



Dr Cameron Dixon
MRAG Asia Pacific



welcome to
MRAG Asia Pacific

MRAG Asia Pacific is an independent consulting firm dedicated to the sustainable use of natural resources through sound, integrated policies and practices.

We specialise in providing professional advice and technical services to assist management agencies and other stakeholders with the sound management and sustainable development of aquatic resources and ecosystems.



RECENT
PROJECTS

[WCPO Transshipment
Business Ecosystem Study](#)

[Towards the Quantification of
Illegal, Unreported and
Unregulated \(IUU\) Fishing in
the Pacific Islands Region](#)

[Queensland Fisheries
Review](#)

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Careers in Marine Science

An aerial photograph of a tropical reef. In the foreground, a concrete pier extends into the water, with several white motorboats docked. Further out, a wooden pier is also visible with more boats. The water transitions from shallow, clear turquoise to deep, dark blue. A large, rusted metal shipwreck is visible in the distance. The sky is a clear, bright blue.

- Fisheries and Aquaculture
 - Science
 - Management
 - Production
- Oceanography, chemistry, resource management etc
 - Institutes or Govt Agencies
 - Various Government Departments
 - Australian Institute of Marine Science
 - Great Barrier Reef Marine Park Authority
 - Universities
 - ENGOs: MSC, WWF, AMCS
 - Private – Consultancy Companies





THE UNIVERSITY OF
MELBOURNE
Australia







Fisheries production and seafood consumption

- Australia is a minor seafood player, producing 150,000 t (<0.2% of global seafood supply).
- NZ catches around 500,000 t annually, with Hoki alone producing 120,000 t in 2018/19
- Peruvian anchovetta annual catches up to 8,300,000 t in recent years (13,100,000 t maximum catch).
- Export earnings accounting for 49% of the Aus. total production value
- Australia's apparent consumption of seafood is 15 kg per person. World consumption is 19 kg per person.
- Imports accounted for 66 per cent of Australia's total consumption.



Marine
Stewardship
Council

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A background image of a blue ocean with white-capped waves and a seagull flying in the sky.

WILD CERTIFIED SUSTAINABLE

For 20 years the Marine Stewardship Council has been part of a team effort to keep oceans healthy and full of life. Choose the blue fish label and make sure the fish you eat can be traced back to a sustainable source. Keep it wild.

Principle 1

Sustainable stocks and harvest strategy

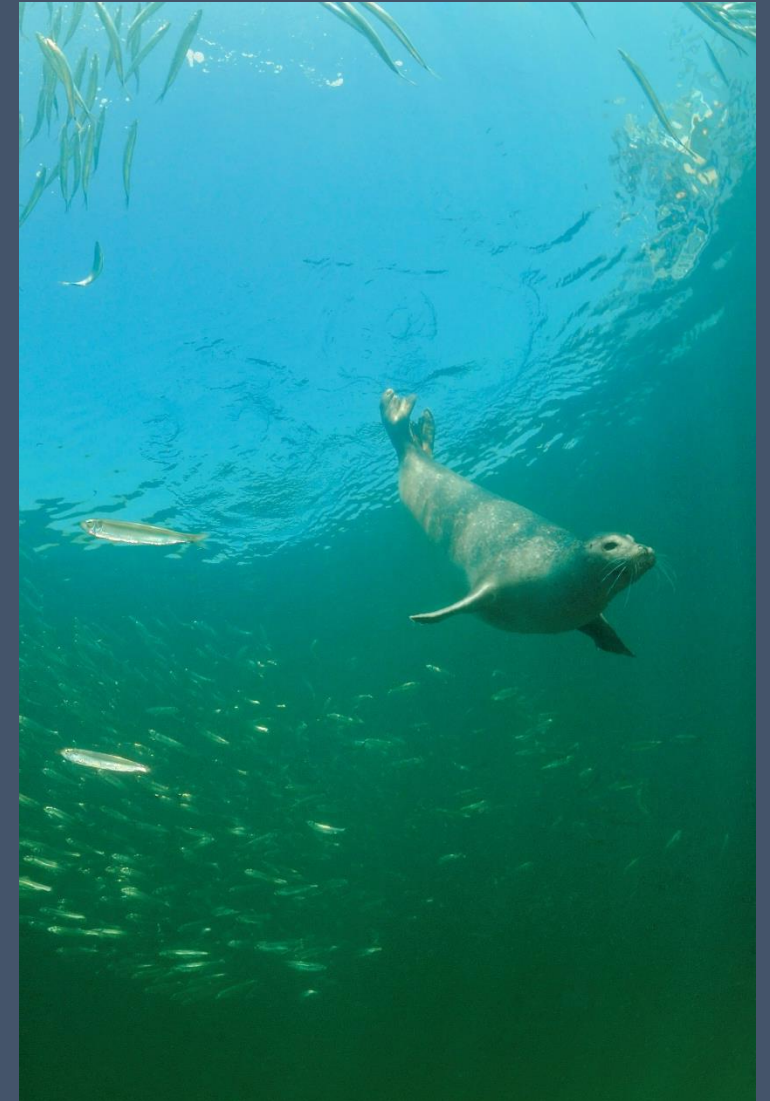
Principle 2

Ecologically Sustainable stocks

- Non-target species
- ETPs
- Habitats
- Ecosystems

Principle 3

Legal system and Fishery specific management



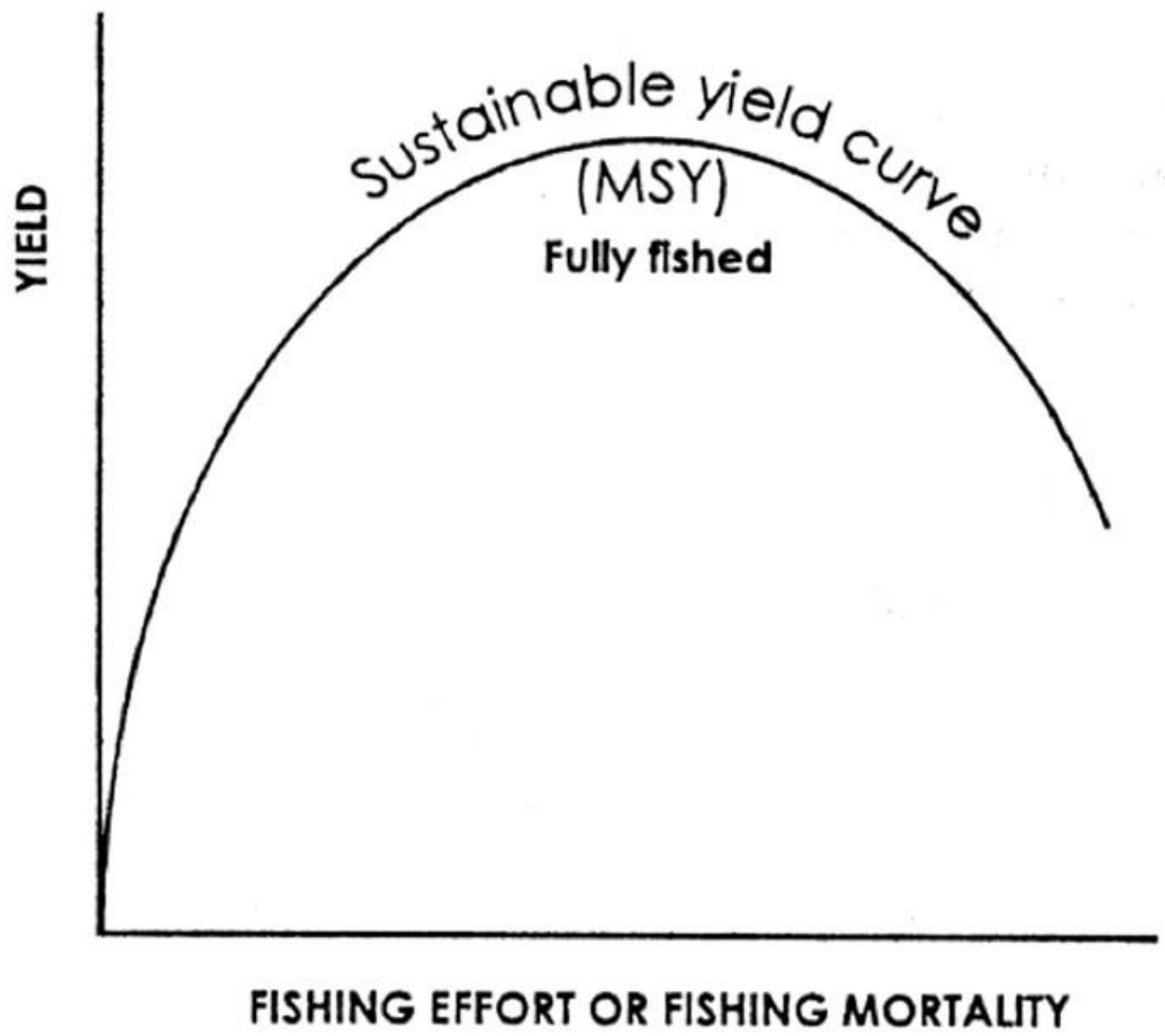
Principle 1 - Target stock

- Density dependence
- Sustainability
 - Sustainable harvest of stocks (maximum sustainable yield)
 - Ecologically sustainable harvest
- Overfishing
- Harvest Strategy
- Population dynamics

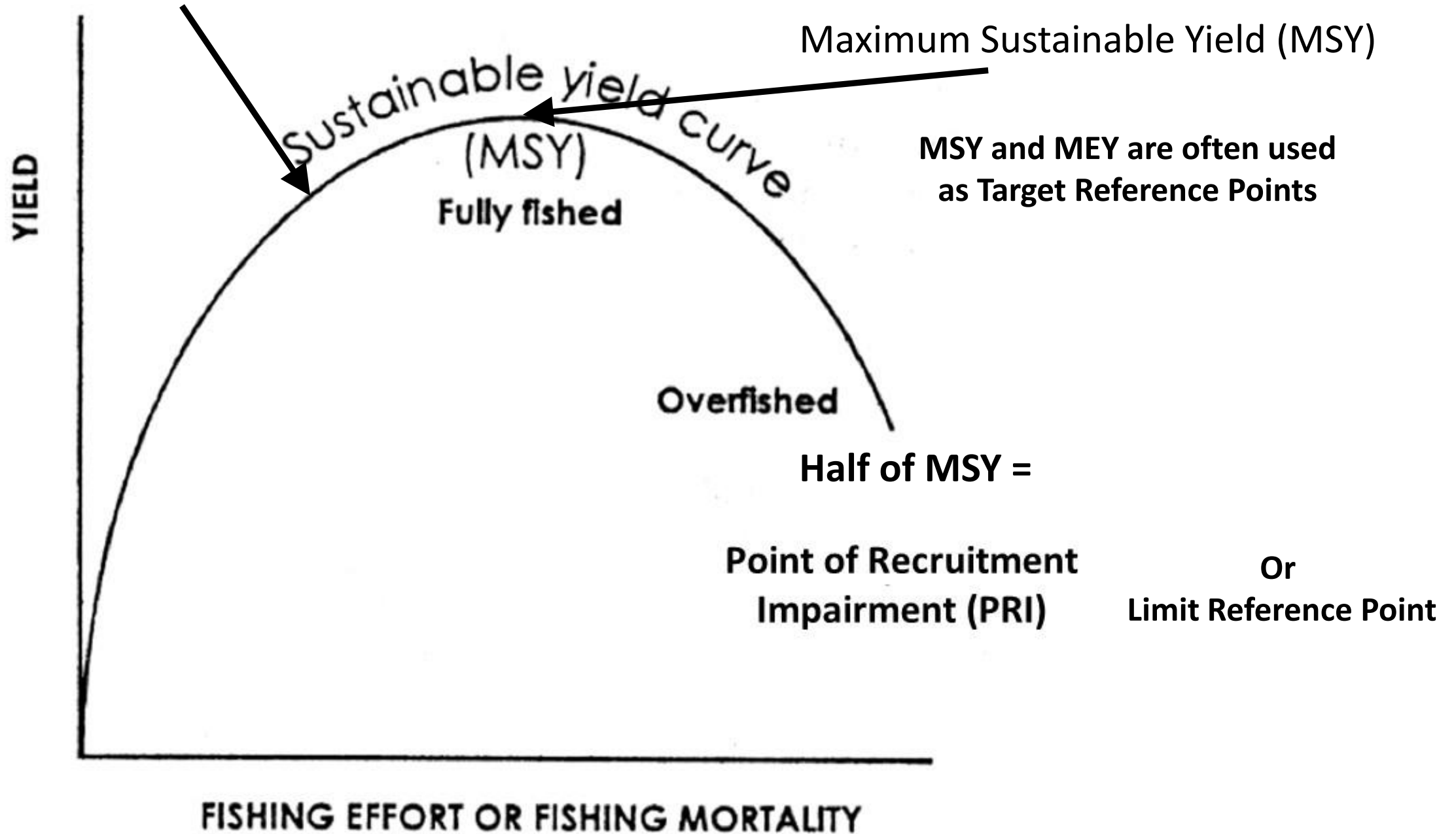


Density dependence

- Growth
- Reproduction
- Survival



Maximum Economic Yield (MEY)



:: [Check out the new 2020 SAFS Report \(5th edition\) available now on this site as part of the World Ocean Day!](#) ::

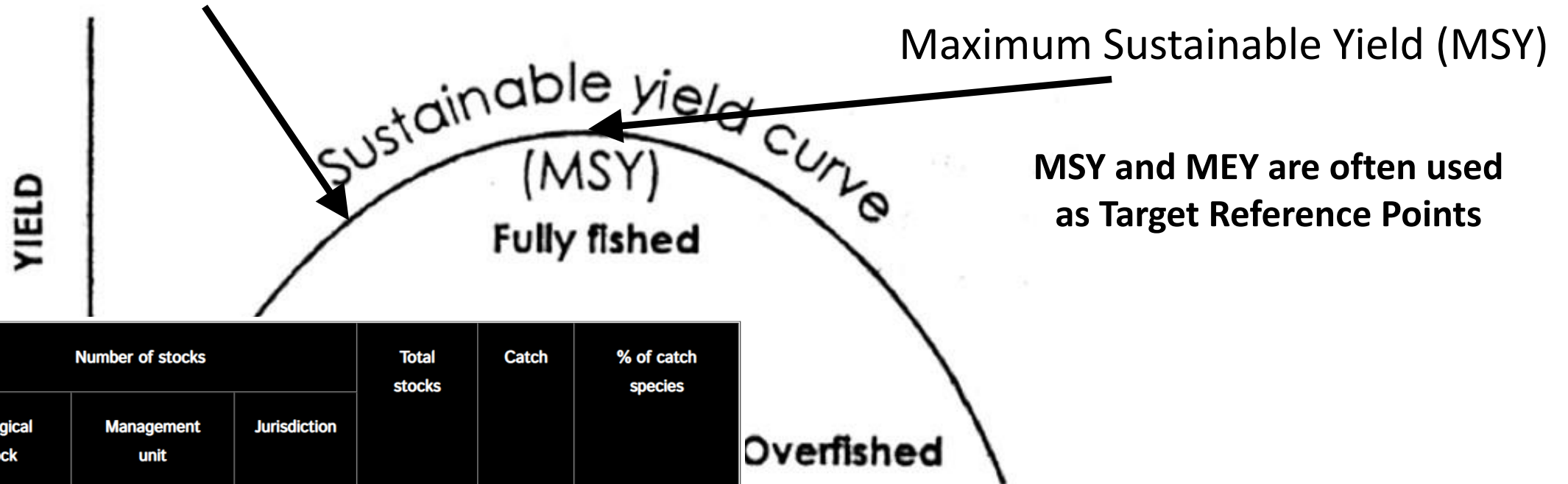
Welcome to the Status of Australian Fish Stocks Reports

The Status of Australian Fish Stocks Reports brings together available biological, catch and effort information to determine the status of Australia's key wild catch fish stocks. As of July 2018, SAFS summary information has been used to inform Australia's progress against [UN Sustainable Development Goal 14.4.1](#), proportion of fish stocks within biologically sustainable levels. The United Nations Sustainability Goals are the blueprint to achieve a better and more sustainable future for all.



[Or view all species](#) →

Maximum Economic Yield (MSY)



Half of MSY =

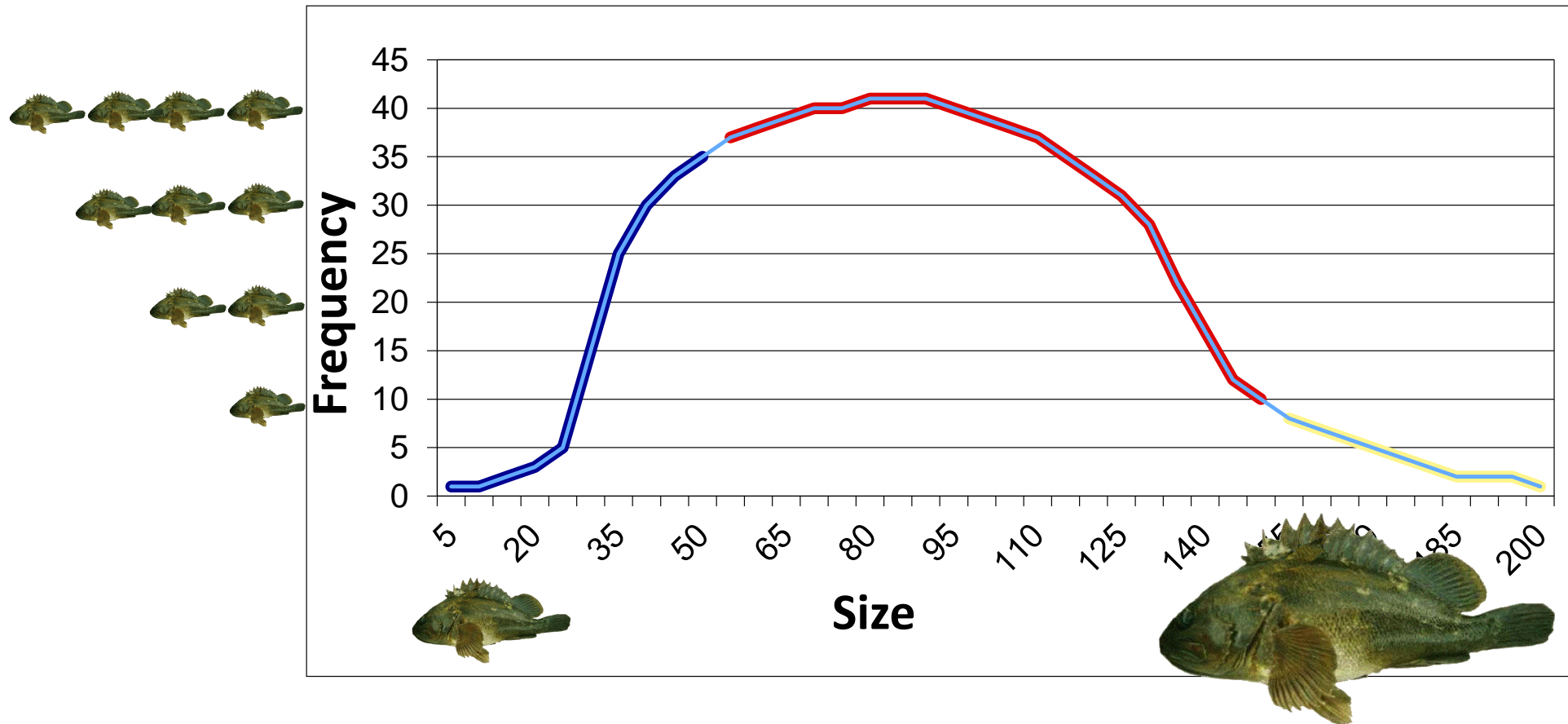
Point of Recruitment
Impairment (PRI)

Or
Limit Reference Point

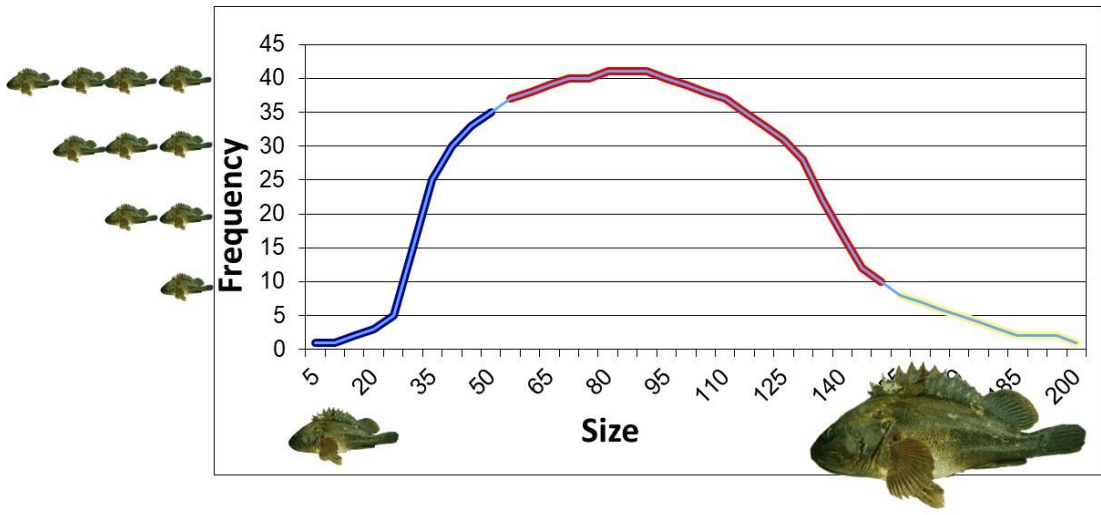
MORTALITY

Stock Status	Number of stocks			Total stocks	Catch	% of catch species
	Biological stock	Management unit	Jurisdiction			
Sustainable	127	102	73	302	134,738	91.70
Depleting	4	10	3	17	1,695	1.15
Recovering	9	4	3	16	6,617	4.50
Depleted	14	15	7	36	2,085	1.42
Undefined	17	25	28	70	1,779	1.21
Negligible	3	3	30	36	27	0.02
Total	174	159	144	477	146,941	100

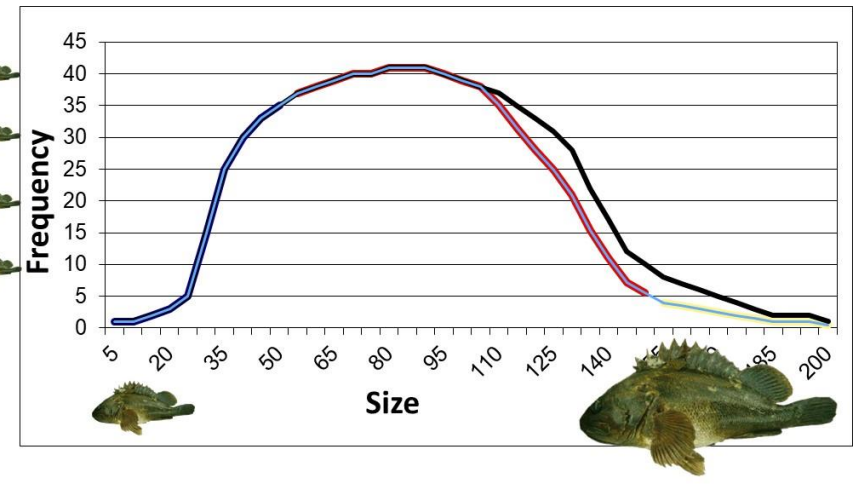
Population dynamics & fisheries data



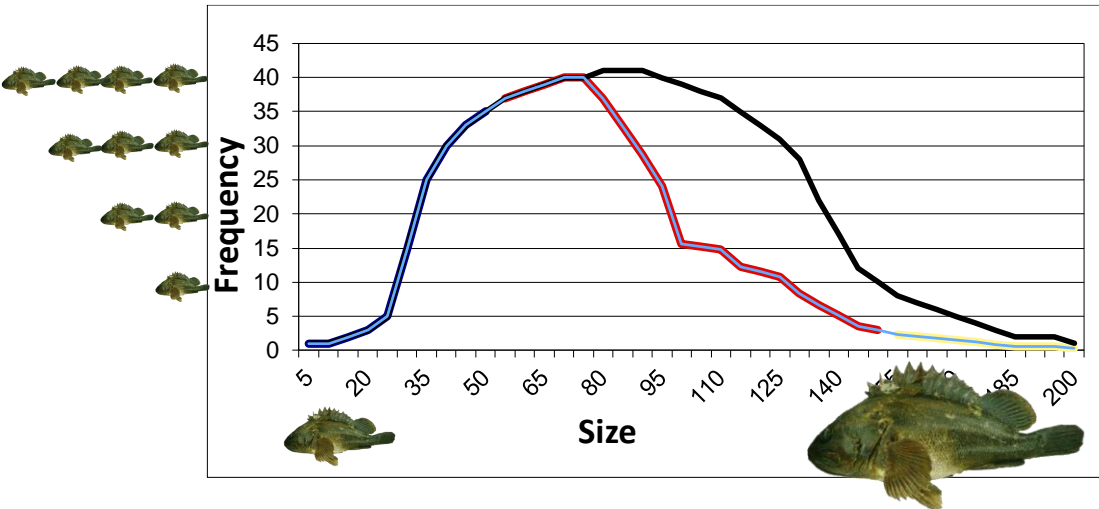
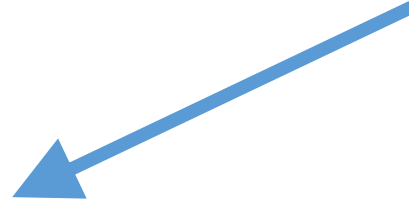
FISHING EFFORT = 0



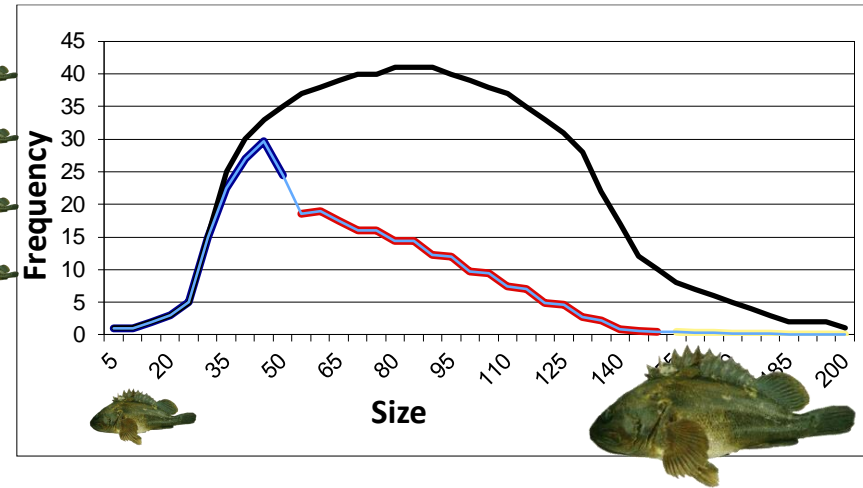
FISHING EFFORT = 0



FISHING EFFORT



FISHING EFFORT



FISHING EFFORT



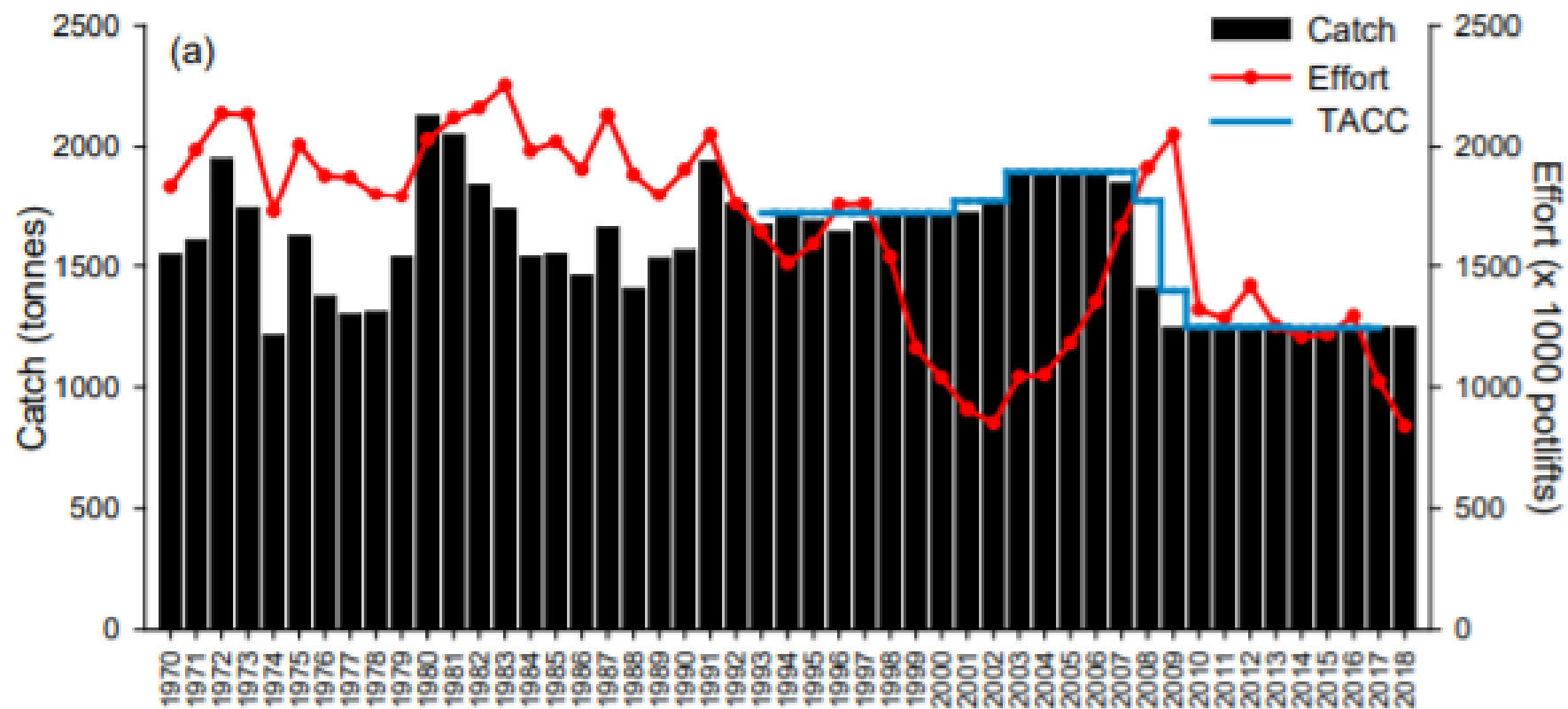
A large, light-colored shark is the central focus, lying horizontally across the frame. It is surrounded by a dense, chaotic pile of various marine life, including numerous smaller fish of different species and colors (some with blue stripes), several large crabs, and other sea creatures. The scene is brightly lit, highlighting the textures and colors of the organisms.

How do we assess fish stocks?
Data and stock assessment

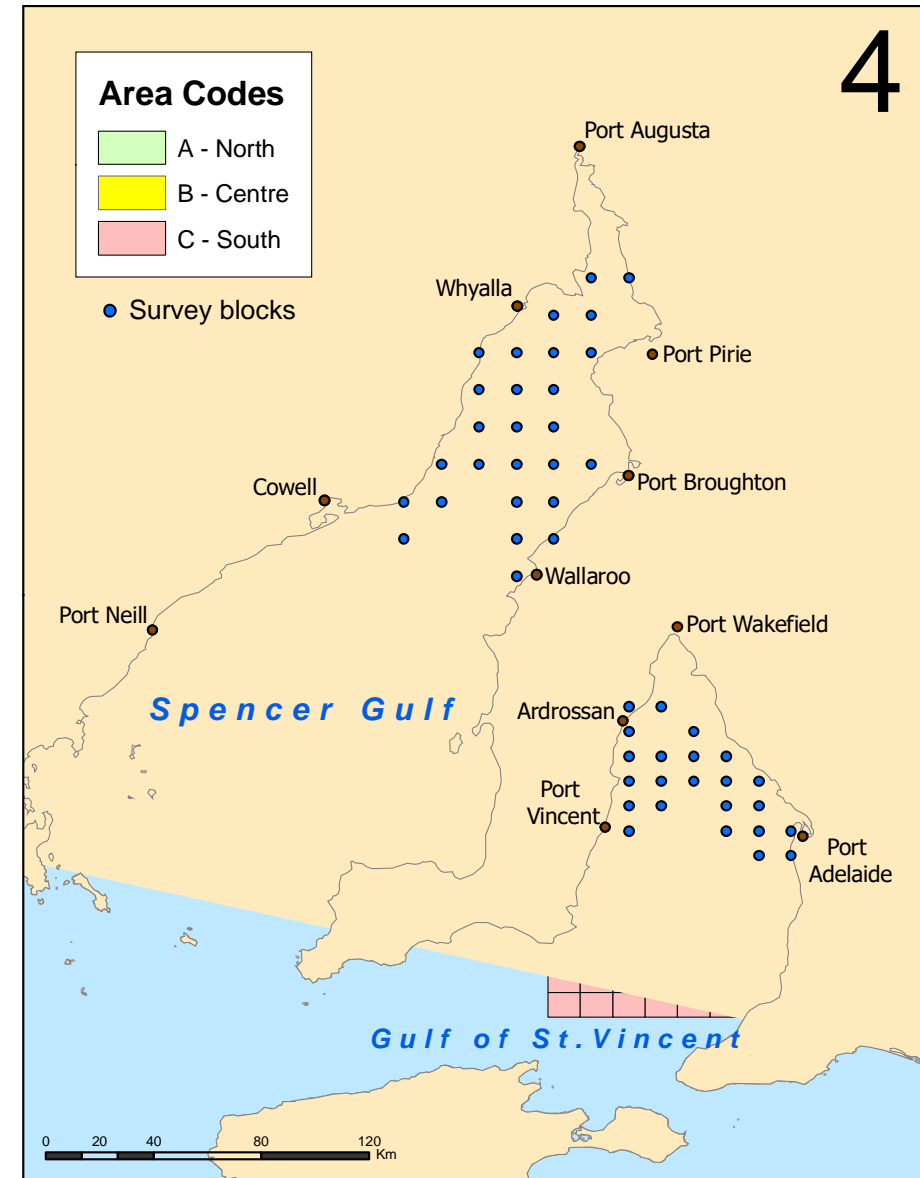
Need to understand the biology



Fishery statistics: Catch and Effort

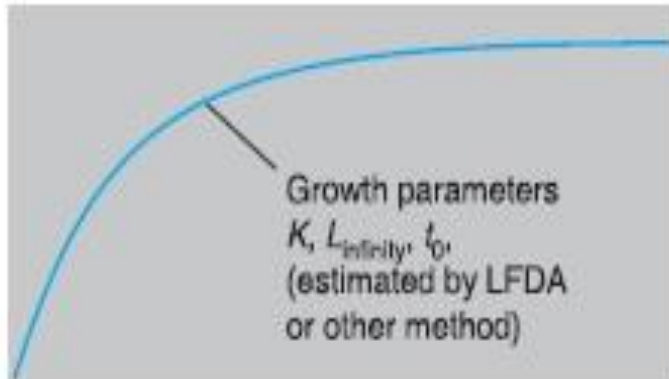


Collect independent survey data

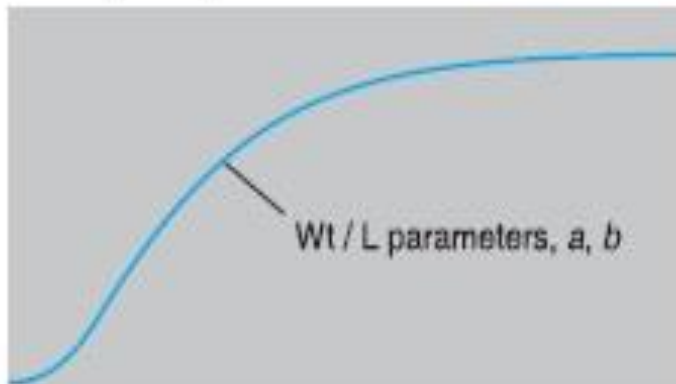


Fishery models – Population dynamics

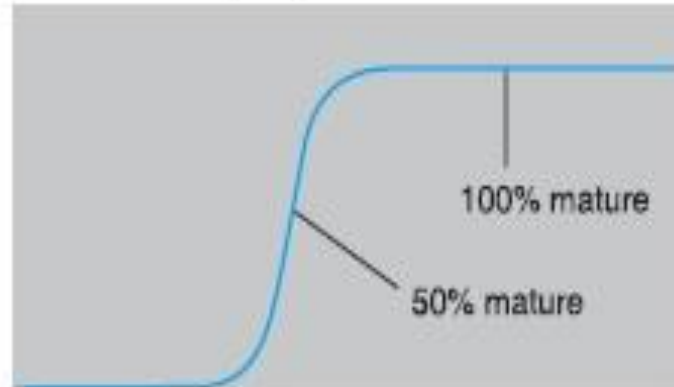
A. Length at age



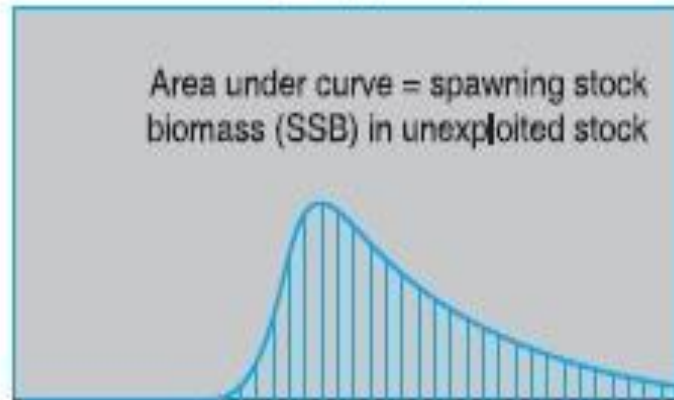
B. Weight at age



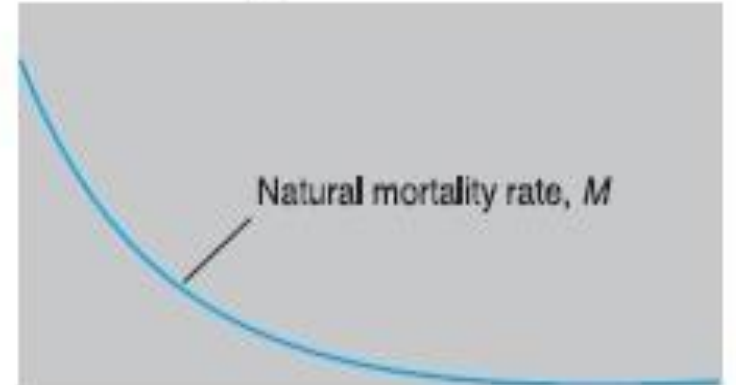
E. Fish maturity at age



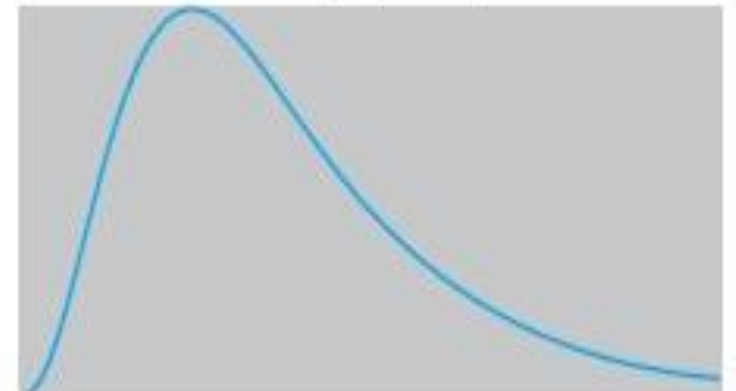
F. Mature biomass (SSB) (= D x E)



C. Numbers at age



D. Total biomass at age (= B x C)



HARVEST STRATEGY: GOVERNMENTS WAY TO CONTROL FISHING EFFORT

A harvest strategy sets out the decision rules for the fishery to harvest the stocks sustainably





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← [Domestic fisheries](#)

[Commonwealth Fisheries
Policy Statement](#)

[Commonwealth Fisheries
Harvest Strategy Policy and
Guidelines](#) ▾

[2005 ministerial direction
to AFMA](#)

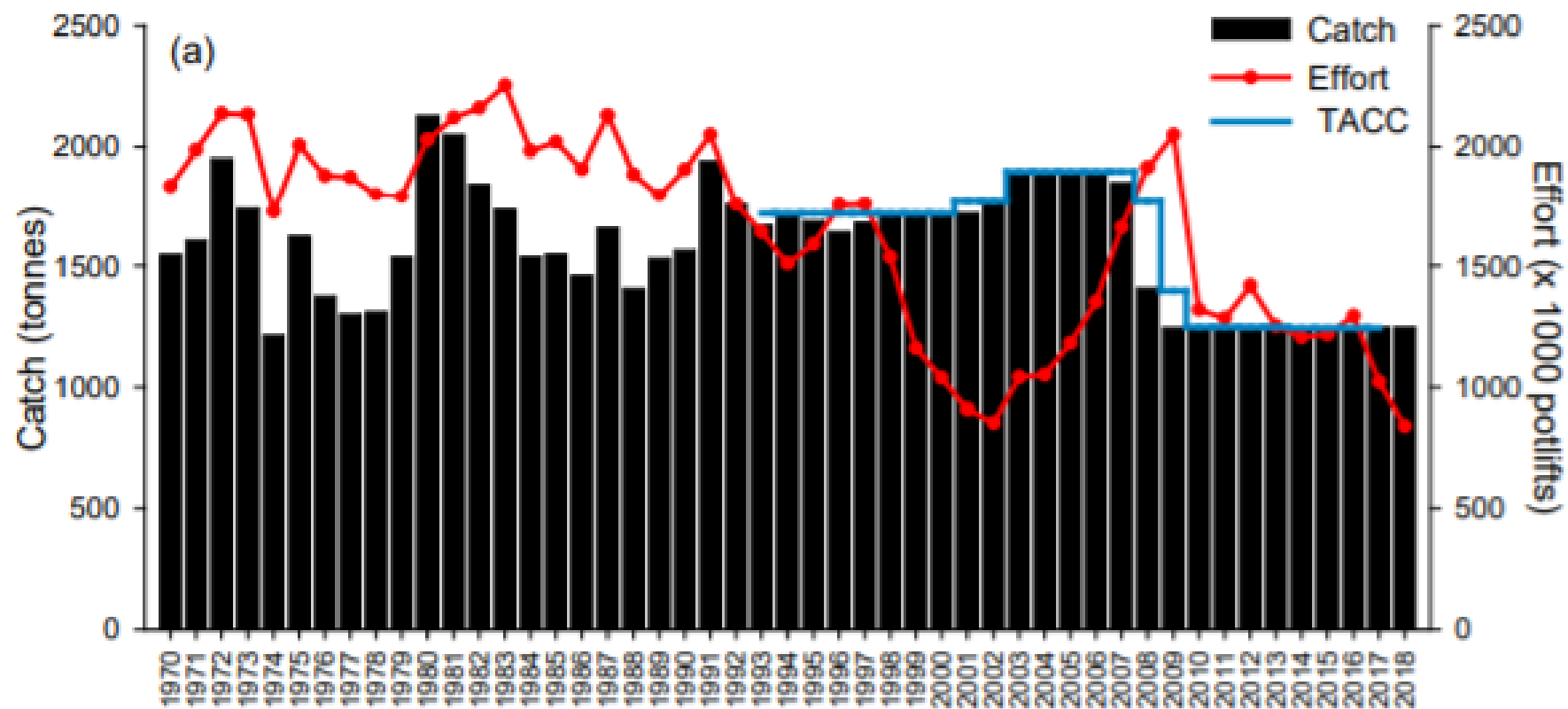
Commonwealth Fisheries Harvest Strategy Policy and Guidelines

Department of Agriculture and Water Resources, September 2007

In December 2005, the then Australian Government Minister for Fisheries, Forestry and Conservation issued a ministerial direction to the [Australian Fisheries Management Authority](#) (AFMA) under section 91 of the *Fisheries Administration Act 1991*. The [ministerial direction](#) included a requirement for the development of a world's best practice harvest strategy policy for Commonwealth fisheries. The harvest strategy policy was developed to satisfy that requirement.

In September 2007 the then Australian Government released the 'Commonwealth Fisheries Harvest Strategy Policy and Guidelines'. The then minister required AFMA to implement harvest strategies in all relevant Commonwealth fisheries by January 2008.

Fishery statistics: Catch and Effort



Principle 2 - Ecologically sustainable harvest





Prawn trawl fisheries in Australia



Prawn trawl fisheries in Australia

MSC certified:

Spencer Gulf Prawn Fishery – <https://fisheries.msc.org/en/fisheries/spencer-gulf-king-prawn/@@assessments>

Australia Northern Prawn – <https://fisheries.msc.org/en/fisheries/australia-northern-prawn/@@assessments>

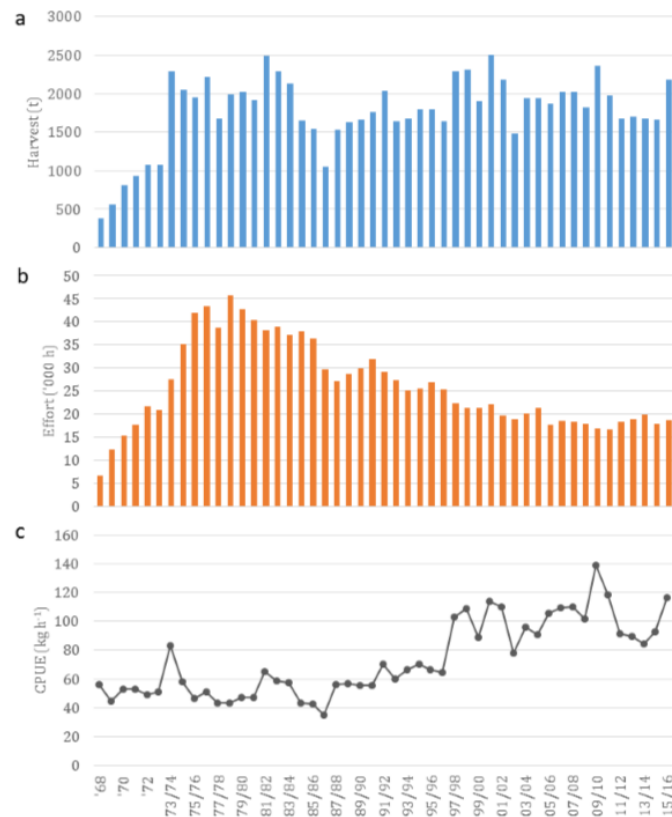


Figure 3.6. a) Annual harvest; b) effort; and c) CPUE in the SGPF from 1968–2015/16.

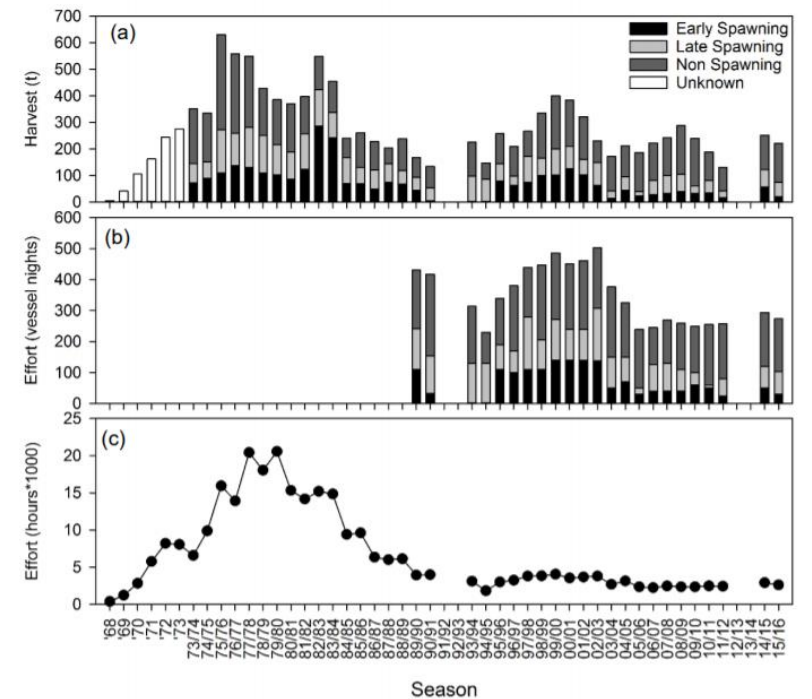
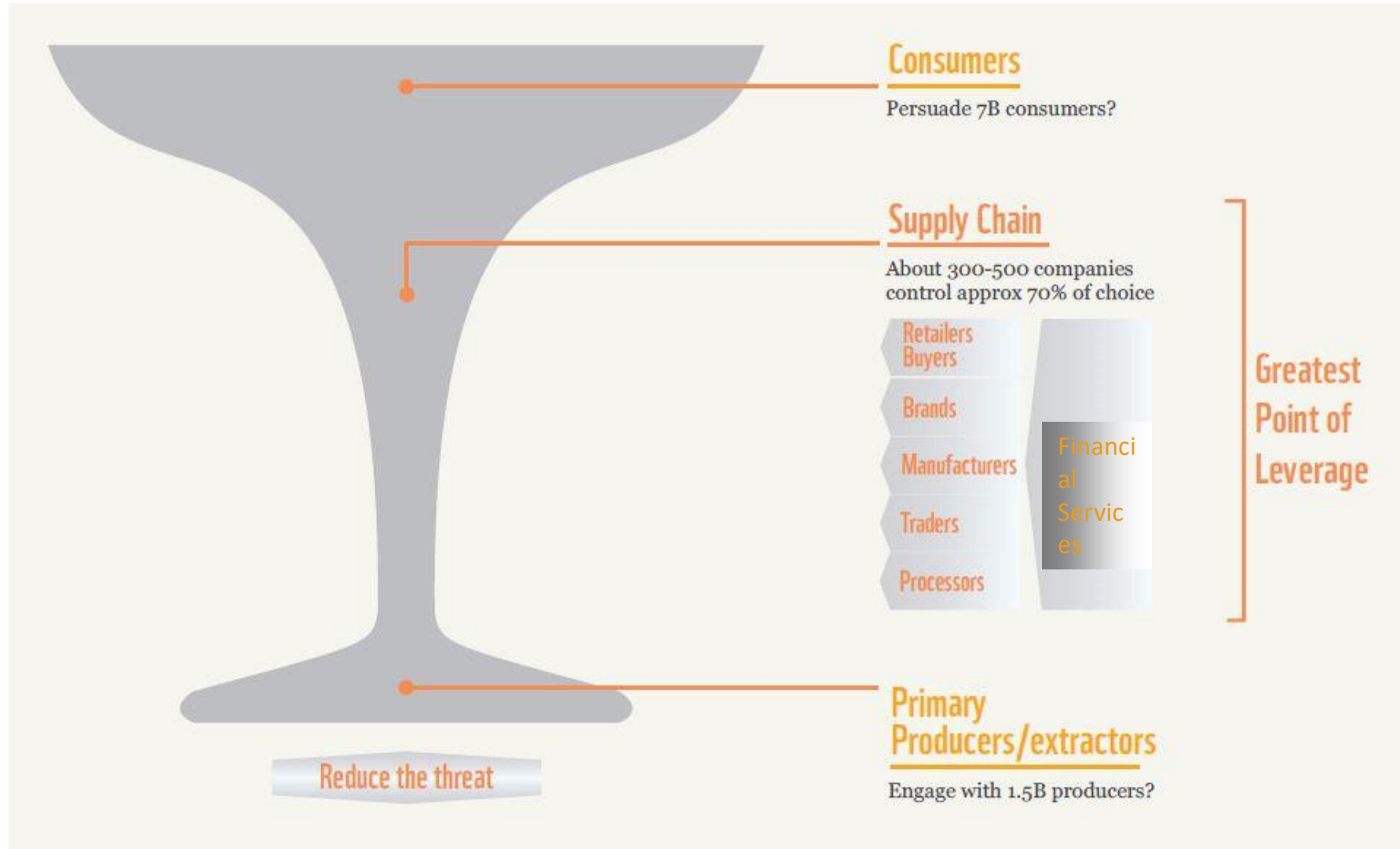


Figure 3.5 Fishery-dependent catch and effort data outputs for the Gulf St Vincent Prawn Fishery; (a) annual catch (t, including surveys) and (b) effort (vessel nights) separated by early spawning (November–December), late spawning (January–March) and non-spawning (April–October) and (c) annual commercial effort (hours * 1000).



Driving sustainable fishing practices: Market Transformation



By 2020 we will have achieved the following.....

Healthy for You

Simply Health



1. Boost the nutritional profile of all of our food and drink by improving the balance of nutrients and removing additives of concern
2. Provide clear nutrition labelling on all our food and drink
3. Offer specialised ranges of food and drink developed to meet customer health needs
4. Inspire customers to prepare and serve nutritious meals

Fresh and Natural



5. Remove or avoid all chemicals of concern from our farms, factories and packaging
6. Thoroughly evaluate emerging product technologies and adopt policies based on science, with Coles customer insights
7. Maximise freshness by offering our foods at the earliest possible time from picking, catching or producing

Responsible Sourcing

Environmental Stewardship



8. Only source from factories and farms with an environment management plan
9. Only sell responsibly sourced seafood
10. Deliver environmental certification in key raw material commodities
11. Actively improve the carbon and water footprint in the worst performing categories
12. Implement a packaging strategy based on sustainable packaging guidelines from the Australian Packaging Covenant
13. Helping our customers to reduce their environmental footprint

Caring for Animals



14. Only source livestock and fish which is fully traceable
15. All livestock to be sourced from farms that are independently assessed to the Five Freedoms
16. 'Against animal testing' certification in place

Fairly Traded



7. Always look to source from Australian growers, farmers and manufacturers first
18. Extend our ethical sourcing program to a) improve wages & benefits and working hours in areas of high risk and b) move down the supply chain in key high risk areas
19. Invest down our supply chain in priority categories to build sustainable communities
20. Increase the amount of products with an ethical certification

Coles “Responsibly sourced seafood”

“Australia’s number one destination for responsibly sourced seafood.”

Seafood Counter



Grocery Frozen Fish



Canned Fish



Welcome to Fishery Progress

A fishery improvement project uses the power of the private sector to address challenges in a fishery. As the number of FIPs around the world has grown rapidly, businesses and conservation organizations need an easier way to access consistent, reliable information about FIP progress.

FisheryProgress.org gives you a range of information about global FIPs from a quick snapshot of progress and opportunities to get involved to detailed evidence for improvements.

[Learn more »](#)



Orange roughy



List of useful websites

Tip: search with Google Scholar not just Google!! You can download many research papers for free.

If you can't find a copy of a paper for free, search the authors name on "researchgate". Scientists on Researchgate often have a free copy of their articles to download on the site.

Australian:

Fisheries Research and Development Corporation (FRDC) - <http://www.frdc.com.au/>

Status of Australian Fish Stocks Reports - <http://fish.gov.au/>

Whichfish - <http://whichfish.com.au/>

The Australian Fisheries Management Authority (AFMA) – <http://www.afma.gov.au/>

ABARES Fishery Status Reports - <http://www.agriculture.gov.au/abares/publications/pubs?url=http://143.188.17.20/anrdl/DAFFService/pubs.php%3FseriesName%3DFishStatus%26sort%3Ddate%26sortOrder%3Ddesc%26showIndex%3Dtrue%26outputType%3Dlist%26indexLetter%3D>

CSIRO - <https://www.csiro.au/>

Queensland Department of Agriculture and Fisheries - <https://www.daf.qld.gov.au/>

NSW Department of Primary Industries - <https://www.dpi.nsw.gov.au/fishing>

NT Department of Primary Industry and Resources - <https://dpir.nt.gov.au/fisheries>

Victorian Fisheries Authority - <https://vfa.vic.gov.au/>

Tasmanian Department of Primary Industries, Parks, Water and Environment - <http://dpiuwe.tas.gov.au/sea-fishing-aquaculture>

Department of Primary Industries and Regions, South Australia (PIRSA) - <http://www.pir.sa.gov.au/>

SARDI - South Australian Research and Development Institute – PIRSA - <http://www.pir.sa.gov.au/research>

WA Department of Fisheries - <http://www.fish.wa.gov.au/Pages/Home.aspx>

Commonwealth Fisheries Harvest Strategy Policy and Guidelines - http://www.agriculture.gov.au/fisheries/domestic/harvest_strategy_policy

International:

Marine Stewardship Council - <https://www.msc.org/>

(To find assessment reports, go to “Track a fishery” then search for the fishery and click on “assessments”. Look for the most recent “Public certification report”.)

Aquaculture Stewardship Council - <https://www.asc-aqua.org/>

OpenSeas NZ - <https://openseas.org.nz/>

FisheryProgress - <https://fisheryprogress.org/>

(You’ll need to create an account. Find a FIP of interest then search the “details” tab and look under “pre-assessment or needs assessment”.)

Food and Agriculture Organization of the United Nations (FAO)
- <http://www.fao.org/fishery/en>

* Fishsource - <https://www.fishsource.org/>

* Seafood Watch - Monterey Bay Aquarium -
<http://www.seafoodwatch.org/>

* Seafish - <http://www.seafish.org/>

* Friends of the Sea - <http://www.friendofthesea.org/>

* *Less robust sources of information*