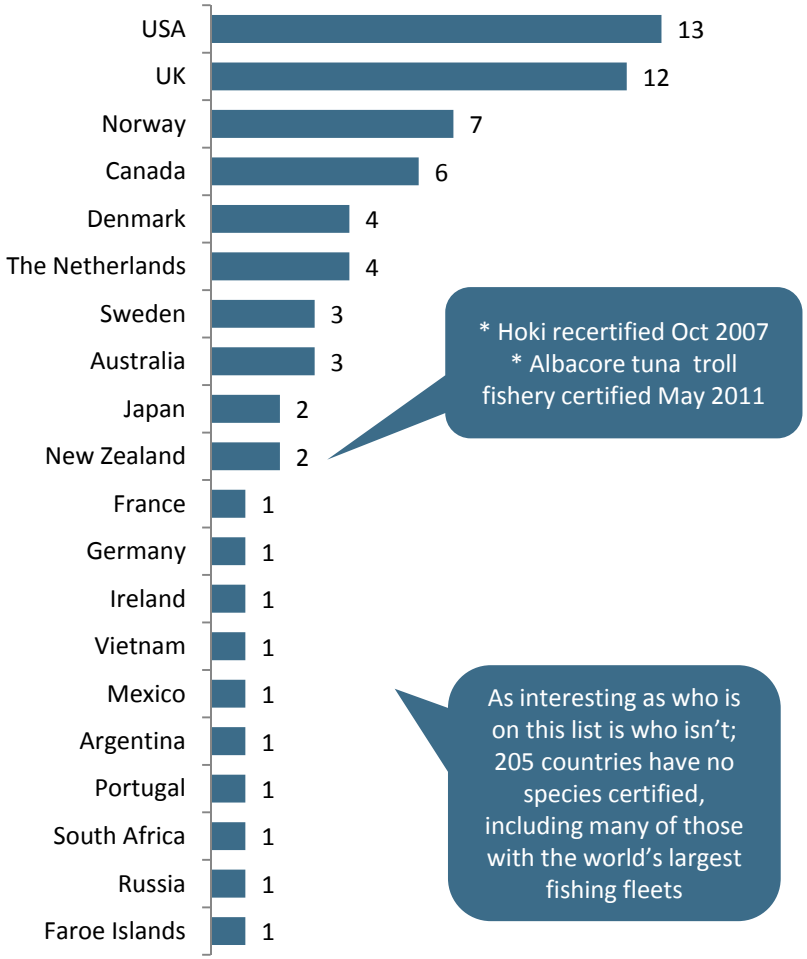
3. SELL SUSTAINABLE – HOW MUCH?

Currently 10% of the world's wild capture is either certified MSC sustainable or in the process of becoming so

Percent of global wild capture seafood production certified as sustainable by the Marine Stewardship Council
(% of volume; 2010)



# of MSC certified wild capture fisheries by country
(#; actual; 2011)

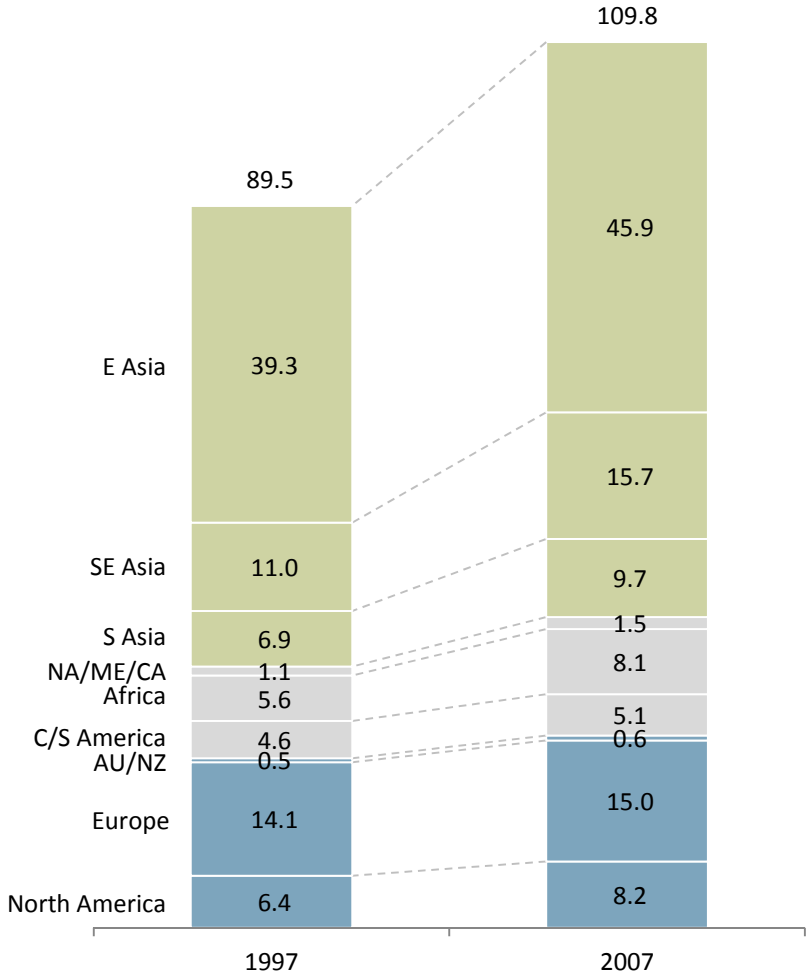


1. Interestingly Japan's 2 species certified are major exports; demand for MSC certified products in Japan is low; Source: MSC website (accessed August 2011); Coriolis analysis

3. SELL SUSTAINABLE – THE MARKET?

Sustainability is currently being driven by rich Western countries representing about one fifth of global seafood consumption

Global seafood consumption by region[1]
(t; m; 1997 vs. 2007)



Subjective rating of regional support for sustainable seafood by
(2007)

	% global seafood consumption	Foodservice operators pushing?	Retailers pushing?	Consumer demanding?
E Asia	42%	○	○	○
SE Asia	14%	○	○	○
S Asia	9%	○	○	○
NA/ME/CA	1%	○	○	○
Africa	7%	○	○	○
C/S America	5%	○	○	○
AU/NZ	1%	◔	◔	◔
Europe	14%	◔	◑	◑
N America	7%	◔	◑	◔

65%

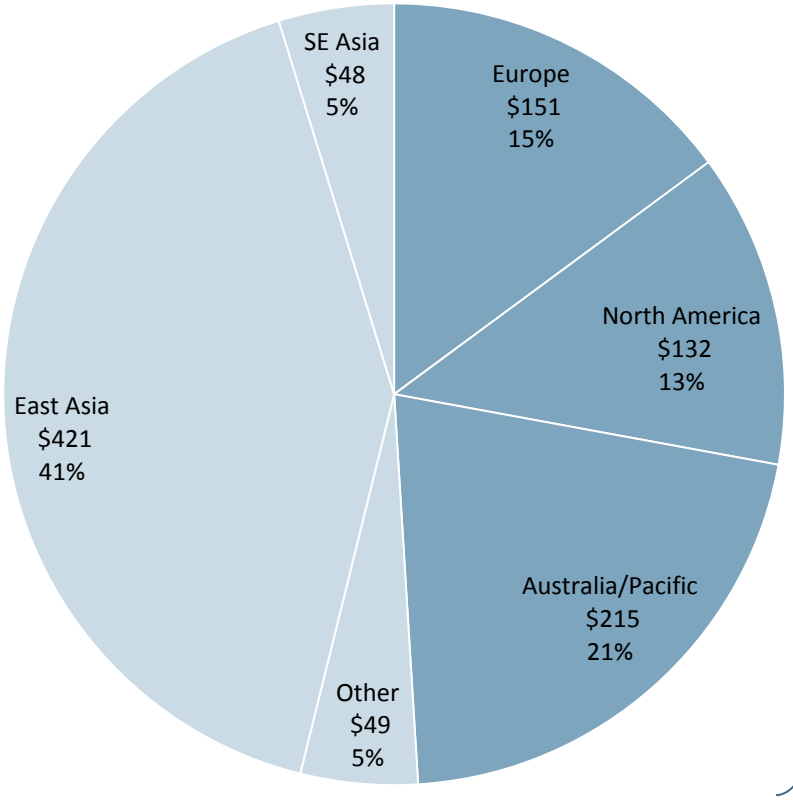
22%

1. Consumption not production; Source: consumption (UN FAO FoodSupply database); subjective rating (various published articles; Greenpeace; Coriolis estimates and analysis)

3. SELL SUSTAINABLE – TARGET BY MARKET

Sustainable seafood is currently "on the agenda" in roughly half our seafood markets by value; and expected to grow in the future in others

New Zealand seafood export value by destination region
(US$m; 2010)



Regions where "sustainable" is a major purchasing criteria for buyers of NZ seafood[1]

~50%

"We will see a surging demand from Asia for seafood in competition with a surging demand from the EU and US on sustainability grounds.

Seafood is so important to the Asian diet, coupled with the growth in the Asian economies and their standard of living.

It will all come to a head. The EU and the USA will look around and say, "Where did all our fish go?" This is an opportunity we can exploit."

CEO, Seafood Company, large, 2011

"We need to position ourselves now because in 10 -15 years the Asians will be demanding sustainable fisheries."

CEO, Seafood Company, large, 2011

1. It is straightforward to argue that even within these markets "sustainable" is a major purchasing criteria (i.e. willing to pay more for it) for at most 20-30% of market volume;
Source: UN Comtrade; Coriolis analysis

3. SELL SUSTAINABLE – EXAMPLE CERTIFICATION PROGRAMS

There are a range of certification programmes; while MSC is the current market leader, this situation is still in flux; practical/technical standards appear to be coalescing around the FAO standards/guidelines[1]

EXAMPLES of major sustainable certification programs currently in use in markets around the world
(2011)

	Year set up	Parent organisation	# certified	Location		Website
	1997	Founded by the World Wildlife Fund (WWF) and Unilever; fully independent 1999	65 fisheries	Global	- Founded by NGO and major seafood buyer - Fully FAO compliant 2006 - Uses Global Trust to certify	www.msc.org/
	2006	Founded by Earth Island Institute	30+ fisheries	Global	- Follow FAO guidelines - Available in 28+ retailer around the world	www.friendofthesea.org/
	2005	Vancouver Aquarium	748 rest, retail, etc.	Canada	- Certifies restaurant menu items and supermarket products	www.oceanwisecanada.org
	2010	Public-private partnership (State of Alaska and private seafood companies)	All can use logo; 2 fisheries now certified; 3 in progress	Alaska	- Alaska mandates all fisheries must be sustainable - Certification program informs consumers - Uses FAO code[1] - No licensing fees; uses Global Trust	www.alaskaseafood.org/
	2008	Certified by The Icelandic Ministry of Fisheries and Agriculture; run by Fisheries Association of Iceland	18 companies certified	Iceland	- Iceland states that all fisheries are sustainable - Uses FAO code & Global Trust (as Alaska) - Significant dissatisfaction with MSC organisation and agenda	www.responsiblefisheries.is www.fisheries.is/management/government-policy/responsible-fisheries/
	2006	Seafish (levy funded UK non-department government body)	418 certified vessels	UK	- Uses Global Trust to certify	rfs.seafish.org www.seafish.org

1. UN FAO Code of Conduct for Responsible Fisheries and the FAO Code of Conduct for the Ecolabelling of Fish and Fishery Products from Marine Capture Fisheries; Source: various websites; Coriolis analysis

3. SELL SUSTAINABLE – DEVELOP OUR OWN SYSTEM

There is nothing more powerful than an idea whose time has come: the New Zealand government could copy Alaska and Iceland and certify all species in the QMS as sustainable

- "The "Iceland Responsible Fisheries" label and the "Alaska Seafood Markets Initiative" are good examples of where we could go; applying our own label. We could create a NZ brand, the clean green, sustainable fisheries and sell it to the retailers. That message does not come through at Expos." *Manager, Government Agency, 2011*

- "We really need to push for encouraging a system that incorporates all of NZ as sustainable fishing resource. To have individual MSC certification for individual species is really expensive, only large fisheries can afford it, like Hoki." *CEO, Seafood Company, large, 2011*

- "Marine Stewardship Council certification is just one type of certifying agencies, there are a lot of others. We need our own." *CEO, Seafood Company, large, 2011*

- "We need to manage our system of fisheries rather than the fish. The MSC is just one of a number of tools in the tool kit. We need to have National Standards. We need to have international recognition and accreditation. It's not too far away. There is momentum to move toward the Icelandic type schemes." *CEO, Seafood Company, large, 2011*

- "It would be fantastic if we could get a National Certification, but I'm not sure it would be recognised. It would need to be an independent body." *Seafood Company, large, 2011*

Source: http://www.fisheries.is/; http://www.alaskaseafood.org/

3. SELL SUSTAINABLE – HOW TO DO IT

Others have been very successful; learn from their approaches and adopt – quickly

Key points in development of sustainability certification systems used by Alaska and Iceland and recommendations for a New Zealand system *(2011)*

	Alaska	Iceland	NZ recommendation
1. Government makes a statement	- Sustainability of fisheries written into Alaskan constitution	- "Statement on Responsible Fishing in Iceland" by Icelandic Government in August 2007[2]	- Adopt Icelandic approach[3] - Certify all QMS species as sustainable
2. Government assigns program management	- To Alaska Seafood Marketing Institute (an Industry/state partnership)	- To Fisheries Association of Iceland	- To SeaFIC
3. Accept the FAO standards and certification[1]	- Accepts and applies the FAO standards	- Accepts and applies the FAO standards	- Accept and apply the FAO standard
4. Appoint independent third party certification agency	- Appoints Global Trust to certify	- Appoints Global Trust to certify	- Appoint an experienced global agency to certify
5. Develops point-of-purchase logo			- "New Zealand Responsible Fisheries" - Develop a logo

1. "the FAO Code of Conduct for Responsible Fisheries (1995)" and "FAO Guidelines for the Ecolabelling of Fish and Fishery Products from Marine Capture Fisheries; 2. Available here: http://www.fisheries.is/management/government-policy/responsible-fisheries/; 3. Iceland copied our fisheries management system so turnabout is fair play

WILD CATCH - OBSERVATIONS

The fourth observation is to focus on ways to sell the same volume of wild catch for more money than we do today

	Observations
1	Control costs
2	Improve quality
3	Sell our sustainable story
4	Sell the same volume for more money
5	More high value species

4. SAME FOR MORE – WRONG MENTALITY

The industry sees itself as primarily a volume-seller of minimally processed ingredients

- "The outstanding generality of the NZ Seafood industry is that we are commodity price takers, not market makers." *Manager, Seafood Industry body, 2011*

- "We aren't adding value, we are traders. We are exporting the same frozen blocks." *CEO, Large Seafood Company, 2011*

- "Our failure to gain higher prices is a failure in value chain management. It starts with a failure to manage the quality of produce to meet high value consumer needs (we strive to meet minimum standards). It continues with an abrogation of market responsibility ("give me the best price on the beach"). Harvest management decisions are taken with an over dependence on prices in the Sydney fish market. But we are in denial because we can always find a counter example." *Manager, Research industry body, 2011*

- "We have no ability to successfully penetrate a market and market to the consumer who recognises and will pay for premium called NZ." *CEO, Medium Seafood Company, 2011*

- "The big companies get into a d--k swinging competition. There are a lot of ego's involved. As an industry we are production led and so the big guys do piss poor. There needs to be a culture change, the real growth is in driving the marketing, the big companies are traders. The same people have been in the industry for 20-30 years, they can't see a different way of doing things." *Manager, Medium sized Seafood Company, 2011*

- "We are raw producers." *Manager, Government Agency, 2011*

- "The industry is full of hunter gatherers; get as much as possible before the next guy. It's the same in the meat industry. Unless a product is treated as a product, a cut or fillet, it has no value. Its taken as long as it has to develop an efficient business the way it is. It is difficult to change. Industry doesn't see the value. Executives are rewarded on that basis, not risk. It is not in the culture of the industry." *Industry Executive, 2011*

4. SAME FOR MORE – SELL THE SAME VOLUME FOR MORE MONEY

There is recognition of the benefits of moving toward value added products

- "We can get three times the value by adding value, by coating it, portioning it, packaging it, but the return has to be there." *GM, Industry representative, 2011*

- "We make more money than the big players selling branded product direct in the market." *CEO, marketing Company, 2011*

- "In the medium term - 10-15 years - we need to become less reliant on white frozen block, and more focused on value added." *Seafood Company, large, 2011*

- "Sealord are an example of a successful branded product that does well in New Zealand and Australia. They have good brand presence, a sales team, consumer acceptance, consistent supply and a relationship with the retailer." *Seafood Company, large, 2011*

- "We need to market high quality seafood, and put it beside wine and other premium food products." *Manager, Seafood representative, 2011*

- "We could do much better as an industry if we put more emphasis on producing higher value (from the consumers perspective, not ours) seafood and less emphasis on producing more and cutting costs. At present the emphasis is on the latter two with the result that poor marketing leads to the "opportunity" to take lower prices." *Manager, Seafood Industry body, 2011*

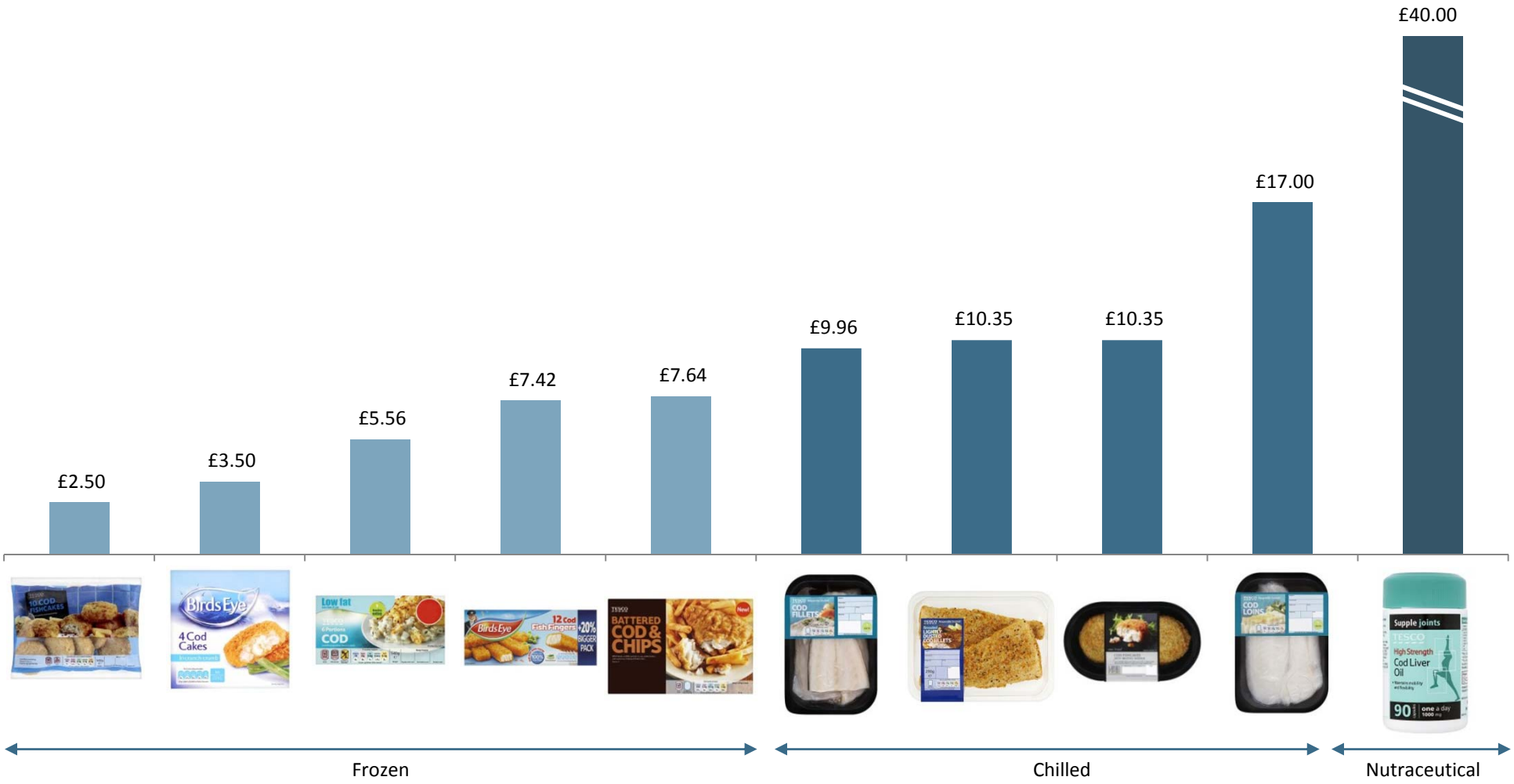
- "Value added product is very stagnant in the NZ market. The NZ companies don't understand the markets that well. NZ supermarkets are worlds apart from the Northern Hemisphere ones. We are good at producing not manufacturing, we never deal with the retailer." *Manager, Government Agency, 2011*

- "If we have different formats, we can drive the price up. Packaging changes that are suitable for retail execution, then you can really increase the price. Packaging needs to be more consumer friendly." *Industry representative, 2011*

4. SAME FOR MORE – MORE COMPLEX THAN IT SEEMS

Unlike some products, processed seafood is not necessarily the highest value; in most cases high quality fresh receives a higher price than processed frozen

EXAMPLE: Price of select cod products in Tesco London
(£/kilo; actual; 8/2011)



Source: Tesco online shopping website (London postcode; Aug 2011); photo credit (fair use; low resolution; complete product/brand for illustrative purposes); Coriolis analysis

4. SAME FOR MORE – BEYOND STATUS QUO

Selling the same volume for more money is easy to say; however moving forward may take time

- "One of the impediments to change in the NZ seafood industry is that too many people are making quite enough money from the status quo to be very interested in making changes. And then if they do want to make changes, there are plenty of people willing and able to advance all sorts of reasons why things shouldn't be changed." *Manager, Seafood Research Industry, 2011*

- "The industry is comfortable. They are making money doing what they are doing now." *Seafood Company, medium, 2011*

- "Adding value is a great idea, but by the time you add up the packaging, getting certain cuts - the problem is it adds to much cost and its not worth it. Our industry is adding cost not value." *CEO, Seafood Company, medium, 2011*

- "Value added probably won't happen in New Zealand. Its too hard to do it here and make money. There are high labour costs, low brand presence and a huge distance to market." *Seafood Company, large, 2011*

- "Where we have overseas market alliances, the "added value" of these alliances seems to show up in the books of the in-market operators and not in corporate NZ." *Manager, Seafood Research industry body, 2011*

- "Reducing wild catch tonnages inevitably lead to lower returns based on a model of cutting costs and producing more. Did anyone say the words "commodity price slaves"? *Manager, Seafood Research Industry body, 2011*

- "The industry is young. 50-60 years old only one or two generations. A lot of people in the industry are the founding fathers of the sector. Time will allow the industry to mature. It hasn't really found its feet. We are just trying to grasp things like nutraceuticals now. We don't know the potential value of what we have." *GM, Seafood Company, medium, 2011*

WILD CATCH - OBSERVATIONS

The fifth observation is to focus on ways to increase production of our key high value species

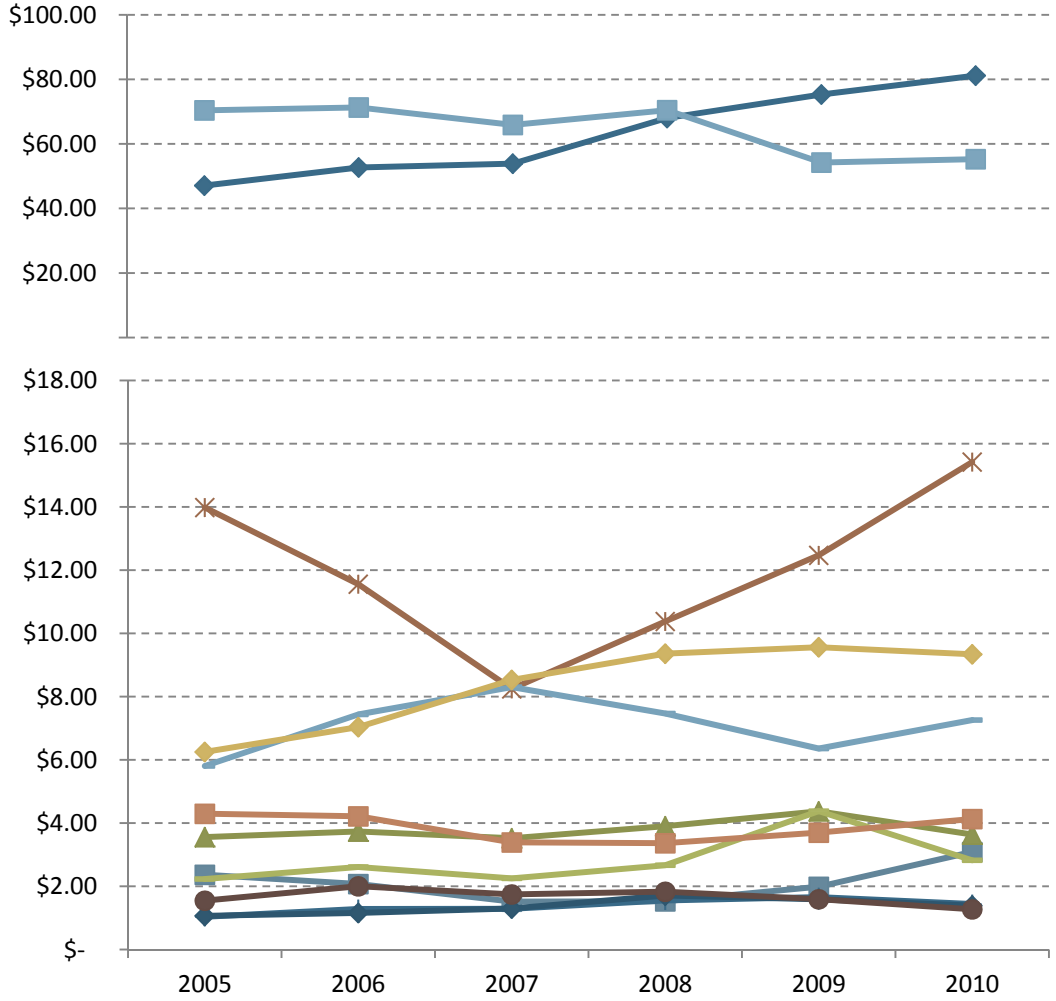
	Observations
1	Control costs
2	Improve quality
3	Sell our sustainable story
4	Better utilisation
5	More high value species

SEAFOOD – EXPORT VALUE BY PRODUCTION TYPE

Is there an opportunity to grow our high value species?

New Zealand Top 10 seafood export species by dollar per kilo

(NZ$; nominal non-inflation adjusted; FOB; 2005-2010)



USES NZ$

	Absolute Growth (05-10)
Rock lobster	+$34.05
Pāua	-$15.12
Orange Roughy	+$1.44
Snapper	+$3.09
Ling	+$1.45
Oreo Dory	-$0.17
Hoki	+$0.08
Squid	+$0.71
Tuna	+$0.60
Jack mackerel	+$0.40
Sth. Blue Whiting	-$0.28

The consumer is speaking +$35/kg in 5 years! Why? Will this continue?

2006 period of highest production for Orange Roughy

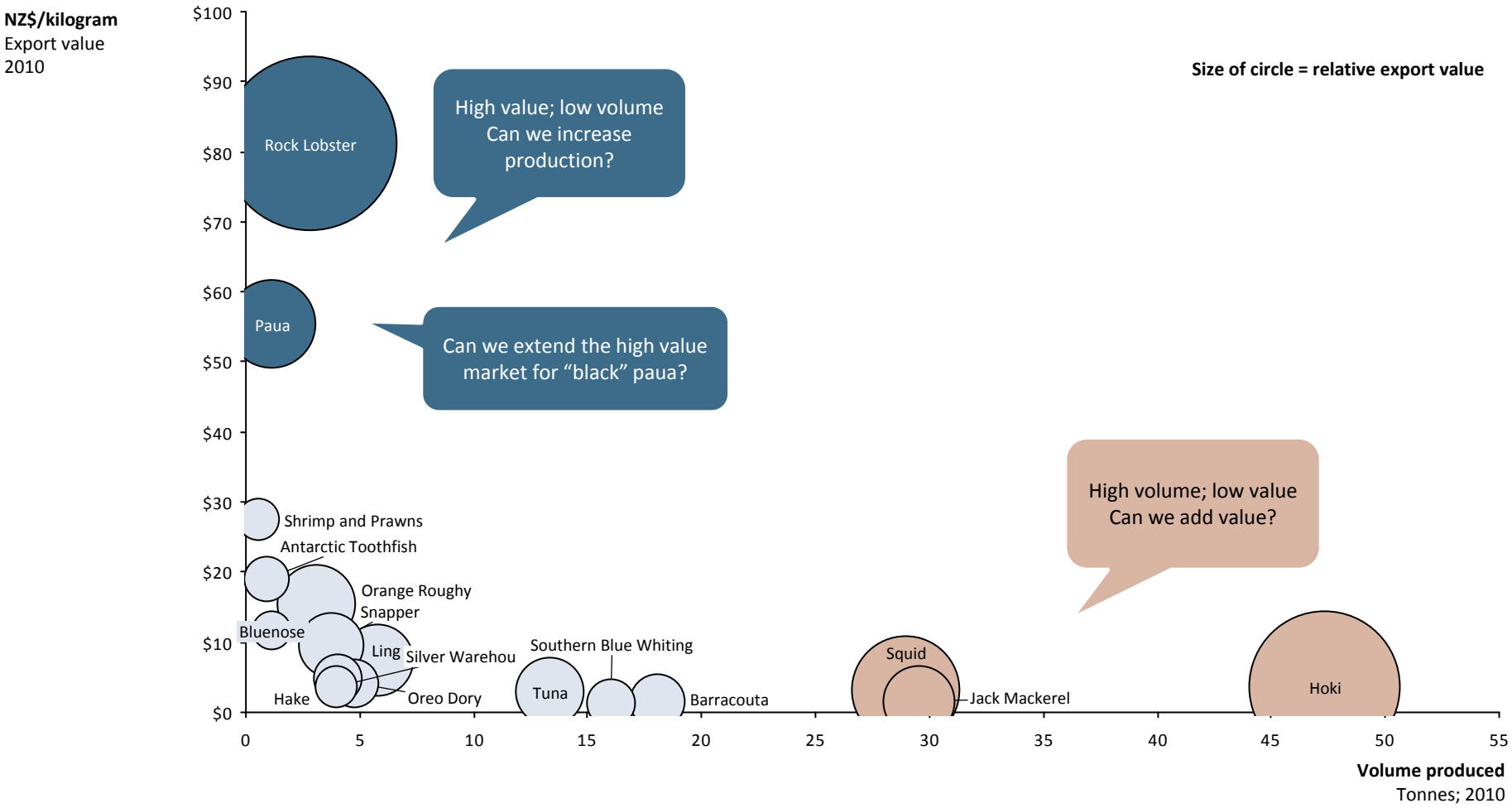
Source: SeaFIC; Coriolis analysis

CORIOLIS

OPPORTUNITY MATRIX

Rock lobster and paua stand out as opportunities for any attempts to increase production/productive capacity

Top 17 wild capture species opportunity matrix: volume vs. unit value vs. relative total export value
(various; 2010)



Source: SeaFIC data; Coriolis analysis

SEEDING POTENTIAL?

Research on seeding high value species should continue, as even small movements in production would deliver large export returns

EXAMPLES of identified activities around lobster and abalone seeding
(various dates)

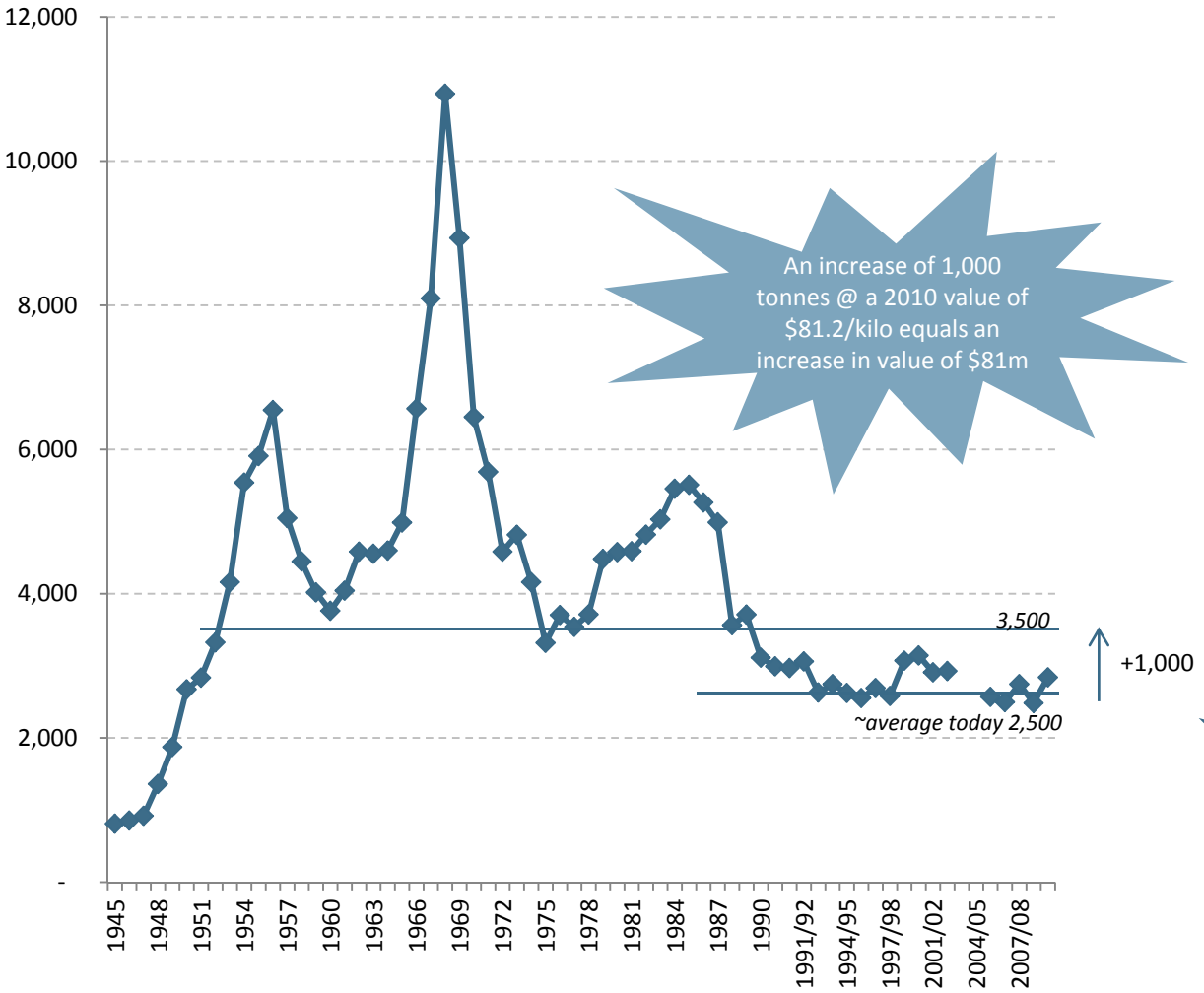
	Details	International successes/activities	Challenges
Spiny red rock lobster *Jasus edwardsii* "NZ crayfish"	- NZ native spiny lobster not related to clawed lobster (Homarus sp.)	- On-growing of wild-caught seed lobsters is widely practised in SE Asia (Vietnam 1000t/year) - Very limited freshwater crayfish (Cherax sp.) aquaculture in Australia; not growing - Seeding/reseeding of hatchery raised American clawed lobster (Homarus americanus) at numerous sites in US and Canada - National Lobster Hatchery in Cornwall, UK grows out European lobsters (Homarus gammarus) eggs from captured females for 3 months and releases - Experimental seeding of Euro lobster in parts of Europe - Experimental aquaculture around the world; no know commercial/viable successes with marine - Japanese research program underway to develop seeding/raising techniques (Panurilus japonicus)	- Historical programs have struggled to demonstrate improvements in lobster catches - Slow growth rates limit viability of longer grow out of juveniles
Blackfoot abalone *Haliotis iris* "Paua"	- NZ native abalone	- Large scale Japanese seeding operations since 1950's - Seeding trials conducted in numerous regions (e.g. CA) - 15 different species of Haliotis attempted or being farmed - Abalone aquaculture growing; China now largest farmed producer - Seeding trials completed in New Zealand	- No clear evidence of successful, longterm seeding outside Japan

Source: various published articles and reports; Coriolis

SPINY RED ROCK LOBSTER – POTENTIAL GROWTH

Growing the available catch of lobster across the main areas could see a significant increase in value

Total landed spiny red rock lobster commercial catch
(all stocks; tonnes; actual 1945-2009/10)



Comments

- The catch in 2009/10 was 101% of the TACC
- Based on the overall value, and value per kilo of this species any way to increase the stock of this high value species would be highly beneficial
- How can industry and science work together to achieve this growth potential? Potential for re-seeding?
- Requires the phyllosoma "grounds" to be kept pristine
- How can we reduce the volume caught illegally? (Industry estimates 300-600 tonnes)

Notes/Definitions

- Species code CRA
- CRA1-10

Difficult? Yes.
Impossible? No.

Source: MFIsh Data report log; website; Coriolis analysis

RESEARCH

Recent FRST-funded wild catch research for "public good" has been primarily process and management orientated

EXAMPLES: Top 10 Wildcatch and Cross industry research projects undertaken by scientists funded by FRST
(2002-2016 (committed into the future)

Organisation	Funding (NZ$m; 02-16)	Years	Projects
Cawthron Institute	$9.4	6	Innovative Systems for Safe New Zealand Seafood in Premium Markets
Crop & Food Research	$5.3	5	Higher Value Seafoods – creating a profitable future for NZ's seafood sector through physiology-driven post-harvest technologies
Crop & Food Research	$2.6	4	Wildfish 2020 - creating a positive future for NZ's wild fisheries through innovative harvesting technologies
NIWA	$2.3	5	Restoration, stewardship and management of harvested taonga freshwater species
NIWA	$2.2	4	Effective adaptive management strategies for seamount fisheries and ecosystems
University of Auckland	$1.2	4	Determinants of Innovation and Growth in the Seafood Sector
NIWA	$0.9	4	Enhancing commercial tipai (scallop) harvest in Tai Tokerau
NIWA	$0.9	4	Matauranga Maori and sustainable management of New Zealand fisheries
NIWA	$0.8	3	Assessment and Enhancement of Mahinga Kai in Te Waihora (Lake Ellesmere)
University of Auckland	$0.4	2	Revealing Larval Lobster Diets

Source: MSI as at July 2011

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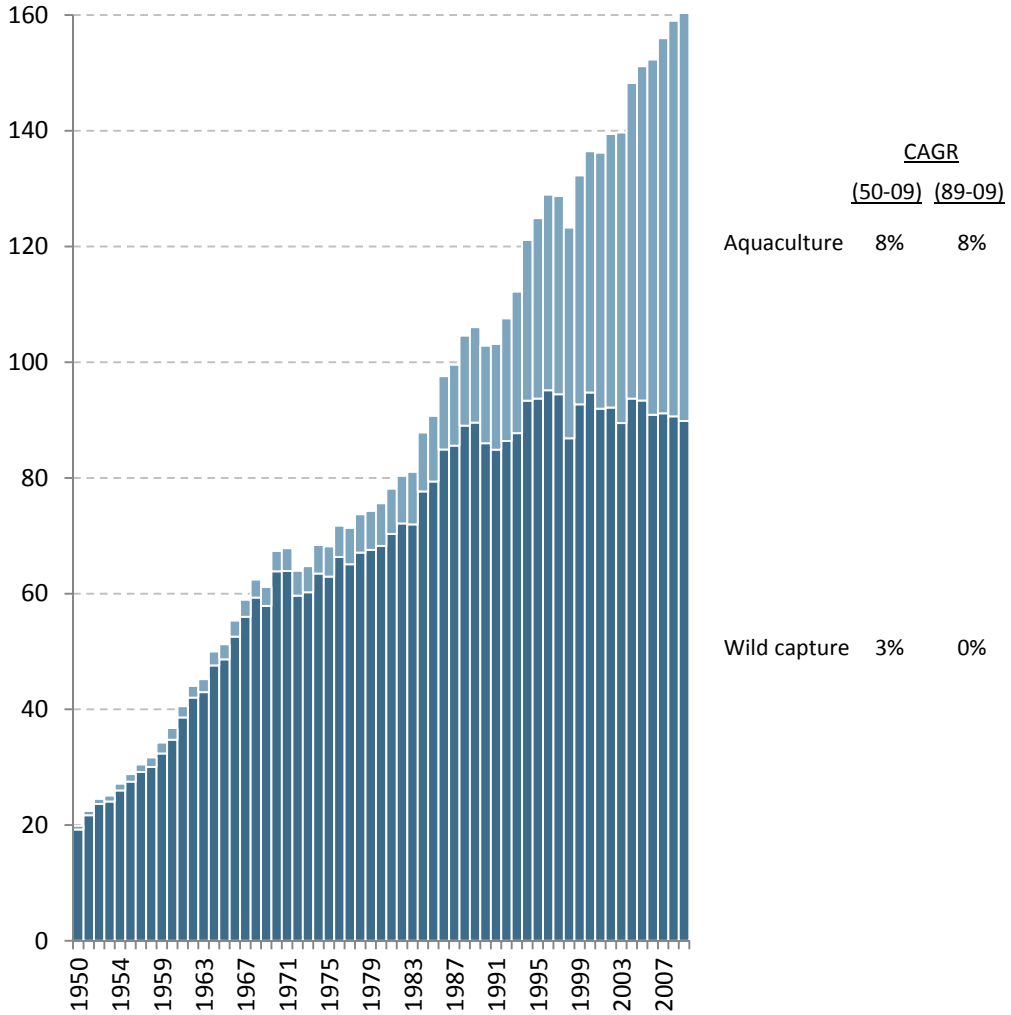
AQUACULTURE – THE GROWTH STORY

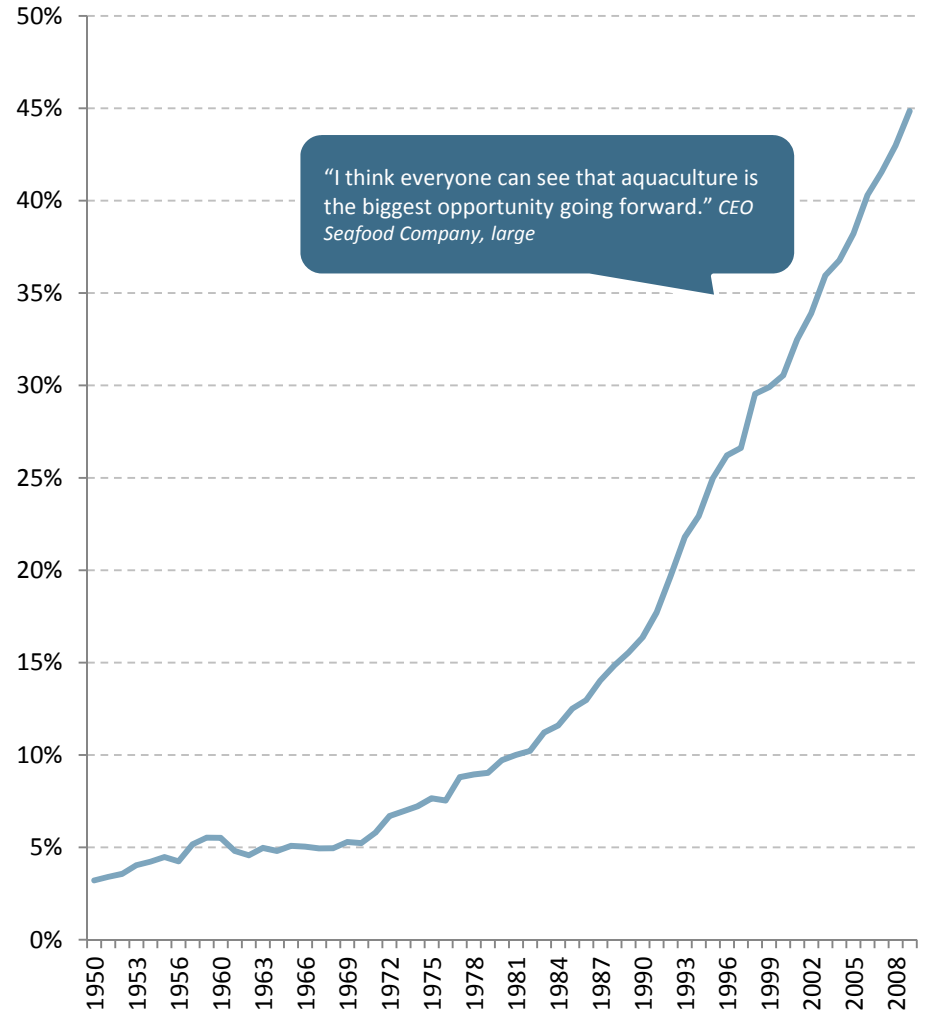
Aquaculture tells a good global growth story; flat wild capture volumes are being replaced by aquaculture, leading to aquaculture strongly increasing its share of total seafood volume

Global seafood production volume by production method
(t; m; 1950-2009)



	CAGR (50-09)	CAGR (89-09)
Aquaculture	8%	8%
Wild capture	3%	0%

Aquaculture as a percent of global seafood production volume
(% of t; 1950-2009)

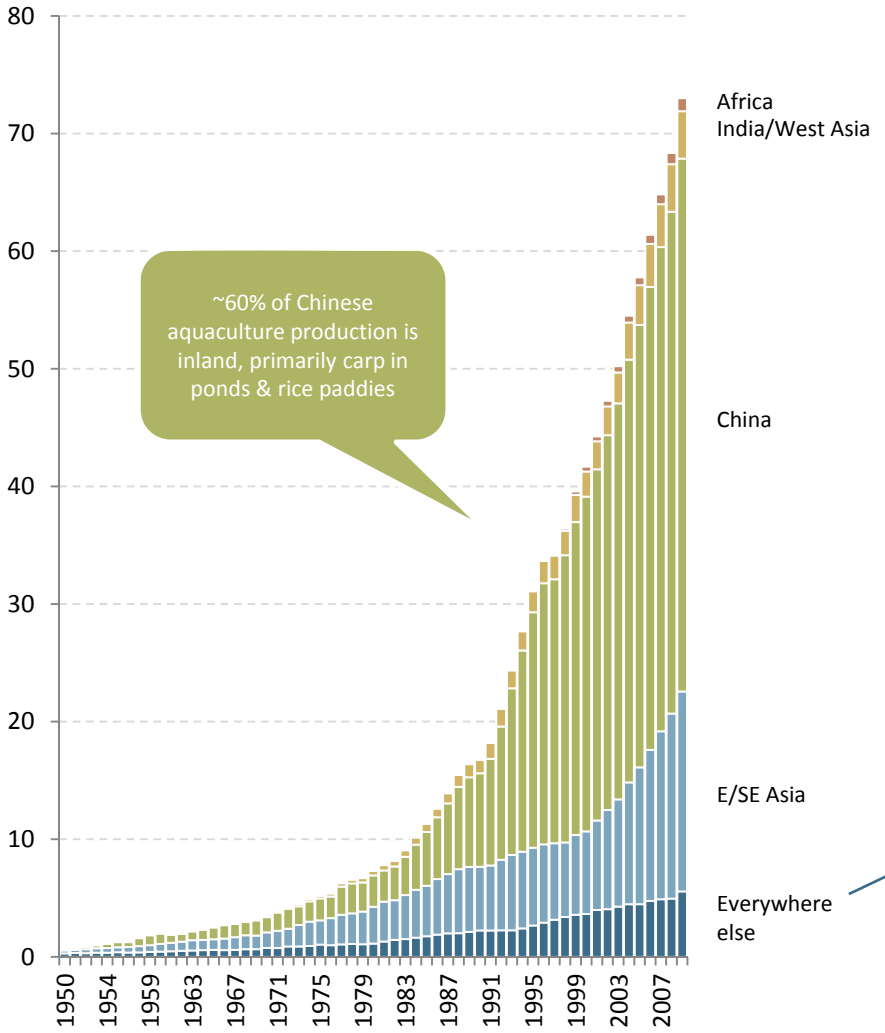


Source: UN FAO FishStat database (custom job); Coriolis analysis

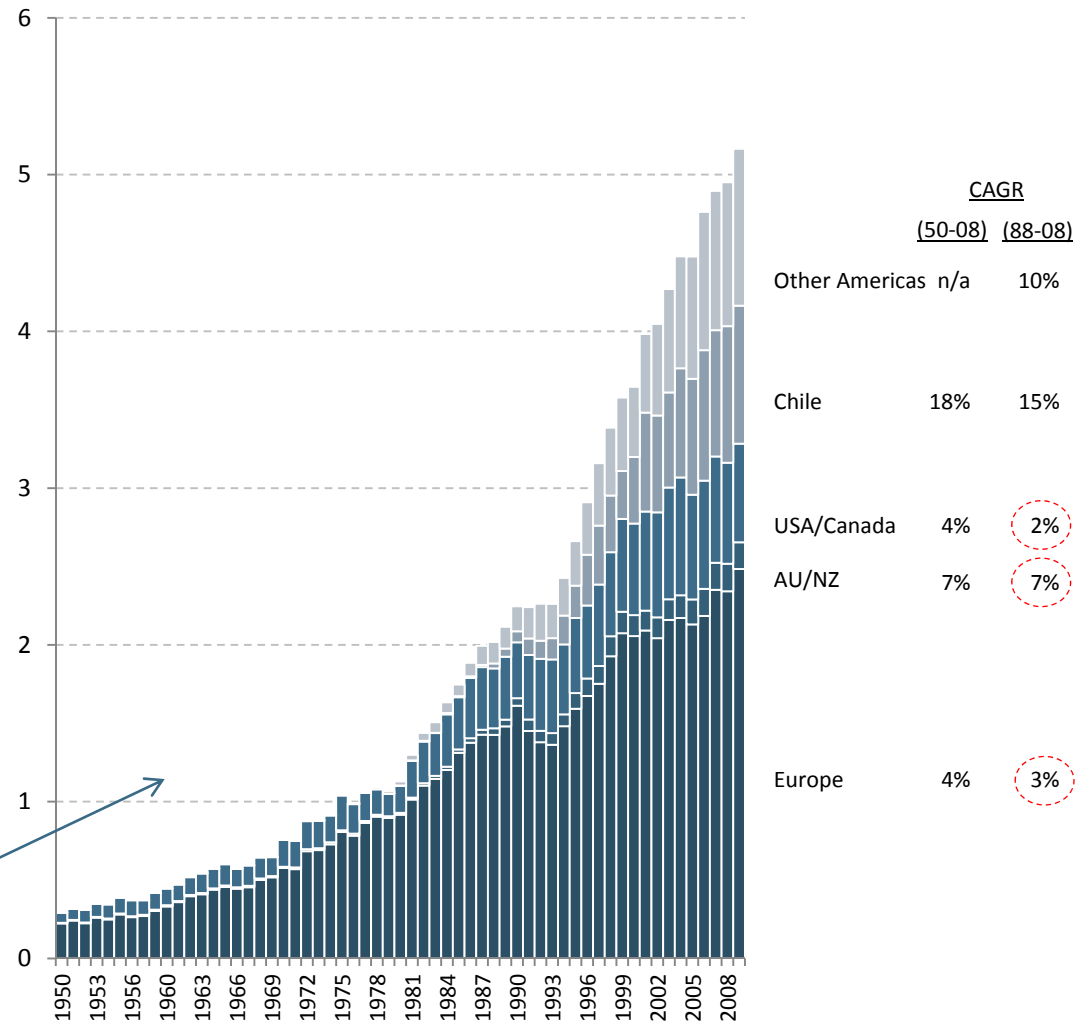
AQUACULTURE – REALITY MORE NUANCED

Reality is more nuanced: growth is primarily coming from China and a handful of SE Asian countries; the growth across regions more relevant to New Zealand is less pronounced

Global aquaculture production volume by select mega-region
(t; m; 1950-2009)



Global aquaculture production volume by select region
(t; m; 1950-2009)



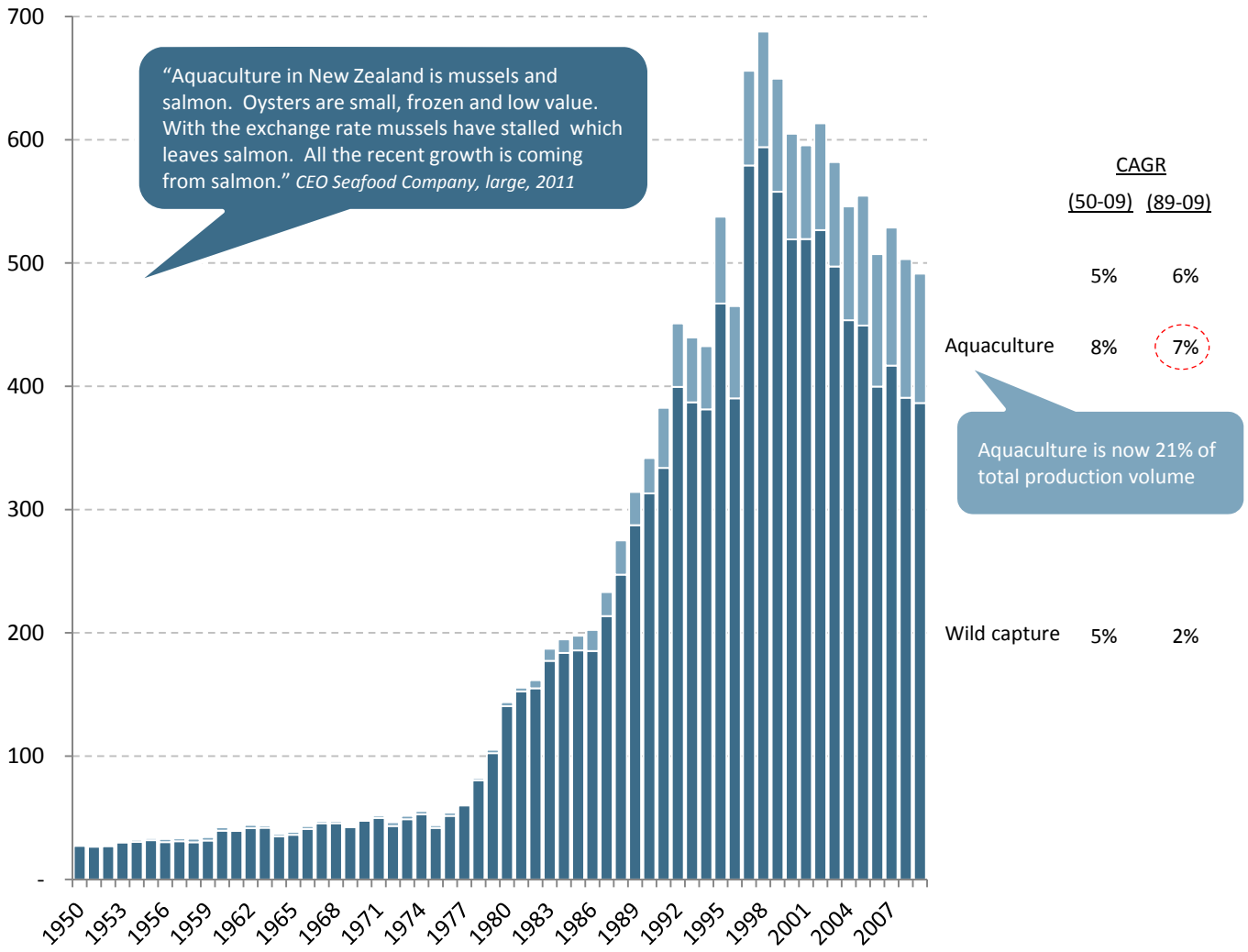
Source: UN FAO FishStat database (custom job); Coriolis analysis

CORIOLIS

NEW ZEALAND – WILD VS. AQUACULTURE VOLUME

The growth of aquaculture volume has not made up for the decline in wild capture in New Zealand

New Zealand seafood production volume by production method
(t; 000; 1950-2009)



Comments

- Volume not value
- Question: What is the trend? Where is this heading?
- "Wild capture will stablise, there are no new species out there. There will be no new volume in wild capture." *Interview*
- "The only opportunity for production growth is in aquaculture." *Interview*

Source: UN FAO FishStat database (custom job); Coriolis analysis

SPACE – AGRICULTURE VS. AQUACULTURE

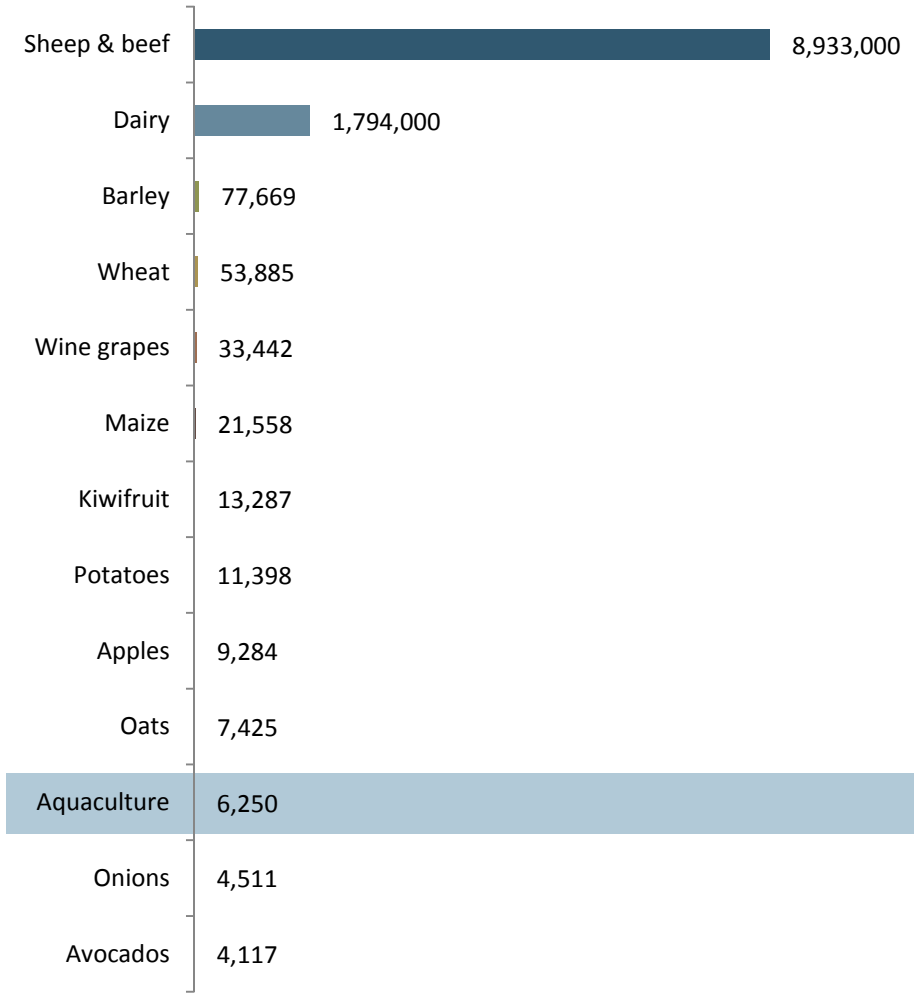
Proportional to agricultural land use, the 6,250 hectares used in aquaculture in 2010 were relatively minimal, being slightly more than onions but less than oats

Latest available comprehensive New Zealand aquaculture metrics
(2010)

	# of farms	Productive marine space (ha)	Value (NZ$m)	$/ha
Mussels	1,000	5,250	$206	$39,238
Salmon	16	100	$145	**$1,450,000**
Oysters	250	900	$26	$28,889
TOTAL	1,146	6,250	$377	$60,320

Clearly, this is revenue only and does not reflect the cost of business, expenses , capital outlay etc. Figure should be taken as directional as varies depending on the figure used for productive space

Relative area usage
(ha; actual; 2010 or as available)



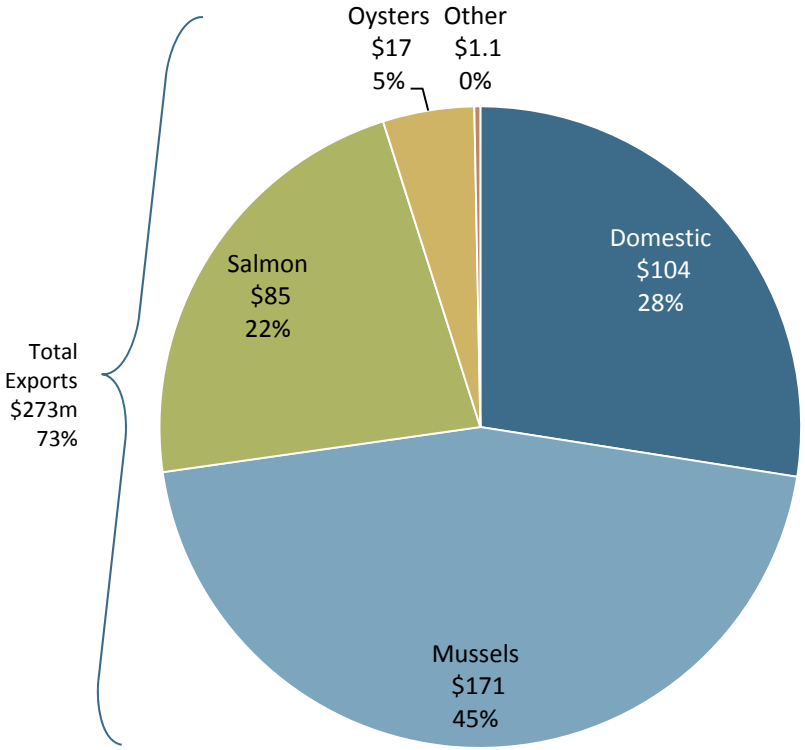
Note: Domestic value and area is directional only; Source: MFish; Aquaculture NZ; Industry Estimations; MAF; UN FAO; Plant & Food Fresh Facts; Coriolis analysis

AQUACULTURE – VALUE BY CHANNEL AND SPECIES

The total value of New Zealand's aquaculture industry is $376m; 73% is exported

New Zealand aquaculture value by species
(NZ$; m; 2010)

6,250 hectares of productive marine space equates to ~$60,000/hectare



Total revenue = $378m

Comments

- Total exports to 75 countries
- Marine aquaculture in 6,250 hectares of productive growing area

Notes/Definitions

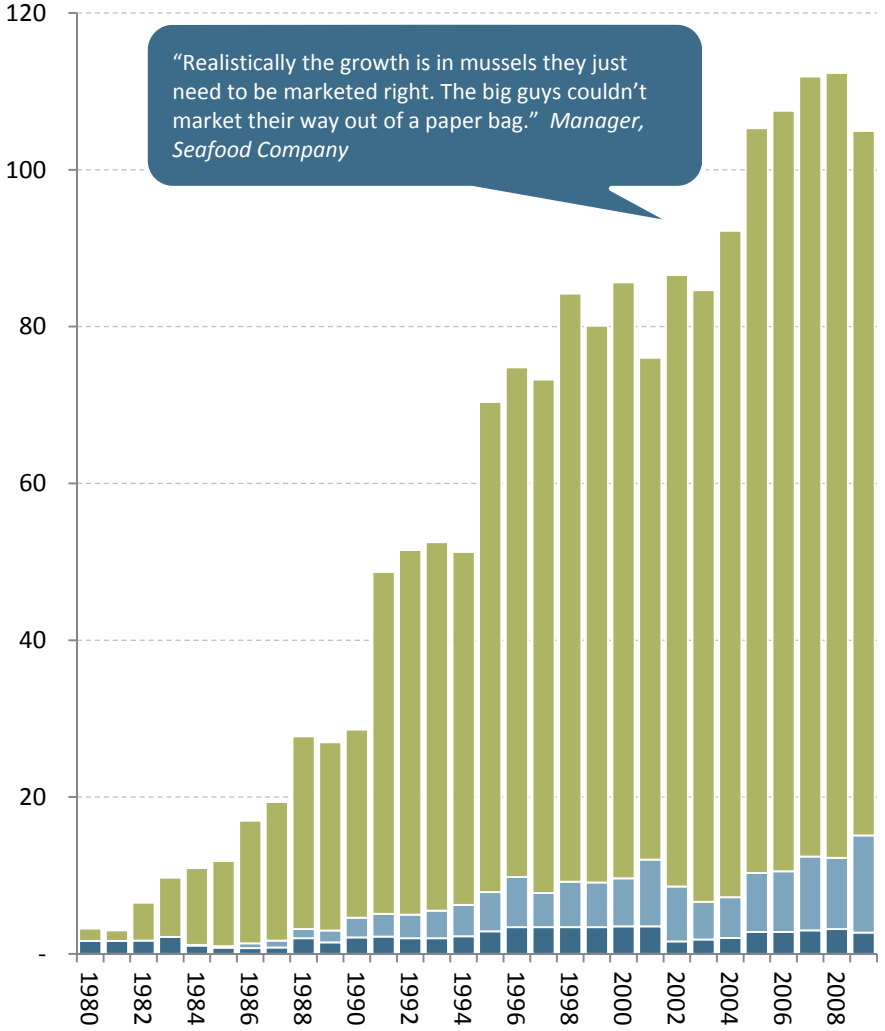
- Value of total domestic consumption of locally grown aquaculture (3 key species only)

Source: Mfish Aquaculture Unit; SeaFic; Statistics New Zealand; Coriolis analysis

AQUACULTURE – PRODUCTION GROWTH

Historically strong New Zealand aquaculture production growth has slowed recently

New Zealand aquaculture production by species
(t; 000; 1980-2009)



"Realistically the growth is in mussels they just need to be marketed right. The big guys couldn't market their way out of a paper bag." *Manager, Seafood Company*

	CAGR (80-99)	CAGR (99-09)	CAGR (08-09)
Green lipped mussel	22%	2%	-10%
King salmon	28%[1]	8%	36%
Pacific oyster	4%	-2%	-15%

"All the recent growth is coming from salmon." *Interview*

Comments

- Aquaculture moratorium 2002 to 2004
- Requirement to give 20% of any/all new aquaculture space created between 1992 and today to local Iwi
- Maori Aquaculture Settlement in progress
- Recent oyster disease outbreak

Notes/Definitions

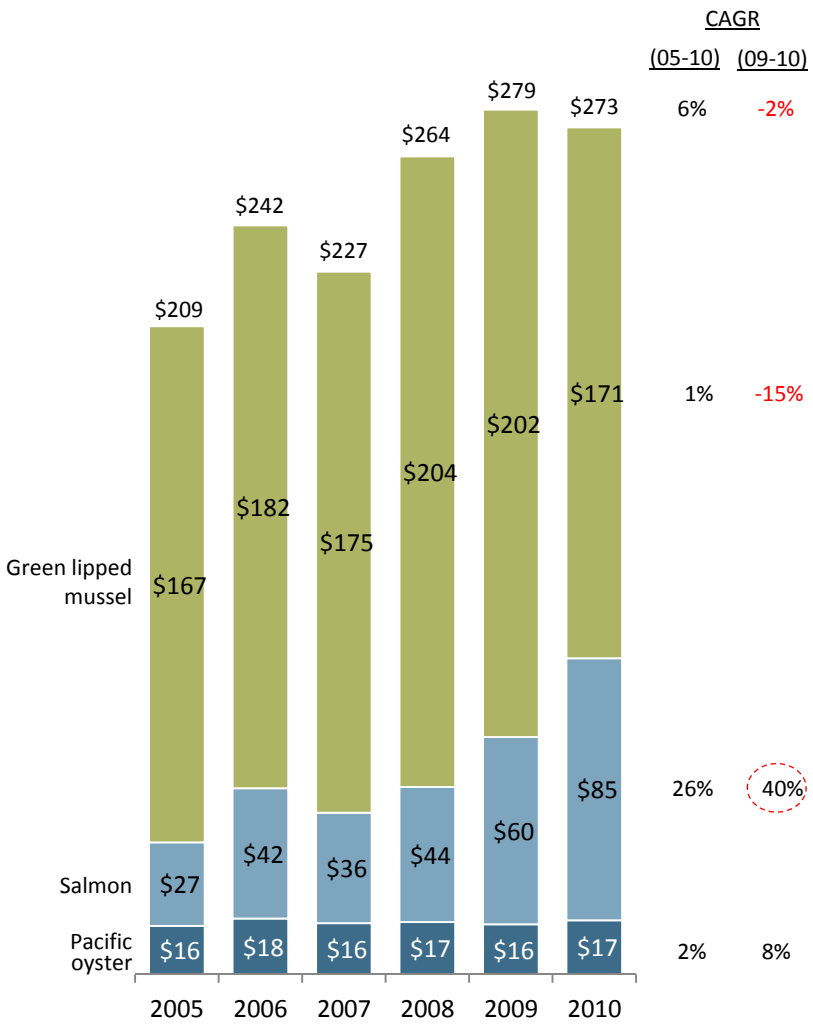
- Mussel data appears to be shell-on greenweight
- Pacific oyster catch for 97-99 a Coriolis estimate as data in FishStat is anomalous

1. Uses 85-99; Source: UN FAO FishStat database (custom job); Coriolis analysis

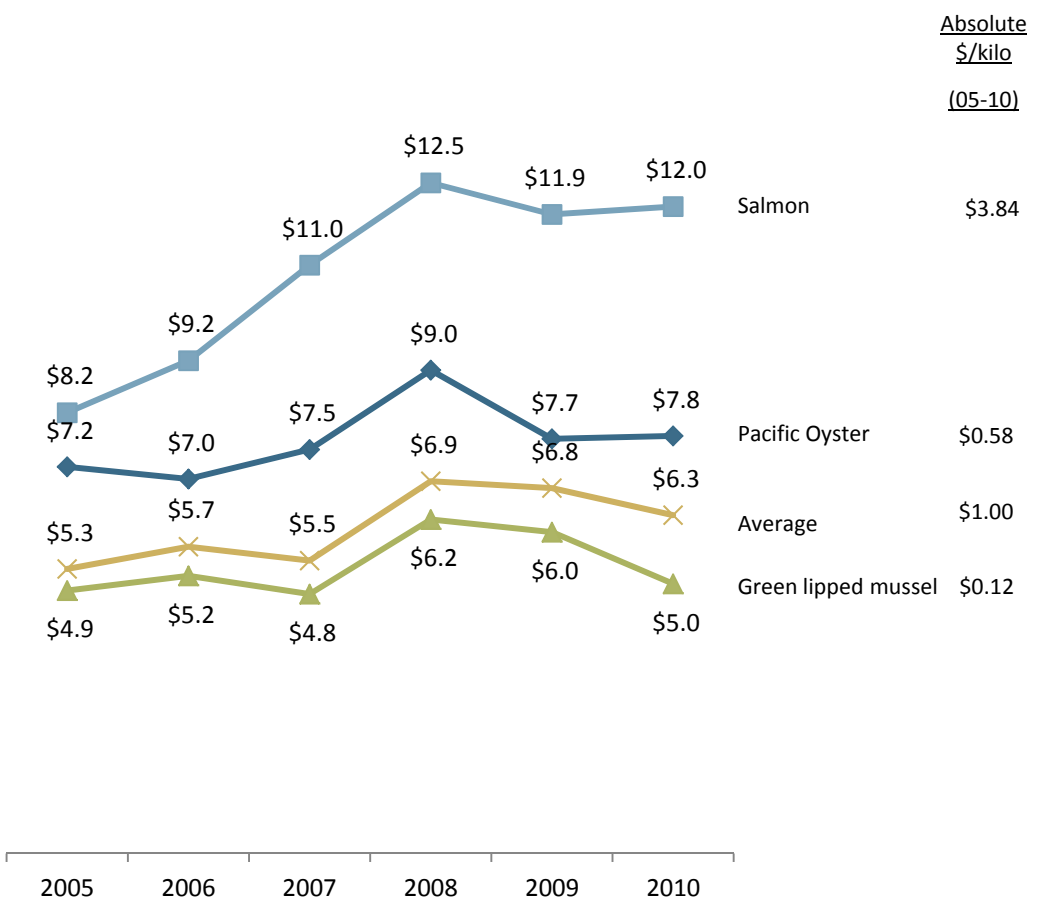
AQUACULTURE – EXPORT GROWTH

Salmon is driving aquaculture export value growth; while driving the value per kilo over this five year period

New Zealand aquaculture export value by species
(NZ$m; 2005-2010)



New Zealand aquaculture export value/kilo by species
(NZ$/kilo; 2005-2010)

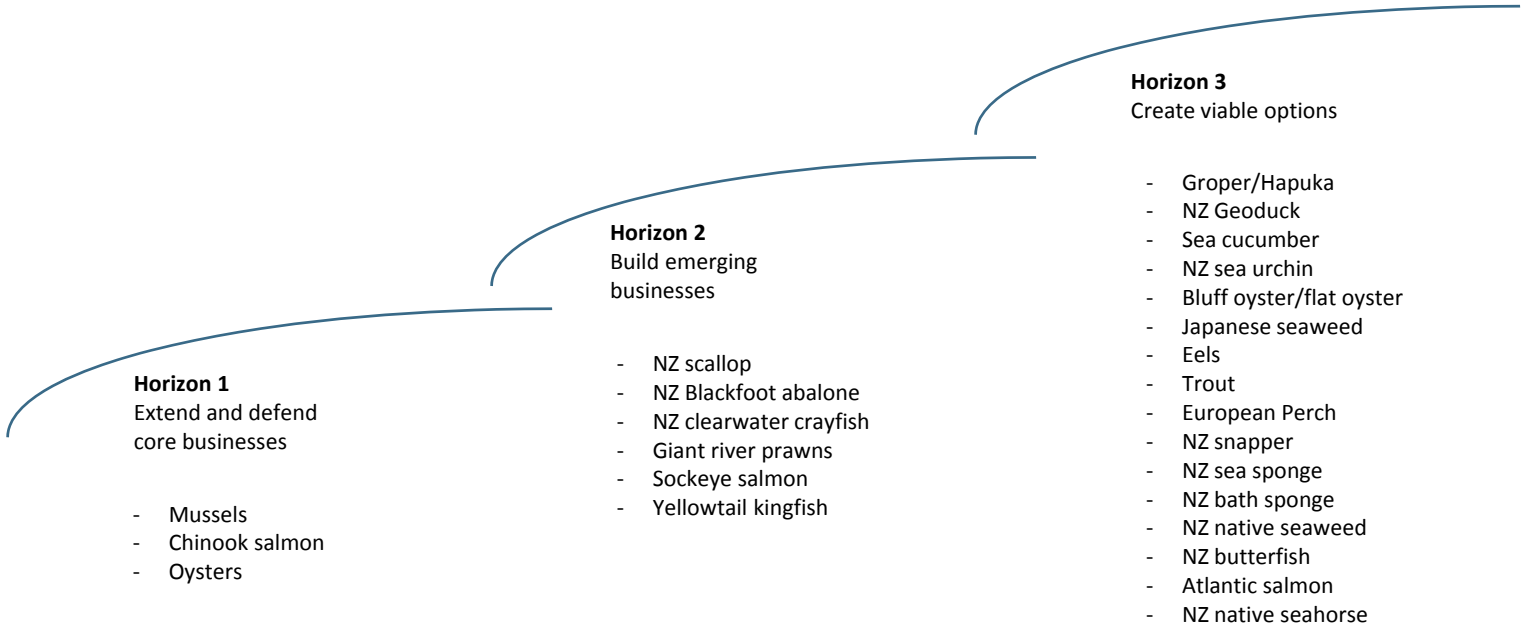


Source: SeaFIC; Coriolis analysis

CORIOLIS

AQUACULTURE – THREE HORIZONS

We propose thinking about opportunities in aquaculture across three horizons of growth



HORIZON 1 – NZ AQUACULTURE KEY SPECIES

New Zealand farms three aquaculture species at any volume – one native and two introduced species

Profile of key aquaculture species in New Zealand
(various; 2010 or latest available)

Common name *Species*	Production (t; 000)	Key production regions	Export value (NZ$m; 10)	Key export markets	Key firms (% volume share)	Source of genetics
Green Lipped Mussels *Perna canaliculus*	95 (10)	Marlborough 68% Coromandel 22% Tasman 3% Auckland 3%	$171.4m	USA Australia Spain South Korea Hong Kong	Sanford 45% Aotearoa Seafood 10% Talleys 10% Sealord 10% Greenshell NZ 10%	- Native species; farming begun in 60's - Most of world grows blue mussel (*Mytilus edulis*), not in NZ - Introduced Mediterranean mussel *(Mytilus galloprovincialis)* also in NZ but not farmed
Chinook/King Salmon *Oncorhynchus tshawytscha*	12.4 (10e)	Marlborough 75% Southland 19% Canterbury 6%	$85.7m	Japan Australia USA	NZKS 67% Sanford 24% Benmore 2%	- Numerous failed attempts to introduce Atlantic salmon in 19th Century - Three species currently in NZ (Chinook, Sockeye and Atlantic) - Chinook introduced from Sacramento, California by Lake Falconer Ayson in 1901 to build industry - First salmon farm 1976
Pacific Oyster *Crassostrea gigas*	2.7 (09)	Northland 47% Auckland 26% Coromandel 21%	$17.5m	Australia Pacific Islands Hong Kong	Aotearoa Fisheries Clevedon Coast Biomarine	- Industry originally farmed native rock oyster (Saccostrea commercialis) - Pacific oyster arrived illegally on barge used to build Auckland harbour bridge - Industry switched to Pacific in 70's as they grew much faster

Source: NZ Salmon Farmer's Association (email); UN FishStat; Aquaculture NZ Farm Facts (Mar 2010); Sanford presentation (Nov 2010); Coriolis analysis

HORIZON 2 – EMERGENT SPECIES IN NEW ZEALAND

New Zealand has a handful of secondary species being farmed; none have yet emerged as a volume species

Profile of secondary aquaculture species in New Zealand
(various; 2010 or latest available)

Species	Key regions	Key firms	Details
Native scallop *Pecten novaezelandiae*	South Island	Challenger Scallop Enhancement Company	- NZ native species - Seeding program to enhance stocks, primarily South Island - Failed small-scale attempts at farming
Blackfoot abalone (Paua) *Haliotis iris*	Northland 100%	Oceanz Blue [Aquaculture Pacific – failed] [East Land Aquaculture – failed] Other sea-based smaller operations	- Native species; most of world farming Ezo abalone (H. discus) or Chinese abalone (H. Supertexta) - Wild stock seeding of different species (Haliotis discus) developed in Japan in 1950's - California pioneers abalone (Haliotis fulgens) farming in 1960's - Small-scale ocean farming in New Zealand 1980's - NIWA begin abalone (Haliotis iris) aquaculture research in 1980's
Native clearwater crayfish *Paranephrops planifrons*	South Island (Blenheim & Alexandra)	Sweet Koura Enterprises (Alexandra) New Zealand Clearwater Crayfish (Blenheim) Waikoura Springs (Kaikoura)	- Emerged in early 90's modelled on yabbie farming in Australia
Giant river prawns *Macrobrachium rosenbergii*	Taupo	Huka Prawn Park 100% (Taupo)	- Major global species; 200,000t - Small scale production in NZ - Introduced from Malaysia in 1988 - Salmond Smith Biolab (Salmon) owned 70% in 90's - Only possible by use of 6ha of geothermally heated ponds
Sockeye salmon *Oncorhynchus nerka*	South Island	Small scale farming (e.g. Ormond)	- Introduced by government in 1901+ - Lived in Lake Ohau and later Lake Benmore; wild population has died out due to hydroelectric construction
Yellowtail kingfish Seriola lalandi Goldstriped amberjack Kahu/Haku Buri Ricciola	Failed to date	Parengarenga Fishfarm tries to develop on-land farm in 2004; goes under 2006 Skeggs/Island Aquafarm develops sea-base farm at converted salmon farm in Pelorus Sound; switches to salmon	- Occurs globally, including in New Zealand - Different species (Seriola quinqueradiata/Japanese amberjack) farmed in Japan in since 1927 from wild fry; commercial scale started 1960's; production stable 150,000t/year - Australia began researching and developing kingfish (S. lalandi) aquaculture in 1990's; 2-3 farms; 2,000t (2007/8) - NIWA began kingfish aquaculture research in 2000;

Source: Coriolis analysis

HORIZON 3 – WHAT ARE THE SCIENTISTS WORKING ON?

New Zealand scientists are working on theoretical aquaculture potential, of a wide range of primarily New Zealand native species

EXAMPLES: Some of the many new aquaculture species under development by scientists in New Zealand
(2000-2010)

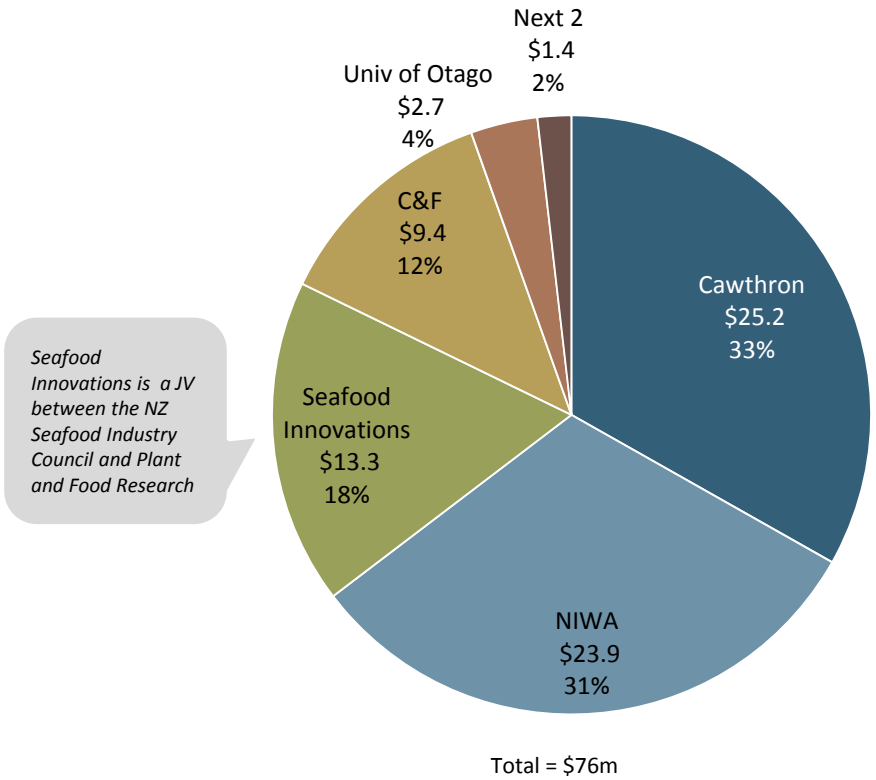
Species	Who?	History of aquaculture development	Results to date
Groper/Hapuka/ Wreckfish *Polyprion oxygeneios*	NIWA	- Basic scientific research on potential for aquaculture conducted around the world - NIWA begin research in 2004; currently pushing development; $4.6m FoRST grant	- No commercial farms to date - Sealord involved in research with NIWA
NZ Geoduck Deepwater clam *Panopea zealandia*	Cawthron	- Different species farmed in US and Canada since 1990's - Early stages of development at Cawthron	- No commercial operations to date - Produced small numbers of geoduck hatchery spat - Farming in tideland likely a barrier (ugly; other land use)
NZ sea urchin/Kina *Evechinus chloroticus*	NIWA, Otago U and UofAuckland	- Basic scientific research into sea cage aquaculture and diet to increase roe production - FoRST funding of $2.8m (04) to Otago/UofAuckland; Sealord and Sea Urchin NZ participated in scientific research	- No major commercialisation attempts to date - NZ roe has bitter taste; considered inferior in Asia - NIWA research early 2000's to improve taste through diet
NZ sea cucumber *Stichopus mollis*	NIWA, UofAuckland, Wakatu Incorp.	- Research around culturing and ongrowing them in association with mussel and finfish farms - Shangdong Oriental Ocean Gp to invest - *A mollis*- Pilot system to produce juveniles and selective breeding	- Research underway at multiple locations - Need to overcome on-growing challenges - No commercial operations to date
NZ Snapper *Pagrus auratus*	NIWA	- Related species (Red Sea Bream) farmed in Japan since 65 - Research programs in New Zealand and Australia	- No commercial operations to date in NZ - Not related to rest- of world snapper (Lutjanidae sp) - Small-scale commercial aquaculture in South Australia
NZ sea sponge *Mycale hentscheli*	NIWA & Victoria University	- Research identifies compound that treats some cancers (similar to drug Taxol) only in sponges in Pelorus Sound - Work with Marlborough Mussels Ltd to develop method for growing the sponge on existing mussel farms	- No commercial operations to date - Drug can be synthesised in lab more efficiently - Fouling and predation problems
NZ bath sponge *Spongia manipulatus*	NIWA & Victoria University	- Experimental trials at four sites in early 2000's	- No commercial operations to date
NZ butterfish *Odax Pullus*	Plant & Food Research	- 2008 early stages of development at Plant & Food Research in Nelson facility with NZ Marine Finfish PRoducers	- No commercial operations to date
Native seahorse *Hippocampus abdominalis*	NIWA	- NIWA trials	- No commercial operations to date

Source: various published articles and websites

SEAFOOD RESEARCH

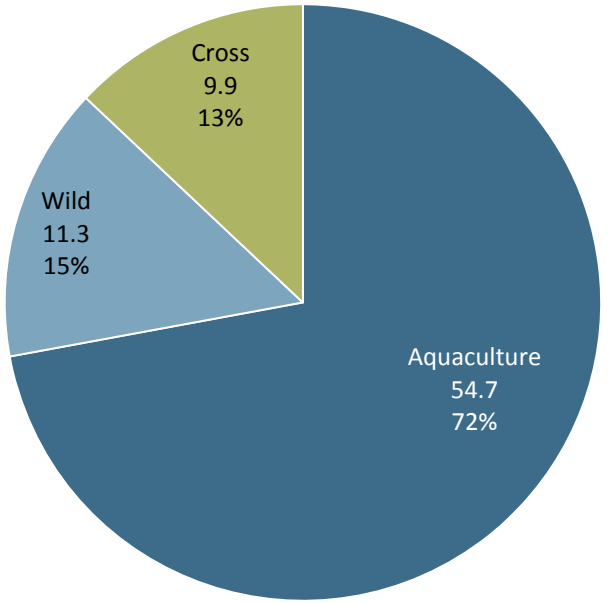
Cawthron and NIWA drive the "public good" seafood research funded by FRST; three quarters of the seafood research spend ($55m) has been on aquaculture

Total Value of food FRST Funding contracts by organisation
(Aggregate value; NZ$m; 2005-2011)



Total = $76m

Total Value of FRST Funding contracts by sector
(Aggregate value; NZ$m; 2005-2011)



Total = $76

Next 2. Auckland University; IRL, Excludes funding from other Ministries, councils, private investment; industry bodies; and FRST contracts outside our definition; Source: MSI as at July 2011

AQUACULTURE RESEARCH

Government funded aquaculture research is primarily towards enhancing value of existing or new species

EXAMPLES: Top research projects undertaken by scientists funded by FRST

(22 aquaculture projects total over this period [1]; 2002-2016 (committed into the future))

Organisation	Funding (NZ$m; 02-16)	Years	Projects
Cawthron Institute	$15.4	5	Adding Value to New Zealand's Cultured Shellfish Industry: Maximising Profit, Minimising Risk
Seafood Innovations	$13.7	7	Seafood Innovations Research Consortium (fund for SeaFIC members)
Crop and Food Research	$2.7	5	Creating Higher Value Seafoods
Cawthron Institute	$8.0	5	Transforming Mussel Aquaculture through Selective Breeding
Cawthron Institute	$2.4	5	Profitable Deep-Water Aquaculture
NIWA	$6.9	5	Rapid Commercialisation of New Aquaculture Species
University of Otago	$2.5	4	Urchin Roe Enhancement
NIWA	$5.9	6	Sustainable Aquaculture
NIWA	$3.2	4	Sustainable aquaculture: balancing production and ecosystem integrity
NIWA	$4.3	6	Increased aquaculture production through advanced broodstock development
Crop and Food Research	$4.0	5	Creating Novel Marine Ingredients
NIWA	$3.4	5	Te Whatukura a Takaroa: Nutraceuticals from Seafood (byproducts for cosmetics industry)
Cawthron Institute	$2.7	4	Use of Algal Technologies to enhance market opportunities for New Zealand Shellfish

1. Not inclusive; prior to 2005 projects were not classified the same way. Data directional only; Source: MSI as at July 2011

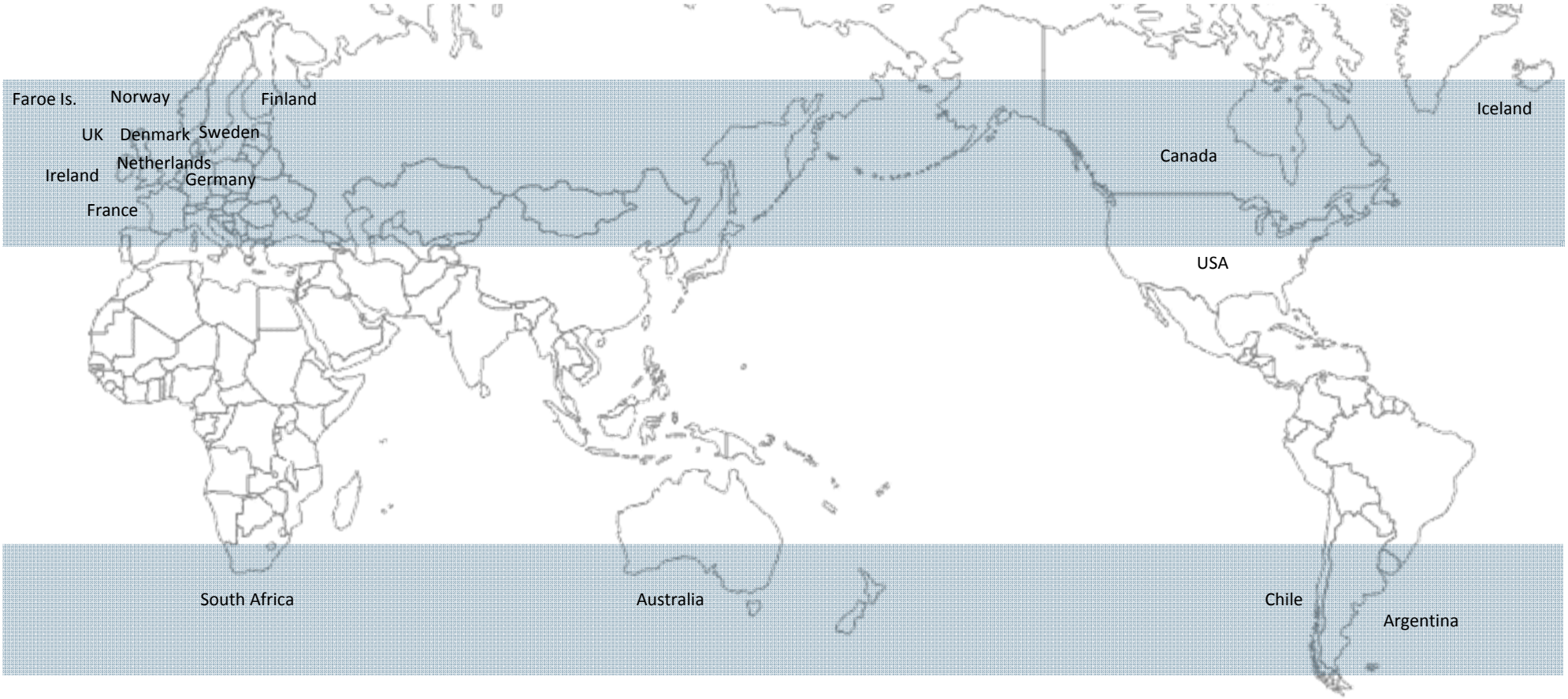
AQUACULTURE – OBSERVATIONS

Aquaculture observation number one: back salmon for growth

	Observations
1	Back salmon for growth
2	Realign science priorities

AQUACULTURE – DEFINING A PEER GROUP

There is a clear peer group of countries with similar climatic conditions to New Zealand in aquaculture



Source: Wikipedia (map: CCA 2.0); Coriolis

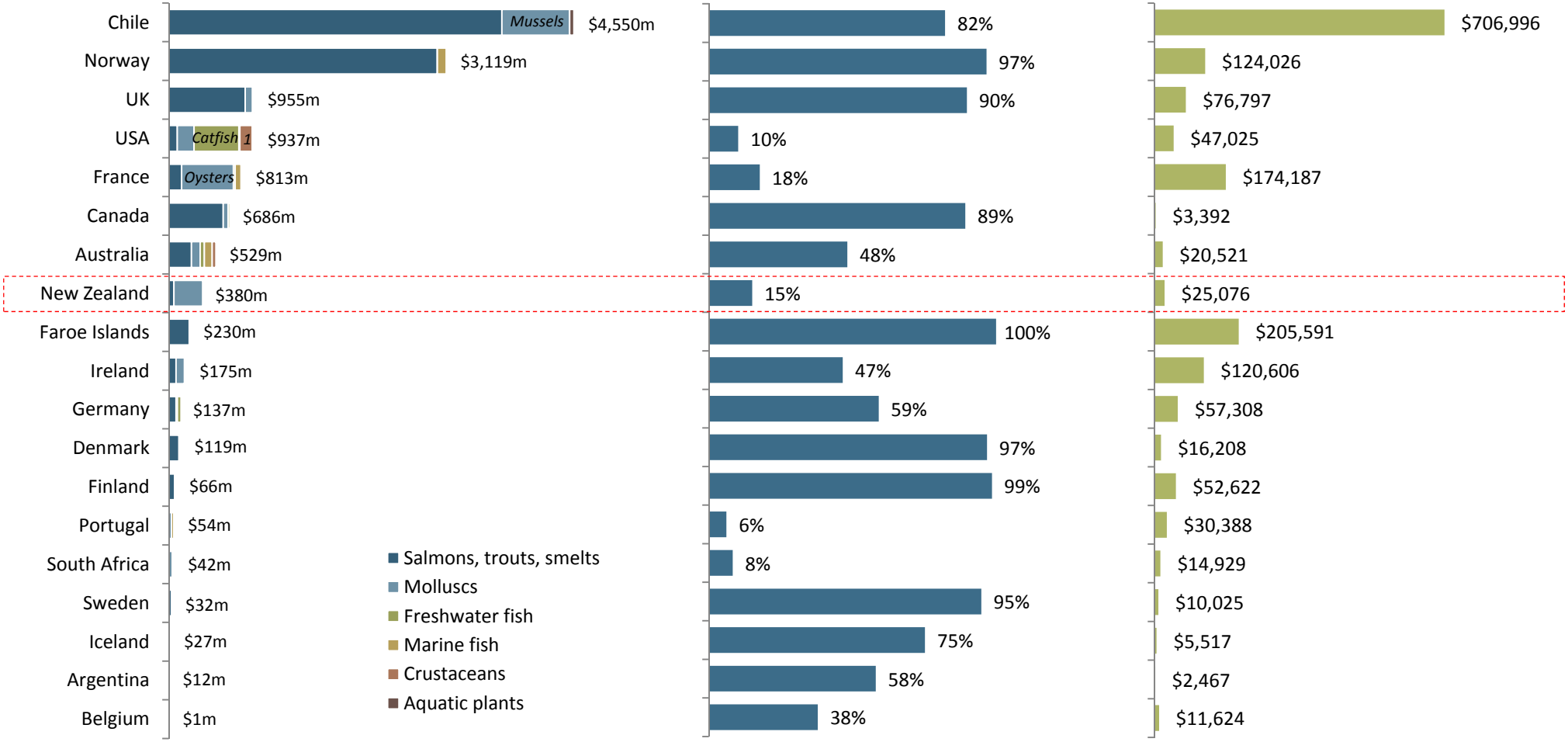
AQUACULTURE – BENCHMARKING

Benchmarking with peer group suggests salmon is the key proven opportunity going forward

Value of aquaculture production by species
(US$m; 2008)

% of value which is salmon
(% of $; 2008)

Aquaculture value per km of coastline
(US$/km; 2008)



1. Shrimp; Source: UN FAO FishStat database (custom job); CIA World Factbook (length of coastline); Coriolis analysis

SALMON – THE GREAT OPPORTUNITY

The salmon industry is heralded by many as a great opportunity with investors planning further expansions

- "The biggest opportunity is salmon. We just need to maintain the premium, it's a premium product, high fat content, great eating quality, it's a very successful product." *Industry representative, 2011*

- "We have worked out how to get a premium for King salmon; it's a rare species. We have to because it takes more to feed, it's not as efficient as Atlantic salmon. We get a 30-40% premium." *CEO, Seafood company, large, 2011*

- "Why not go for the low hanging fruit, like salmon, it is the biggest opportunity" *Industry representative, 2011*

- "The mussels are huge, but the salmon is still in its infancy. There is such opportunity there." *GM, Seafood Company, medium, 2011*

- "Wild catch will stablise, there are no new species out there, and we are limited by supply. Growth will come from salmon." *CEO, large Seafood Company, 2011*

- "New Zealand King Salmon is applying to increase its current production of 7,500 tonnes of salmon a year to 15,000 tonnes by 2015. If successful, New Zealand King Salmon believes it can double its production in three to five years in support of the aquaculture industry's target of $1 billion in sales by 2025. " *New Zealand King Salmon, April 2011*

- "Mt Cook Alpine Salmon CEO, Matthews is driving a bold $20 million expansion plan he says will fuel a 1400 per cent production increase for the company within four years…When Matthews took over, Mt Cook was producing 160 tonnes per year. This year it will produce 400 tonnes. And with a $20 million expansion, including a processing factory and a value-added plant, Mathews says they will be turning out 1000 tonnes in 2012 and 2000 tones in 2013." *Matthews, CEO, Alpine Salmon, Aquaculture NZ, July 2011*

SALMON – CHALLENGE – ACCESS TO SPACE

The salmon industry, in particular, is being held back by space limitations

- "The salmon sector has got such huge potential. A unique product which is getting its feed conversion rate down which will increase productivity. All it needs is additional space allocated and it will hum. " *Industry body representative, 2011*

- "The biggest limitation with salmon is the access to water space in the Marlborough Sounds. Some of the decisions we make and the places we deploy our efforts is so inefficient. We waste resources with bad decision-making. 70% of all marine assets are in the wrong place. They are not producing what they should. We could move a farm 20 metres and double our production. The system is incapable of making decisions. We make the choice to have a small 14,000 tonne salmon industry as opposed to a 1m tonne one. Ideally we would be in Marlborough it has the infrastructure and great environment, close to the airport, town." *CEO, Seafood company, large, 2011*

- "We want to change some space from mussels to salmon, the cost is just too prohibitive. The process is too much, it doesn't make it feasible." *CEO, Seafood Company, medium, 2011*

- "The whole water space allocation is a debacle. Salmon compared to mussels has 5 times the value to the water space. There is complete halt until the legislative reform. Salmon need more space to develop." *GM, Seafood Company, medium, 2011*

- "The biggest hold up to development is the regulatory environment. Consenting process to get water space and the ability to change the use of the water space. Even when you do get a change it still takes 18 months to 2 years to start developing and selling something." *Manager, Seafood company, Medium, 2011*

- "The industry needs scale. The government seems keen, yet access is still a huge issue." *CEO, Seafood Company, medium, 2011*

- "Consent changes are a nightmare. We can change to salmon, but it is a huge cost." *Manager, Seafood company, Medium, 2011*

SALMON – COPY NORWEGIAN SYSTEM?

Norway has a successful salmon farming industry; New Zealand could consider copying its system

- "It would be great to have a system like in Norway, it is a two stage process, a concession is granted the right to farm a certain volume. Then the second part is to negotiate with the regions for a site. In Norway there is an excess of space and regions encourage the farms for the employment and infrastructure development." *CEO, Seafood company, large, 2011*

- "Do people really think that a country as developed as Norway have a salmon industry that is destroying the environment." *Staff, Government agency, 2011*

AQUACULTURE – OBSERVATIONS

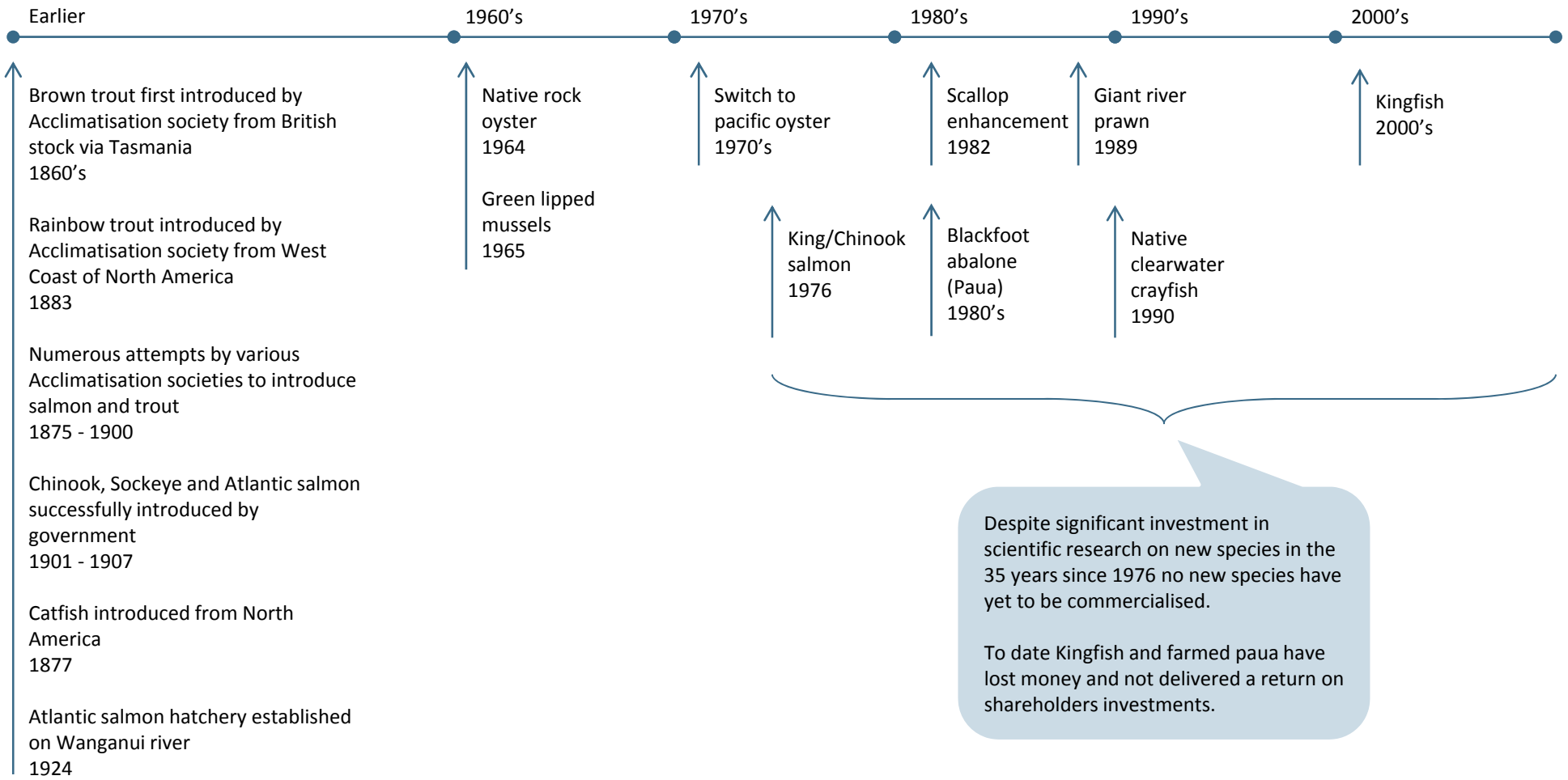
Aquaculture research priorities need to be realigned

	Observations
1	Back salmon for growth
2	Realign science priorities

NEW SPECIES – WHERE ARE THE RESULTS?

Aquaculture emerged in New Zealand in the 1960's; no successful[1] new species has emerged in the last 35 years (i.e. since king salmon in 1976)

Timeline of aquaculture development in New Zealand
(1860-2010)



1. Successful in the sense of creating a meaningful amount of production and exports; Source: Coriolis

HORIZON 2 – WHY NOT?

Developing new species is both (1) highly risky [*particularly around unproven species & technology*] and (2) takes a long time to produce returns

- "The problem with aquaculture is profit and aquaculture aren't good bed fellows. Return on capital in this area is a problem." *CEO, Seafood Company, medium, 2011*

- "Aquaculture just need to get on with it. But the biggest issue is getting a return on your investment. There would be very few mussel companies that could say they were doing that." *CEO, Seafood company, large, 2011*

- "The combined effects of insufficient working capital, on-going plant failures and spiralling costs had overtaken the business. Hence we made the decision to cease operations." *Winiata Brown, Chairman, Preengarenga Incorporation, quoted in Northern Advocate, June 2006*

- "The Kingfish operation in Northland failed in 2006 owing $8m. They blamed the poor equipment for low yields." *Manager, 2011*

- "You will suffer for 15 years trying to make money in new species. Tasmania have been trying to make it in Kingfish for years. They still haven't managed after 20 years." *CEO, Seafood company, large, 2011*

- "New species will go from a standing start to cash positive in maybe 10 years. There is limited knowledge in the technology, markets, moving aquaculture into finfish will require very deep pockets. It will cost $50-$100m to commercialise. You need scale - at least 20 hectares. Why not go for the low hanging fruit, like salmon? Hapuka is a very risky proposition – a small egg size is very hard to feed and survive. It's very expensive, unproven and unknown. It will take at least 10 years." *Industry body representative, 2011*

- "There is a lot of under-developed water space that needs capital - with finfish especially. King Salmon would never have made it without foreign investment." *CEO, large Seafood Company, 2011*

- "With Kingfish, the price is half what you get for salmon and it is higher cost, less efficient to fillet. Hapuka we have no experience. The fillet yields 40% as opposed to salmon which is 71%." *CEO, Seafood company, large, 2011*

- "With salmon, they have big eggs that support the smelt; they are easy to manipulated, fertilise. With a kingfish, they have tiny eggs; there are problems with feeding and survival." *CEO, Seafood company, small, 2011*

NEW SPECIES – DISCONNECT

There is a currently a disconnect between the scientists and industry in Horizon 3

	Scientists	Industry
Key objectives	- Scientific curiosity - Government funding	- Returns to investors/shareholders - Limit or minimise risk
Key limitations	- Appear to be required to predominantly research native species - Little understanding of - or experience in - realities of commercial aquaculture development	- Highly interested in non-NZ species with proven economic model and farming systems - Cynical of potential for new unproven species; experienced leaders have no interest in being first to develop new species or operations
Species	- Groper/Hapuka/Wreckfish - Geoduck - NZ butterfish/Greenbone - Kina - Snapper - Common NZ bath sponge - Native seahorse - Native seaweed - Sea cucumber - Others	- Salmon, salmon & more salmon - Trout - Bluff/Flat Oyster - Japanese Seaweed - Sea cucumber

HORIZON 3 – SCEPTICAL

Industry was sceptical about commercialising new species

- "I think its just a hobby for the scientists to justify their positions." *CEO, large Seafood company, 2011*

- "There is a huge opportunity for changing to new species but science and industry knowledge must be in balance. Science providers are keen to create but they don't always understand the commercial realities of profitability and efficiencies. We need to work together to pick the winners. At the moment everything is random." *Owner, Seafood company, medium, 2011*

- "Hapuka and Kingfish are huge ticket items, but there is no differentiation in the market between aquaculture and wild, but the aquaculture is a higher cost. Why would you bother?" *Manager, Seafood company, Medium, 2011*

- "Hapuka are being investigated, but I can't see it happening." *CEO, large Seafood company, 2011*

- "We know how to grow mussels, we have worked that out, but commercially growing finfish? Who knows how to do that? There are so many things to line up; the science, the regulations, the capital. It will take a lot of years. There is going to be no huge bonanza." *CEO, large Seafood company, 2011*

- "With Kingfish give me $30m and I will make you $10m. Cleanseas lost about $45 million. Its not going to work. Geoducks aren't going to work, ours are too small, the demand is for the larger ones. The hapuka need at least $75 million to look at it and the return on investment just isn't there. Abalone have done it tough, they haven't had it easy. It has taken a lot longer than anticipated and the market reaction was complicated (with the colour). Oysters are labour intensive and have limited growing areas, they don't work in open waters." *CEO, large Seafood company, 2011*

- "Until we can find an aquaculture species that we can grow economically with a high end consumer and buyer then there is no point. We have relatively unproductive waters and high labour costs." *CEO, Seafood Company, large, 2011*

HORIZON 3 – NEW OPPORTUNITIES ACCORDING TO INDUSTRY

Companies specifically identified a handful of new species with potential

Atlantic salmon

- "Salmon has growth but we need to get faster growing species like the Atlantic they just grow so much faster." *CEO, large Seafood company, 2011*

Sea cucumber

- "Sea cucumbers have potential. At least they have investment which will help. They are in high demand in Asia… We have some Chinese scientists coming over to give us a hand, we are doing trials. We will see how it all goes." *Manager, Seafood company, medium, 2011*

- "The sea cucumber have a big dollar return." *Industry body representative, 2011*

Flat oysters

- "The flat oyster has potential, there is real opportunity there." *Manager, Seafood company, medium, 2011*

- "Oysters have promise, there is high demand and the locations are generous. The market for Pacific oysters are limited but flat oysters have greater opportunities especially in Australia." *Industry body representative, 2011*

Trout

- "Trout has great potential… You can get $2m per hectare per tonne, compared to mussels at 20-30,000 per hectare per tonne." *CEO, Seafood company, large, 2011*

- "Build on capabilities, trout is just a salmon, if we could build this market it is huge." *CEO, Seafood company, large, 2011*

HORIZON 3 – NOT EVERYTHING CAN BE FARMED

New Zealand agriculture is based on a handful of introduced species which are farmed globally due to their superior production economics; globally aquaculture is effectively the same[1]

	Native New Zealand species farmed	Introduced non-NZ species farmed	Major farmed non-NZ species suitable for NZ but not farmed
Sea animals	- Green lipped mussels - [Scallops]	- King salmon - Pacific oyster	- Carp - Tilapias - Catfish - Clams - Shrimp/prawns - Atlantic salmon - Trout
Land animals		- Cow (milk & beef) - Sheep - Goat (milk and meat) - Deer - Pig - Chicken (eggs & meat) - Turkey - Game birds - Water buffalo - Alpaca/Llama - Rabbit - Bees (honey) - Ostrich - Emu	- Guinea pig - Alligator/Crocodile - Kangaroo

"Finfish in NZ is salmon - like on land it is beef, sheep, venison, pork, chicken - there are 4-5 choices. That's what it will come down to in aquaculture."

CEO, Seafood company, small, 2011

1, and becoming more so – we are only in the early stages of the domestication of fish and other seafood

AQUACULTURE – CHALLENGE OF PUBLIC PERCEPTIONS

Many interviewees identified a challenge in the public perception of aquaculture being different than reality

- "Legislation is painfully slow, there is too much say for New Zealanders. It only takes one Auckland lawyer to have a bach in a bay in the Marlborough Sounds and they kick up a stink and we are allowed no development in that area." *CEO, Seafood company large, 2011*

- "The industry and Government need to do a selling job. Aquaculture isn't scary. Seeing lines and cages isn't that different to seeing cows and irrigators in paddocks." *Seafood Industry representative, 2011*

- "The issue seems to be that the aquaculture industry in NZ is young, it therefore has limited history and acceptance from the general population or from councils or government groups. In countries who have a large and established industry they know that there are limited impacts from the activity. Our scientists don't seem to know that." *Staff, Government agency, 2011*

- "If we had an environmental issue (which is unlikely) we can easily move our operation and in a few years you would not have even known it was there. Why don't the scientists acknowledge this." *CEO, Seafood company large, 2011*

- "New Zealand is hamstrung. There is no legislation to change fish farming. Until that is more flexible no one is going to invest... There is no water space or rights." *Owner, Seafood company, medium, 2011*

- "There is such a conflict with the aquaculture industry. With the property rights law if aquaculture impacts the wild catch then it can't occur, but if there is more value in aquaculture then things need to change. There is a conflict with recreational fishing, land owners. Salmon don't have that much of an impact look at the GAPI reports[1]." *Manager, Government Agency, 2011*

1. http://web.uvic.ca/~gapi/ http://web.uvic.ca/~serg/initiatives/flapi.html

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OYSTERS – KEY SPECIES

Pacific oysters – the introduced species NZ farms – is by far the largest of the three species of oyster farmed globally in any quantity

Overview of the key/secondary species in the global oyster industry
(various; 2008-2010 as available)

Not all oyster species listed

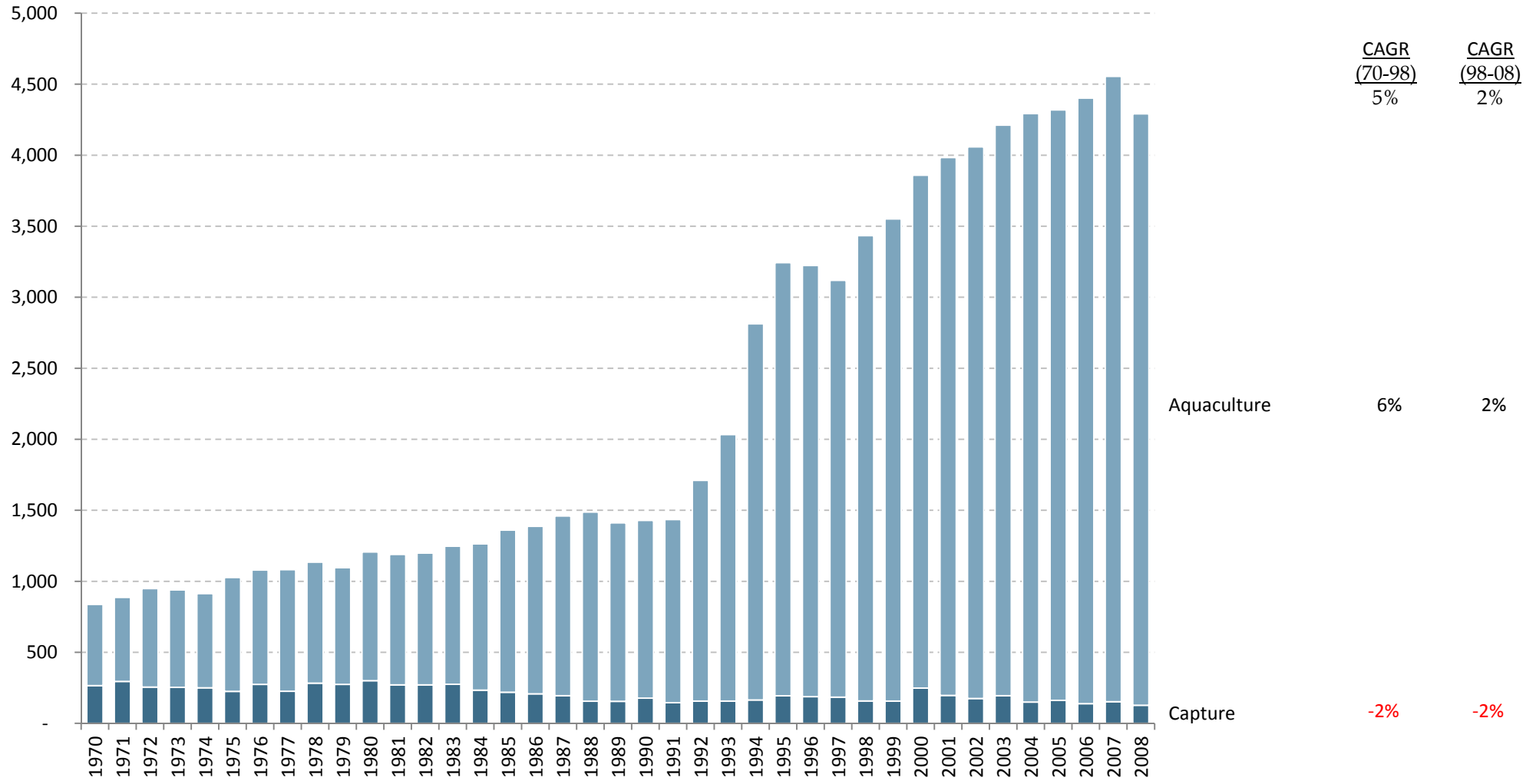
Scientific name	Common name(s)	Wild capture (t; 000; 08)	Aquaculture production (t; 000; 08)	Key aquaculture producing countries		Comments/notes
Crassostrea gigas	Pacific oyster Pacific cupped oyster	32	649	S. Korea Japan	France Taiwan	
Crassostrea in China undef.	[Pacific oyster???]	-	3,354	China		- Available data suggests this is primarily Pacific (Crassostrea gigas)
Crassostrea virginica	Eastern oyster Amer. cupped oyster	91	96	USA Canada	Mexico	
Crassostrea iredalei	Slipper cupped oyster	0.1	20	Philippines		
Crassostrea madrasensis	Indian backwater oyster		2	India		
Crassostrea rhizophorae	Mangrove cupped oyster		2	Cuba		
Crassostrea corteziensis	Cortez oyster		1	Mexico		
Ostrea edulis	Belon oyster	2	4	France Spain		
Ostrea chilensis	Chilean flat oyster		0.2	Chile		
Ostrea lutaria	New Zealand dredge oyster	0.4	-	-		
Saccostrea commercialis	Sydney rock oyster Sydney cupped oyster	-	4	Australia		

Source: UN FAO FishStat; UN FAO FIGIS; Wikipedia; Coriolis analysis

OYSTERS – GLOBAL PRODUCTION BY TYPE

Globally, oyster aquaculture growth more than making up for decline in capture

Global oyster volume by species: aquaculture & wild capture
(t; 000; 1970-2008)



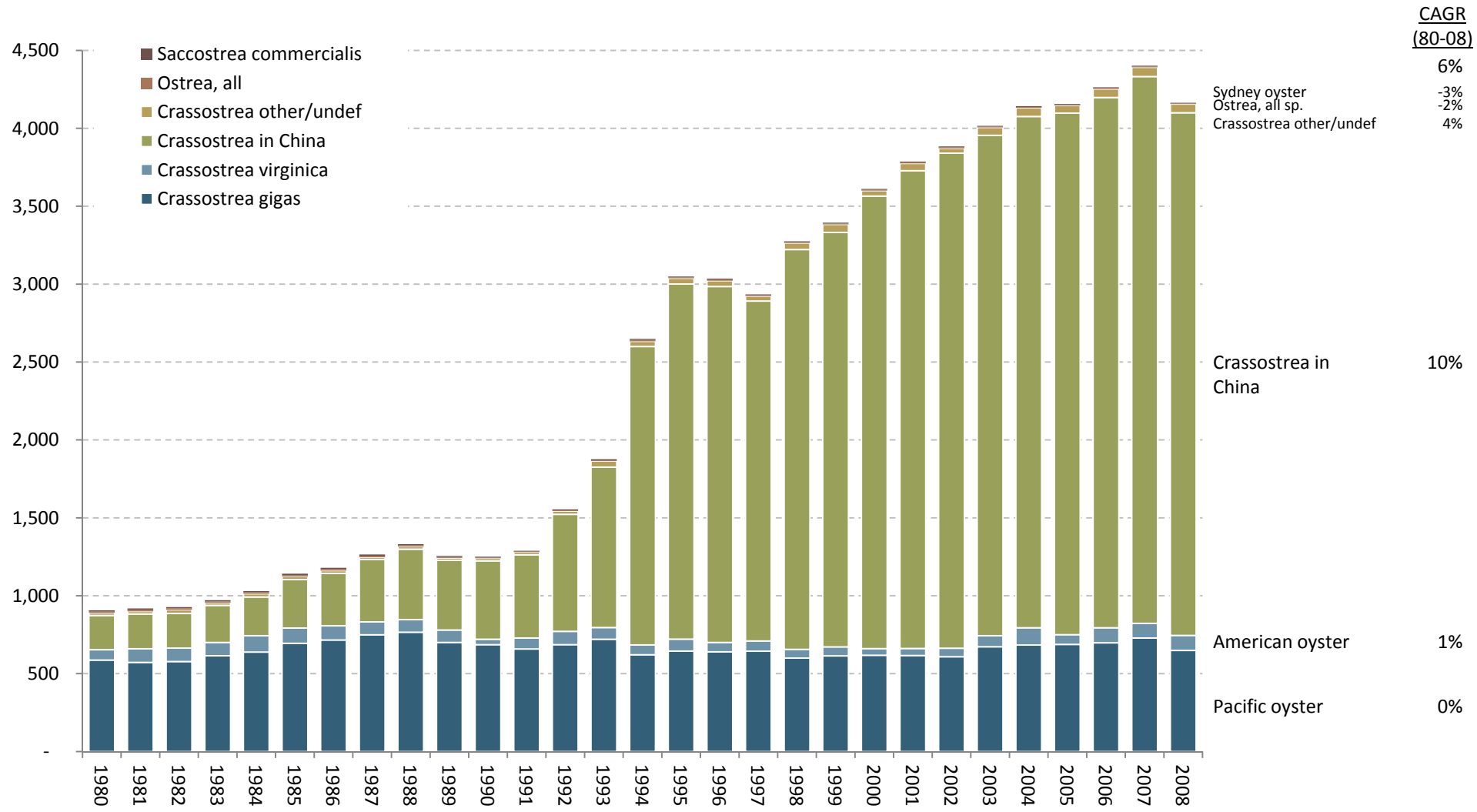
Source: UN FAO FishStat; UN FAO FIGIS; Coriolis analysis

CORIOLIS

OYSTERS – GLOBAL AQUACULTURE PRODUCTION

Global oyster aquaculture is growing – however effectively all growth is coming from China

Global oyster aquaculture production volume
(t; 000; 1980-2008)



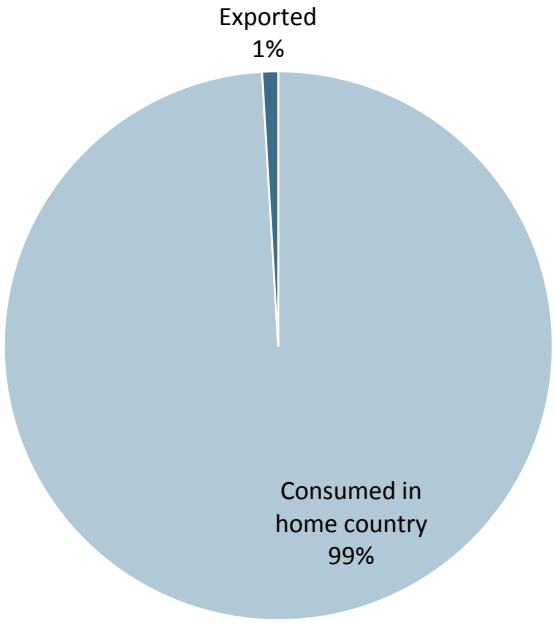
Source: UN FAO FIGIS database (custom job); Coriolis analysis

CORIOLIS

OYSTERS – GLOBAL TRADE

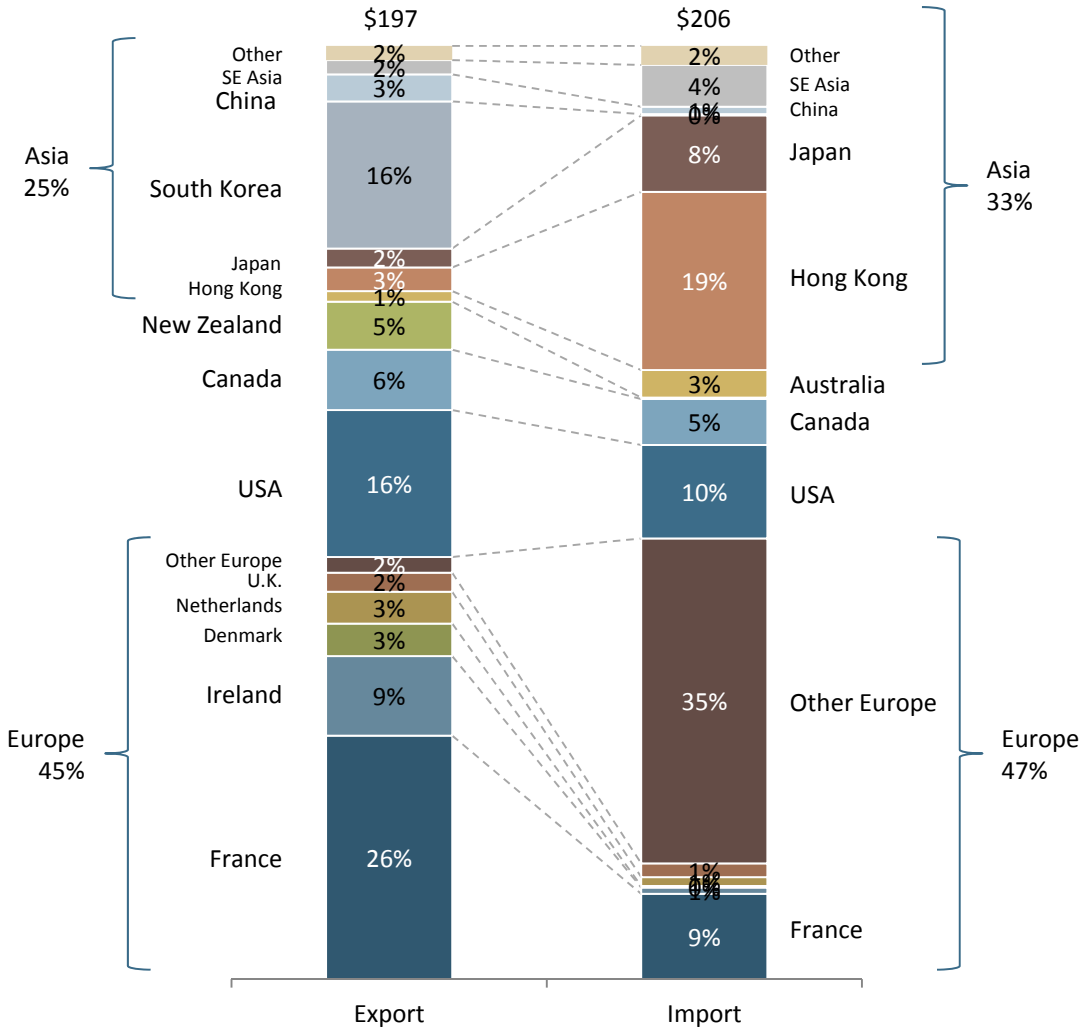
Only 1% of global oyster production volume is exported; New Zealand gets 5% of global oyster export value; the main importing regions are Europe, North America and Asia

Global oyster volume by place of consumption
(t; 000; 2008)



TOTAL = 4,296t (000)

Global oyster value: import vs. exports
(US$; m; 2009)

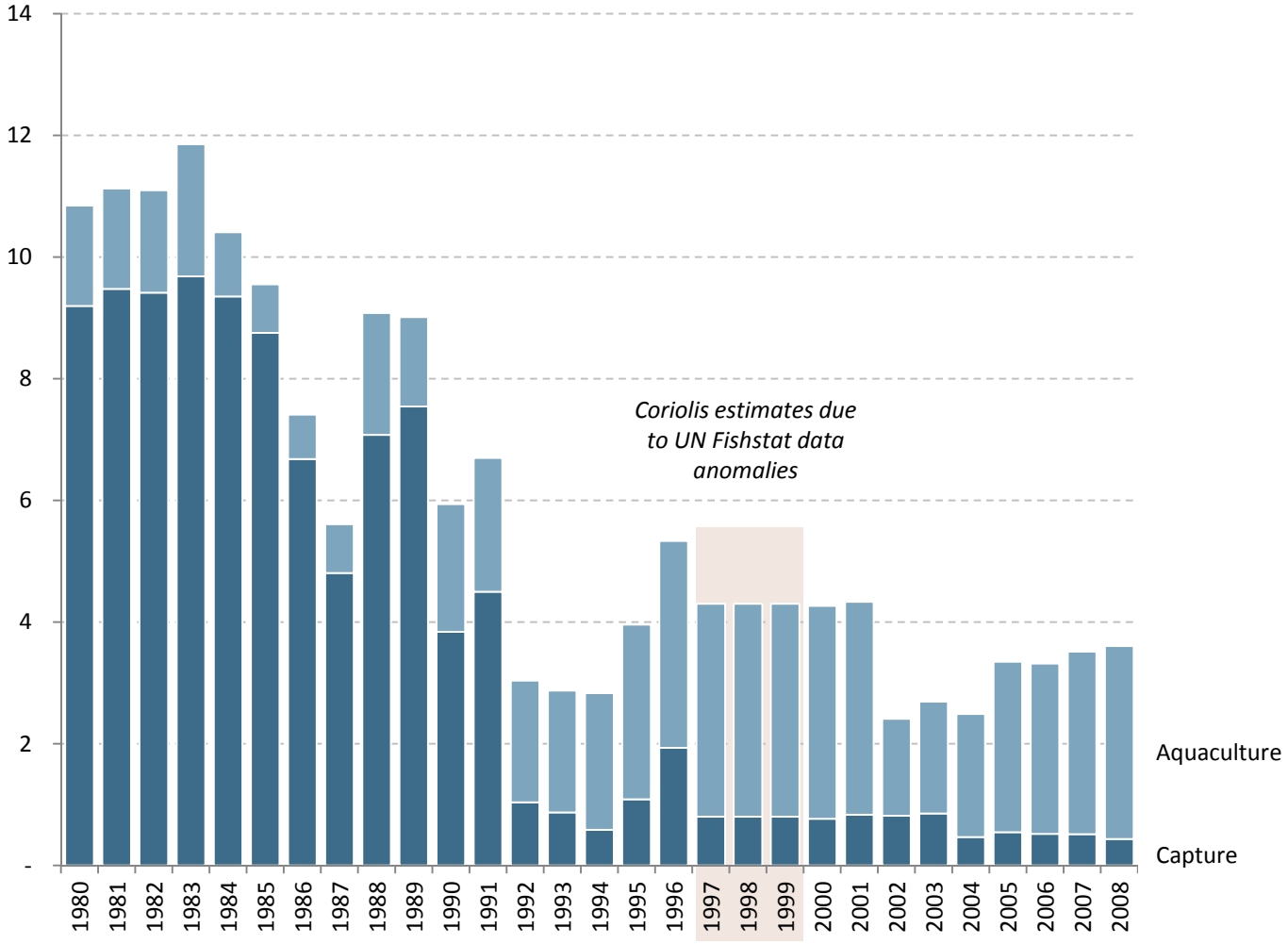


Note: global exports and imports do not agree due to understood data issues; Source: UN FAO FishStat; UN FAO FIGIS; UN Comtrade; Coriolis analysis

OYSTERS – NZ – PRODUCTION

Total New Zealand oyster production declined through the early 90's; since then growth in aquaculture has replaced declining wild capture

Total New Zealand oyster production by production method
(t; 000; 1980-2008)



Comments/Notes

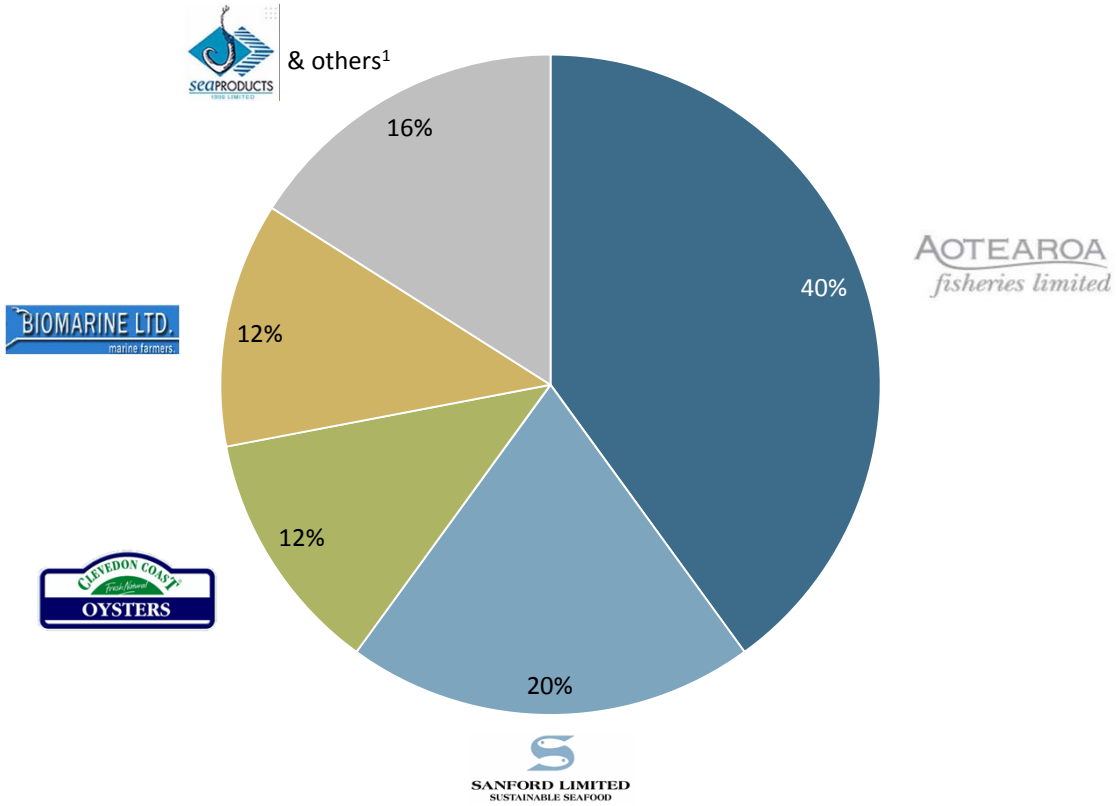
- Wild capture of native oyster being replaced by farming of introduced species
- Results should be treated as preliminary and directional and subject to significant revision
- Calculation is apparent consumption (production-exports=domestic consumption); will include wastage
- 1997-1999 currently Coriolis estimates due to data anomalies in UN Fishstat data
- 2008 is most recent data available in UN Fishstat; unable to source more recent data from Aquaculture NZ
- Export weight is as reported across all SNZ 10 digit HS codes

Source: UN FAO FishStat; UN FAO FIGIS; UN FAO PopStat; Coriolis analysis

OYSTERS – SHARE CONSOLIDATED

Oyster aquaculture in New Zealand is highly consolidated

New Zealand Pacific oyster aquaculture production share by key producers
(% of production volume; 2010)



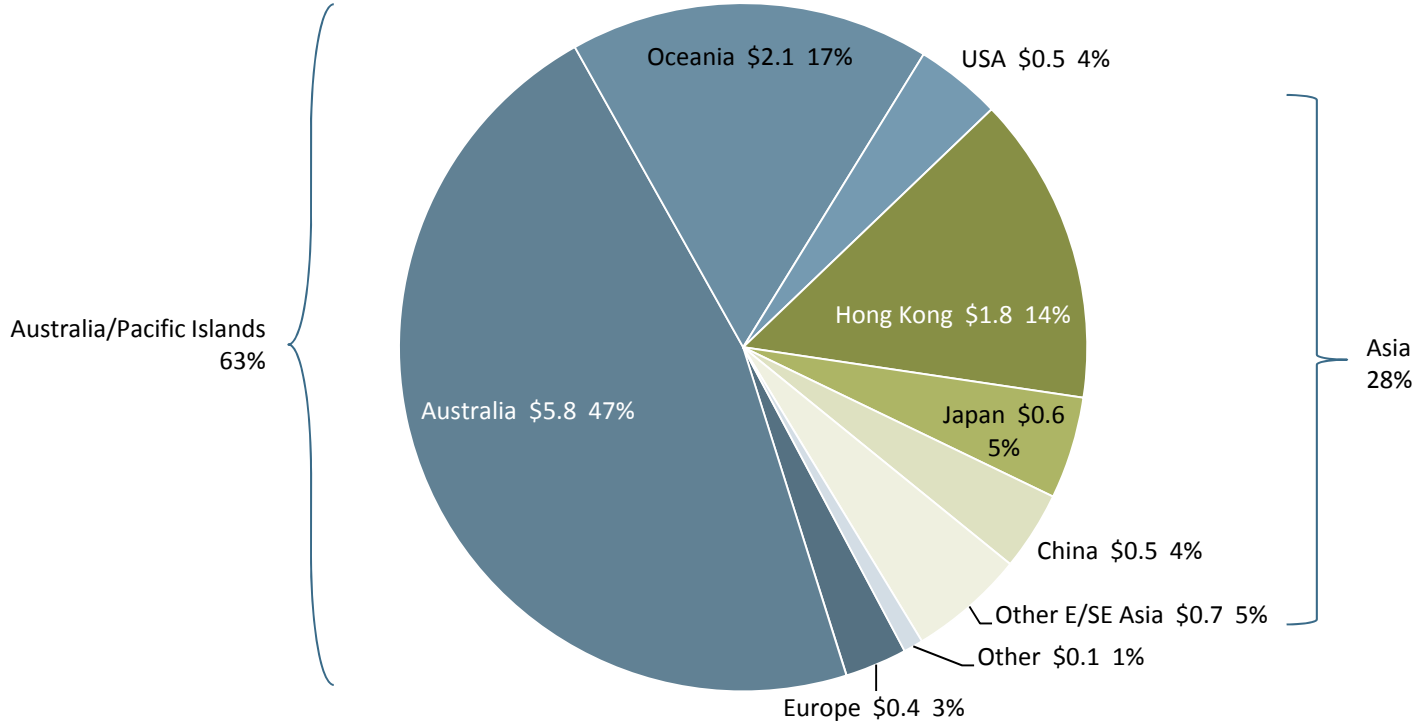
1. Includes SeaProducts 1998, Aquarius etc. Source: Jemco website [http://www.oystersnz.com/] (accesses April 2010); interviews; Coriolis analysis

OYSTERS – NZ – EXPORT VALUE BY MARKET

Two thirds of New Zealand's oysters go to Australia and the pacific islands; almost 30% go to Asia

New Zealand fresh/chilled/frozen oyster [HS030710] export value by key markets
(US$; m; 2010)

Note: Excludes non-fresh/chilled/frozen processed oyster due to lack of 8-digit HS data in Comtrade (so it is impossible to do cross country comparisons beyond 6 digit)



Source: UN Comtrade; Coriolis analysis

OYSTERS – NZ – DISEASE OUTBREAK

New Zealand oyster aquaculture appears to have a difficult future ahead

- "We are observing a series of viral pandemics in oyster stocks for which there are recognised environmental factors which can be anticipated to worsen in established production areas in the future. This would have been good news New Zealand oyster growers until the recent herpes virus outbreaks proved we are not free of the disease. The principal commercial oyster in NZ is the non-native but widely farmed Pacific oyster. The small size of the NZ industry and the modest market placement of our products would suggest that we will not see the innovation and investment that would permit us to develop mitigation strategies or capitalise on respites from outbreaks. The current mortality events are anticipated to shrink the current industry. Northland Regional Council has expressed concern that the clean-up of bankrupt or abandoned farms threatens the region with a substantial economic burden for clean-up which will have a chilling effect on the creation of new farming capacity." *New Zealand Scientist, 2011*

- "Northland oyster farmers are trying to stay positive as a mystery disease decimates what should be next season's harvest. The predicted massive reduction in the harvest could mean a $15 million loss of sales - a devastating effect on the Northland producers' incomes and the regional economy. Two thirds of the country's oyster farms are in Northland, and the industry reaped $30 million in national sales last year. About 500 jobs are attached to the industry." *Northern Advocate, December 2010*

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MUSSELS – KEY SPECIES

Mussel aquaculture occurs globally across two species groups (Myrtus and Perna); within each there are three key farmed species

Overview of the key/secondary species in the global mussel industry
(various; 2008-2010 as available)

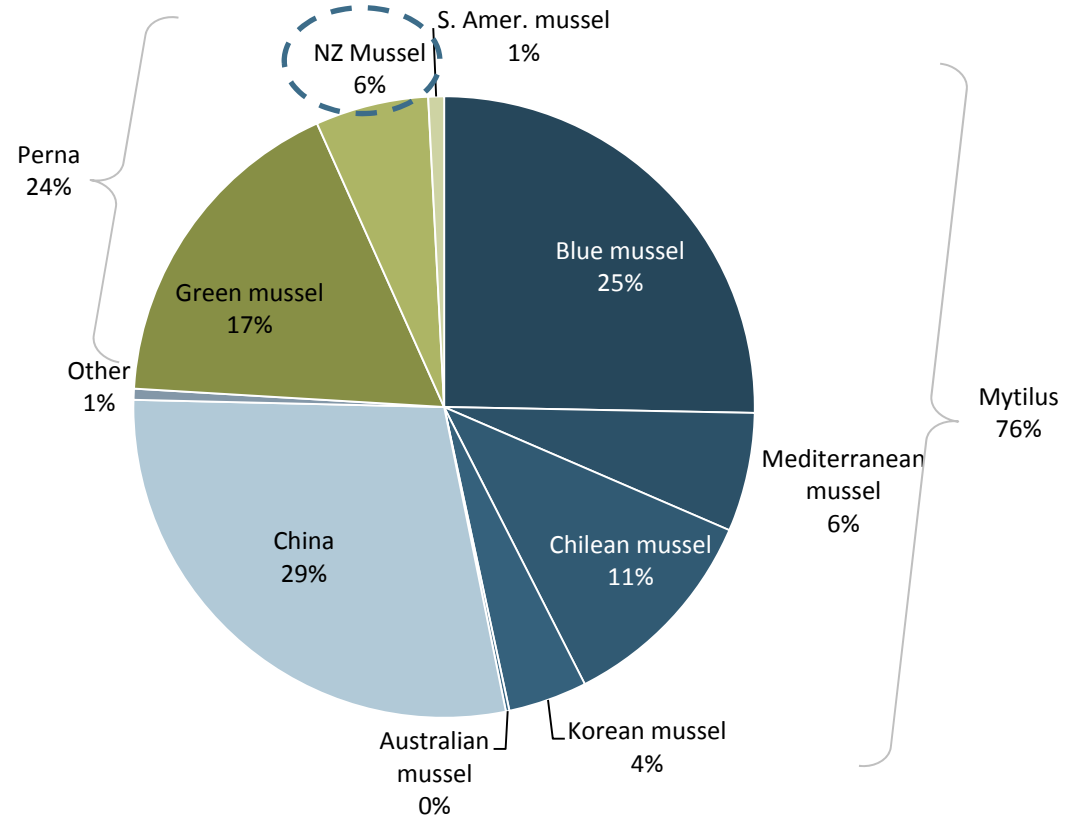
Scientific name	Common name(s)	Wild capture (t; 000; 08)	Aquaculture production (t; 000; 08)	Key aquaculture producing countries		Comments/notes
Mytilus edulis	Blue mussel	56	374	France Ireland Netherland	U.K. Germany	- Primarily produced and consumed in Europe
Mytilus gallo-provincialis	Mediterranean mussel	1	104	Italy Greece	France	- Introduced into New Zealand
Mytilus chilensis	Chilean mussel	0.5	187	Chile		
Mytilus coruscus	Korean mussel	2	67	S. Korea		
Mytilus planulatus	Australia mussel		3	Australia		
Mussels, all sp. in China	Mytilidae sp.	5	480	China		- No good species data available for China
Perna viridis	Green mussel	0.04	295	Thailand Philippines	India Malaysia	
Perna canaliculus	NZ green-lipped mussel		100	N. Zealand		
Perna perna	South American rock mussel	2	12	Brazil		

Source: UN FAO FishStat; UN FAO FIGIS; Wikipedia; Coriolis analysis

MUSSELS – GLOBAL PRODUCTION BY TYPE

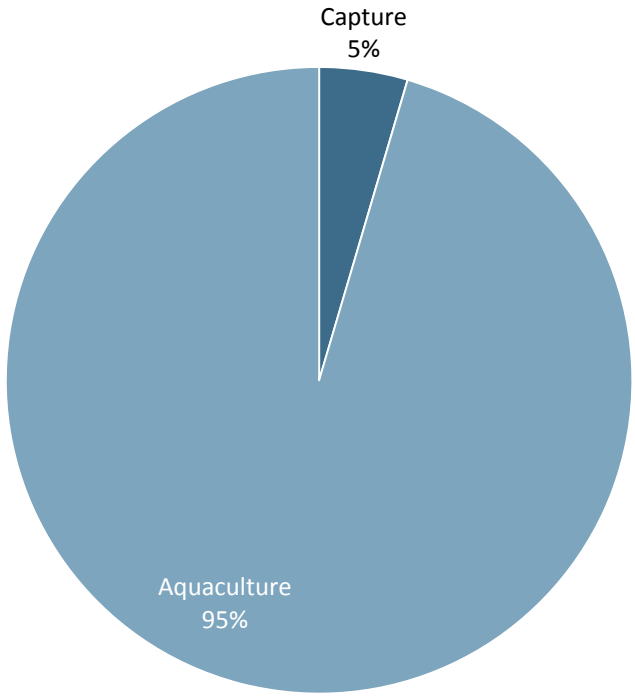
In 2008 global production of mussels was 1.7m tonnes, 95% of which was aquaculture; three quarters is mytilus species, one quarter perna species (including NZ green lipped mussels); NZ is 6% of global production

Global mussel volume by species: aquaculture & capture
(t; 000; 2008)



TOTAL = 1,700t (000)

Global mussel volume by production: aquaculture & capture
(t; 000; 2008)



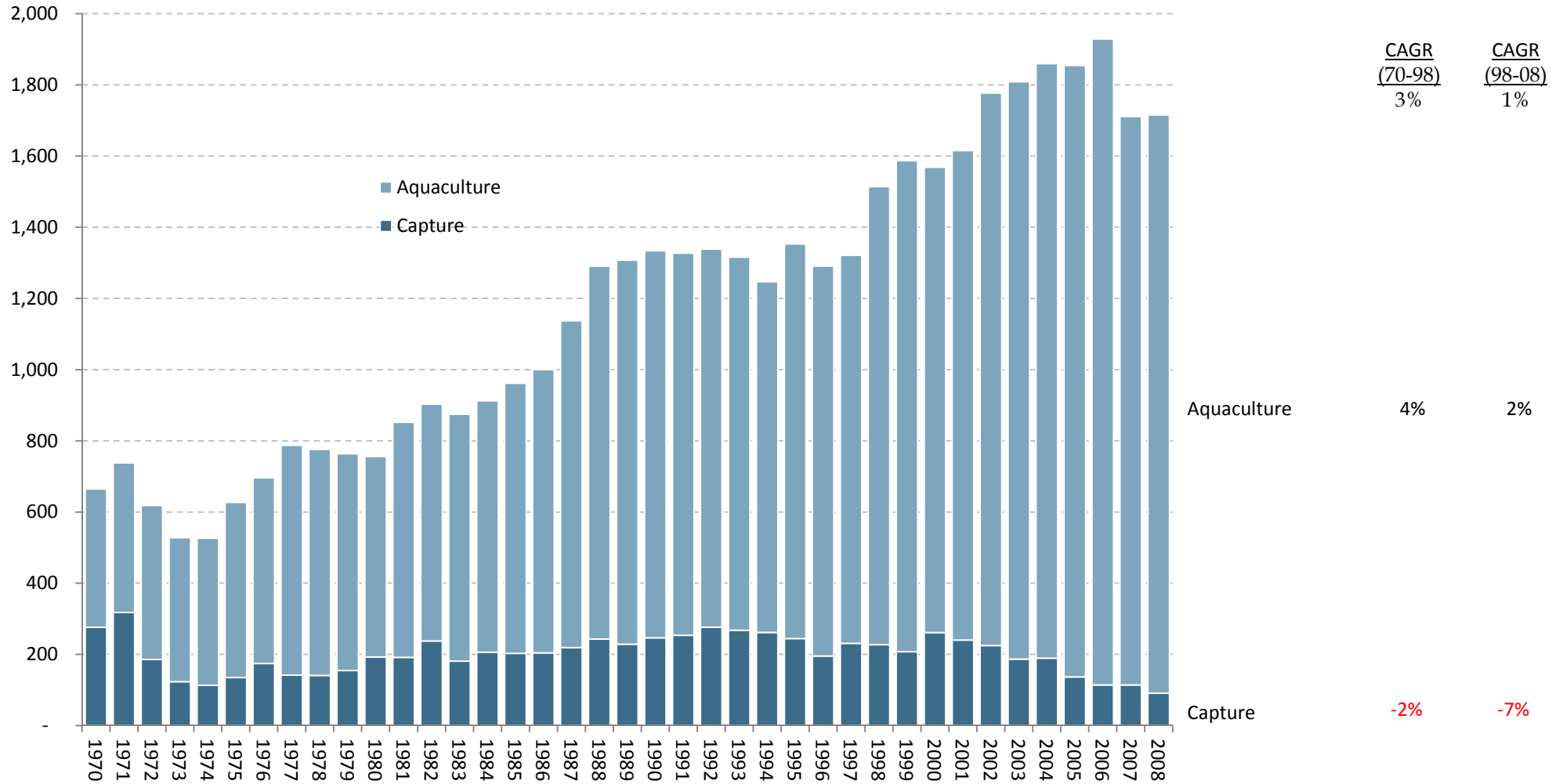
TOTAL = 1,700t (000)

Source: UN FAO FishStat; UN FAO FIGIS; Coriolis analysis

MUSSELS – GLOBAL PRODUCTION BY TYPE

Mussel aquaculture growth more than making up for decline in capture

Global mussel volume by species: aquaculture & capture
(t; 000; 1970-2008)



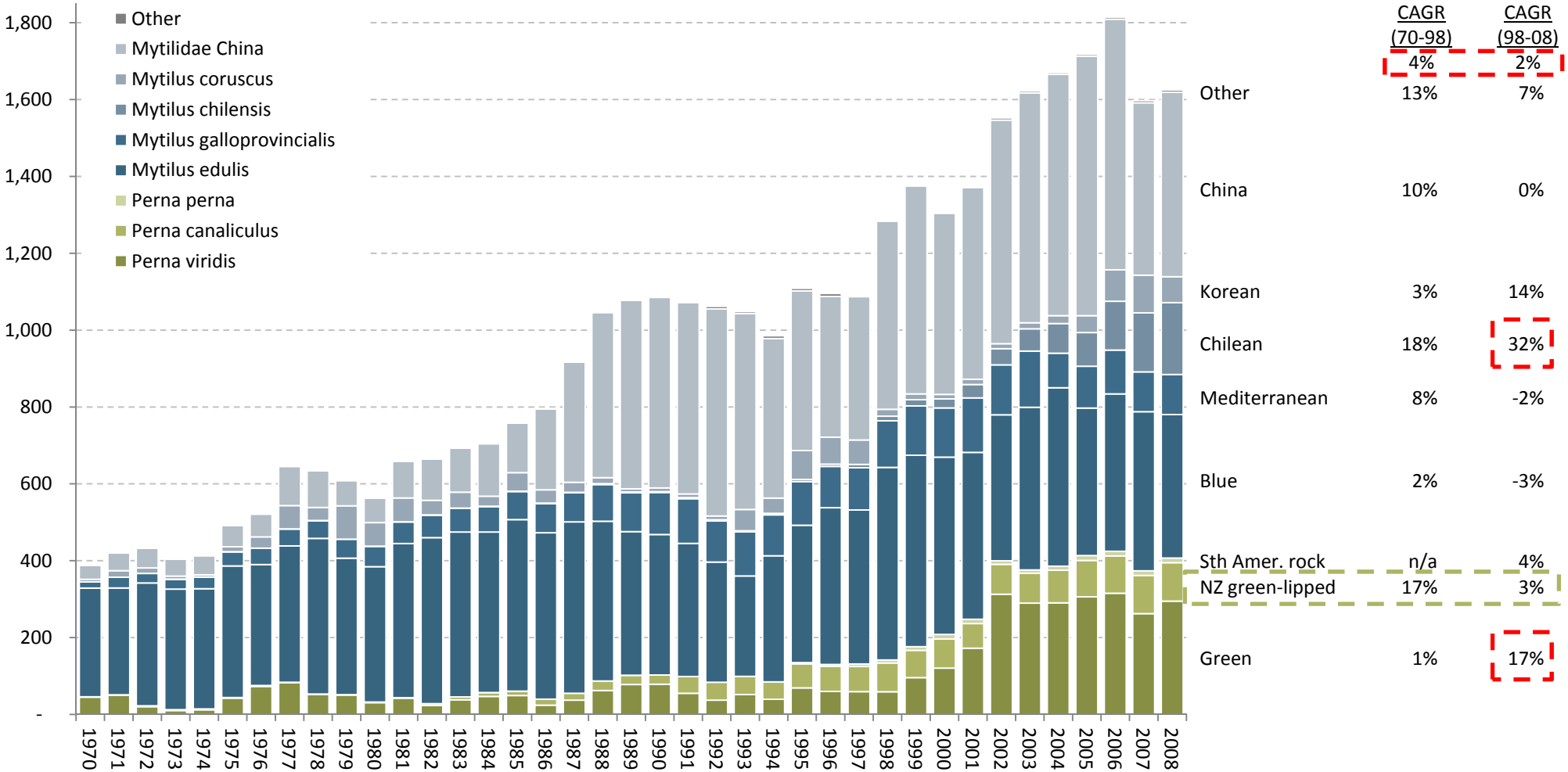
	CAGR (70-98)	CAGR (98-08)
	3%	1%
Aquaculture	4%	2%
Capture	-2%	-7%

Source: UN FAO FishStat; UN FAO FIGIS; Coriolis analysis

MUSSELS – GLOBAL AQUACULTURE PRODUCTION GROWING

Global mussel aquaculture production has grown at a CAGR of 2% over the past decade; while NZ's rate of growth has slowed, Chilean and Green mussels (prim. Thailand) continue to grow

Global mussel aquaculture volume by species
(t; 000; 2008)



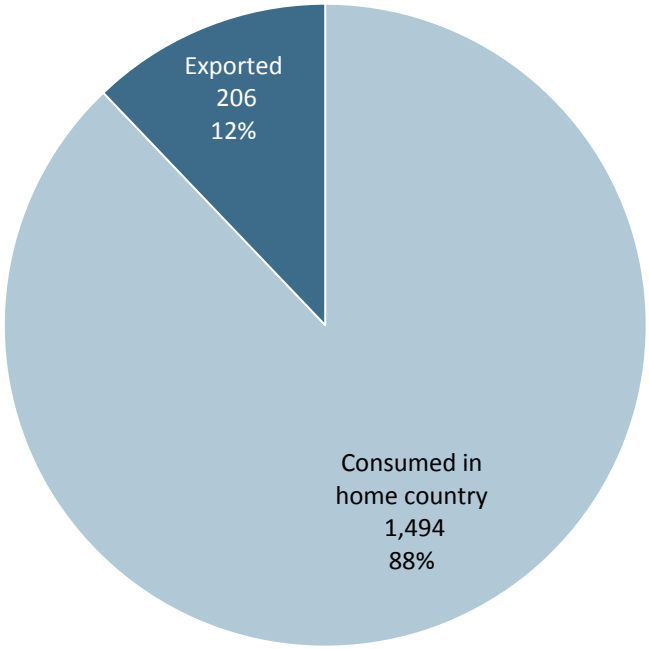
	CAGR (70-98)	CAGR (98-08)
	4%	2%
Other	13%	7%
China	10%	0%
Korean	3%	14%
Chilean	18%	32%
Mediterranean	8%	-2%
Blue	2%	-3%
Sth Amer. rock	n/a	4%
NZ green-lipped	17%	3%
Green	1%	17%

Source: UN FAO FishStat; UN FAO FIGIS; Coriolis analysis

MUSSELS – GLOBAL TRADE

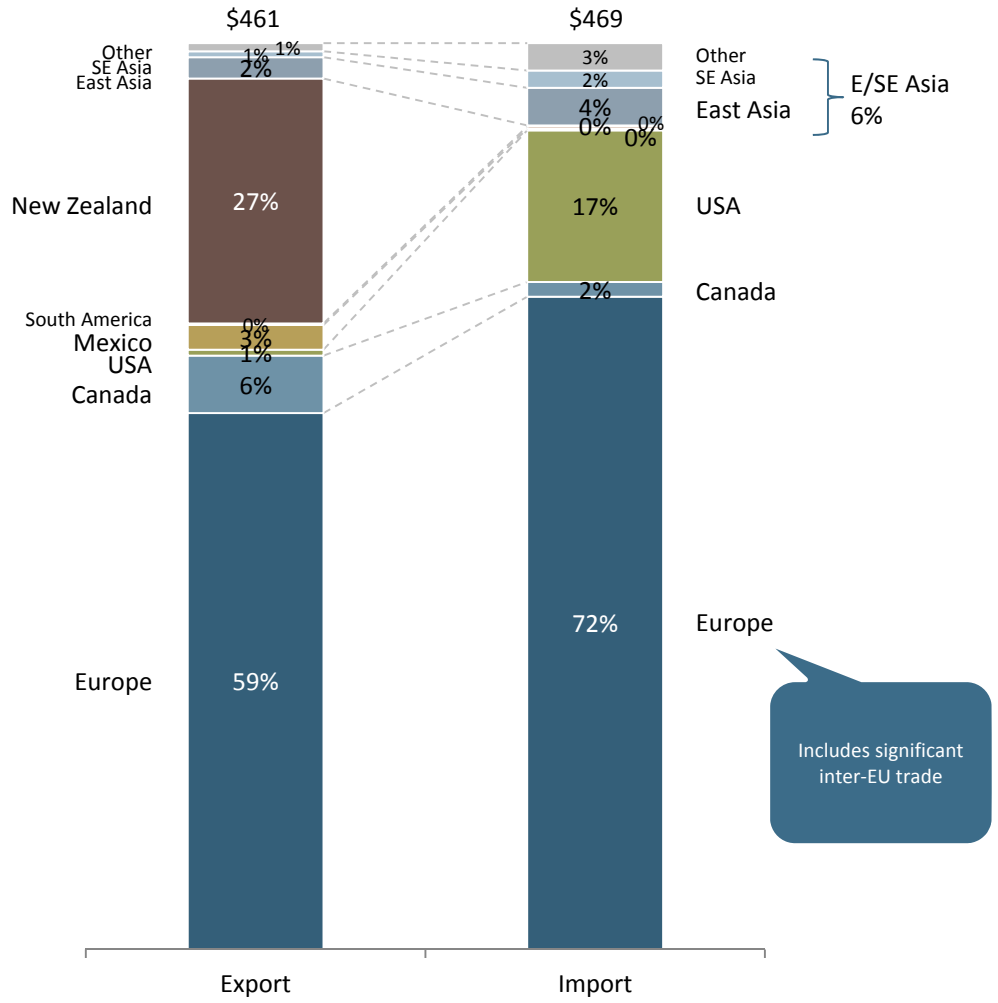
Only 12% of global mussel production volume is exported; New Zealand gets 27% of global mussel export value; the main importing countries/regions are Europe and North America, not Asia

Global mussel volume by place of consumption
(t; 000; 2008)



TOTAL = 1,700t (000)

Share of global mussel value: import vs. exports
(% of US$m; 2009)



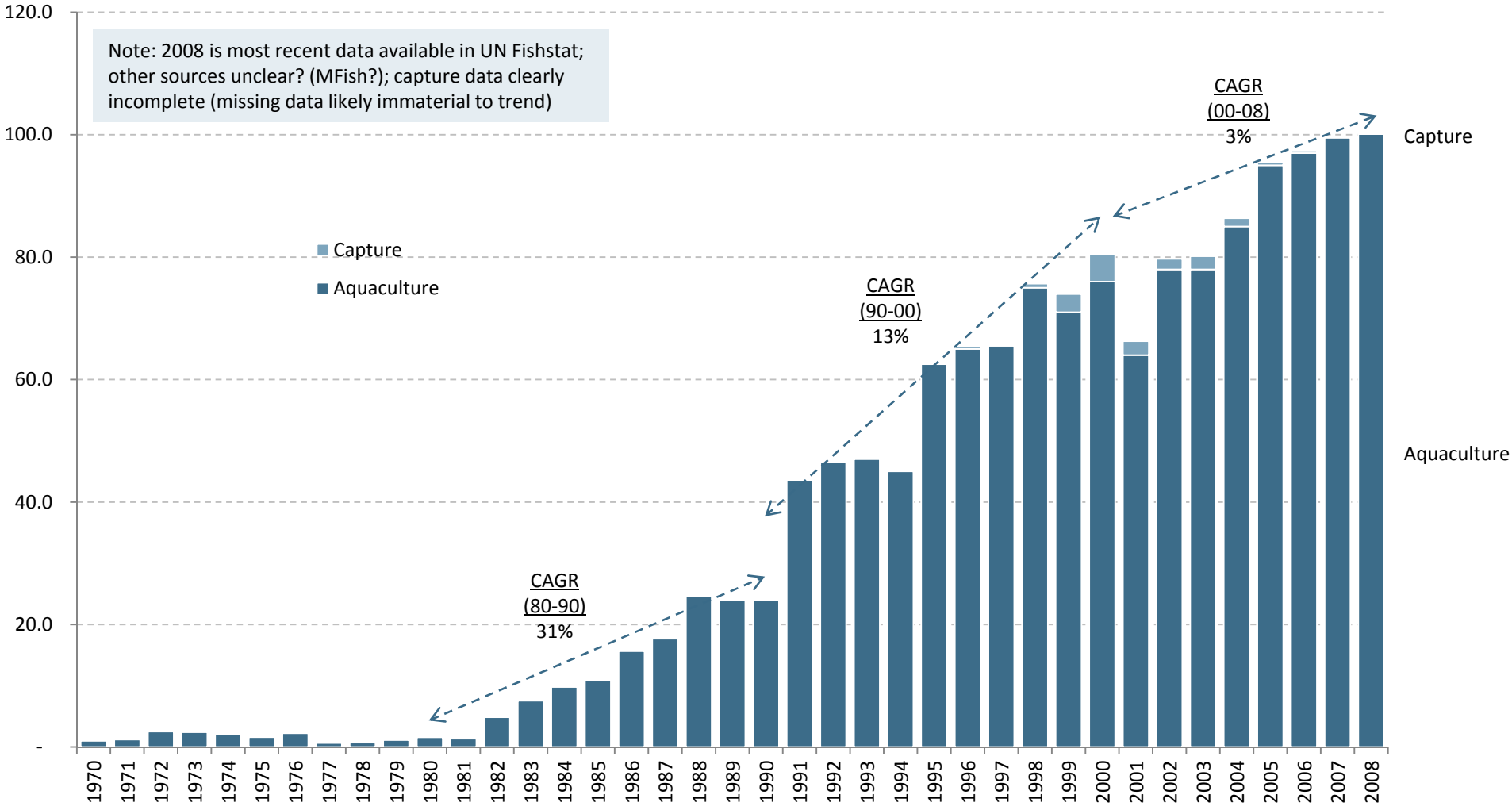
Note: global exports and imports do not agree due to understood data issues; Source: UN FAO FishStat; UN FAO FIGIS; UN Comtrade; Coriolis analysis

CORIOLIS

MUSSELS – NZ PRODUCTION

New Zealand mussel production growth has slowed

Total New Zealand mussel production by production method
(t; 000; 1970-2008)



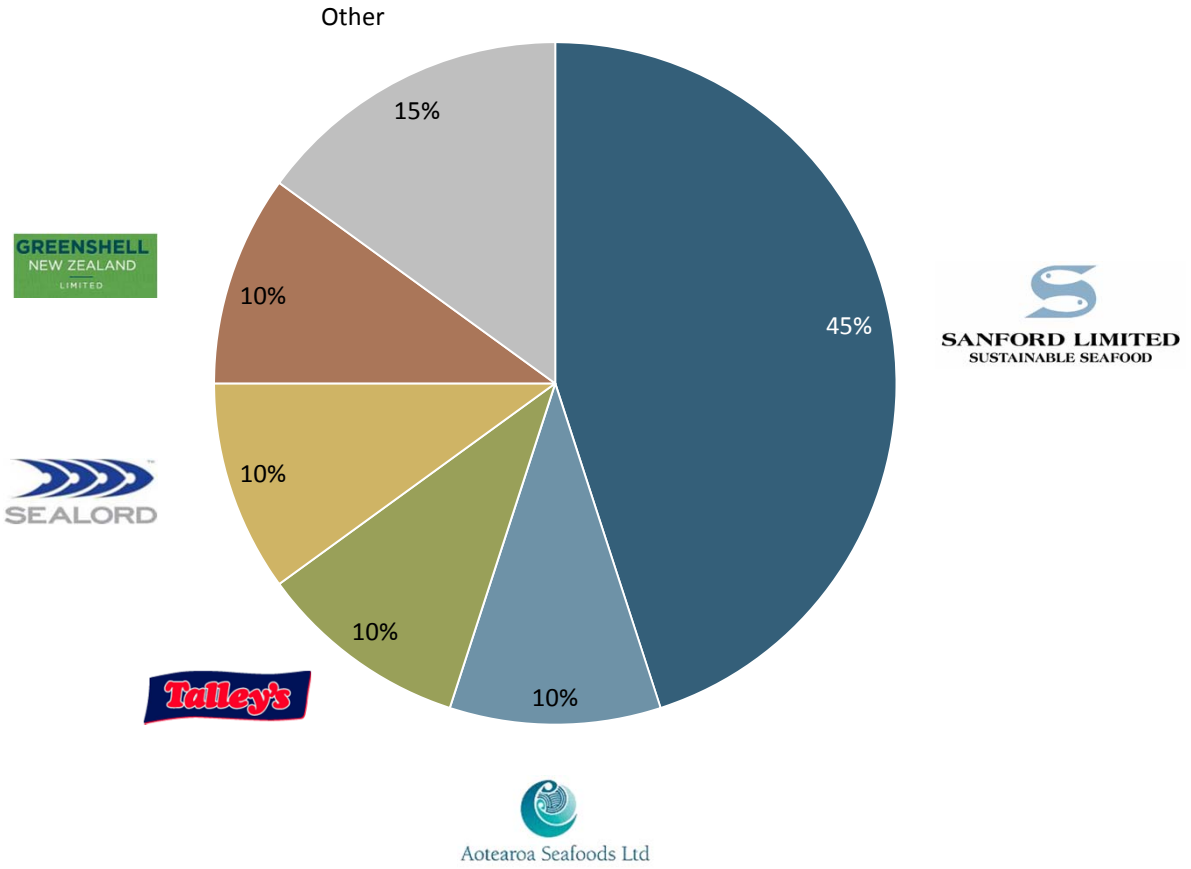
Source: UN FAO FishStat; UN FAO FIGIS; UN FAO PopStat; Coriolis analysis

CORIOLIS

MUSSELS – NZ PRODUCTION SHARE

Mussel production is highly consolidated

Aquaculture production share by key producers[1]
(% of production volume; 2010)

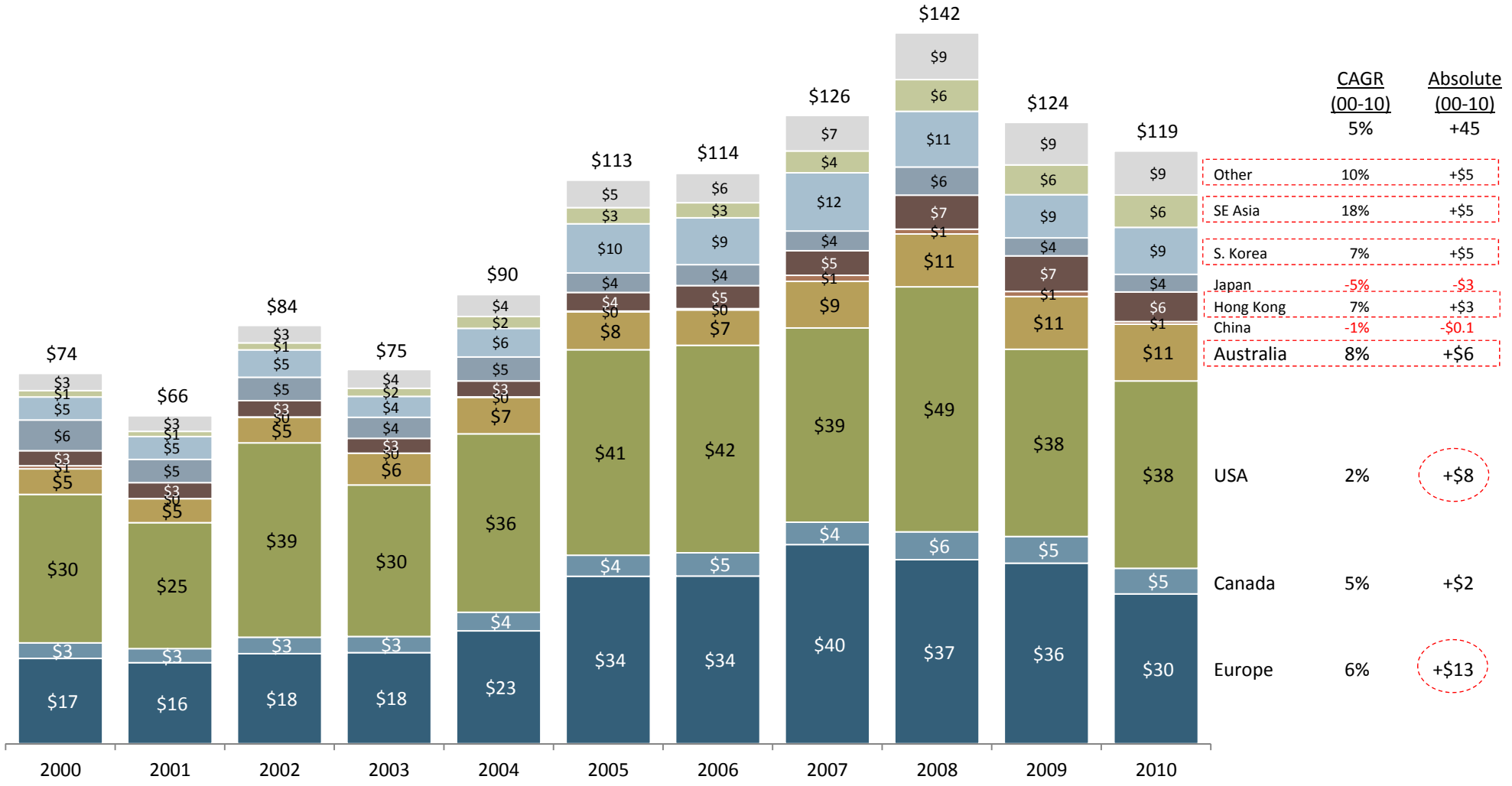


1. Production not harvest; directional; information not publicly disclosed; Source: Sanford presentation (Nov 2010) ; interviews; Coriolis analysis

MUSSELS – NZ EXPORT VALUE BY COUNTRY

While traditional markets are still important, Australia and parts of Asia are driving growth

New Zealand mussel exports value by select key markets
(US$m; 2000-2010)



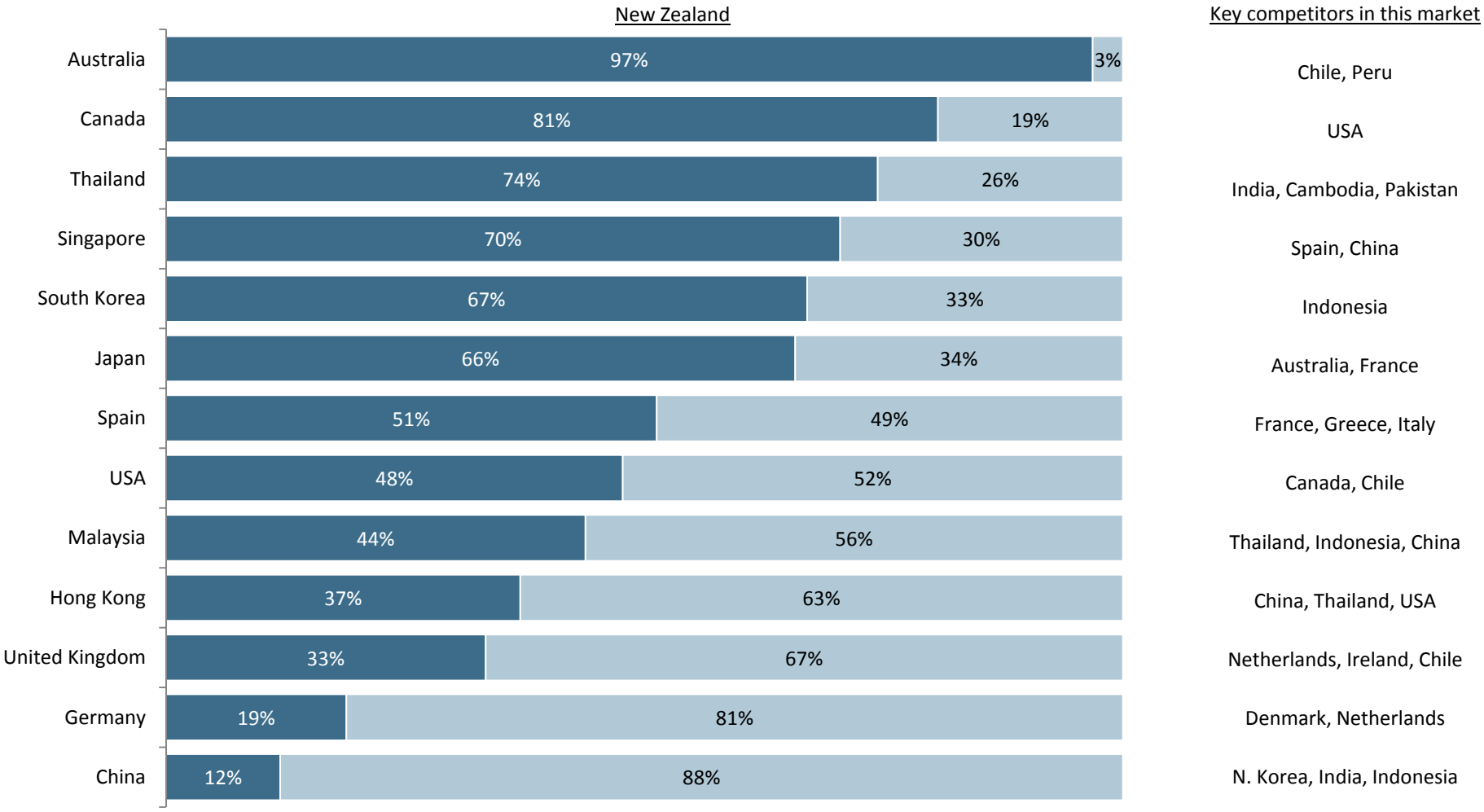
Source: UN Comtrade database (custom job); Coriolis analysis

CORIOLIS

MUSSELS – NZ SHARE OF IMPORT VALUE BY COUNTRY

New Zealand has a strong position in most of its key markets; no other country stands out as a key competitor across all markets (much of the trade is within the local region)

New Zealand value share of total mussel imports (030731,030739) by select country
(% of US$; 2009)



Source: UN Comtrade database (custom job); Coriolis analysis

MUSSELS – NZ CHALLENGES

The mussel industry has faced challenges, primarily around exchange rate fluctuations

- "A price war between major processors, who are undercutting one another in the international market, is forcing independent growers from the industry… The price is absolutely diabolical. The few independent growers left are bone heads and just keep going ... we're either strong-willed or stupid… [I'm] getting up to $650 per tonne green weight (with shells) compared with $1,230 four years ago." *Ray Thomas, Mussel Farmer, quoted in The Marlborough Express, Mar 2010*

- "There is discontent within New Zealand's multimillion-dollar mussel industry, with claims companies are undercutting one another. A "significant number" of people within the industry had expressed "extreme disquiet" about the pricing of mussels on the international market, said David Hogg, managing director of Richmond-based Sea Health Foods, which last week announced it was closing. "Until there's a much greater effort to move the product we have in New Zealand to higher-value markets, and stop the commoditisation and price-taking in offshore markets, this industry will remain in a poor state," he said. The closure of Sea Health Foods, a mussel-processing business, will see up to 75 staff lose their jobs, with some finishing today.
- The rising New Zealand dollar and the falling market for greenshell mussels had forced the closure, Mr Hogg said. The market price for the mussels, which were mainly exported to North America and Australia, had fallen from $2 to $1.40 per 453g. Mr Hogg said there were few offshore buyers for mussels, and they were driving down prices dramatically by forcing New Zealand companies to compete against each other. It was "completely and utterly wrong" if people thought the mussel industry was in a healthy state, he said. "The aquaculture industry has lofty targets. If they are going to rely on greenshell mussels, those targets are not reachable," Mr Hogg said." *Nelson Mail, Oct 2009*

- "New Zealand mussel producers are undercutting each other in foreign markets and dragging down prices for the country's biggest aquaculture export. It's New Zealand producers shooting themselves in the foot." *Eric Barratt, Managing Director, Sanford, May 2010*

- "Once the infrastructure is in place it has lower costs (than salmon) , so you can make good money. You can breakeven after 2-3 years, but there are issues with the exchange rate and there are lower margins. Consolidation of the mussel industry will reduce set up costs, marketing, harvesting, production. There will be a consistent supply, increased quality, good grading, and more mechanism to drive productivity." *Industry body representative, 2011*

MUSSELS – NZ BREEDING PROGRAMME

A Primary Growth Partnership (PGP) has recently committed to investing up to $52.1m in a program aimed at "domesticating" the New Zealand green lipped mussel

- "A Government-backed mussel-breeding project aims to boost industry earnings by nearly $250 million. The $52.1 million project by Shellfish Production and Technology New Zealand (SPATnz) has been given $26.1 million of funding over seven years by the Government's Primary Growth Partnership.
- SPATnz is a collaboration by Sanford, Sealord Group and Wakatu Incorporation aiming to domesticate the New Zealand greenshell mussel. Toni Grant, chairwoman of the SPATnz steering group for the bid, said "it would enable the biggest development in the industry since the start of long-line mussel farming nearly 40 years ago". "This project will revolutionise the industry by domesticating the mussel and developing selectively bred, high-value product," Grant added. "It will create in excess of 1000 new jobs and add up to $230 million per year to the New Zealand economy at the completion of the project."
- The aquaculture sector is worth about $380 million, with a target to grow to $1 billion of annual revenue by 2025. Sanford managing director Eric Barratt said the project could help the industry hit its billion-dollar target faster. "Just to grow sufficient spat for meeting the near-term industry needs is going to be a huge undertaking."
- Spat is harvested in the wild before being grown on farms and a hatchery would aim to produce product that would grow faster, bigger and better. "It's focused around selective breeding in the same way as our primary industries have used selective breeding on everything we do, whether it's plants or animals ... to get the maximum out of them," Barratt said. "This is just taking that same principle and applying it to mussels."" *New Zealand Herald, Feb 2011*

- "There is a great opportunity to really understand the mussel and to provide a product that the public really want, we can alter the colour, the size the shape…all to suit their needs." *Manager, Seafood company, medium, 2011*

- "The selective breeding of the mussel is such an opportunity to breed for particular variables; consistency, tenderness, flavour, size. We can breed for different markets. The productivity gains will be amazing. 35% in year one, then increasing to 37% , then 32%. They have an 18 month breeding cycle so it can happen pretty fast." *Industry body representative, 2011*

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SALMON – PRODUCTION REGIONS

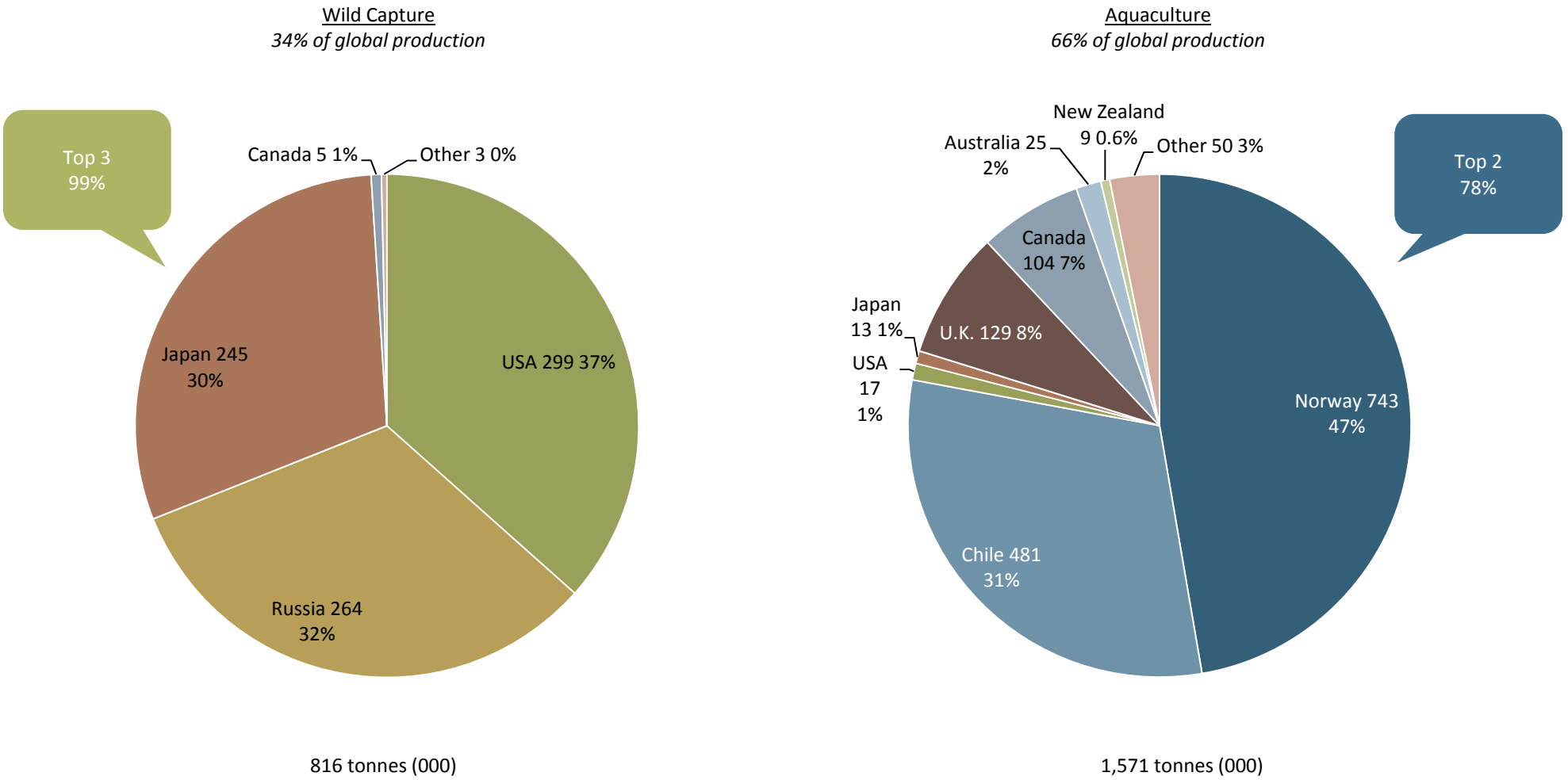
Salmon only live in the cold waters near the poles; they can only be farmed in similar areas

Salmon producing regions
(2011)

SALMON – SHARE BY PRODUCTION TYPE

The US, Russia and Japan dominate wild capture of salmon while Norway and Chile dominate aquaculture

Share of global salmon production by key country
(t; 000; 2008)

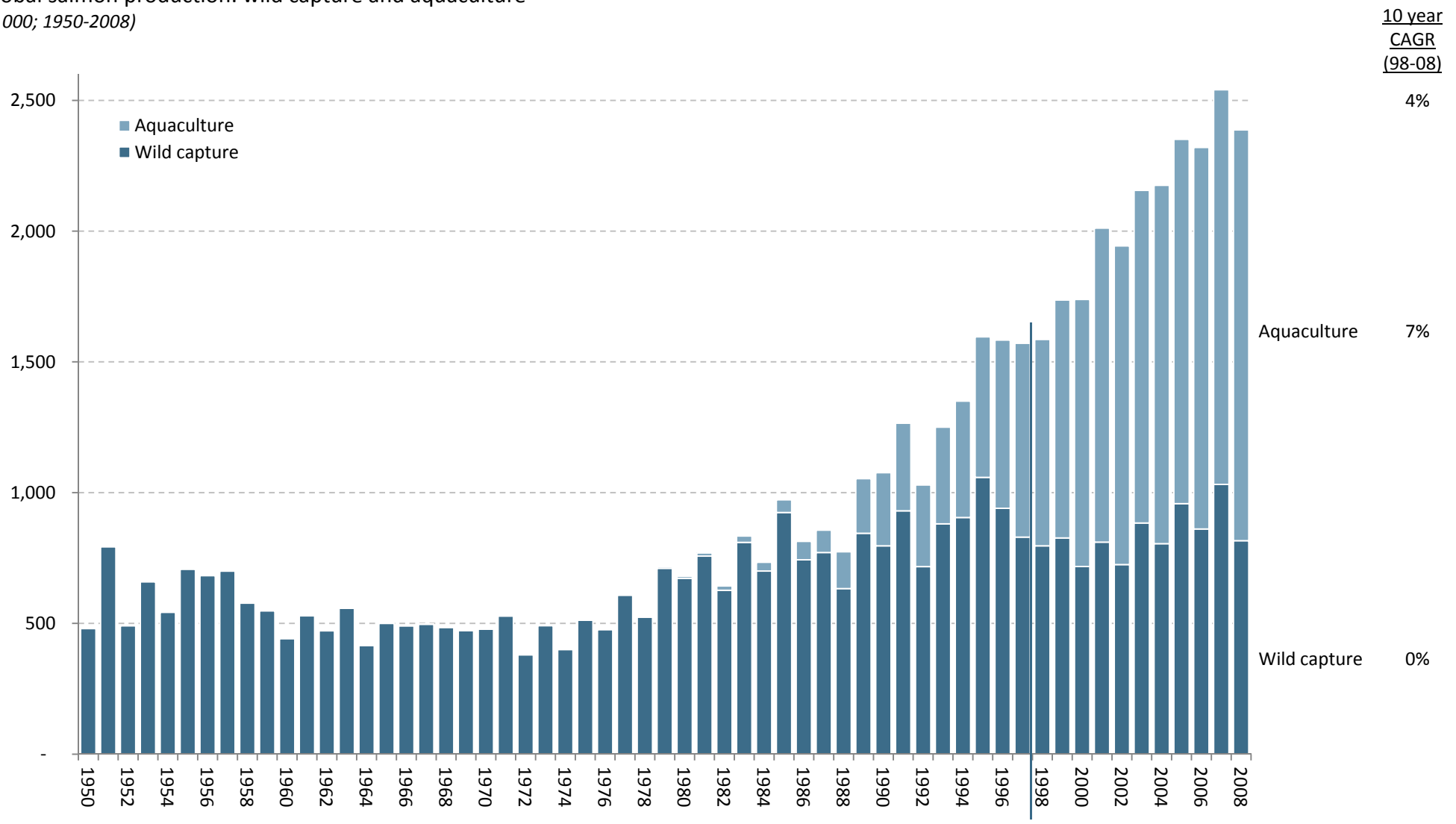


Note: not all countries shown on both charts for ease of reading (e.g. Norway has a small amount of wild capture); Source: UN FAO FIGIS database (custom job); Asia chum and pink estimates due to no FAO data yet; Coriolis analysis

SALMON – GLOBAL PRODUCTION

Global salmon production has been growing at 4% per year over the past decade driven by aquaculture; wild capture has been flat

Global salmon production: wild capture and aquaculture
(t; 000; 1950-2008)



CORIOLIS

SALMON – KEY SPECIES

There are five key salmon species globally – two farmed (Atlantic and Coho) and three wild (Pink, Chum and Sockeye); New Zealand farms a minor species Chinook/King salmon

Overview of the key/secondary species in the global salmon industry
(various; 2008-2010 as available)

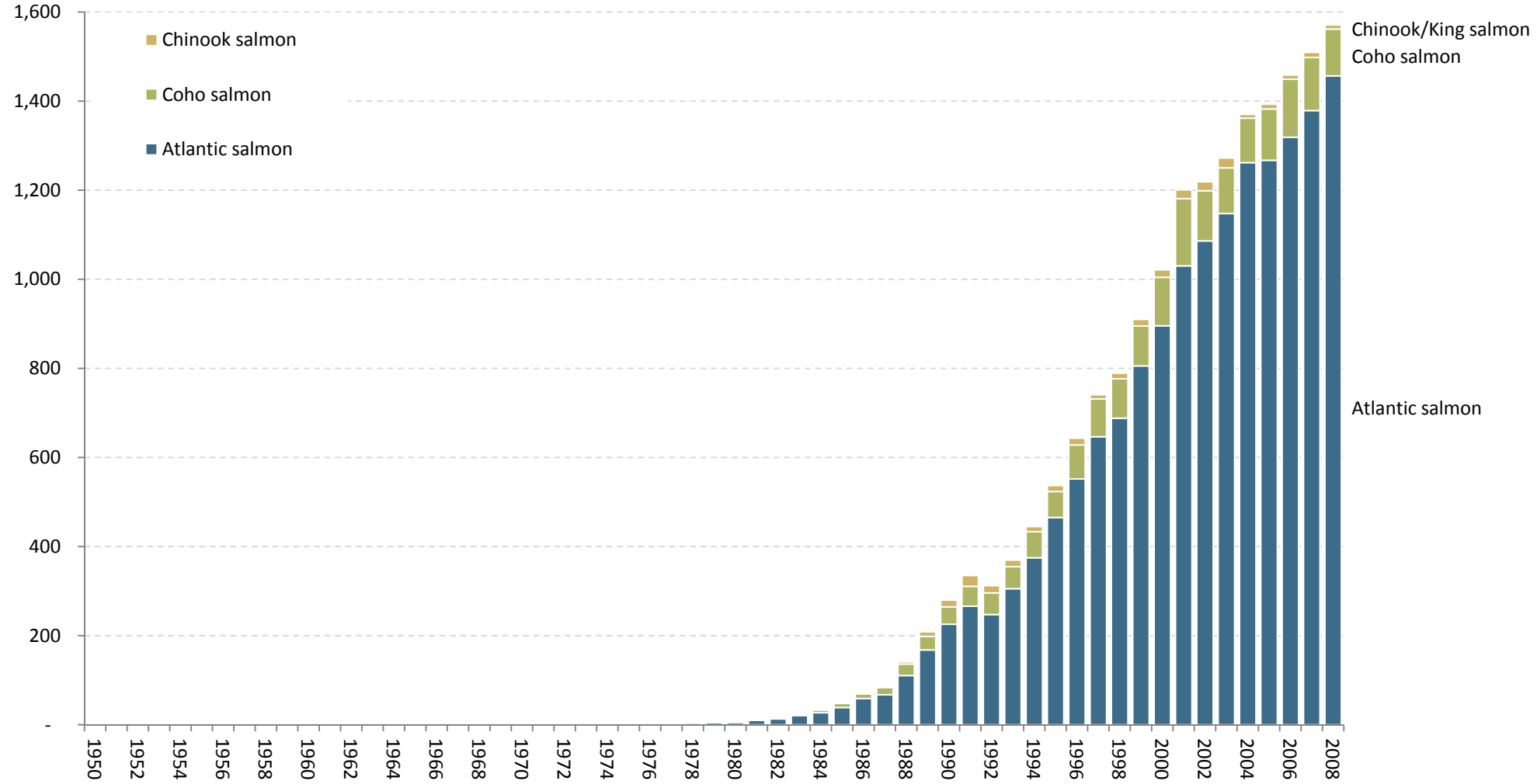
Scientific name	Common name(s)	Wild capture (t; 000; 08)	Aquaculture production (t; 000; 08)	Key aquaculture producing countries		Comments/notes
Salmo salar	Atlantic salmon	3	1,457	Norway Chile Scotland Canada	Faeroe Isl. USA Others	- Most important species globally - Most suitable for farming - Strong breeding programs in place improving performance - In New Zealand but not currently farmed
Oncorhynchus kisutch	Coho salmon	21	105	Chile Japan		- Valuable enough for farming - Primarily for Japanese market
Oncorhynchus tshawytscha	Chinook salmon King salmon Columbia river salmon Copper river salmon	6	9	N. Zealand Canada		- Other countries getting out of not into this species due to its poor performance relative to Atlantic (e.g. rate of growth, real world FCR, etc.) - Persistent fish health challenges in other markets (bacterial kidney disease, rickettsia) - Effectively only three firms farming this species globally (NZKS, Sanford and Creative Salmon [B.C.. Canada]) at any scale - New Zealand produces 70%+ of global farming output
Oncorhynchus gorbuscha	Pink salmon Humpback salmon	307	-	-	-	- Of low value so not attractive to aquaculture
Oncorhynchus keta	Chum Dog salmon Keta salmon	343	-	-	-	- Of low value so not attractive to aquaculture
Oncorhynchus nerka	Sockeye salmon	136	-	-	-	- Less adaptable for farming because it has lower growth and survival rates, it has a lower fillet yield and it is more susceptible to stress leading to poor product quality - In New Zealand and farmed at a very small scale

Source: UN FAO FishStat; UN FAO FIGIS; Wikipedia; Coriolis analysis

SALMON – AQUACULTURE PRODUCTION

Global salmon aquaculture is growing, driven by Atlantic salmon

Global aquaculture production of select salmon species
(t; 000; 1950-2008)



Source: UN FAO FIGIS database (custom job); Coriolis analysis

SALMON – WHY ATLANTIC?

Atlantic salmon dominate global aquaculture because they have "faster growth rates, greater tolerance for higher stocking densities, superior disease resistance, and more efficient feed conversion rates"

- "Atlantic salmon is a species with exceptional characteristics for intensive culture. The hatchery rearing is a relatively straightforward process. Eggs are easy to extract and incubate and the young fry are large and capable of feeding directly on dry feed. During growout in cages, they easily tolerate moderate crowding and careful handling. They are also moderately resistant to diseases and quickly grow to market size in less than 18 months after the 50-100 gram juveniles are put in net-pens. The meat quality is excellent and appealing to millions of consumers worldwide. The fillet yield is high, up to 60 percent of edible meat. A high fillet yield is critical for the creation of value-added products." *The Great Salmon Run[1], Traffic/WWF, 2007*

- "The increase in aquaculture of Atlantic Salmon can be explained by reasons such as its favorable fattiness and the fact that it can be consumed both cooked and raw, the fact that markets for Atlantic Salmon exist around the world, allowing sales to be expanded easily, the fact that year round harvesting is possible and the fact that productivity at processing plants is high because the size upon harvest is bigger than other species." *Nissui Japan website (http://www.nissui.co.jp/english/corporate/frontier/02/)*

- "Atlantic salmon have become the dominant farmed species for a number of reasons. Most notable is that Norway's—and to a lesser extent Scotland's—early development of Atlantic salmon aquaculture meant that the techniques and technologies for cultivating this particular species, as well as markets for its sale, were well established by the time the industry spread to other countries. In addition, Norway's dominance of the market, combined with its pioneering role in developing salmon aquaculture, has meant that aquaculture research and experience in Norway has strongly influenced the industry's development. Well-established Norwegian breeding programs have developed highly domesticated broodstock with "…faster growth rates, greater tolerance for higher stocking densities, superior disease resistance, and more efficient feed conversion rates". These domesticated fish are understood to be easier to farm." *Melanie Power, Lots of fish in the sea[2], 2004*

- "FCR is not the only constraint on the uptake of Chinook salmon farming: persistent fish health challenges (Bacterial Kidney Disease, Rickettsia) in other regions (Canada, Chile) are profound challenges to production for North American or European markets." *Andrew Forsythe, Chief Scientist, NIWA*

1. www.traffic.org/species-reports/traffic_species_fish25.pdf; 2. http://www.ethics.ubc.ca/workingpapers/deg/deg004.pdf

SALMON – AQUACULTURE – KEY COUNTRIES

Salmon aquaculture is concentrated in a small number of stable, relatively wealthy countries close to the poles; most countries, other than Japan & NZ, farm Atlantic salmon

Key global salmon aquaculture regions
(various; 2010

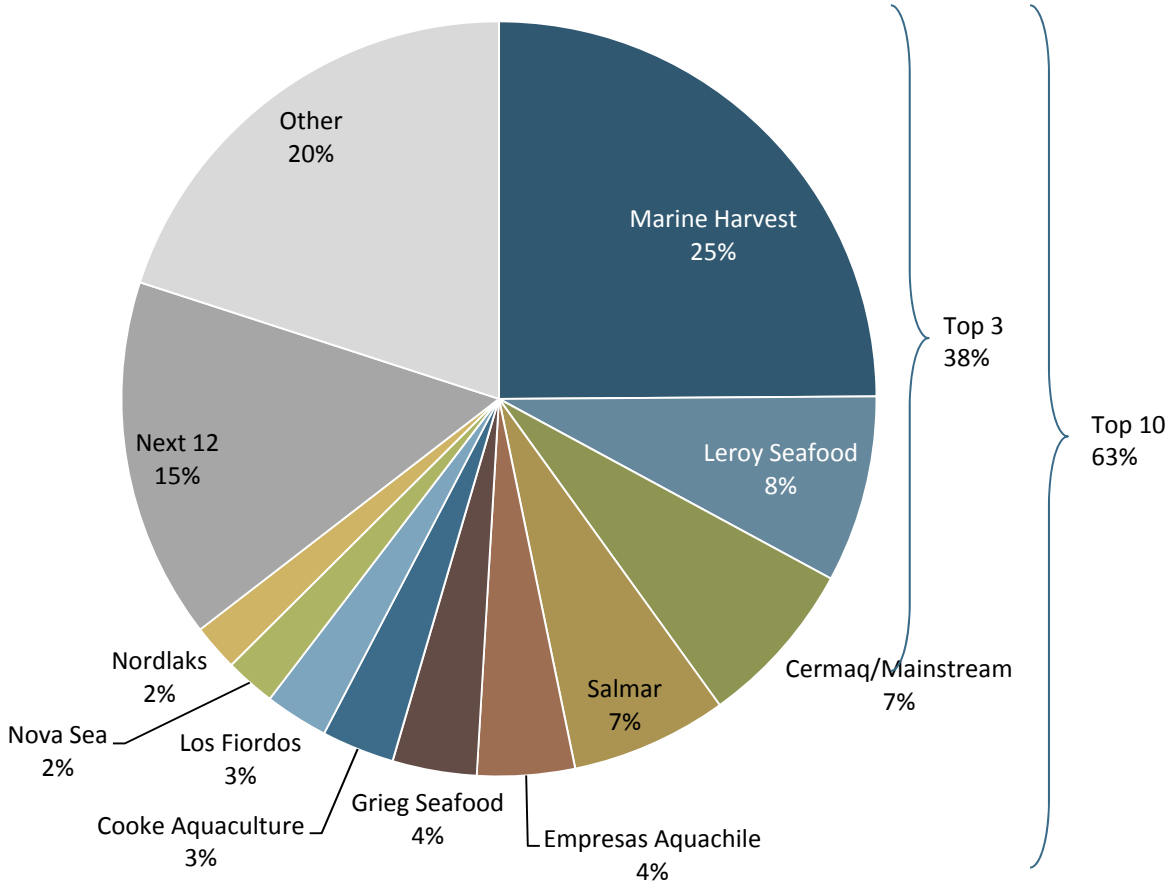
	Pop	GDP/capita (US$)	Coastline	Species farmed	Production (t; 000)	10 year production CAGR	
Norway	4.7m	$84,540	25,148 km	Atlantic salmon	743	7%	- Global industry leader - Limits on future production
Chile (Southern)	16.9m	$11,800	6,435 km	Atlantic salmon Coho salmon	481	10%	- Recent ISA outbreak - Significant regulation undertaken
Scotland/UK	5.2m	$39,700	11,803 km	Atlantic salmon	129	2%	- Regulation and alternative uses slowing growth
British Columbia	4.5m	C$41,700	25,725 km	Atlantic salmon (3 firms) Chinook (1 firm[1])	82[2]	6%	- Four firms (incl. Marine Harvest)
Faroe Islands	0.05m	$45,200	1,117 km	Atlantic salmon	38	7%	- ISA outbreak early 2000's
Tasmania	0.5m	A$44,010	4,882 km	Atlantic salmon	24	14%	- Two firms ~90%+ (Tassal & Huon) - Sealord recent purchase
Maine	1.3m	$36,745	5,633 km	Atlantic salmon	13	1%	- Industry consolidated 100% Cooke
Japan	127.4m	$42,325	29,751 km	Coho salmon	13	0%	- Industry consolidated around Nissui (50% owner of Sealord)
Ireland	4.7m	$45,640	1,448 km	Atlantic salmon	10	-4%	- Marine Harvest ~60%
South Island, New Zealand	4.3m	$31,590	15,134 km	Chinook salmon	9	5%	- NZ King Salmon ~80%+
Washington state	6.7m	$41,751	4,870 km	Atlantic salmon	4	0%	- Industry consolidated 100% Icicle /American Gold Seafood

1. Creative Salmon (so effectively three firms globally of any scale); 2. BC is 82 of 104 total Canada; Source: UN FAO FIGIS database (custom job); CIA World Fact Book; Wikipedia; various other reports and webpages; Coriolis analysis

SALMON – AQUACULTURE PRODUCTION SHARE

The global salmon aquaculture industry is relatively consolidated; the top three firms control a third of the market; the top ten two thirds

Global salmon aquaculture production share by key firm
(t; 000; % of t; 2009)



Source: Marine Harvest Salmon Farming Industry Handbook 2010 data; Coriolis analysis

SALMON – AQUACULTURE – KEY FIRMS

The global salmon industry is now dominated by a handful of (primarily Norwegian) listed firms

Profiles of the key firms in the global salmon aquaculture industry
(various; 2010 or as available)

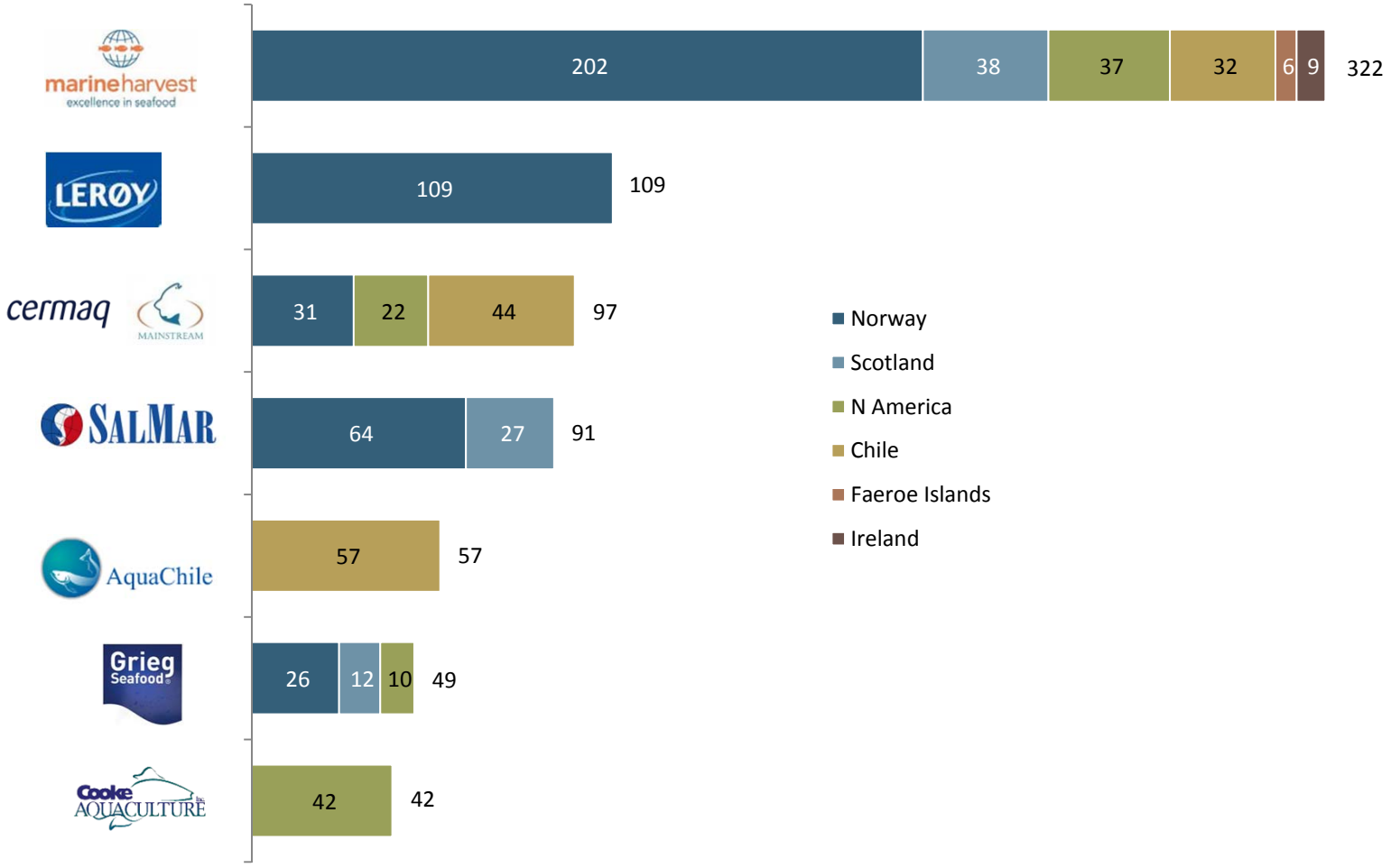
Company	Year founded	Home country	Global salmon prod (t; 000)	Total global turnover[1]	Ownership	Note/comments
marineharvest excellence in seafood	1992	Norway	308	NOK15,191m (10) ~US$2,732m	Listed (OSE: MHG)	- Formed in 03 merger of three firms - Major owner is John Fredriksen (world's largest oil tanker fleet) - www.marineharvest.com
LERØY	1939	Norway	109	NOK7,473m (09) ~US$1,344m	Listed (OSE)	- Austevoll owns 63% - Group has significant non-salmon operation www.leroy.no
cermaq MAINSTREAM	1995	Norway	97	NOK8,971m (09) ~US$1,613m	Listed (OSE: CEQ)	- 44% owned by Government of Norway - Fish farming operations branded Mainstream - www.cermaq.com
SALMAR	1991	Norway	64	NOK3,429m (09) ~US$617m	Listed (OSE: SALM)	- Started in 1991 with one salmon license - www.salmar.no
AquaChile	80's	Chile	57	US$440m (09)	Listed (Santiago)	- Market leader in Chile - www.aquachile.com
Grieg Seafood	1884	Norway	49	NOK2,447m (10) US$440m	Listed (OSE: GSF)	- Merged with Volden Group in 2006 - Listed 07; Grieg Holdings 41% (Grieg family) - http://www.griegseafood.no/
Cooke AQUACULTURE	1985	Canada	42	US$176m (09)	Cooke family	- Owned by founding families - www.cookeaqua.com
morpol	1996	Norway	*Primarily processing*	NOK1,467m (09) US$260m	Listed (OSE: MORPOL)	- www.morpol.com - Acquired Marine Farms ASA - "the world's largest salmon processor" - "world leader in smoked salmon"

1. Includes non-salmon activities; Source: various industry publications; various published articles; company websites and annual reports; Coriolis analysis

SALMON – AQUACULTURE BY KEY FIRM BY REGION

Many of the key firms now have operations across all the major producing regions of the world; none have operations in New Zealand[1]

Key salmon aquaculture firms production by country/region
(t; 000; 2009)

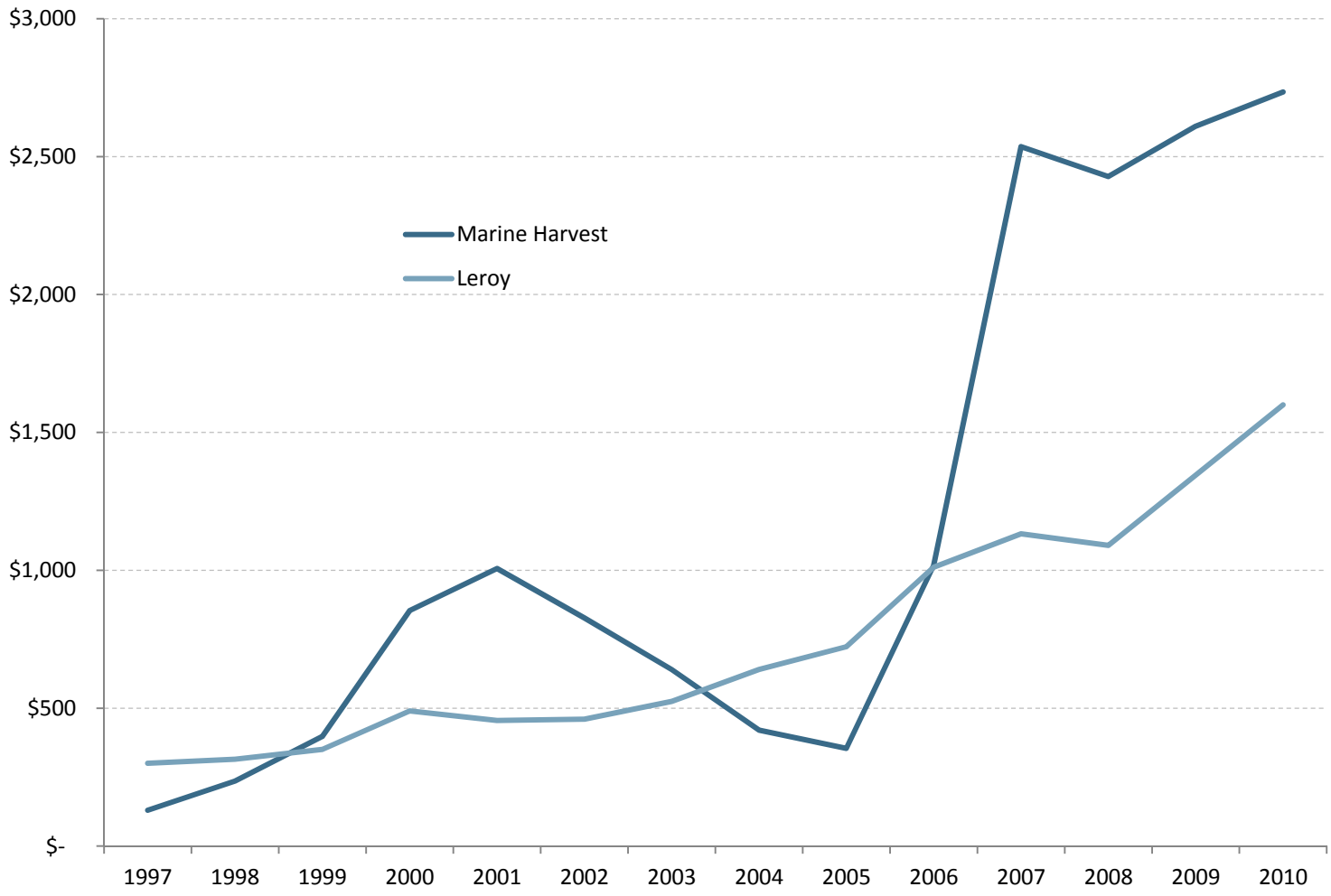


1.In fact none of the global top 30 salmon aquaculture firms have operations in New Zealand; Source: Marine Harvest Salmon Farming Industry Handbook 2010 data; Coriolis analysis

SALMON – TOP TWO FIRMS TURNOVER GROWTH

Mergers and acquisitions are driving the growth of the two largest global salmon aquaculture firms

Turnover growth of two largest salmon aquaculture firms
(US$; m; 1997-2010)



13 year CAGR (97-10)

marineharvest excellence in seafood 26%

LEROY 14%

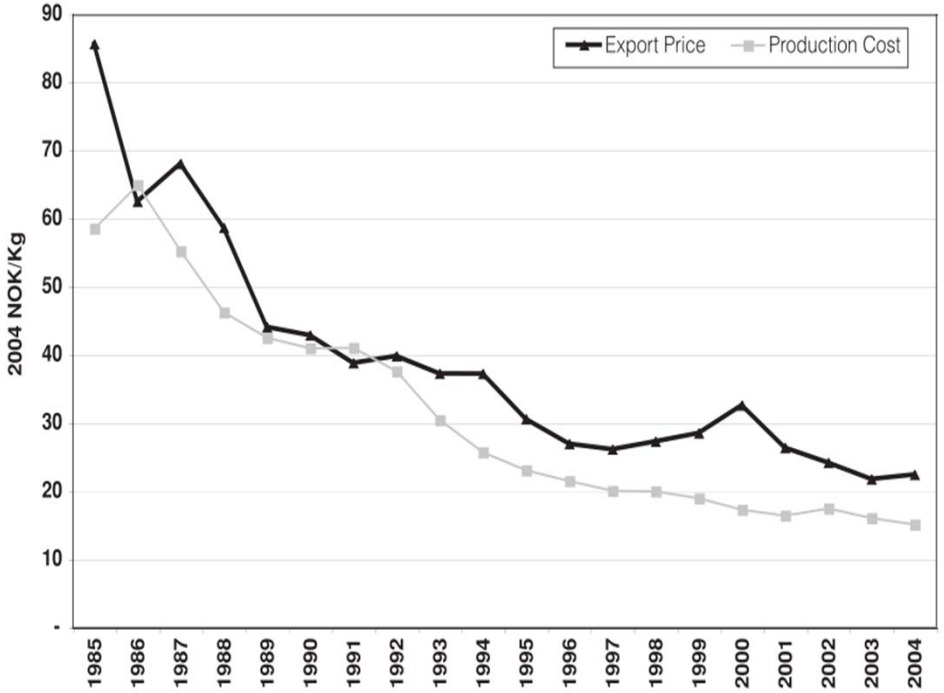
Note: assumes constant exchange rate of NOK1=US$0.18; Source: various company annual reports and presentations; Oanda; Coriolis analysis

CORIOLIS

SALMON – FALLING PRODUCTION COST

Production costs and prices have been trending downward

Figure 10 Export Price and Production Cost of Norwegian Atlantic Salmon (1985-2004)



"The growth in farmed salmon was also stimulated by production and institutional factors. Over the past twenty-five years, broodstock quality, feed quality, disease management techniques and processing have all improved. Through consolidation, economies of scale have occurred. These factors resulted in a steady decline in production costs, providing the means for increasing production even with a fall in salmon prices.

Figure 10 shows inflation-adjusted production costs contrasted with export prices in Norway, in 2004 Norwegian kroner, with a distinct downward trend.

The largest cost component of production costs is feed. In the 1980s, feed conversion ratios (FCR) in Norway were around 3 kilograms of feed per kilogram of salmon. In 1999, the average feed conversion ratio was 1.19 kilograms of feed per kilogram of salmon.

The reduction in production costs and FCR was made possible through consolidation and vertical integration of the industry, better broodstock, technology and improvements in nutrition, disease management and farm production systems (Asche et al. 2003). Undoubtedly, the many efforts conducted by the industry since 1989 to expand and broaden the market have been instrumental in dealing with the downward pressure on prices."

Source: The Great Salmon Run: Competition Between Wild and Farmed Salmon; *Traffic/WWF, 2007;* "www.traffic.org/species-reports/traffic_species_fish25.pdf"

SALMON – FURTHER CONSOLIDATION

There are expectation of further consolidation ahead

- "Consolidation is on the cards. Smaller salmon farmers will use the opportunity now to sell some of their licenses to the bigger players." *Roar Husby, Chief Financial Officer, SalMar, Nov 2010*

- "Marine Harvest can expand its existing business in Norway over the next two years… and then we will need to make acquisitions. The company is concentrating on fish-health issues in Chile… In Scotland, the industry is fairly consolidated already, and in Canada, there are only three players." *Alf-Helge Aarskog, Chief Executive Officer, Marine Harvest, Nov 2010*

- "We could see both a lot of bolt-on or add-on acquisitions, but we also see the potential for several larger acquisitions." *Mikael Clement, analyst, Pareto Securities, Nov 2010*

- "Grieg Seafood is well positioned for consolidation whether as a target or a purchaser." *Morten Vike, CEO, Grieg Seafood, Nov 2010*

SALMON – NORWAY APPROACHING THE LIMIT

Marine Harvest (global #1) recently presented data suggesting Norway is approaching a production limit

Norwegian production approaching the limit

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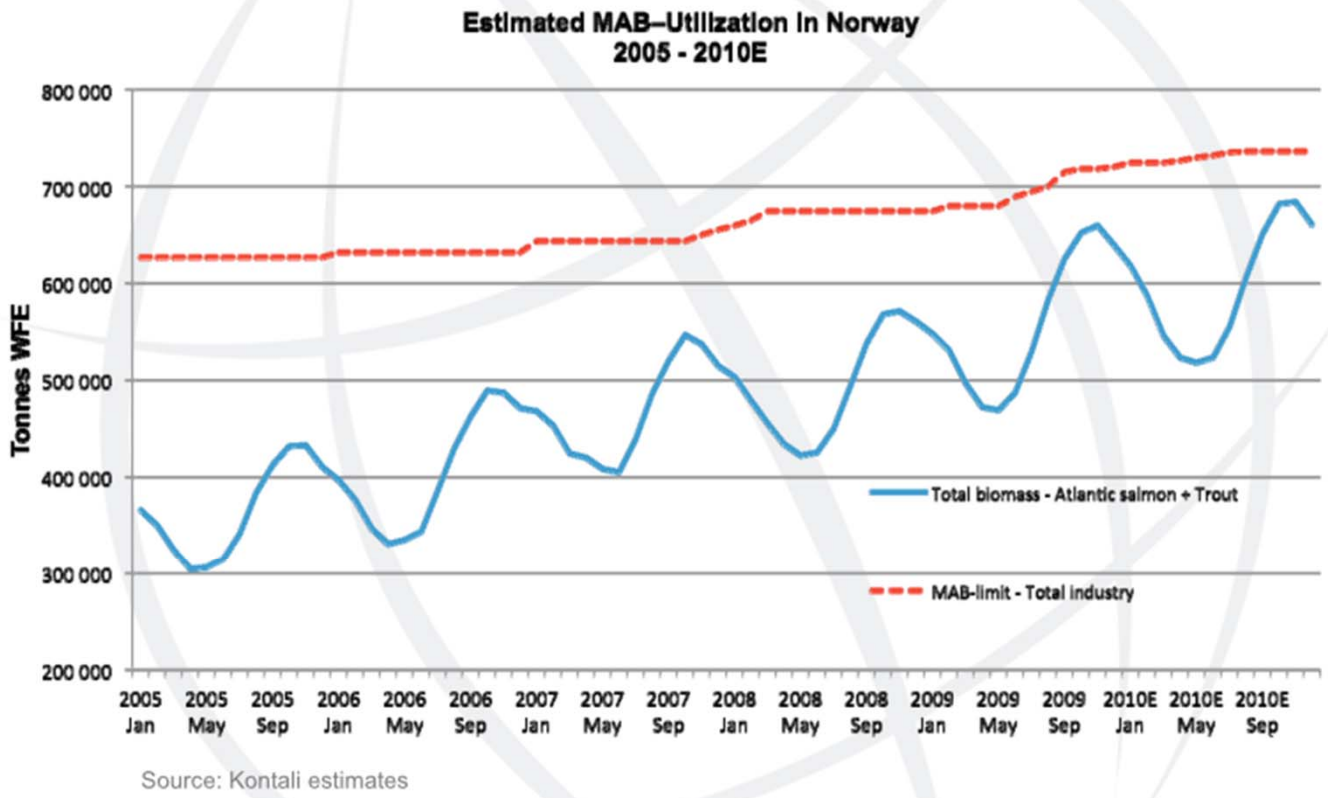


MAB = maximum allowable biomass
(A Norwegian regulatory framework)

"Since 1973, a licence has been required to operate a salmon farm in Norway. A licence gives the right to farm salmon either in freshwater or in sea… In addition to giving the location, each licence will also specify maximum allowable biomass (MAB) which dictates how much fish can be produced at the site. One license is set to a MAB of 780 tonnes (900 tonnes in Troms & Finnmark). In general maximum production capacity is 1.5 times MAB on the site. Most Norwegian fish farming sites have between 2,340 and 3,120 tonnes allowed maximum standing biomass.

24/11/2010 7

Source: Marine Harvest "Oslo Salmon Summit 2010"; "http://www.marineharvest.com/PageFiles/1296/Handbook%202010.pdf"

SALMON – DISEASE OUTBREAK IN CHILE

An outbreak of ISA in Chile has "clobbered" its industry and increased world salmon prices

- "A deadly fish virus and scarce credit have clobbered the salmon sector in Chile, the world's No. 2 producer… Chile exported a record 445,000 tonnes of salmon and trout in 2008, worth just under $2.4 billion, up sharply from 2007 levels of 397,000 tonnes as salmon farmers harvested fish early to avoid ISA, which is like a deadly flu or cold for the most common Salar species, or Atlantic salmon. But Chile's leading industry association, SalmonChile, expects output to fall around 30 percent in 2009 to around 320,000 tonnes because early harvesting will mean production gaps this year and sees similar output levels in 2010. It expects to see a recovery in 2011." *Reuters Mar 2009*

- "When a devastating virus swept through Chile's farmed salmon stocks last year, some of the industry's biggest players laid off thousands of workers, packed up operations and moved to unspoiled waters farther south along the Chilean coast. But the virus went with them. Last month, the Chilean government began hashing out tougher measures to improve the sanitary and environmental conditions of the troubled industry. But producers expect still deeper losses this year, as the virus continues to kill millions of fish slated for export to the United States and other countries. Government and industry officials say they have already taken important steps to improve the ways salmon are farmed. But the persistent problems, critics say, reveal that neither the industry nor the government has fully grasped the need for the far-reaching changes required to protect not only consumers and the environment, but also one of Chile's most important industries from itself. They are not the only ones concerned. In the midst of the virus crisis, Chile has continued to raise salmon for export with chemicals and medications not approved for use in the United States and Europe, according to documents from regulators." *New York Times, Feb 2009*

- "Salmon prices are jumping after a sharp decline in global supply following the collapse of the Chilean industry following an outbreak of a fish disease." *Financial Times, Feb 2010*

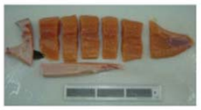
SALMON – CHILE DRIVING FUTURE GROWTH

Despite the impact of ISA, there is widespread belief in future growth potential of the Chilean salmon industry

cermaq

Chile remains optimal for salmon production

- Ideal coast line
- Optimal water temperatures
- Low labor cost
- Close to main fish oil and -meal producers in Peru
- Product innovation
  - Distance from main markets drives growth of value added and frozen products
- High processing capacities
- Reduced operational risk through
  - Expected tight regulations
  - Improved husbandry



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Cermaq (Global #3), March 2010

Outlook

marineharvest
excellence in seafood

- Well geared towards strong markets in 2011 and 2012
  - Strong volume increase in 2011 (~15%)
  - Increased contract share in 2011
  - New Business Unit Global Sales & Marketing
- Chilean operations profitably adapted to low activity level due to the biological risks
  - Well positioned for substantial longer term growth
- A dividend of NOK 0.60 per share will be proposed for the AGM in May 2011
- The board expects to announce a second dividend in connection with the presentation of the results for the second quarter of 2011

[1] As presented at the 2010 Capital Markets Day

5

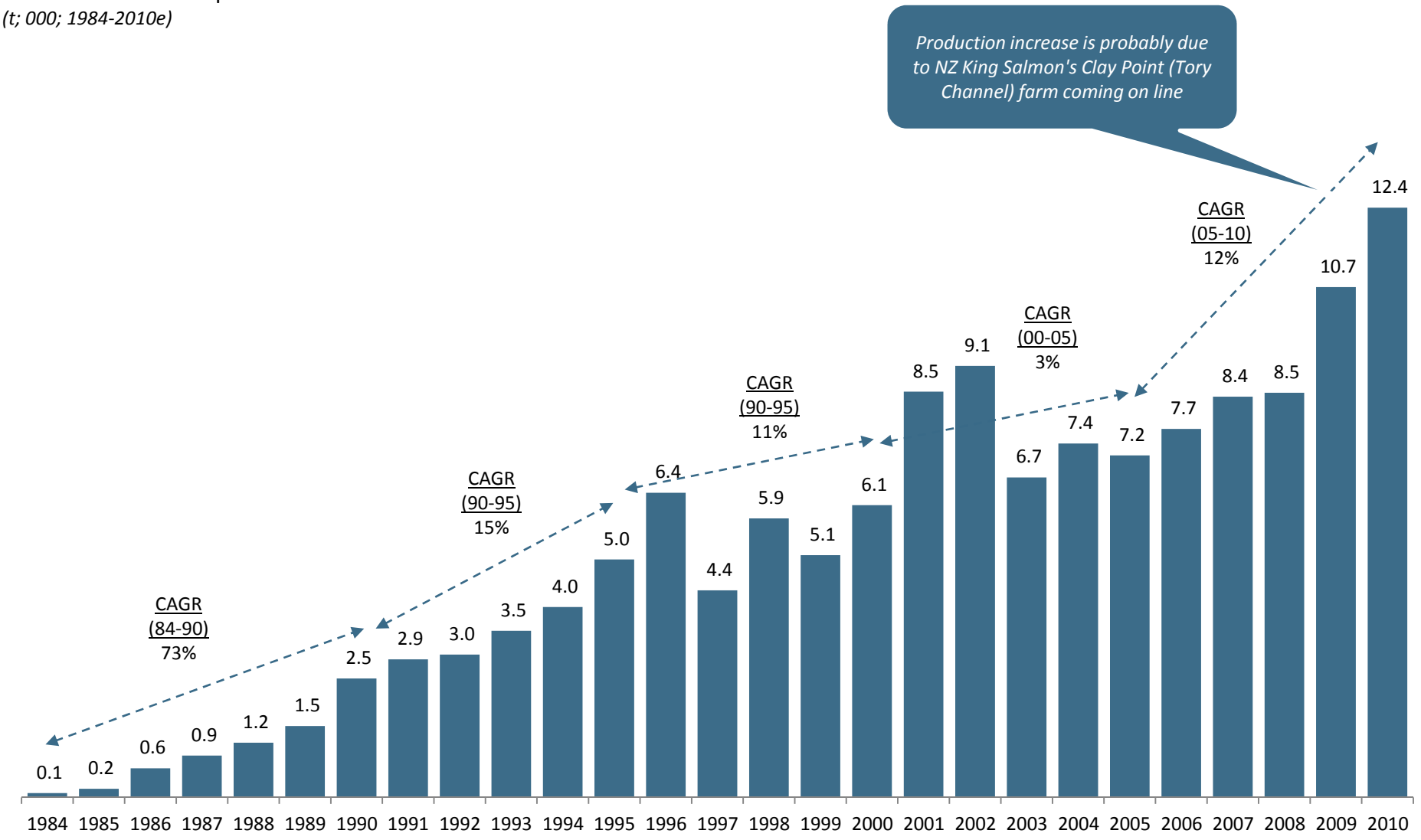
Marine Harvest (Global #1), March 2011

Point-of View Chile: "ISA in Chile tip of the iceberg on the lack of integrated fish health management. Norway has effectively managed the same spectrum of pathogens; that capability is transferable and the recent events in Chile will drive that transfer."

SALMON – NZ PRODUCTION

The New Zealand salmon industry experienced a period of strong growth through the mid-90's; growth since was slowing until a recent surge 09/10e (likely caused by Chile)

New Zealand salmon production
(t; 000; 1984-2010e)

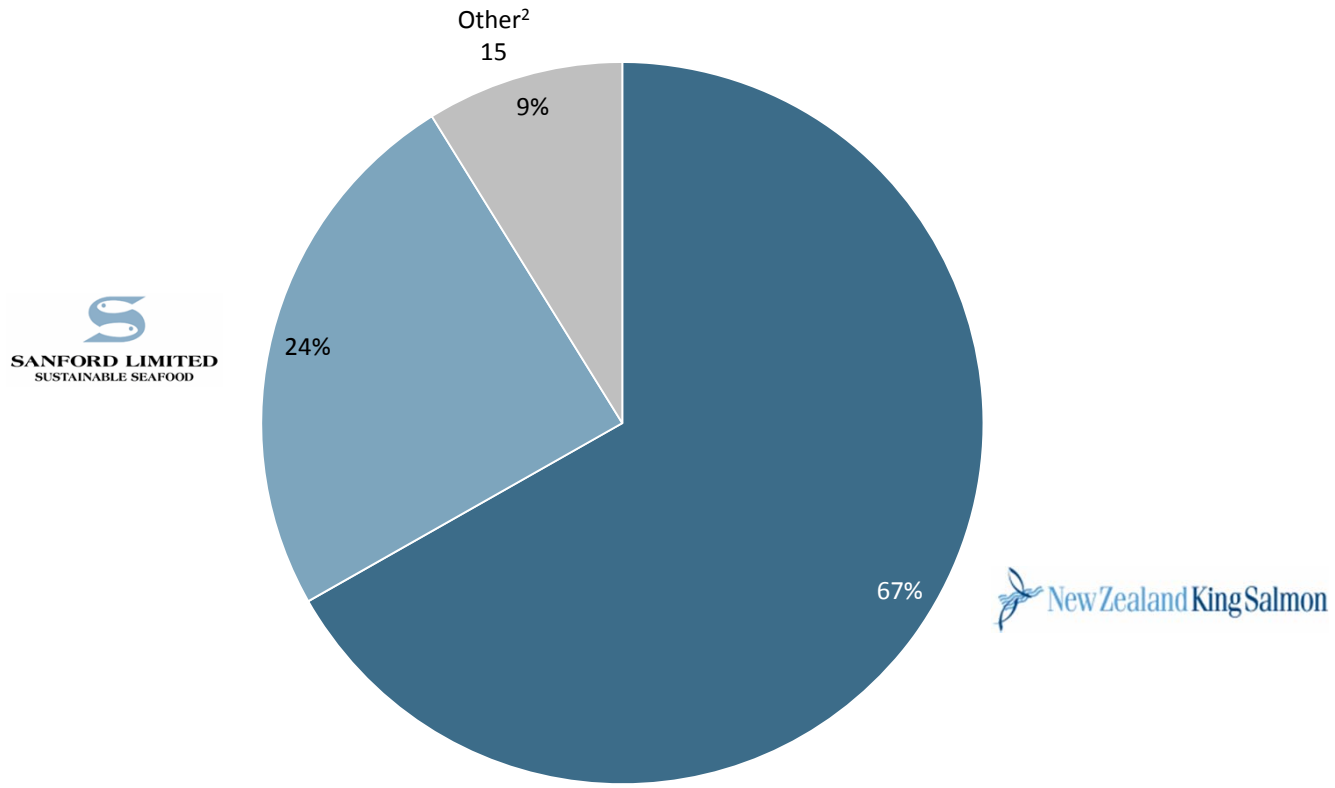


Source: UN FAO FishStat (1984-1997); NZFSA (1998-2009+2010e); Coriolis analysis

SALMON – NZ PRODUCTION

New Zealand salmon aquaculture production is highly consolidated

New Zealand salmon aquaculture production share by key producers by species
(% of production volume; 2010)



1. Primarily onshore river producers, plus ocean (e.g. Benmore, Waiau, Mt Cook, Akaroa); Source: NZ Salmon Farmer's Association (email); Coriolis analysis

SALMON – AQUACULTURE – KEY NZ FIRMS

New Zealand has two salmon aquaculture firms producing more that 1,000 tonnes – New Zealand King Salmon and Sanford

Profiles of the key firms in New Zealand salmon aquaculture sector
(various; 2010 or as available)

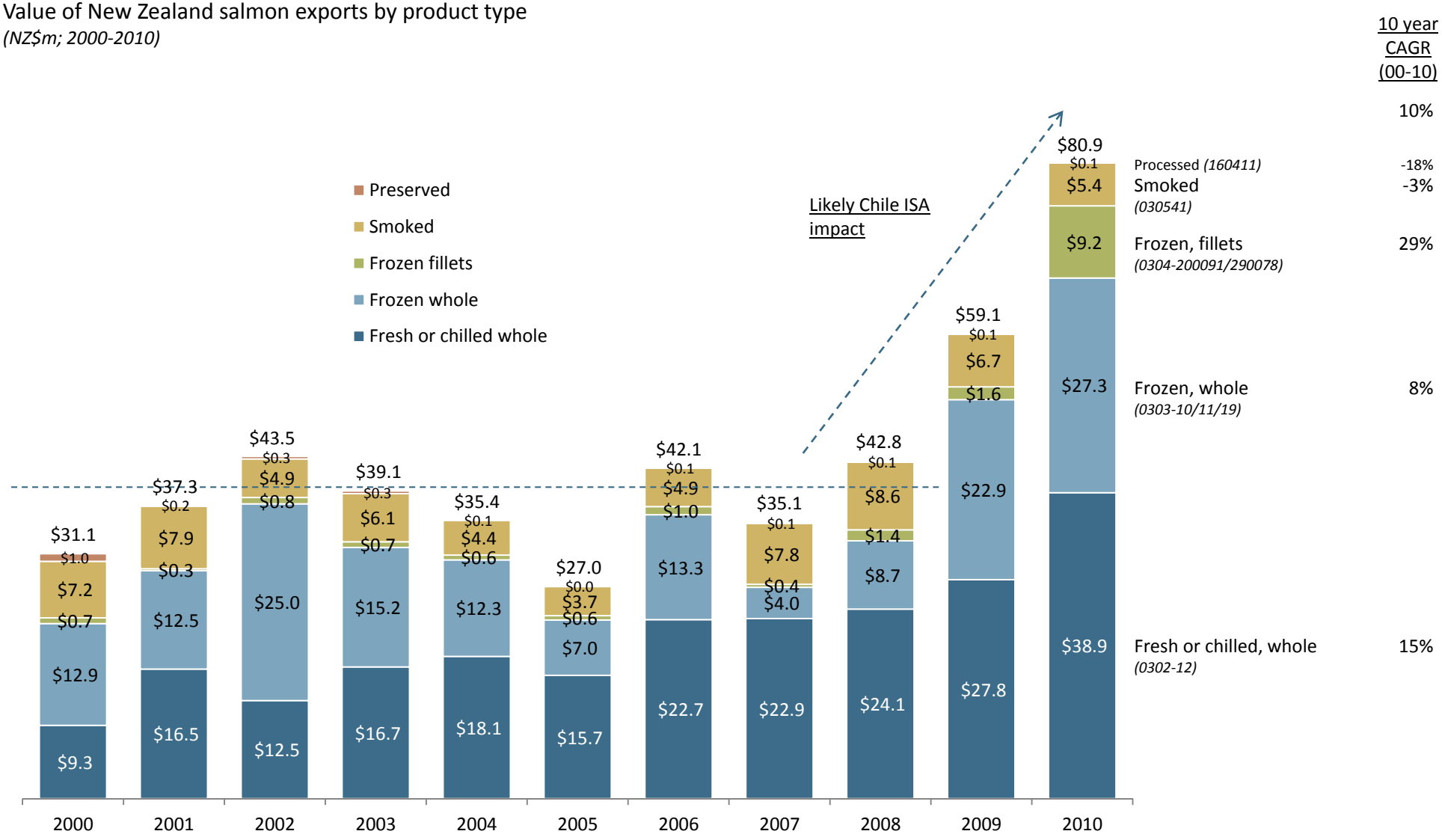
Company	Year founded	Salmon prod (t)	Turnover	Employees	Ownership	Note/comments
New Zealand King Salmon	1996 merger	7,161	NZ$115m	420	Evergreen/Tiong 53% Direct Capital 43.5% Management 3.5%	- Formed in 1996 merger of Southern Ocean & Regal Salmon - 5 sea farms (Marlborough Sounds (M.S)); 2 hatcheries; 4 processing facilities - www.kingsalmon.co.nz
Sanford Limited Sustainable Seafood	1993 acquired	2,613	Group NZ$421m	1,055 FT/PT	Amalgamated 37% Others 63%	- 1 farm; Big Glory Bay, Stewart Island - Purchased in 1993 - Recently acquired Pacifica Seafood, did not incl salmon operations in M.S. - NZ$7m upgrade in 2007; 1,900t to 3,000t - www.sanford.co.nz
Aoraki Benmore	1994	256	TBD	TBD	Evans family	- Operate in Central Otago hydroelectric canals - www.mtcooksalmon.com
Skeggs Group Limited	1952	202	TBD	TBD	Skeggs family	- Sanford recently acquired mussel/oyster operations (for $85m) but not salmon - http://www.skeggs.co.nz/
Akaroa Salmon	1984	189	$3m	22	Bates family	- 1 farm; Lucas Bay, Akaroa Peninsula - www.akaroasalmon.co.nz
Isaac	n/a	121	TBD	TBD	Isaac family	- Ex-quarry; production highly variable - www.isaac.co.nz/salmon_farm.html
Mt Cook Alpine Salmon	1992	74	TBD	TBD	Various	- Operate in Central Otago hydroelectric canals - www.mtcooksalmon.com
High Country Salmon	1992	66	TBD	TBD	Logan family	- Operate in Central Otago hydroelectric canals - No website

1. Includes non-salmon activities; Source: various industry publications; various published articles; company websites and annual reports; NZSFA; Coriolis analysis

SALMON – NZ EXPORT VALUE

The value of New Zealand's salmon exports were relatively flat until the last two years; we suggest the recent surge is related to the Chilean ISA outbreak driving up world prices +18% (09) and +16% (10)

Value of New Zealand salmon exports by product type
(NZ$m; 2000-2010)



	10 year CAGR (00-10)
	10%
Processed *(160411)*	-18%
Smoked *(030541)*	-3%
Frozen, fillets *(0304-200091/290078)*	29%
Frozen, whole *(0303-10/11/19)*	8%
Fresh or chilled, whole *(0302-12)*	15%

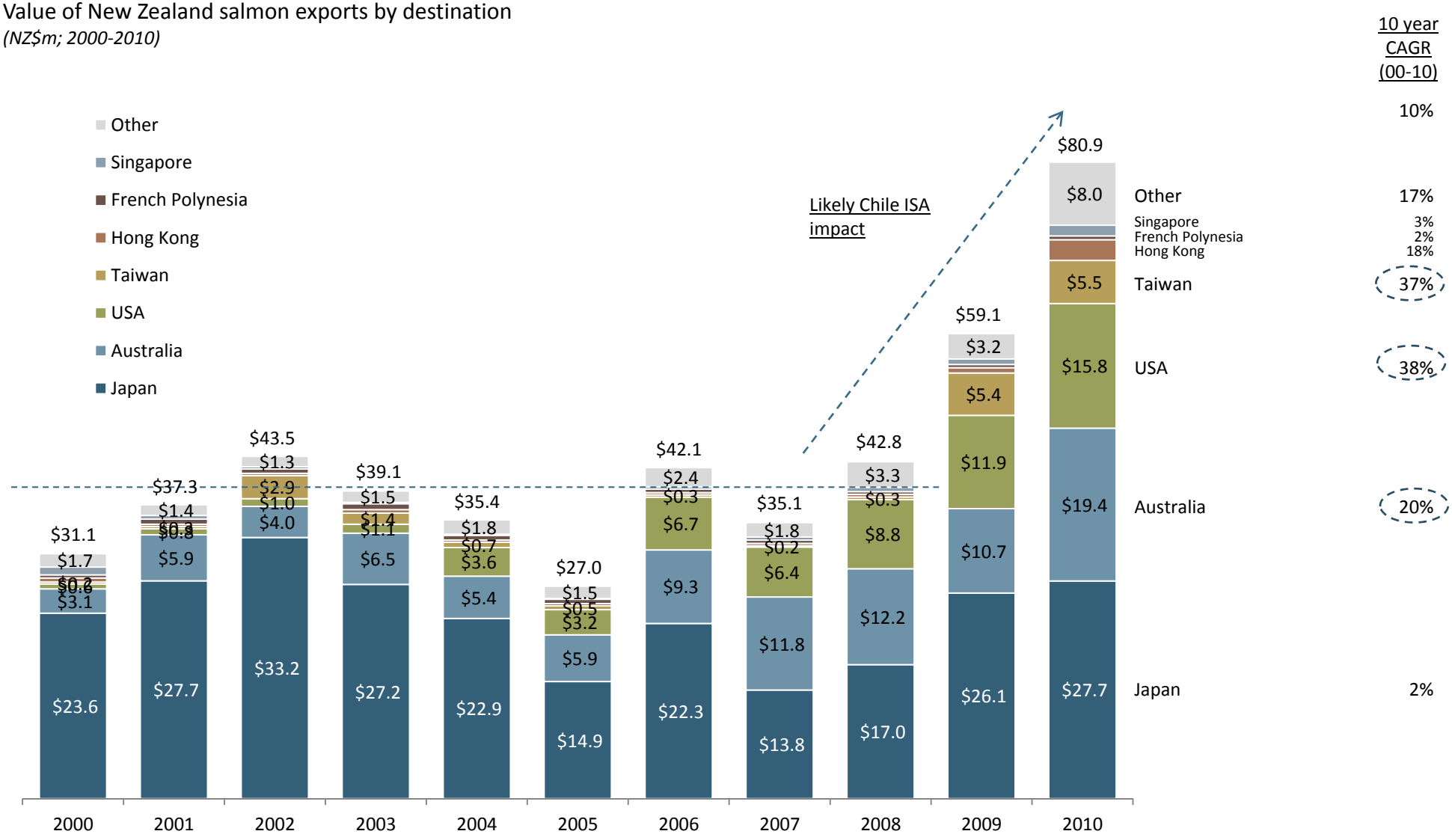
Source: Statistics New Zealand Infoshare database (custom job); Coriolis analysis

CORIOLIS

SALMON – NZ EXPORT VALUE

Growth has come from a surge in sales to Australia, the US and Taiwan (among others)

Value of New Zealand salmon exports by destination
(NZ$m; 2000-2010)



	10 year CAGR (00-10)
Other	10%
Singapore	3%
French Polynesia	2%
Hong Kong	18%
Taiwan	37%
USA	38%
Australia	20%
Japan	2%

Source: Statistics New Zealand Infoshare database (custom job); Coriolis analysis

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FIRM PROFILE – SEALORD

Sealord is the largest firm in the New Zealand seafood industry

Contact details	
Name: **Address:**	Sealord Group (Kura Limited) 149 Vickerman Street, Nelson 7010 PO Box 11, Nelson
Ownership:	Aotearoa Fisheries 50% Nippon Suisan Kaisha 50% (listed Japan)
Contact:	+64 3 548 3069 www.sealord.co.nz info@sealord.co.nz/enquiries@sealord.com
CEO:	Graham Stuart

Key metrics	
Turnover:	$531m (2010)
5 year turnover CAGR:	-0.9% (05-10)
EBIT/Operating profit:	$24.35m (2010)[1]
EBIT margin:	4.6%
Total/Net assets:	$760.6m/$461.4m (2010)
ROTA/RONA (ROE):	3.2%/5.3%
# of employees:	1,100 (CI)
Turnover/employee:	$483k
EBIT/employee:	$22k
% export:	90% (CI)

Key categories

Catching, processing & marketing of seafood
- Wild capture (add key species)
- Aquaculture (mussels, salmon [AU], barramundi [AU])

Key regions

Eleven business operations worldwide
- New Zealand
- Australia (NSW, QLD, TAS)
- Europe (UK, Spain, France, Denmark)
- North America
- Asia

Associates *(select)*

50% NZ Longline
50% Westfleet Seafoods
33% North Island Mussel Processing

Outward direct investment (ODI) *(select)*

40% Europacifico Alimentos S.L. (Spain)
Yuken (Argentina)
King Reef Seafoods (Australia)
50% of Petuna Seafood (Australia)
50% of Petuna Aquaculture (Australia)
Caistor (UK; fish processor)

Key brands

- Sealord
- Antarctic
- Captains Choice
- Fifeshire
- [Greenshell Mussels]

Notes/Comments/Recent activities

- 50% owner Nissui is #2 Japanese seafood firm with global sales of US$5.2b (2009) and 8,800 employees (consolidated) & has been shareholder since 1973
- Recent major acquisitions all outside New Zealand
  - Argentina (deep sea wild capture) (FY09)
  - Queensland (aquaculture) (FY09)
  - Tasmania (aquaculture) (FY10)
- Firm under some financial pressure[1]
- Sold its 35% of Nordic Seafood A/S (Denmark) [Aug 2010] for $23.3m to 50% owner Nissui
- Invested $1.8m in new equipment for Nelson coated products plant (FY10)
- Divested 240ha NZ mussel space to Sanford
- Purchased 63m longline vessel (jointly with Talleys) (Sep 08)
- Chartered replacement factory freezer trawler (Jun 09)
- New NZ$10m plant in Caistor, UK (2007)
- 50% Westfleet Seafoods (inshore species quota) (FY07)
- East Coast SI quota from Pacifica/Skeggs (FY06)
- Launched 18 new frozen seafood product lines in Australia doubling market share in seafood meal category (FY07)

1. Uses "operating profit before financing costs" which also excludes share of profit from associates; 2. http://www.stuff.co.nz/dominion-post/business/4518069/Sealords-Japanese-shareholder-comes-to-rescue Source: various company annual reports; various company websites; Kompass; Coriolis analysis

FIRM PROFILE – SANFORD

Sanford is the second largest firm in the New Zealand seafood industry

SANFORD LIMITED
SUSTAINABLE SEAFOOD

Contact details	
Name: **Address:**	Sanford Limited 22 Jellicoe St, Freemans Bay. Auckland 1010 PO Box 443, Shortland St., Auckland 1140
Ownership:	New Zealand; listed (NZX: SAN) 37% Amalgamated Dairies (Goodfellow family)
Contact:	+64 9 379 4720 www.sanford.co.nz info@sanford.co.nz
Managing Director:	Eric Barratt

Key metrics	
Turnover:	$421.1m (2010)
5 year turnover CAGR:	2.9% (05-10)
EBITDA:	$49.1m (2010)
EBIT/Operating profit:	$35.3m (2010)[1]
EBIT margin:	8.4%
Total/Net assets:	$720m/$552m (2010)
ROTA/RONA (ROE):	4.9%/6.4%
# of employees:	2,000 (K)
Turnover/employee:	$210k
EBIT/employee	$18k

Key categories

Catching, processing & marketing of seafood
- Wild capture
  - Hoki (12% of sales)
  - Deepwater (23% of sales)
  - Inshore (14% of sales)
  - Pelagic (9% of sales)
- Aquaculture (15% of sales)
  - Mussels (#1 in NZ; 45% of production) worth $200m
  - Oysters

Key regions (% of sales)

Asia (30%)
Australia (20%)
North America (16%)
New Zealand (15%)
Europe (12%)

Associates /Subsidiaries *(select)*

47% NZ Japan Tuna Co. (wild capture/processing)
20% Barnes Oysters (seafood processing/wholesale)
25% Live Lobster Southland (seafood processing)
50% San Won (cold storage)
The Big Picture Auckland (tourism)
Auckland Fish Market (auction/retail/school complex)
33% North Island Mussel Processing

Outward direct investment (ODI) *(select)*

75% Primestone [seafood wholesaler] (Australia)
50% Waihai Dong Won Food [seafood processor] (China)
partner is Dong Won Fisheries (South Korea)
35% Pure NZ Greenshell Mussels partnership (China)

Key brands

- Sanford
- Neptune
- Big Glory
- [Greenshell Mussels]

Notes/Comments/Recent activities

- Consolidating leadership in mussels
  - Acquired Pacifica Seafoods (mussels/oysters) for $85m from Skeggs (2010)
  - Acquired240ha mussel area from Sealord (2009)
- Increase share in Waihai (China) +10% in FY09
- Sold share of Fisheries Products Int. (Canada)
- Sold share of High Liner Foods (Canada)
- Sold share in Pesquera San Arawa (Argentina)
- "Over 200 customer in 60 countries around the globe"

1. Uses "EBIT" which also excludes net gain on sale of investments, etc; Source: various company annual reports; various company websites; Kompass; Coriolis analysis

FIRM PROFILE – AOTEAROA FISHERIES

Aotearoa Fisheries – representing collective iwi ownership – owns 50% of Sealord and a number of other seafood firms

AOTEAROA fisheries limited

Pukataki Rangatopu	
Name: **Address:**	Aotearoa Fisheries Level 3, 138 Halsey St., Auckland PO Box 445, Auckland 1140
Ownership:	New Zealand (57 Iwi/tribal interests/organisations)
Contact:	+64 9 302 1520 afl.maori.nz
CEO: **Chairman:**	Jeremy Fleming Robin Hapi

Whanonga Pütea	
Hokohoko:	$157.6m (2010)
5 year hokohoko CAGR:	7.0% (05-10)
EBIT/Operating profit:	$19.5m (2010)[1]
EBIT margin:	12.4%
Total/Net assets:	$512.4m/$392.8m (2010)
ROTA/RONA (ROE):	3.8%/5.0%
# of employees:	300
Turnover/employee:	$527k
EBIT/employee	$89k

Rängai Mahi

Harvesting, procurement, farming, processing and marketing of seafoods
- Wild capture
  - Snapper, gurnard, blue nose, hapuka, orange roughy
  - Lobster & abalone
- Aquaculture
  - Oyster (#2 NZ)

Mäkete

Network of distributors

Moni whakangao *(select)*

50% Sealord Group (Kura)
50% Seafood Processors Ltd. (w/Anton's)
Moana Pacific (seafood)
OPC (fish and lobster)
Pacific Marine Farms (oyster & mussel aquaculture)
Kia Ora Seafoods (oyster aquaculture)
Prepared Foods Processing
Seafood Processors Ltd.
50% Prepack Limited (pouch meals/army ration packs)

Outward direct moni whakangao (ODI) *(select)*

Australian quota licenses($1.2m asset value [AR p63])

Key brands

- Moana/Moana Pacific
- OPC
- PFL
- Kia Ora (oysters)
- [Jemco] via Japan oyster marketing JV

Kupu Akoako

- Formed in 2004 as part of Maori Fisheries Act
- Significant holder of Paua, Crayfish and Snapper quota
- Acquired Ocean Ranch (abalone) (FY09) and paua quota; was JV partner in Prepared Foods (PFL)
- Purchased 20t of crayfish quota (FY09)
- Created Prepack Ltd. JV (FY09) with Multi Pack Limited
- Acquired Pacific Catch (Wellington retail) (FY09)
- $12.5m worth of quota (2007)

Note: Maori translations from AFL AR p21-22 (any mistakes ours). 1. Uses "profit before income tax" less share in profit of associates plus finance expenses; Source: various company annual reports; various company websites; Kompass; Coriolis analysis

FIRM PROFILE – AOTEAROA SEAFOODS

Aotearoa Seafoods is the mussel growing and processing company owned by Wakatu Incorporated

Aotearoa Seafoods Ltd

KONO NEW ZEALAND SEAFOOD

Contact details	
Name: **Address:**	Aoteroa Seafoods Ltd 16 Bristol Street, Blenheim PO Box 762, Blenheim
Ownership:	Wakatu Incorporation
Contact:	+64 3 578 2069 www.aotearoaseafoods.co.nz enquiries@asf.co.nz
CEO:	Keith Palmer

Key metrics	
Turnover:	$45m (CI)
5 year turnover CAGR:	N/A
EBIT/Operating profit:	N/A
EBIT margin:	N/A
Total/Net assets:	$43m/$39m (CI; 2010)
ROTA/RONA (ROE):	5%/15%
# of employees:	195
Turnover/employee:	$231k
EBIT/employee:	N/A
Established:	1998

Key categories

Greenshell Mussels (Cultivation and processing)
Lobster
Oysters

Key regions

27 countries

Subsidiaries *(select)*

ASL Processing in Blenheim
ASL Farms – spat production and mussel growing
ASL Contracting – Cultivates mussels infloats and 65% contract grower

Outward direct investment (ODI) *(select)*

Key brands

Aotearoa Seafoods
Kono
Greengold

Notes/Comments/Recent activities

- Owner Wakatu Incorporated is a Nelsonbased investment company ; investing in the Tohu Wines, Kono Wines, online sales of mussels and wine, Horoirangi Centre of Seafood and Aquaculture Innovation, Horticulture & Abel Tasman Kayaks
- Along with Sealord, Sanford & Greenshell Investments created “Pure New Zealand Greenshell Mussels General Partner” to set up “single desk seller” in the Chinese market (2010)

1. Uses “operating profit before financing costs” which also excludes share of profit from associates; Source: various company annual reports; various company websites; Kompass; Coriolis analysis

FIRM PROFILE – TALLEYS GROUP

Talleys is diversifying into a production and processing food company covering red meat, dairy, seafood, vegetable sectors

Contact details	
Name: **Address:**	Talleys Fisheries Ltd P.O. Box 5, Motueka, New Zealand
Ownership:	Private (Talley Family)
Contact:	+64 3 528 2800 www.talleys.co.nz inquiries@talleys.co.nz
Managing Directors:	Andrew Talley Michael Talley

Key metrics	
Turnover:	$200m (Ce)
5 year turnover CAGR:	N/A
EBIT/Operating profit:	N/A
EBIT margin:	N/A
Total/Net assets:	N/A
ROTA/RONA (ROE):	N/A
# of employees:	600 (Ce)
Turnover/employee:	$300k
EBIT/employee:	N/A
Established:	1936

Key categories

Meat, Vegetables, Ice cream, Dairy
Catching, processing & marketing of seafood

Owns and operates inshore and deepwater vessels with many contractor vessels
Shellfish operations (2 factories) – cockles, oysters and scallops, mussels and 2 fishmeal factories
Amaltal Fishing operate deepwater operations

Key regions

Global

Subsidiaries/Associates *(select)*

Talleys Group (100%) – Seafood /veg processing
AFFCO Holdings (100%) - Meat
South Pacific Meats 100% (30% direct; 70% AFFCO)
Amaltal Fishing Co (100%) (Deep water operations)
Open Country Dairy 52% (17% directly; 35% via AFFCO)
Clearwater Mussels 50%
New Zealand Longline 50% (w/Sealord)
Soltal 50% (w/ Solander)

Outward direct investment (ODI) *(select)*

TBD

Key brands

- Talley's
- Amaltal

Notes/Comments/Recent activities

- Seafood Div: estab 1936, 4 plants
- Vegetable Div: estab 1978, 2 factories
- Ice cream Div: estab 1995 via Open Cheese, 1 plant
- Meat Div: estab AFFCO

1. Uses "operating profit before financing costs" which also excludes share of profit from associates; Source: various company annual reports; various company websites; Kompass; Coriolis analysis

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SEAFOOD – CLASSIFICATION

Seafood can be split into wild capture (four types) and aquaculture (mussels, salmon and oysters)

Overview of structural classifications of New Zealand seafood production and exports
(2010)

	Category	Landed volume (t; 000; YE 9/10)	Export volume (t; 000; YE 9/10)	Export value (NZ$m; FOB; YE 9/10)	Value per tonne NZ$/t; 000; FOB; 10)	Key species	ANZSIC classification
Wild capture (A041)	Pelagics	127.1	100.9	$207.9m	$2.1	Blue mackerel Squid Tuna Barracouta Jack mackerel	- Line fishing (A041-300) - Fish trawling, seining and netting (A041-400) - Other fishing (A041-900)[1]
	Deepwater	191.7	81.9	$341.3m	$4.2	Hoki Orange roughy Ling Southern blue whiting Hake Oreo dory Scampi	
	Inshore finfish	46.7	16.1	$107.8m	$6.7	Snapper Bluenose Small sharks Flatfish Red cod Groper John dory	
	Other	62.1	53.1	$262.5	$4.9	Other[2]	
	Inshore shellfish	3.9	3.9	$273.6m	$71.0	Rock lobster Abalone (Paua) Scallops	- Rock lobster & crab potting (A41-100) - Other fishing (A041-900)[1]
Aquaculture (A02)		N/A	41.5	$252.4m	$6.1	Green lipped mussels Salmon Oysters	- Longline & rack (offshore) (A020-100) - Caged (offshore) (A020-200) - Onshore aquaculture (A020-300)

1. Other fishing will capture both other inshore shellfish and all other finfish; 2. Other unclear at source (see note 6 page 5); appears to be minor species (without HS code?); Source: Mfish Fisheries and Aquaculture production and trade period ending Sept 2010; ANZSIC classifications; Coriolis analysis

SEAFOOD – INDUSTRY ORGANISATIONS

The Seafood Industry Council is the primary industry body supported by a number associations supporting the seafood farmers and processors

Key seafood industry organisations[1]
(2010)

PRELIMINARY
- In progress -

	# of members	Annual budget	Funding	
SEAFOOD INDUSTRY COUNCIL			- Commodity Levies Act	http://www.seafoodindustry.co.nz
Aquaculture New Zealand			- Commodity Levies Act - NZ Mussel Industry Council (levy) - NZ Salmon Farmers Assn. (levy) - NZ Oyster Industry Assn. (levy)	http://www.aquaculture.org.nz
New Zealand Salmon Farmer's Association Inc.			- Voluntary, subscription based - active freshwater and seawater salmon farmers, salmon processors and service product suppliers to the industry	http://www.salmon.org.nz
new zealand ABALONE FARMERS association			- National body supporting the Abalone farmers in NZ - Formed in 1986 , "13 farms"	http://www.nzafa.org.nz
Mussel Industry Council	350 (ws)		- Representing the interests of NZ mussel growers	-
New Zealand Oyster Industry Association	TBD	TBD	- Representing the interests of NZ mussel growers	
DeepWater Group	14+ (ws)		- Formed in 2005; Deepwater fishing quota holders are shareholders and pay a fee based on their quota	http://www.deepwater.co.nz
New Zealand Federation of Commercial Fishermen			- a national body that represents the interests of owner-operator commercial fishermen in New Zealand	http://www.nzfishfed.co.nz
mfa MARINE FARMING ASSOCIATION			- Subscription based organisation representing South Island marine farmers	http://www.nzmfa.co.nz
New Zealand Rock Lobster Industry Council			- The NZ Rock Lobster Industry Council is an umbrella agency representing the interests of New Zealand's nine regional rock lobster fisheries commercial stakeholder organisations	http://www.nzrocklobster.co.nz

1. Additional organisations at http://www.seafoodindustry.co.nz/n392,67.html Source: Coriolis analysis

SEAFOOD – INDUSTRY SCIENTIFIC RESEARCH

Three organisations have strong involvement in seafood industry research, there are also key specialist organisations

Key scientific research organisations involved in seafood industry research in New Zealand
(2010)

PRELIMINARY
- In progress -

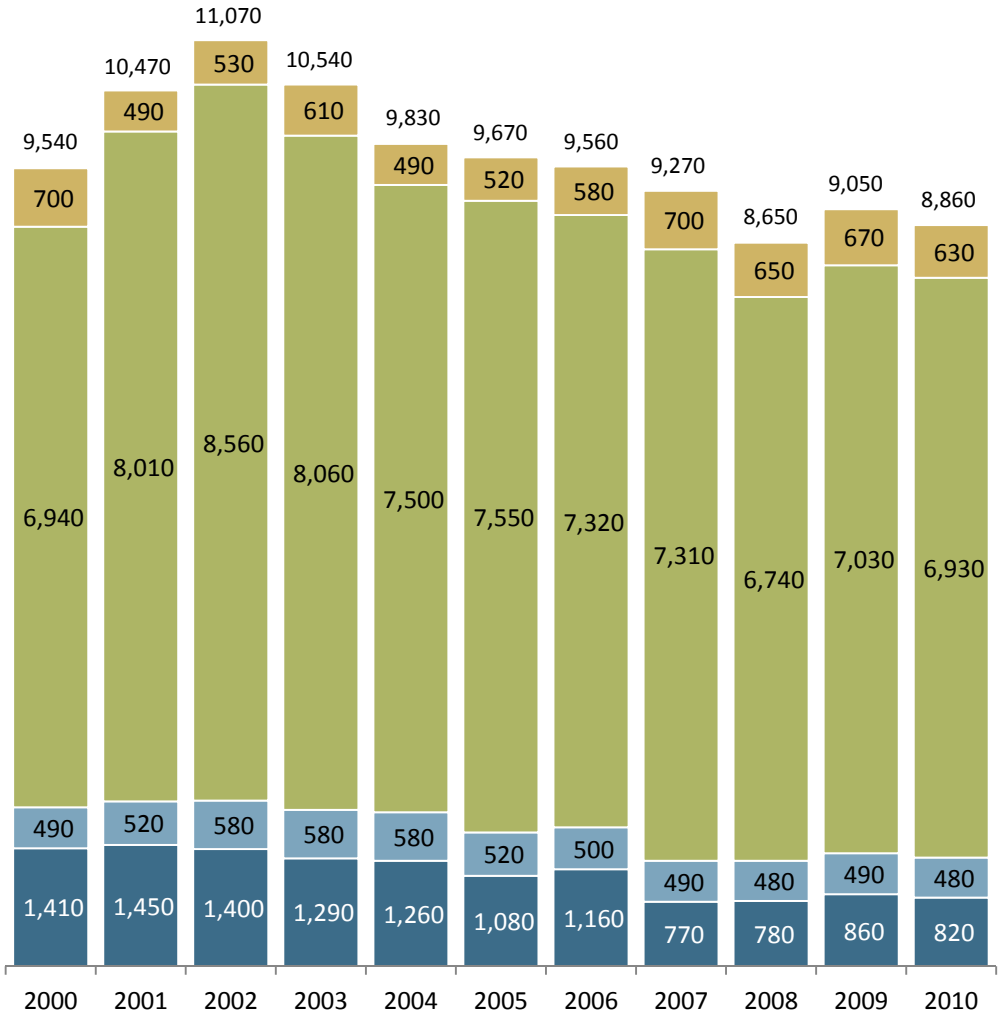
	Total Income	Total Staff	Focus & activities
NIWA Taihoro Nukurangi National Institute of Water & Atmospheric Research	$127.9m (2010)	750 across 16 sites (2010)	- Conducts wide range of activities (e.g. weather forecasting); focuses on atmospheric, marine, and freshwater research – extending from the deep ocean to the upper atmosphere – in New Zealand, the Pacific, Southern Ocean, and Antarctica - Formed in 1992 restructuring of NZ science sector (combined DSIR & Met Service scientific activities); fisheries research of MAF joined in 1995 - Two aquaculture facilities: Bream Bay Aquaculture Park & Mahanga Bay Aquaculture Research Facility - Supporting commercialisation of three new (to NZ) aquaculture species: Kingfish, hapuka and abalone (paua) - $50m aquaculture research facility at Bream Bay with 24 staff - $4.6 million selective breeding research programme aims to develop broodstock for three new key high value species: yellowtail kingfish (Seriola lalandi), groper (hapuka, Polyprion oxygeneios) and paua (abalone, Haliotis iris). It's supported by industry and the Foundation for Science, Research & Technology.
CAWTHRON	$18.4m (2010)	180	- Breeding programs around pacific oysters and green shell mussels around Nelson; developing geoduck - Provides research, consulting and analytical services is area of Aquaculture, Coastal and Freshwater resource use, Biosecurity & Biotechnology - MSI funding is 40% of total income
Plant & Food RESEARCH RANGAHAU AHUMĀRA KAI	$117.5m (2010)	900+	- "Work with the seafood industry to deliver high quality seafood to consumers using sustainable fish production and processing systems" - "Working with nutraceutical companies to identify natural marine compounds with potential health promoting properties and develop safe and economical technologies for industrial production"
MAHURANGI TECHNICAL INSTITUTE	n/a		- Established in 2007 – research into breeding of NZ short finned eels

Source: Cawthron annual report and website; Coriolis analysis

TOTAL SEAFOOD – EMPLOYMENT

The number of people employed in the seafood industry is declining

Number of persons employed in the seafood industry in New Zealand by enterprise unit[1]
(people; 2000-2010)



	CAGR (00-10)	CAGR (09-10)
Seafood wholesaling	-1%	-2%
Seafood processing	-1%	-6%
Aquaculture	0%	-1%
Wild capture	-0.2%	-2%
	-5%	-5%

Comments

- Likely a mixture of increasing industry productivity through:
  - Consolidation (fewer/larger)
  - Automation (replacing labour with machines)
- Question: Are we sending processing offshore? (e.g. to China?)

Notes/Definitions

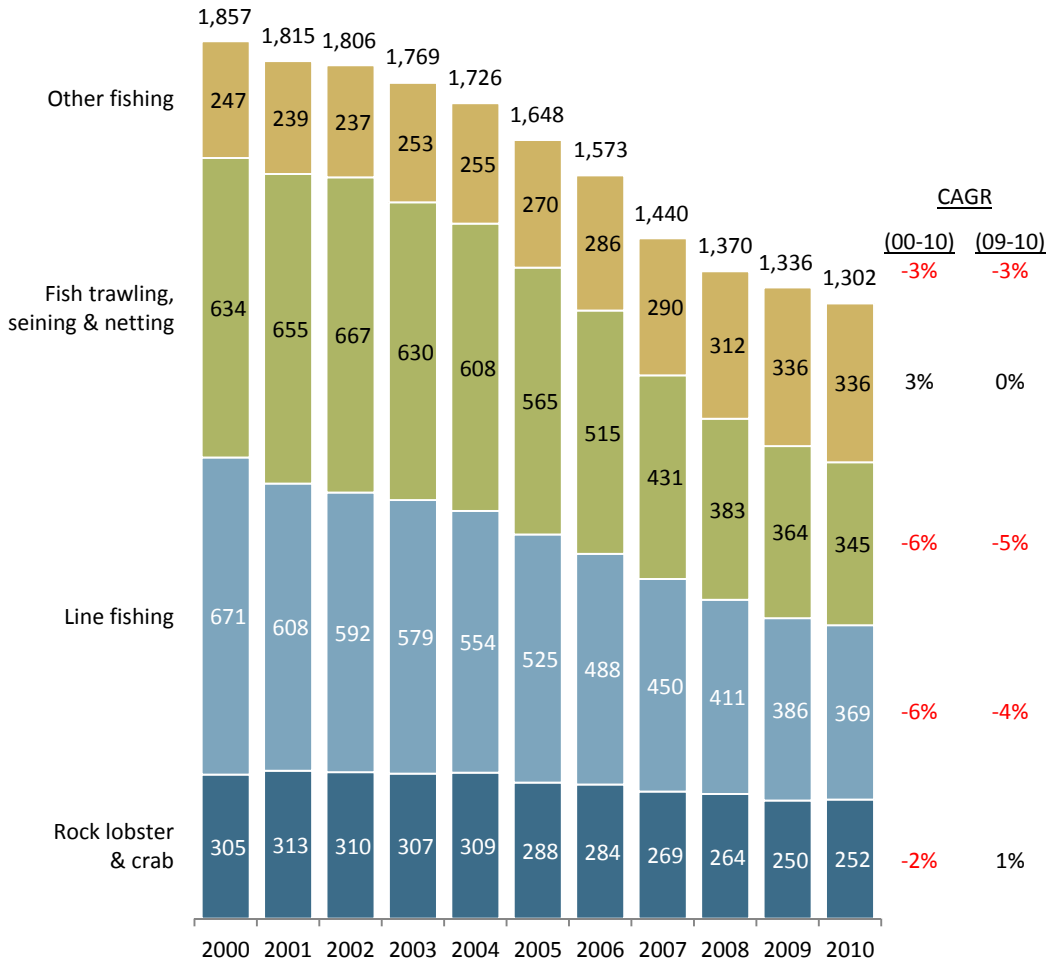
- Wild capture (A041), Aquaculture (A02)
- Seafood processing (C112000), Seafood wholesaling (F360400)
- If business activity is over 51% in one category ie seafood processing all business and employment is categorised in that category, therefore aquaculture appears low.

1. Uses persons employed by enterprise unit; Source: SNZ business demographics detailed industry for enterprise units; Coriolis analysis

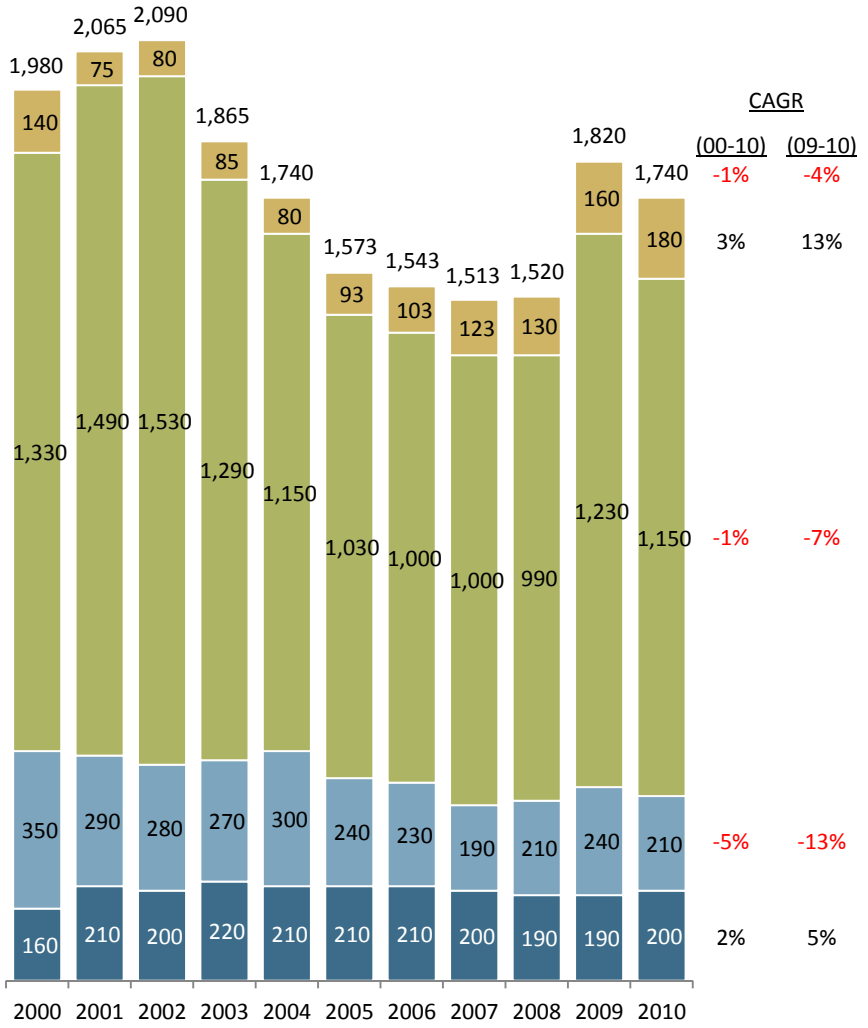
WILD CATCH ENTERPRISES & EMPLOYMENT

The number of wild catch fishing enterprises is falling at -3% per annum (00-10); employment is falling less rapidly at -1% per annum (00-10); appears to indicate increasing productivity

Number of wild capture fishing enterprise units in New Zealand
(enterprise units; 2000-2010)



Number of persons employed in wild capture fishing in New Zealand[2]
(people; 2000-2010)

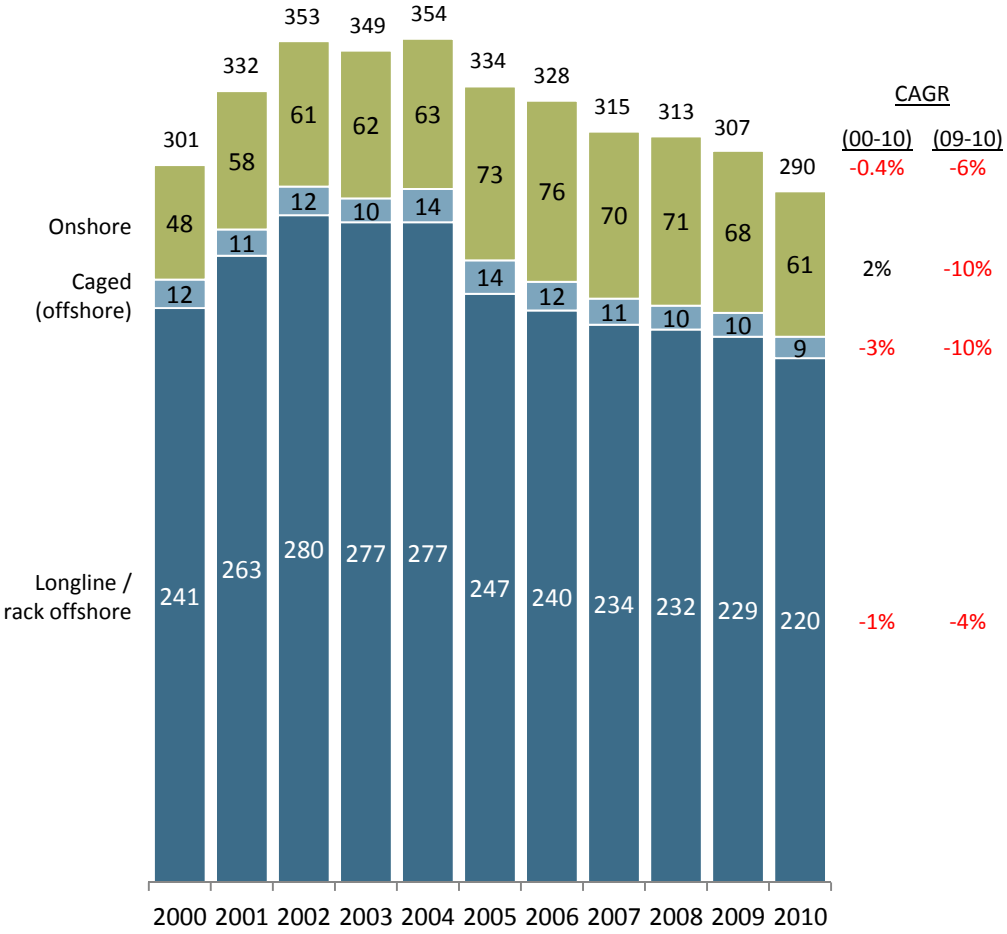


1. Will also reflect use of foreign contract boats/crews; 2. Uses persons employed by geographic units (not enterprise units); Source: SNZ business demographics (detailed industry for enterprise units) and (detailed industry for geographic units); Coriolis analysis

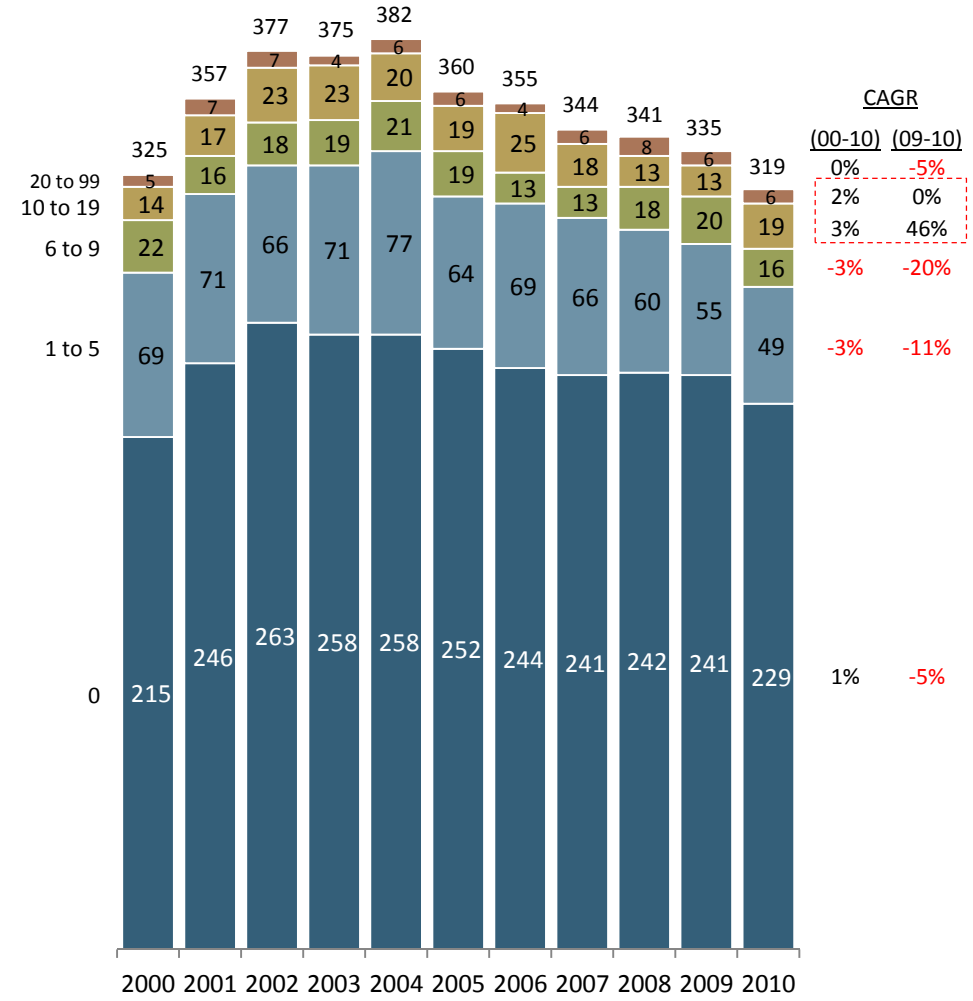
AQUACULTURE – ENTERPRISES

Aquaculture enterprise numbers are falling and growth in number of sites (geographic units) is only coming from large operations; data suggests sector consolidation into fewer/larger operations is underway

Number of aquaculture production enterprise units in New Zealand
(enterprise units; 2000-2010)



Number of aquaculture geographic units by employment size[1]
(people; 2000-2010)



1.. An "enterprise unit" can have a number of "geographic units" (ie sites); Source: SNZ business demographics (detailed industry for enterprise units) and (geographic units by employment size); Coriolis analysis

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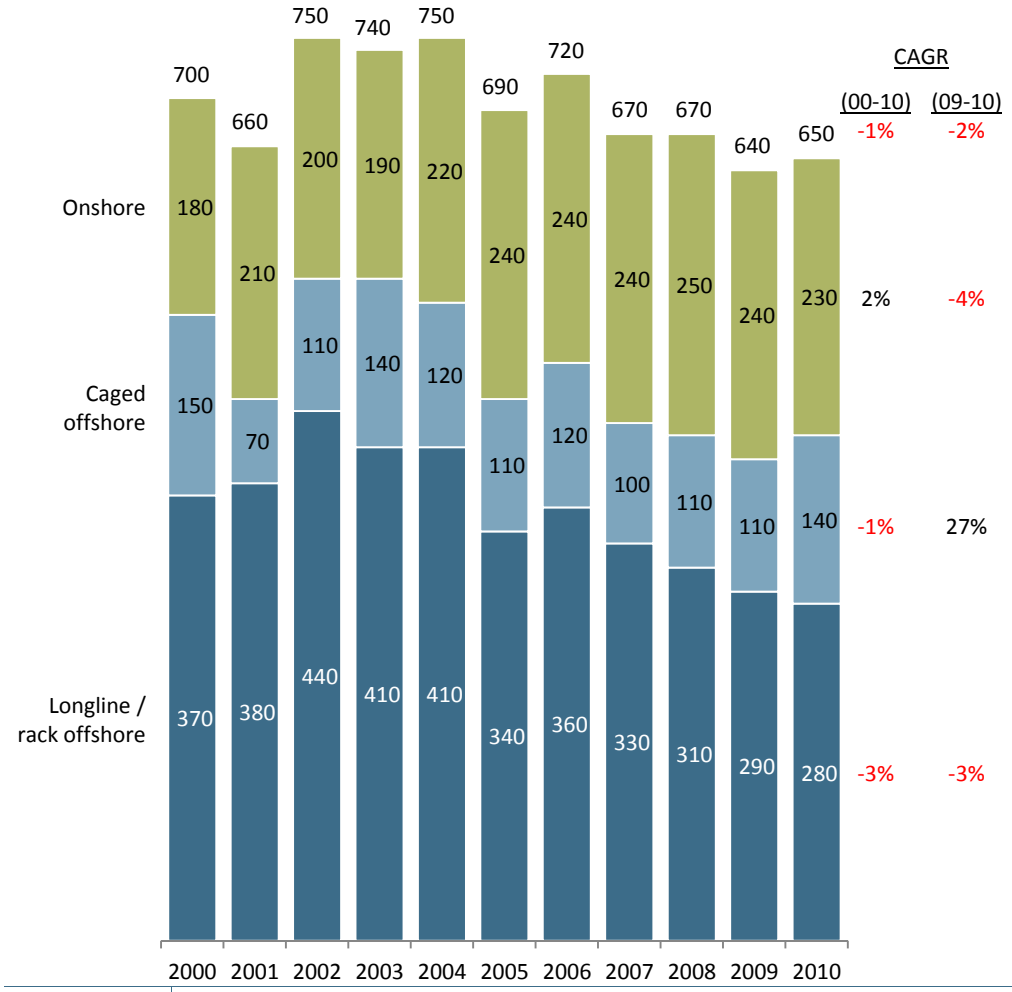
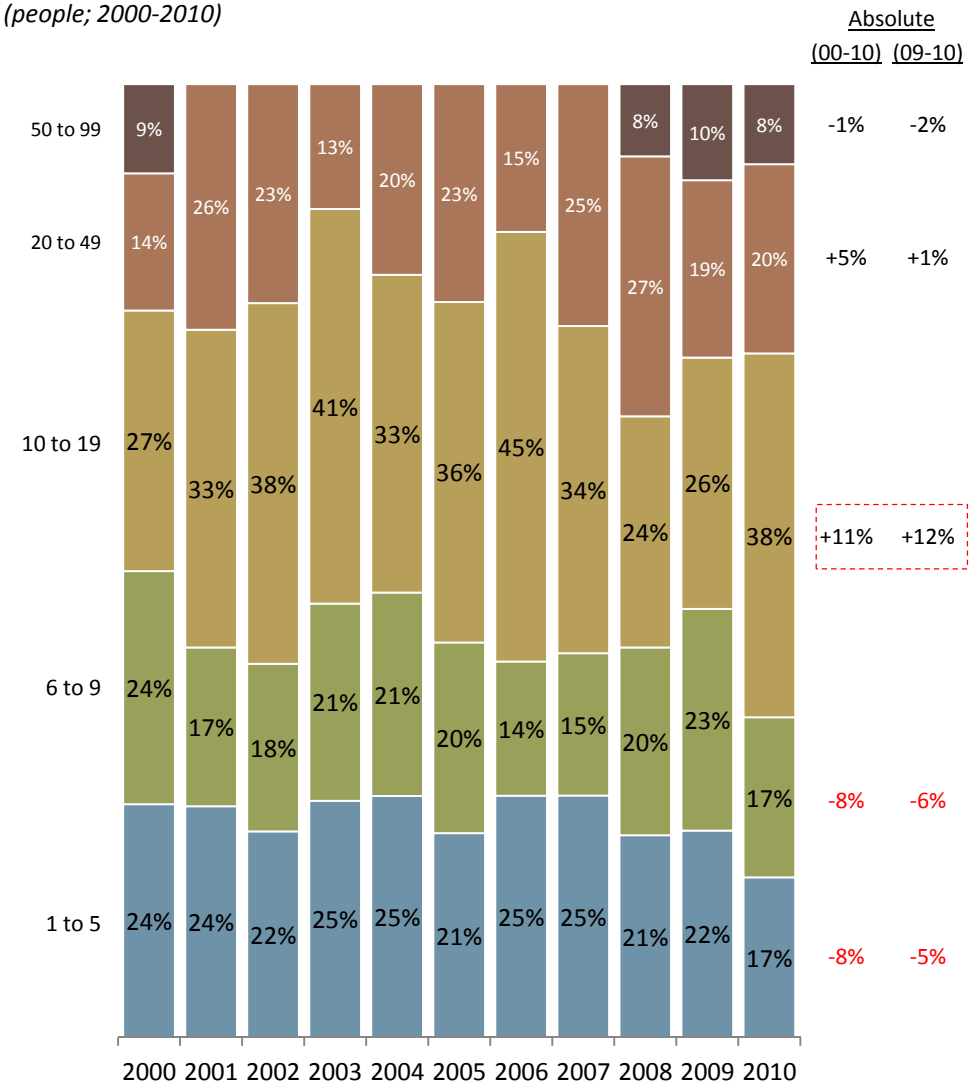
AQUACULTURE – EMPLOYMENT

Aquaculture employment appears to be trending downward, however employment losses are coming from sites employing less than ten people; data again suggests consolidation into fewer/larger operations

Number of persons employed in aquaculture production in NZ[1]
(people; 2000-2010)



Number of persons employed in aquaculture by site employment size[2]
(people; 2000-2010)

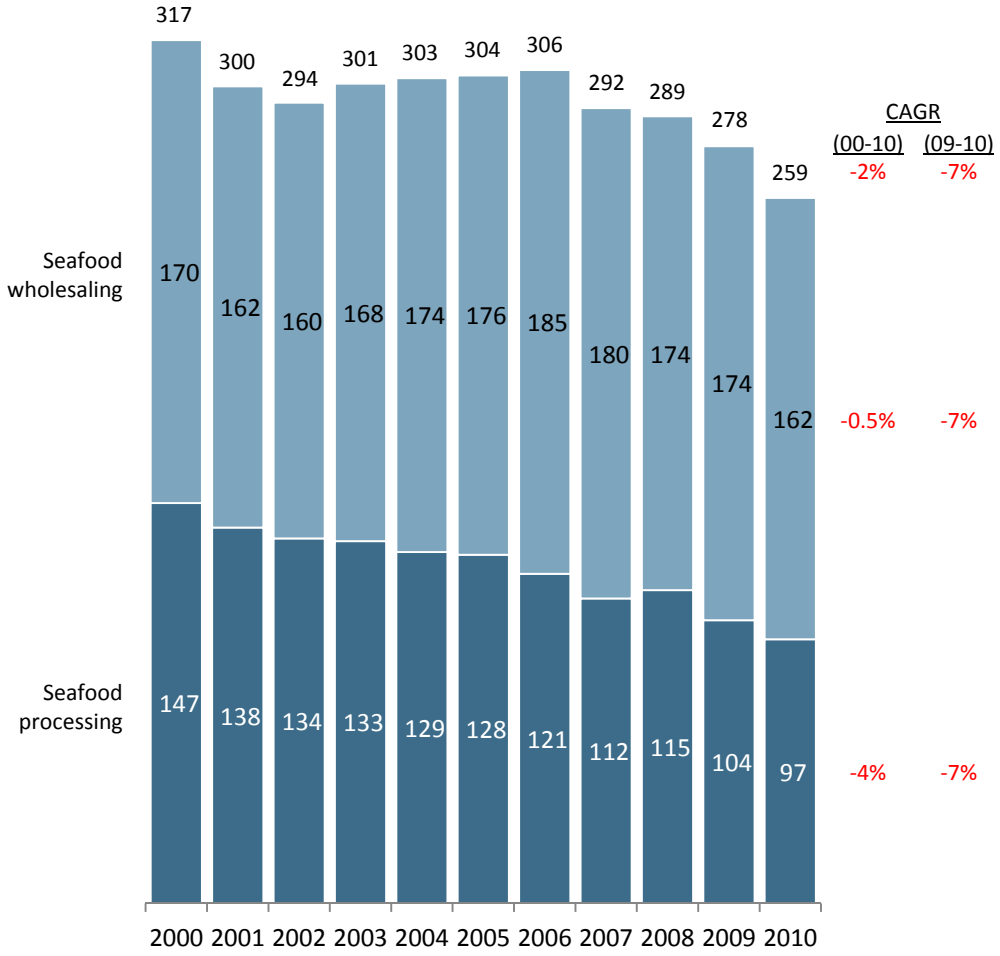


1. By Geographic Unit; 2. site not firm employment size; Source: SNZ business demographics (detailed industry for enterprise units) and (detailed industry for geographic units); Coriolis analysis

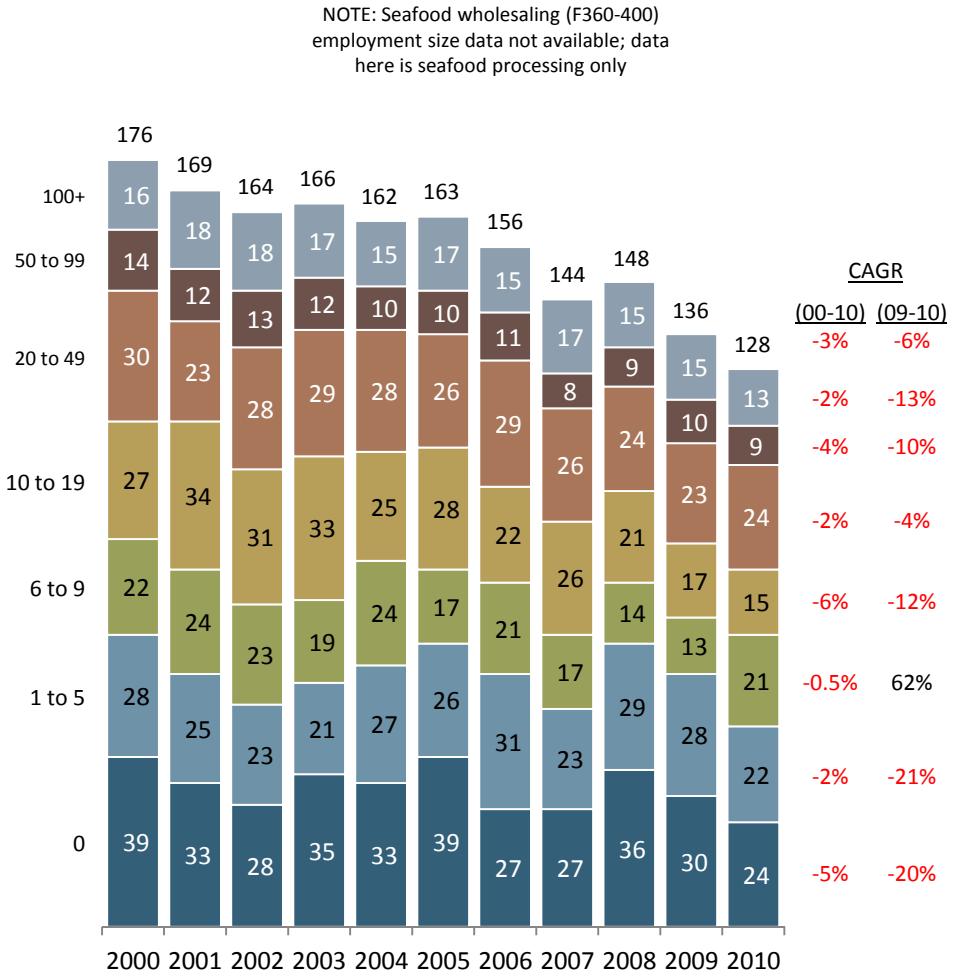
SEAFOOD PROCESSING – ENTERPRISES

Seafood processing and wholesaling have declining enterprise numbers; the loss of processing unit numbers is across the range of site employment sizes

Number of seafood processing & wholesaling enterprise units in NZ
(enterprise units; 2000-2010)



Number of seafood processing geographic units by employment size[1]
(people; 2000-2010)

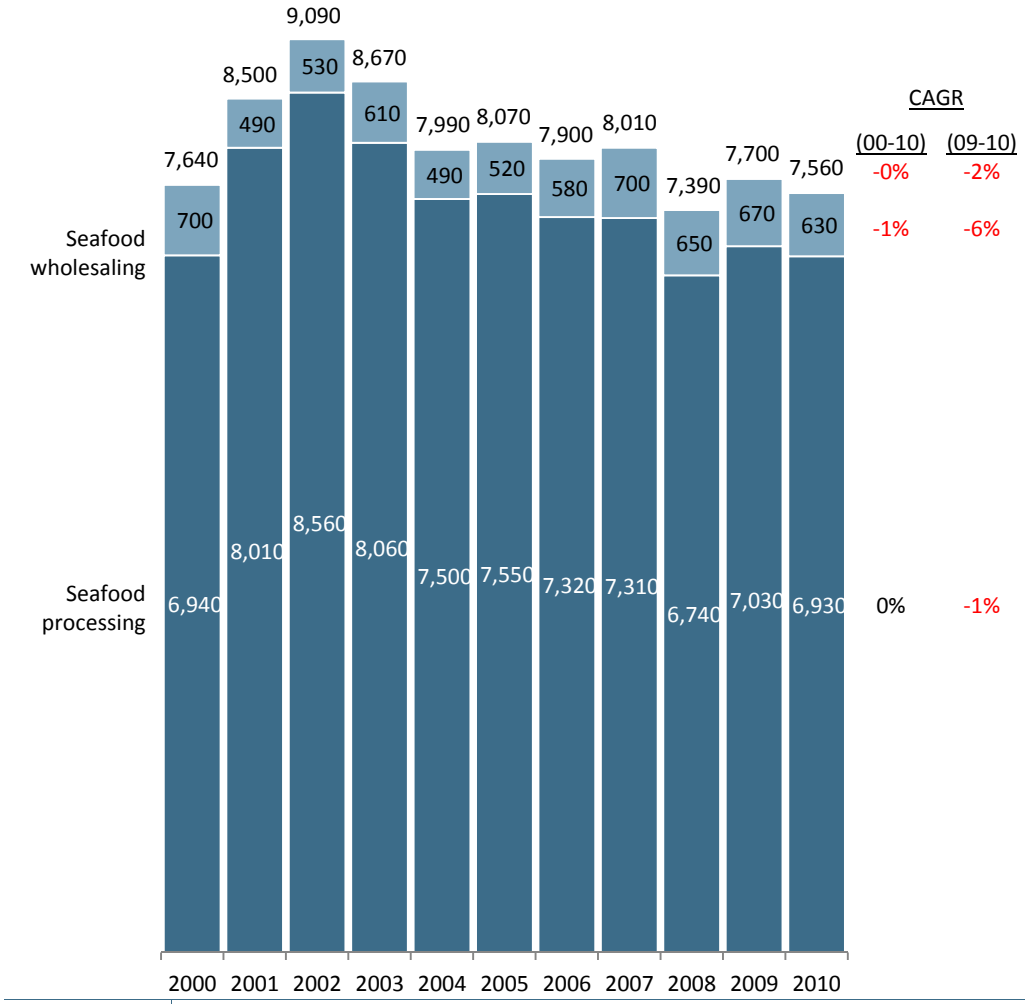


1.. An "enterprise unit" can have a number of "geographic units" (ie sites); Source: SNZ business demographics (detailed industry for enterprise units) and (geographic units by employment size); Coriolis analysis

SEAFOOD PROCESSING – EMPLOYMENT

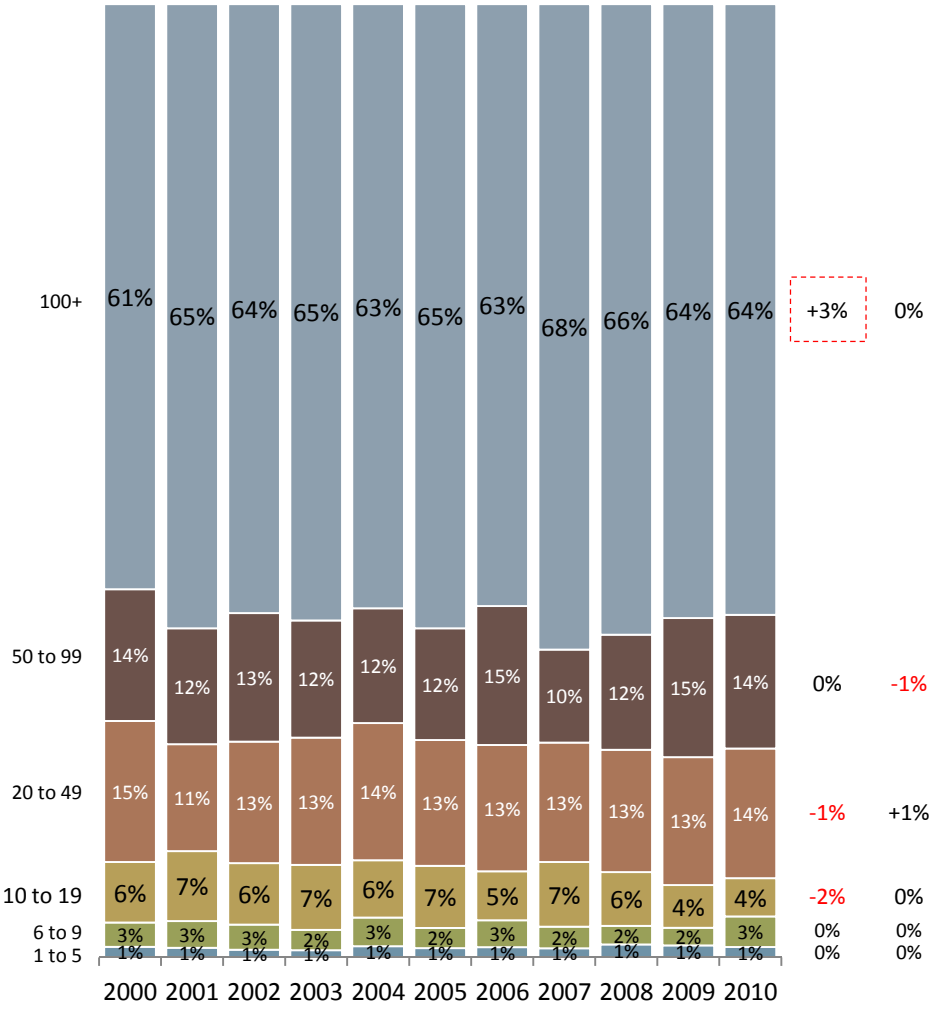
However, total seafood processing and wholesaling employment is flat, with employment growing in the larger firms; data suggests consolidation into fewer/larger firms

Number of persons employed in seafood processing in NZ[1]
(people; 2000-2010)



# of persons employed in seafood processing by site employment size[1]
(people; 2000-2010)

NOTE: Seafood wholesaling (F360-400) employment size data not available; data here is seafood processing only



1. Note uses enterprise employment ; Source: SNZ business demographics (detailed industry for enterprise units) and (detailed industry for geographic units); Coriolis analysis

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