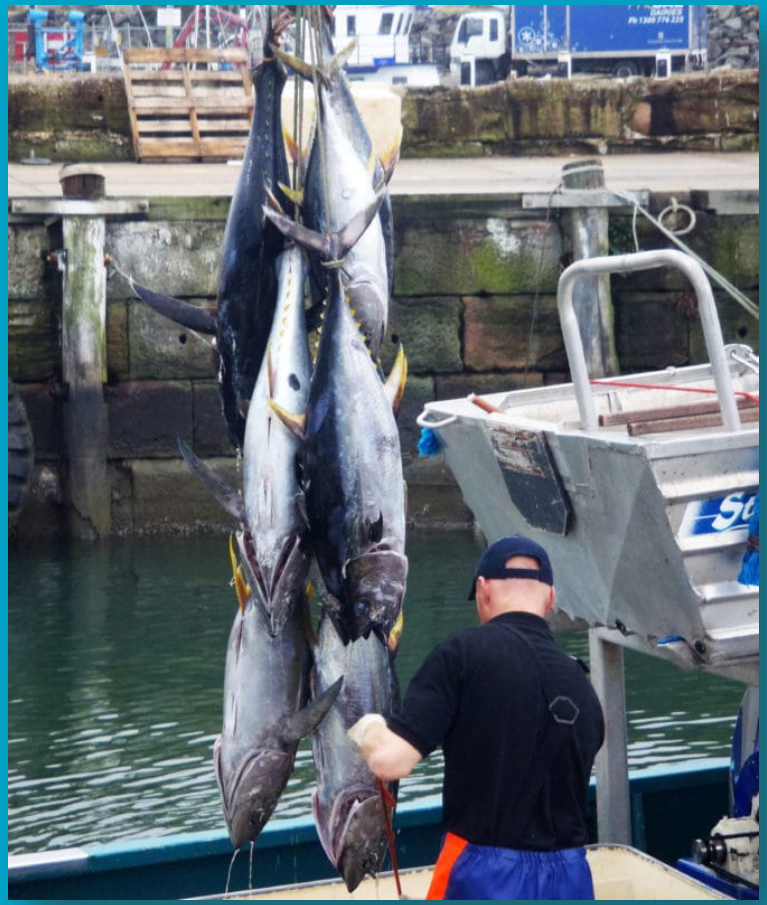
What we know about the impacts of Individual Tradeable Quotas:

It is neither simple nor straightforward

Presented by:
Ingrid van Putten

Thanks to Sean Pascoe and Eriko Hoshino



https://tunaaustralia.org.au/news/crew-safety-at-the-forefront-in-new-tuna-australia-research-project/ © AFMA

What are Individual Tradeable Quotas (ITQs)

Individual Transferable Quotas (ITQs) are **permits** that allow **rightsholders*** to catch a share of a **total allowable catch** (TAC) of a fish species

Rights holders can **sell** or **lease** (temporarily transfer) the ITQs to someone else

Can't have an ITQ without a TAC

https://mysunshinecoast.com.au/news/news-display/unprecedented-internationally-australian-seafood-given-sustainability-tick-for-seventh-consecutive-year

*ITQ is a quasi-property right to the use of the resource – It can be allocated to individual fishers, vessels, communities or others with an interest in the fishery (e.g. processors)

Reason for introducing ITQs

Country	Species group	Year	Stock depletion Overfishing	Over capacity Race to fish	Economic /safety
Australia	Crustaceans, Demersal, Molluscs, Pelagics, Reef fish	1984	✓	✓	
Argentina	Demersal, Pelagics	2010	✓	✓	
Canada	Demersal, Mollusks	1983	✓	✓✓	✓
Chile	Crustaceans, Pelagics	1989	✓	✓	
Denmark	Demersal, Pelagics	2003	✓	✓	
Estonia	Pelagics	2001	✓	✓	
Falkland island (UK)	Cephalopods	2006			✓
Iceland	Crustaceans, Demersal, Molluscs, Pelagics	1986	✓		
Peru	Pelagics	2009		✓✓	
Netherlands	Demersal, Pelagics	1985	✓	✓	
New Zealand	Crustaceans, Demersal, Molluscs, Pelagics	1986	✓	✓	
Norway	Pelagics	2004	✓	✓	
South Africa	Pelagics	1998	✓		
Sweden	Pelagics	2009		✓	✓
USA	Crustaceans, Demersal, Molluscs	1990	✓	✓✓	

ITQs are primarily a market based instrument aimed at improving economic efficiency of the fleet (Hannesson 1996)

The **reason*** for ITQ introduction has primarily been to help **stock recovery** in overexploited fisheries

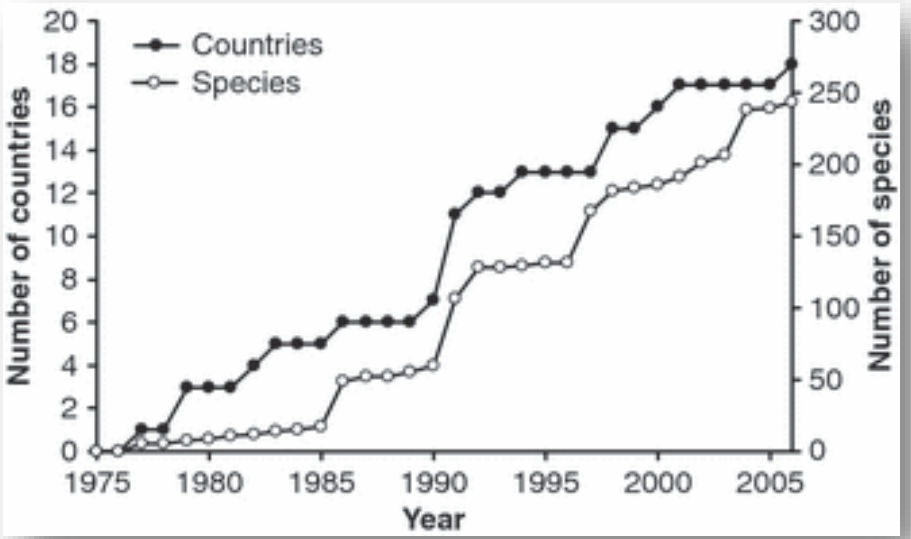
* As stated in the papers

Eriko Hoshino, Ingrid van Putten, Sean Pascoe, Simon Vieira (2019) Individual transferable quotas in achieving multiple objectives of fisheries management, *Marine Policy*.
R. Hannesson, On ITQs: an essay for the Special Issue of reviews in fish biology and fisheries, Rev. Fish Biol. Fish. 6 (1996) 91–96.

CSIRO

Where have ITQs been implemented?

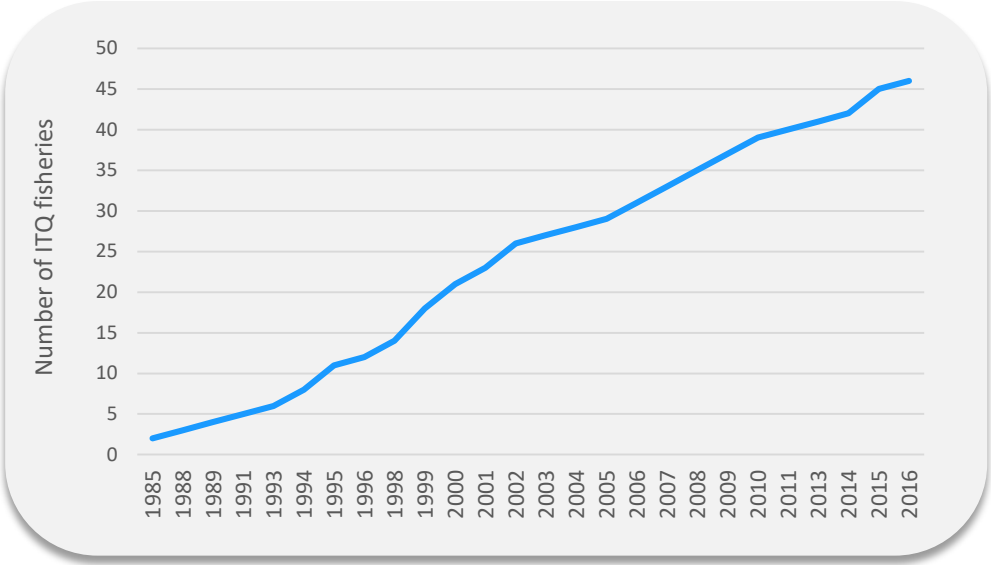
ITQs have been implemented in over 20 countries and for over 250 different species*



* But this is quite old information

Fish and Fisheries, Volume: 10, Issue: 2, Pages: 217-230, First published: 11 May 2009, DOI: (10.1111/j.1467-2979.2008.00313.x)

Australian ITQ (& ITE) fisheries



South Australia
Abalone Fishery 1985

Tasmania
Abalone Fishery 1985

Victoria
Abalone Fishery 1988

Queensland
Beche-de-Mer 1991

Commonwealth
Southern Bluefin Tuna Fishery 1994

Western Australia
South Coast Purse Seine Managed Fishery 1994

Northern Territory
Demersal Fishery 1995

New South Wales
Abalone & Lobster Fishery 2000

Last Western Australia Shark Bay Crab 2016

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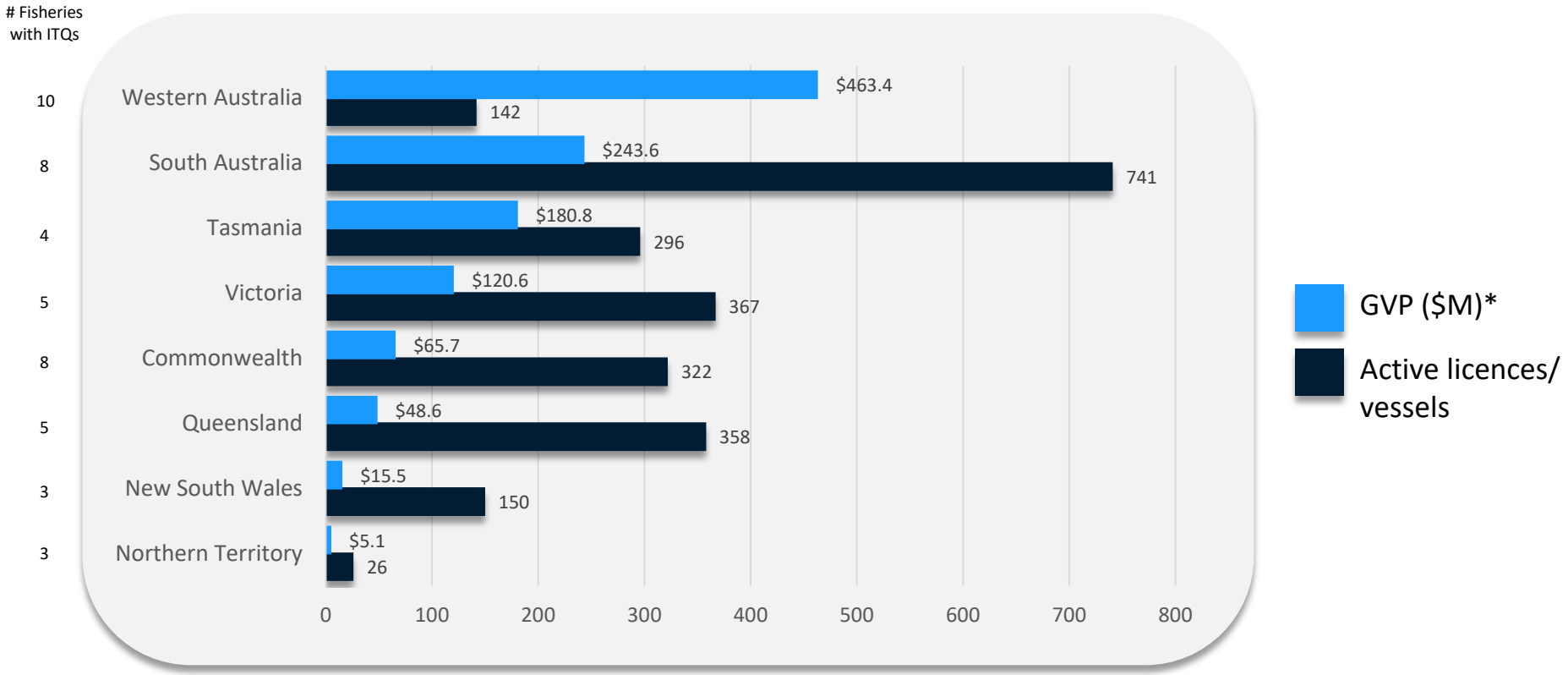
ITQ fisheries by jurisdiction



*GVP not available for 1 commonwealth, 3 NT, 3 SA, 4Vic, 1WA fishery so total GVP shown likely to be higher.

Pascoe, S., Hoshino, E., van Putten, I. and Vieira, S., 2019, Retrospective assessment of ITQs to inform research needs and to improve their future design and performance, CSIRO

Quick summary

- ITQs have been introduced in a large number of fisheries worldwide
- Many decades of international and national experience in ITQ management
- Possible (and timely) to get an empirical picture of the sustainability, economic, and social impact of ITQs

Fisheries management objectives

Fisheries management in Australia (as in most places) aims to achieve **multiple**, sometimes **conflicting**, objectives.

Objectives are often **poorly defined**

Operational level management objectives are often **absent in legislation** or policy documentation

But there are **common themes** across jurisdictions relating to sustainability, economic, and social objectives

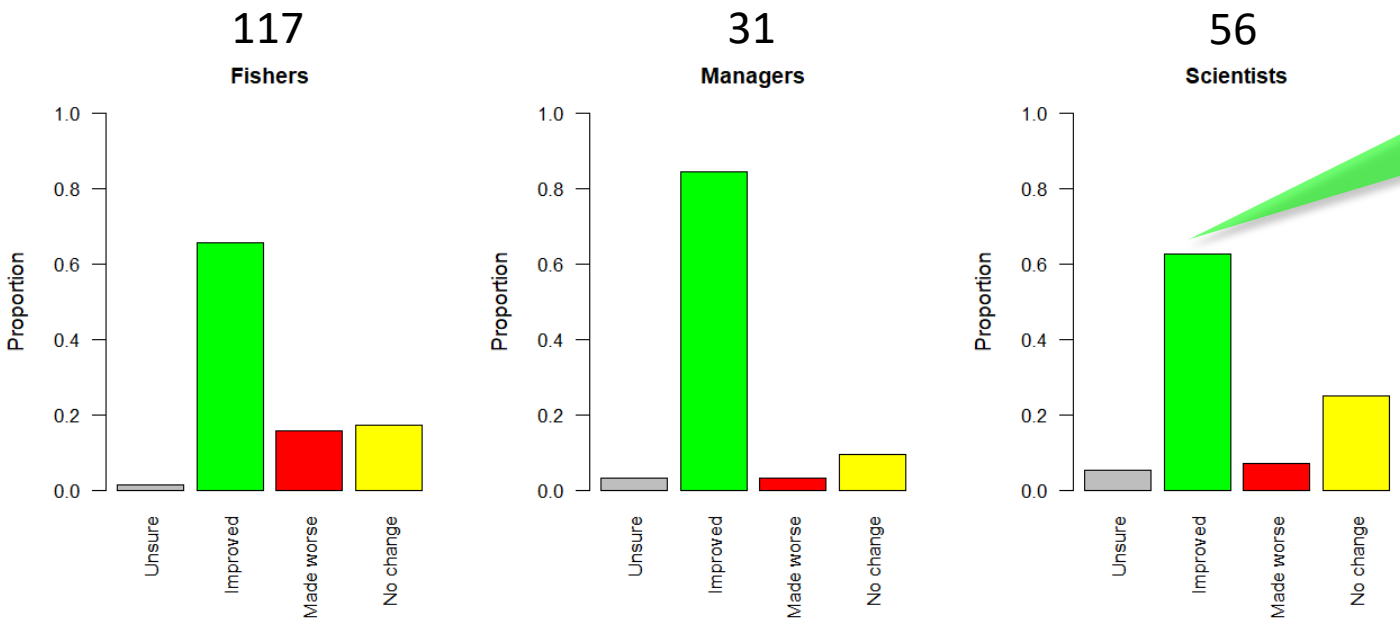
What is the impact of ITQs on the sustainability, economic, and social objectives?

https://theconversation.com/plenty-of-fish-in-the-sea-not-necessarily-as-history-shows-84440

Ogier, E., Emery, T., Farmery, A., Flood, M., Gardner, C., Jabour, J., Nicol, S., Sloan, S. and Stobutzki, I. (2020). Meeting Sustainability Expectations: Policy Translation, Objective Setting and Reporting for Australian Fisheries, *FRDC Project No 2013-204*. FRDC, Canberra

Impact of ITQs on sustainability

Online survey Australian fisheries (N=204)



Respondents mostly thought that the sustainability of the fishery had **improved** since ITQ introduction

Is sustainability improvement **attributable** to ITQs *per se* or due to the catch restriction embodied in the TACs?

Without a TAC, it would **not be possible** to implement ITQs and the effects of the two may **not be easy to separate**

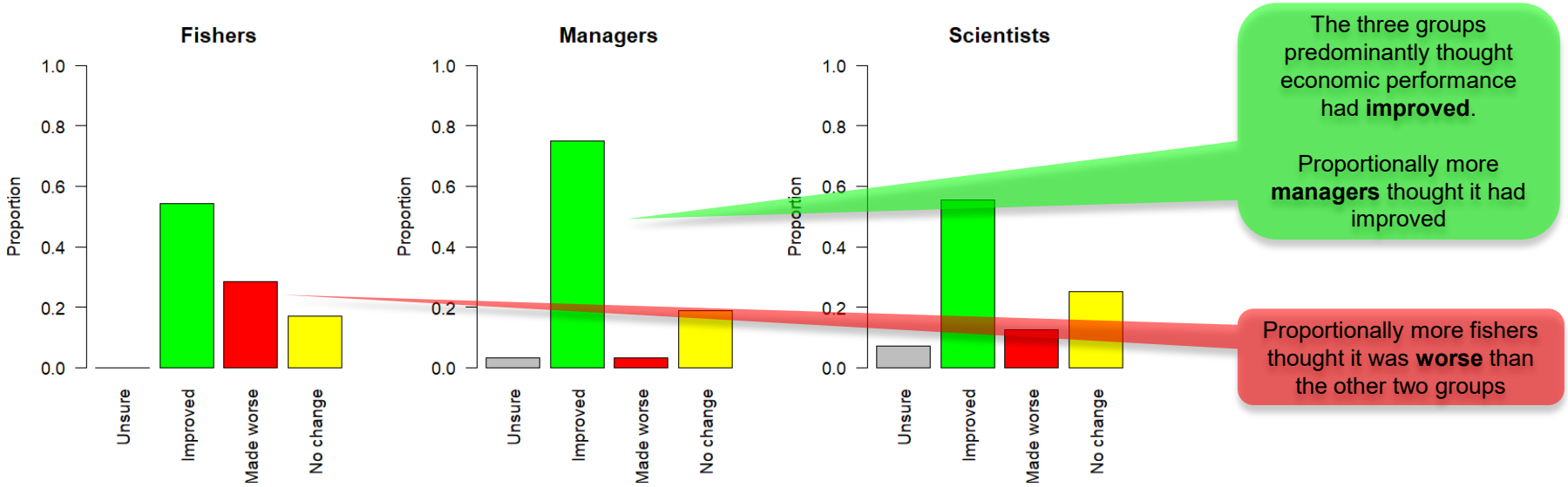
Pascoe, S., Hoshino, E., van Putten, I. and Vieira, S., 2019, *Retrospective assessment of ITQs to inform research needs and to improve their future design and performance,* CSIRO

Eriko Hoshino, Ingrid van Putten, Sean Pascoe, Simon Vieira (2019) Individual transferable quotas in achieving multiple objectives of fisheries management, *Marine Policy*.

Pascoe, S. van Putten, E.I., Hoshino, E. and Vieira, S. (2019) Determining key drivers of perceptions of performance of rights-based fisheries in Australia using a Bayesian Belief Network, *ICES journal*

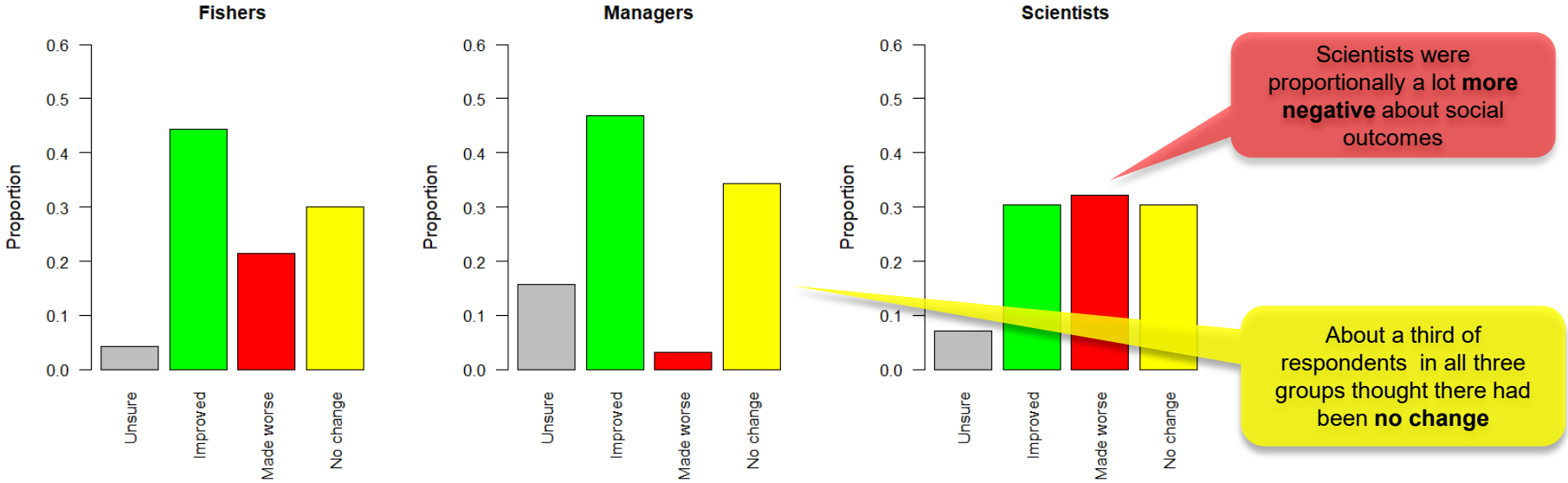
Sean Pascoe, Ingrid Van Putten, Eriko Hoshino, and Simon Vieira (In review) Individual Transferable Quotas in Australia: the good, the bad and the ugly, *Fish and Fisheries*

Impact of ITQs on economic performance



Pascoe, S., Hoshino, E., van Putten, I. and Vieira, S., 2019, *Retrospective assessment of ITQs to inform research needs and to improve their future design and performance,* CSIRO

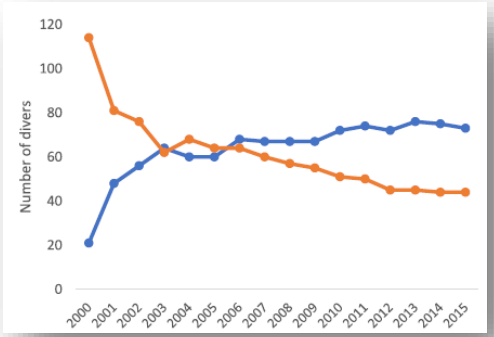
Impact of ITQs on social outcomes



Pascoe, S., Hoshino, E., van Putten, I. and Vieira, S., 2019, *Retrospective assessment of ITQs to inform research needs and to improve their future design and performance,* CSIRO

Perceptions depend on whether you own quota

Tasmanian Abalone fisheries



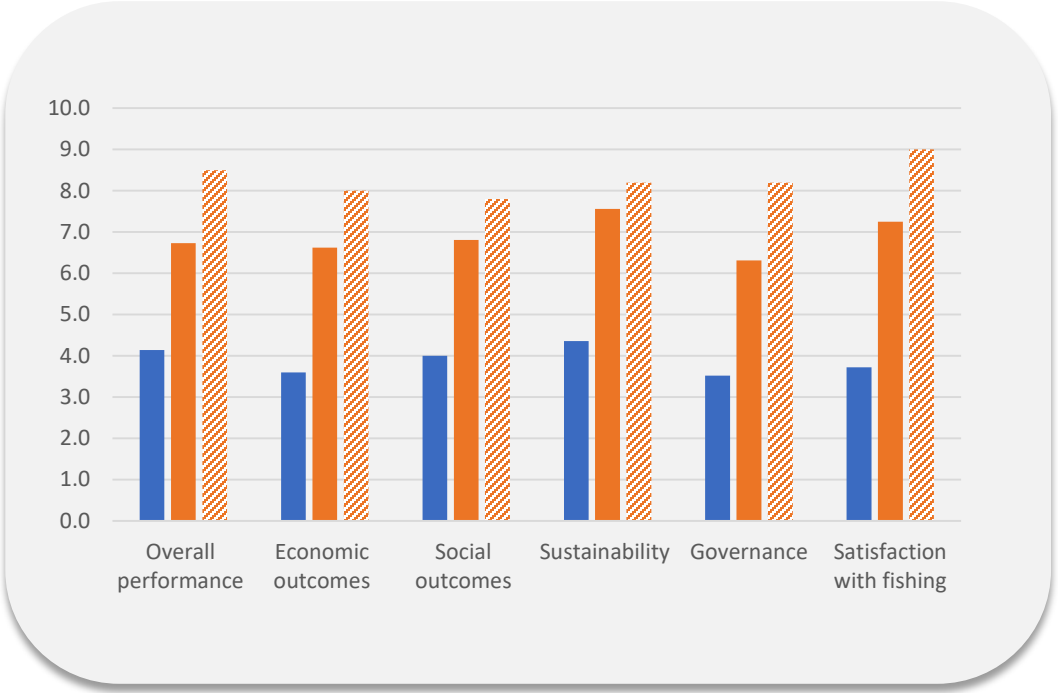
Lease dependent fishers (don't own quota)

Fisher who own quota

Investors (who don't fish)

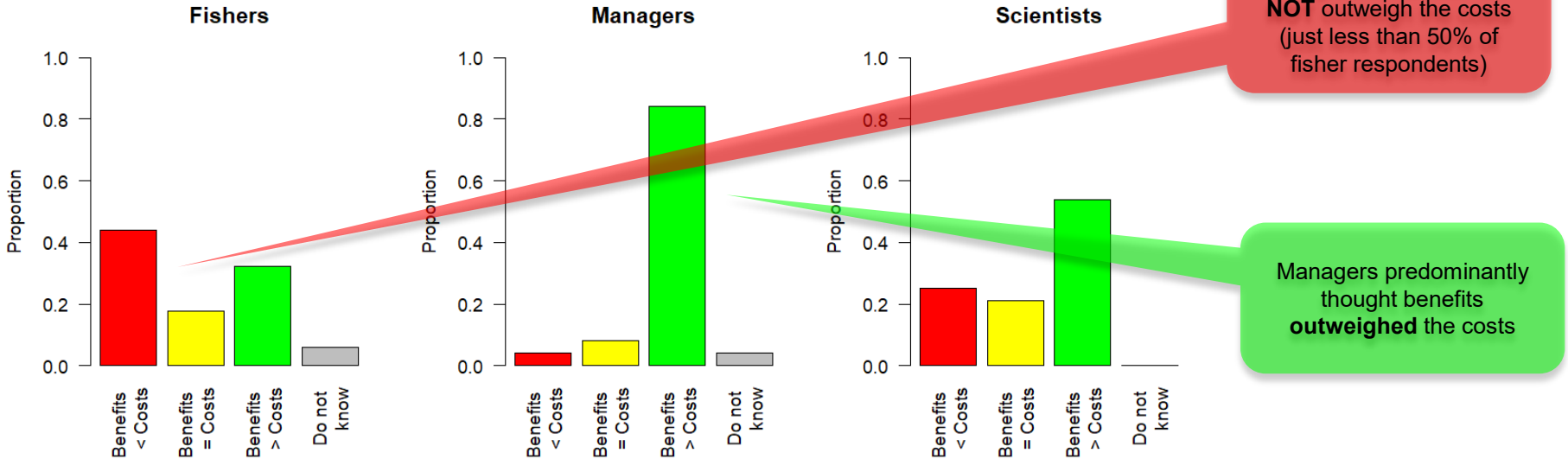
Better

Worse



Eriko Hoshino, Ingrid van Putten, Sean Pascoe, Simon Vieira (2020) Does quota ownership affect perceptions of fishery performance? *Marine Policy*

Perceptions of overall net benefits of ITQs



Pascoe, S., Hoshino, E., van Putten, I. and Vieira, S., 2019, *Retrospective assessment of ITQs to inform research needs and to improve their future design and performance,* CSIRO

Quick summary

- Fisheries objective not well defined but there are 3 generalisable domains
- Differences in perceptions between fishers, managers, scientists in impact of ITQs
- But majority saw sustainability and economic improvement
- But if you're a fisher it all really depends on whether you own quota
- Even though generally ITQs improved outcomes – almost half of fishers said the benefits did NOT outweigh the costs
- Next …. What does the empirical literature tell us about the impacts – when are the impacts of ITQs not so clear or straightforward - and what is it that we don't know

Sustainability impact: High-grading and discarding

ITQs have some behavioural implications that affect sustainability

ITQs create **incentives** to "high-grade"

> Where smaller sized fish (which generally attract a lower price) are discarded to save the quota for use for larger fish*

Increased levels of discards in multi species fisheries, as catch taken above the quota cannot be landed

But empirical evidence is **mixed** on both high-grading and discarding (context specific)

https://waterfordwhispersnews.com/2015/01/30/editorial-cartoon-eu-fishing-quotas/

* Concerns have led the European Union to adopt regulations which make high-grading an illegal practice (Batsleer *et al.* 2015).

Batsleer, J., Hamon, K.G., van Overzee, H.M.J., Rijnsdorp, A.D. and Poos, J.J. (2015). High-grading and over-quota discarding in mixed fisheries, *Reviews in Fish Biology and Fisheries* 25, 715-736.

Sustainability impact: Spill-over effect

Another behavioural implication of ITQs

In multispecies fisheries there can be a "spill-over effect"

Fishers **shift fleets or effort** to catch other (non-ITQ) species

This shifting can contribute to **increased fishing pressure** and **overcapacity** in these other fisheries

https://coreybradshaw.files.wordpress.com/2010/04/spilloverfish1.jpg

(Squires *et al.* 1998, Asche *et al.* 2007; Hutniczak 2014; Cunningham *et al.* 2016; Blomquist and Waldo 2018; Dinesen *et al.* 2018)

Sustainability impact: Stewardship behaviour

Why might sustainability change other than as a consequence of TAC?

Property ownership (ITQ) provides an incentive to be a steward of the resource

(ownership of asset –ITQ- changes normative values which changes stewardship behaviour *)

There may be a relationship with respect to ITQs but there is **insufficient empirical evidence**

Not possible to conclude that improved environmental outcomes in ITQ managed fisheries are attributable to fisher's changing normative values

https://www.australiangeographic.com.au/topics/science-environment/2018/01/a-guide-to-sustainable-seafood/

* As stewardship theory suggests

Putten, van E.I., Boschetti, F., Fulton, E.A., Smith, A.D.M., Thebaud, O. (2014) Individual Transferable Quota contribution to environmental stewardship: A theory in need of validation. *Ecology and Society*.

Sustainability impact: Stewardship behaviour

A disincentive for stewardship behaviour

Stock rebuilding requires **short-run sacrifices** by fishers and other stakeholders

> Although local fishers may have feelings of attachment and stewardship toward the fishery or resource, this is **no guarantee** they will support restrictive TAC
>
> Financial pressures can **shift attitudes** toward short-run financial survival and thus, a **higher TAC level**

The human component of the (co-management) system can derail good TAC setting

https://theconversation.com/new-zealands-fisheries-quota-management-system-on-an-undeserved-pedestal-82210

Edward J. Garrity 2020 Individual Transferable Quotas (ITQ), Rebuilding Fisheries and Short-Termism: How Biased Reasoning Impacts Management Systems, 8, 7

The economics and social stuff

A key advantage of ITQs over other management systems is the **autonomous adjustment** in the fleet that **improves economic efficiency**

Both **theory and empirical** evidence suggest ITQs improve economic performance of the fishery

But there are also examples where this is not the case

https://www.seafoodsource.com/news/supply-trade/australia-adjusts-quotas-for-multiple-species

Pascoe, S., Dichmont, C.M., Brooks, K., Pears, R. and Jebreen, E. (2013). Management objectives of Queensland fisheries: Putting the horse before the cart, *Marine Policy* 37, 115-122.

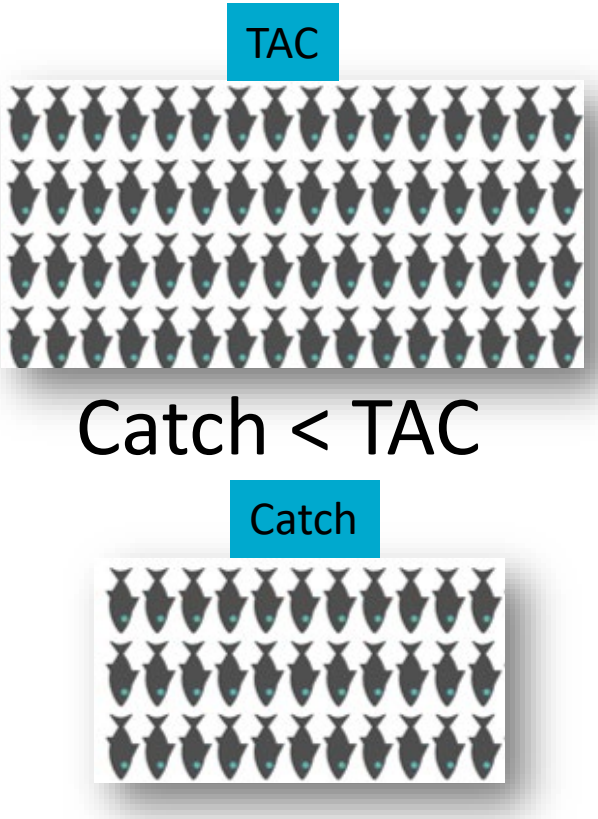
Economic impact: A non binding TAC

There can be **declining economic** performance during a period of non-binding TAC*

Without binding TACs, fisheries revert to a **regulated open access** system and worsening economic performance

The asset value of the ITQ allocation is also **weakened** because there is uncertainty about future profitability because the allocated catch **cannot be taken**

A low quota lease price can also contribute to an **increase in fleet capacity** – potentially also worsening sustainability outcomes



* As was experienced by the Tasmanian Rock Lobster Fishery

Rafael León, Caleb Gardner, Ingrid van Putten and Klaas Hartmann (2015) Changes in the lease and permanent sale quota markets of a rock lobster fishery in response to stock abundance. *ICES Journal of Marine Science* 72(5), p. 1555-1564.

Emery, T.J., Hartmann, K., Green, B.S., Gardner, C. and Tisdell, J. (2014). Does 'race to fish' behaviour emerge in an individual transferable quota fishery when the total allowable catch becomes non-binding?, *Fish and Fisheries* 15, 151-169

Economic impact: Barriers to entry

1st generation of ITQ owners received their ITQ *gratis*

Most have seen an **increase** in the value of their asset

Includes fishers as well as investors

Price of quota is **high**

Low volumes of quota change hands

Barriers to entry for (young) fishers

Increase in fishers who lease quota

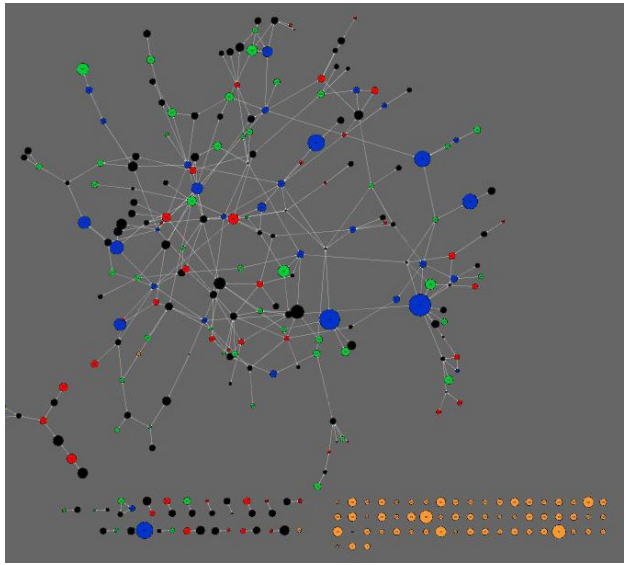
ITQs may **not flow** to most **economically efficient** operators but rather to those with **most access to capital**

https://www.pinterest.com.au/kingfisher517/old-fishermen

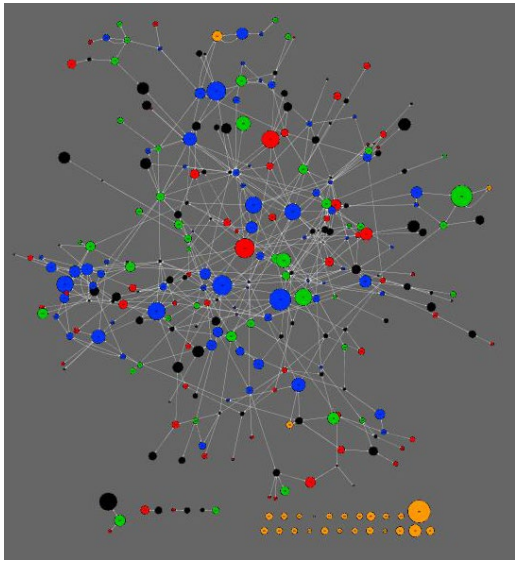
Dewees, C.M. (1998). Effects of individual quota systems on New Zealand and British Columbia fisheries, *Ecological Applications* 8, S133-S138.
Cullenberg, Paula et al. 2017. Turning the tide: How can Alaska address the 'graying of the fleet' and loss of rural fisheries access? Anchorage: University of Alaska Fairbanks

Economic impact: Quota concentration

1999



2007



Change in the network structure of the market indicates that

- the number of **lease dependent fishers** increasingly numerous

and

- a smaller number of quota owners (**investors**) have become **increasingly dominant**

Lease dependent fishers (do not own quota)

Compressed profit margins because leasing quota are an operational cost

Investors Do not fish and can be a portfolio investor in Sydney – or a fisher who no longer fishes themselves

23% of Tasmanian rock lobster quota holders were located outside the State in 2017

Putten, van E. I. and Gardner C. (2010) Lease quota fishing in a changing rock lobster industry. *Marine Policy*, DOI 10.1016/j.marpol.2010.01.008

Putten, van E. I, Hamon, K., Gardner C. (2011) Network analysis of a rock lobster quota lease market, *Fisheries Research*. 107, pp. 122-130. DOI: 10.1016/j.fishres.2010.10.015

Social impact: Distributional issues

Distributional concerns (i.e. concentration of ownership) have led to **additional transferability** and **ownership restrictions**

- Maximum quota holdings
- Quotas only allocated to active fishing vessel (or the individuals or firms that own these active vessels)
- Quota transferable only to other existing quota owners
- Non-transferable individual vessel quota
- Restrictions of trade in a general quota market (i.e. allow for transfers within firms and associations)
- Quotas transferable only within certain time frames

https://www.marineconservation.org.au/fisheries/

Social impact: Employment

Demand for employment has generally **fallen** (e.g. due to lower number of vessels)

> Some fisheries have seen a **decrease in part-time work** while no change (or an increase) in full-time employment was observed.

Where quota is **sold** to non-fishers or "outsiders" this can manifest in **lower employment**

> For example, where quota is leased to Chinese or Korean vessels with Indonesian crew, and the catch is processed in Thailand or China – both fishing and fish processing jobs are lost

https://www.nature.org/en-us/what-we-do/our-priorities/provide-food-and-water-sustainably/food-and-water-stories/global-fisheries/

(Copes and Charles 2004; Merayo *et al.* 2018; Eythórsson 2000; Stewart *et al.* 2006; Sumaila 2010; Olson 2011; Batstone and Sharp 1999)

Social impact: Safety

Context dependent

Because ITQs provide fishers more **flexibility** in deciding when to fish (e.g. when market is favourable or avoid fishing during adverse weather conditions) this can result in **safer fishing** operations.

Lessee fishers* have been found to **take more risk** than fishers who own their quota

Because of their compressed profit margins (i.e. leasing quota are an operational cost)

Fishing Boats in Rough Weather off St Michael's Mount, Cornwall
Eugène Isabey (1803–1886)

* e.g. in the Tasmanian Rock Lobster Fishery
(Grafton et al. 2000, Emery *et al.* 2014, Birkenbach *et al.* 2017).

Social impact: Power asymmetry

ITQs in many places go hand in hand with **co-management** arrangements

- often an **annual process** of determining next year's TAC level – including a number of different stakeholder groups

There is some evidence of **power asymmetries** developing in these co-management decision forums due to **concentration of quota ownership** and some stakeholder (i.e. lease quota fishers) do **not have a seat** at the table

https://www.knkx.org/post/race-fish-slows-down-why-thats-good-fish-fishermen-and-diners

J. Parslow, Individual transferable quotas and the "tragedy of the commons", Can. J. Fish. Aquat. Sci. 67 (2010) 1889–1896.
C.P. Leal, R.A. Quinones, C. Chavez, What factors affect the decision making process when setting TACs?: the case of Chilean fisheries, Mar. Policy 34 (2010) 1183–1195.
F. Nunan, D. Cepic, E. Yongo, M. Salehe, B. Mbilingi, K. Odongkara, et al., Compliance, corruption and co-management: how corruption fuels illegalities and undermines the legitimacy of fisheries co-management, Int. J. Commons 12 (2018) 58–79.

Governance impact: Management cost

There are **substantial** 'management costs' associated with ITQ management

- There is **little information** on the actual ITQ management cost, and the different cost components

In most ITQ fisheries the fees collected are generally **well below** the actual management cost

- The management costs recouped from the fishery under ITQ systems **varies substantially** from almost nothing to about 3-4% of the fishery's gross revenue

https://www.nzgeo.com/stories/the-price-of-fish/

(see Hoshino et al 2019; Arnason *et al.* 2000; Hatcher *et al.* 2002; Chávez and Stranlund 2013; Hatcher et al. 2002; Copes 1986b; Bromley 2009; Plagányi et al. 2013; Squires et al. 2017)

Governance impact: Compliance

The effect of ITQs on compliance cost (and more generally compliance and reporting behaviour) is relatively **under researched**

> Catch and compliance monitoring make up a **substantial part** of the overall management costs (particularly for multispecies and transboundary species)

There are indications (albeit scant) that ITQs has had **both** a positive and negative impact on compliance and quality of reporting

https://www.afma.gov.au/rules-and-regulations

(see Arnason *et al.* 2000; Hatcher *et al.* 2002; Chávez and Stranlund 2013; Hatcher et al. 2002; Copes 1986b; Bromley 2009; Plagányi et al. 2013; Squires et al. 2017)

Summary

- Sustainability objectives mostly achieved through TAC (perhaps independently of ITQs)?
- Some negative behavioural incentives (discarding, high-grading, spill-over)
- Relying on changes in stewardship behaviour (due to property ownership) for positive sustainability impact may not cut it
- ITQs predominantly work if the TAC is binding
- High quota prices are barrier to entry
- Concentration of quota ownership & lease dependent fishers creates distributional issues
- Additional ownership and transferability restrictions can address some of the distributional issues
- Employment, safety and power impact context dependent
- Little know about management and compliance impact (but costs are not recouped)

Are ITQs sufficient to meet management objectives?

ITQs on their own* are **not sufficient** to meet management objectives

Having a combination of additional controls in place may be necessary

Address **social** impacts

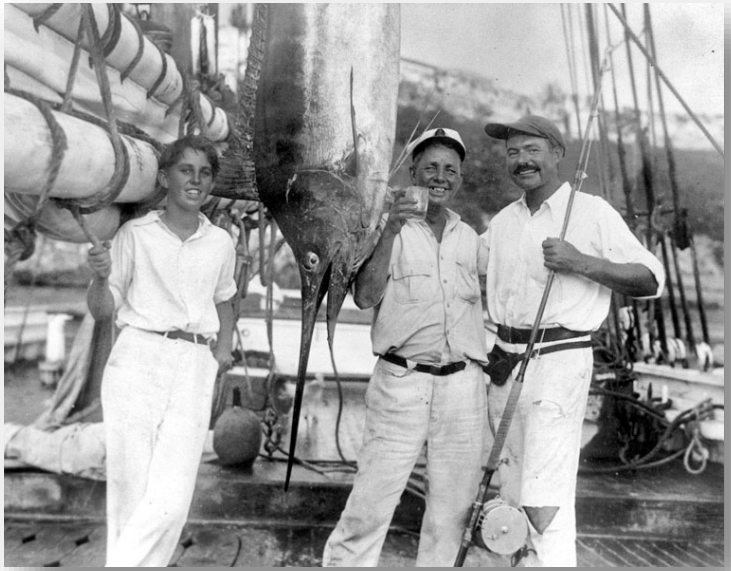
Distributional issues through additional ownership and transferability restrictions (discussed before)

Address **sustainability** objectives

Additional closures (spatial, temporal)

Gear restrictions (type, size, number, vessel size, add-ons)

And other input / access /controls



https://www.britannica.com/topic/The-Old-Man-and-the-Sea-novel-by-Hemingway

* Acknowledging again that ITQs cannot be implemented without a TAC (see Melnychuk *et al.* 2016; 2021, Emery et al 2012)

Questions?

Thank you

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Thanks again to Sean Pascoe and Eriko Hoshino