Agriculture and Fisheries and Other Legislation Amendment Bill 2023

Submission No:	36
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Publication:	Making the submission and your name public
Attachments:	See attachment
Submitter Comments:	

RE: Submission regarding the proposed Fisheries Act amendments within the Agriculture and Fisheries and Other Legislation Amendment Bill 2023

Dear Chair,

The Australian Marine Conservation Society (AMCS) and WWF-Australia (WWF) welcome the opportunity to provide a submission to the State Development and Regional Industries Committee regarding the proposed Fisheries Act amendments within the Agriculture and Fisheries and Other Legislation Amendment Bill 2023. Our organisations support the amendments detailed below with a recommended addition.

AMCS has worked to protect Australia's oceans since 1965, through advocacy, scientific research, policy reform, community engagement and education. We represent over 300,000 active supporters from all walks of life.

WWF-Australia is part of the WWF International Network with over 4 million supporters locally. For over 40 years, WWF-Australia has been working with communities, businesses and governments to protect and restore the health of our oceans for the benefit of people and nature.

Queensland's oceans are some of the most biodiverse on the planet, supporting globally significant populations of threatened species such as dugongs, turtles, sawfish and sharks. We are custodians of some of the world's most important marine ecosystems, including the extraordinary World Heritage listed Great Barrier Reef. Our ocean backyard and its health are essential to our identity, our economy and our way of life.

AMCS and WWF work on issues relating to fisheries and threatened species around the country and have engaged with the Queensland Government on fisheries matters for decades. Our organisations are strong supporters of the Sustainable Fisheries Strategy 2017-2027, which if fully implemented has the potential to deliver worlds best-practice fisheries management.

Fisheries Impacts on Threatened, Endangered and Protected Species

Queensland is home to a huge diversity of iconic threatened species including dugongs, marine turtles, inshore dolphins, sea snakes, sharks and rays. Great Barrier Reef waters are a global

stronghold for the threatened dugong and home to six of the world's seven species of marine turtle, including the largest green turtle nesting site at Raine Island.These populations are so significant they make up part of the Great Barrier Reef's Outstanding Universal Value and contribute to its World Heritage Listing. The Reef and the Gulf of Carpentaria are also home to some of the world's last viable populations of endangered sawfish. Four of the world's five sawfish species are found in Queensland waters, and Australia is often considered a 'lifeboat' for sawfish considering their depletion and extinction internationally[1]. Queensland is also within the epicentre of sea snake biodiversity, with 16 species known to occur in Great Barrier Reef waters[2], as well as being host to an incredible diversity of sharks and rays including endangered hammerhead sharks and grey nurse sharks[3].

However, many of these species are under threat and Queensland populations are in decline. Recent aerial surveys of the Great Barrier Reef and southeast Queensland dugong population found that the southern Great Barrier Reef population is in long term decline and has been declining by 2.3% per year for nearly 20 years[4]. Queensland populations of hawksbill turtles, green turtles and loggerhead turtles[5], sea snakes[2] and sawfish[1] are also declining due to cumulative impacts on their populations.

The incidental catch of threatened species in commercial fishing gear, particularly gillnets and trawl nets, has been identified as the most significant fisheries sustainability issue in the Great Barrier Reef[6]. These fisheries have been assessed as a high or intermediate risk to a multitude of threatened species[789].

Commercial fishing gear such as gillnets are often largely invisible to protected species like dugongs, turtles, dolphins and sawfish that are easily entangled and can quickly drown, or are, on occasion, intentionally and illegally killed when being removed from the net. Commercial gillnets have been listed as one of the primary threats to sawfish[1], marine turtles[5], dugongs[10,11] and inshore dolphins[12], while trawl bycatch is one of the key threats to sea snakes[2]. These

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[1] Commonwealth Department of the Environment (2015). Sawfish and river sharks multispecies recovery plan.
[2] https://elibrary.gbrmpa.gov.au/jspui/retrieve/62d985cf-79b1-4615-b80a-9b43c8b517f3/gbrmpa-VA-SeaSnakes-11-7-12.pdf
[3] Kyne, P.M., Heupel, M.R., White, W.T. and Simpfendorfer, C.A. (2021). The Action Plan for Australian Sharks and Rays 2021. National Environmental Science Program, Marine Biodiversity Hub, Hobart.
[4] Cleguer C, Hamel M, Rankin RW, Genson A, Edwards C, Collins K, Crowe M, Choukroun S, Marsh H (2023) '2022 Dugong Aerial Survey: Mission Beach to Moreton Bay', JCU Centre for Tropical Water & Aquatic Ecosystem Research Publication 23/44, Townsville. 128pp. https://doi.org/10.25903/s661-1j55
[5] Recovery Plan for Marine Turtles in Australia, Commonwealth of Australia 2017
[6] Great Barrier Reef Marine Park Authority (2020), Position Statement - Fishing
[7] Jacobsen, I., Walton, L. and Lawson, A. (2021) *East Coast Inshore Large Mesh Net Fishery Level 2 Ecological Risk Assessment [Species of Conservation Concern].* Technical Report. State of Queensland, Brisbane, Queensland
[8] Jacobsen, I., Walton, L. and Lawson, A. (2021) *Gulf of Carpentaria Inshore Fishery Level 2 Ecological Risk Assessment [Species of Conservation Concern].* Technical Report. State of Queensland, Brisbane, Queensland
[9] Dedini, E., Jacobsen, I. and Zieth, J. (2023) *East Coast Otter Trawl Fishery Ecological Risk Assessment Species of Conservation Concern.* Technical Report. State of Queensland, Brisbane, Queensland
[10] Marsh, H. et al (2002) Dugong Status Report and Action Plans for Countries and Territories. United Nations Environment Program.
[11] Marsh, H., Hagihara, R., Hodgson, A., Rankin, R., and Sobtzick, S. (2019). Monitoring dugongs within the Reef 2050 Integrated Monitoring and Reporting Program: final report of the Dugong Team in the Megafauna Expert Group, Great Barrier Reef Marine Park Authority, Townsville.
[12] Parra, G. J., Schick, R. and Corkeron, P. J. (2006). Spatial distribution and environmental correlates of Autralian snubfin and Indo-Pacific humpback dolphins. Ecography 29: 396406.

species are late to mature and produce few offspring, so even the loss of a few individuals can have devastating impacts on populations[13] .

One of the most significant issues with the incidental catch of threatened species is the unknown scale of the problem. Despite mandatory reporting requirements, interactions with protected species are widely believed to be significantly under-reported[13,14]. The scale of the problem is likely significantly worse than the available data suggests. AMCS and WWF regularly receive images and video of threatened species bycatch, often in commercial gillnets, from concerned members of the public. Our records do not correlate with those reported by fishers, and in some cases outnumber reported interactions. Conservative estimates of threatened species bycatch in commercial fisheries can be calculated based on observed interaction rates in the 2006-2012 Fisheries Observer Program (ECIF) and previous studies on sea snake bycatch in the trawl fishery (ECOTF)[15]. A comparison of reported interactions and estimated interactions in 2022 is presented in the table below.

East Coast Inshore Fishery (gillnet and ringnet only)		
Species	**Reported**	**Estimate**
Dugong	1	21
Turtles	336	730
Sawfish	108	1294
Dolphins	0	21
East Coast Otter Trawl Fishery		
Species	**Reported**	**Estimate**
Sea snakes	269	23,931

Independent Onboard Monitoring

Independent Onboard Monitoring (IOM) is a vital tool to provide accurate data on catch and bycatch from commercial fisheries. In Queensland fishers are legally required to report their catch in logbooks, including interactions with Threatened, Endangered and Protected Species (TEPS). IOM can be used to validate fisher reporting and ensure that the data being used to manage fisheries and ascertain risk to threatened species is accurate.

[13] Great Barrier Reef Marine Park Authority 2019, Great Barrier Reef Outlook Report 2019, GBRMPA, Townsville.

[14] Assessment of the Queensland East Coast Otter Trawl Fishery, December 2021, Commonwealth of Australia 2021'.

[15] AJ Courtney, BL Schemel, R Wallace, MJ Campbell, DG Mayer and B Young (2010). Reducing the impact of Queensland's trawl fisheries on protected sea snakes. FRDC Project No. 2005/053

IOM is part of the Queensland Government's Sustainable Fisheries Strategy 2017-2027[16]. We note however that its implementation is running more than three years behind schedule. The 2018 Data Validation Plan:

"provides a framework for the validation and collection of more accurate fisheries information by implementing:
1. Processes to independently validate catch and effort fishing data including interactions with protected species;
2. Education programs to improve submission of accurate catch data; and
3. Robust systems for checking and forensically analysing incoming data.[17]

There are two primary means of IOM, independent scientific observers, and electronic monitoring (or digital observers via cameras on boats). Each with advantages and disadvantages that may lead to one option being more suitable for a specific fishery.

Independent scientific observers
Historically IOM has been carried out by independent scientific observers who are present on a proportion of fishing trips to record data on catch and bycatch and in some cases, take scientific samples to assist further scientific research. Fisheries Queensland implemented a fisheries observer program on a number of commercial fisheries between 2006 and 2012. IOM was only re-introduced in the Commercial Trawl (Fin Fish) Fishery in 2021 to meet Wildlife Trade Operation accreditation conditions and maintain the export approval for the fishery. This fishery consists of only two vessels. No other Queensland fisheries are currently operating under a Queensland IOM policy. However, there is increasing interest in an IOM trial in the trawl fishery.

Independent scientific observers are used in a number of fisheries in Australia and worldwide. Commonwealth fisheries including the Northern Prawn Fishery and the Torres Strait Prawn Fishery utilise independent scientific observers, however coverage rates are typically low (2-5%)[18,19] and unlikely to provide a high degree of certainty and confidence in the reported levels of TEPS bycatch.

One of the main advantages of independent scientific observers is that if suitably trained they are able to identify TEPS to a species level, some of which may not be able to be identified to a species level via electronic monitoring due to the need to observe fine scale details. Sea snakes are an example as some species may not be able to be identified to a species level via electronic monitoring due to the need to undertake scale counts or similar[20], which may not be possible from imagery. Independent scientific observers are also able to take biological samples

[16] Queensland Department of Agriculture and Fisheries (2017), Queensland Sustainable Fisheries Strategy 2017-2027
[17] Queensland Department of Agriculture and Fisheries (2018), Fisheries Data Validation Plan.
[18] ABARES. (2017). *Fishery status report: Torres strait prawn fishery*. Available at: http://data.daff.gov.au/data/warehouse/9aam/fsrXXd9abm_/fsr17d9abm_20170929/18_FishStatus2017TorresStraitPrawn_1.0.0.pdf
[19] AFMA Northern Prawn Fishery [https://www.afma.gov.au/fisheries/northern-prawn-fishery] accessed 5 December 2023.
[20] Bonnet, Xavier, Arne R. Rasmussen, and François Brischoux, 'Sea snakes', in C. Kenneth Dodd (ed.), *Reptile Ecology and Conservation: A Handbook of Techniques* (Oxford, 2016; online edn, Oxford Academic, 23 June 2016), https://doi.org/10.1093/acprof:oso/9780198726135.003.0012, accessed 11 Dec. 2023.

that can be used in other scientific studies such as genetics based population studies or post-capture mortality studies.

However, independent scientific observers have a number of limitations that limit their suitability for use amongst large fleets, such as those found in many Queensland fisheries. In Australia, independent scientific observers come at a high cost of approximately $1,000/day[17]. To get full coverage across a large fleet such as the trawl fleet would cost approximately $30m a year, based on recent effort levels. Furthermore, assuming an observer can work 100 days per year, 300 observers would be required for the trawl fishery alone[21]. Far above feasible staffing levels.

Due to these high costs, fisheries that operate with independent scientific observers tend to have low levels of coverage of 2-5% of fishing activities[18,19]. A level that is insufficient to provide a high degree of certainty and confidence in the reported levels of TEPS bycatch. Some studies have found that observer coverage of 20% is required for common species and 50% is required to give good estimates of bycatch of rarely encountered species such as TEPS[22].

If independent scientific observers are only present on a proportion of fishing effort then a phenomenon known as the observer effect has been shown to occur. The placement of scientific observers on vessels for some trips has been shown to influence where fishing may take place, for example fishing in an area where bycatch of TEPS is known to be lower, or lead to changed operational behaviours such as correctly reporting bycatch or changes to handling procedures[21,23]. This can lead to significant bias in the dataset collected by independent scientific observers, limiting the usefulness of the data and a failure to meet the objectives of the data validation plan - to accurately collect data to independently validate catch and bycatch data and interactions with TEPS.

In fisheries where small vessels are common an independent scientific observer may not be suitable. Vessels in the East Coast Inshore Fishery or Gulf of Carpentaria Inshore Fishery may only be 5m long and in survey allowing for one or two fishers to be onboard that vessel. Permitting an observer to undertake trips on these vessels may not be possible while meeting Australian Maritime Safety Authority requirements.

Electronic Monitoring Systems

Electronic monitoring systems consist of a series of cameras, computer systems, data storage and in some cases gear sensors that are used to independently monitor fishing activities. Cameras are only required to capture the landing and sorting of catch and the discard of bycatch. The data is then sent to reviewers (either independent or Departmental employees) via the cloud or external hard drives for review and validation of fishing activities. However, in the future the use of artificial intelligence may automate the process of footage review, significantly reducing costs and increasing the speed in which review is undertaken. A number of artificial

[21] Course, G.P., Pierre, J., and Howell, B.K., 2020. What's in the Net? Using camera technology to monitor, and support mitigation of, wildlife bycatch in fisheries. Published by WWF.

[22] Babcock, Elizabeth & P kitch, Ellen & Hudson, Charlotte. (2011). How much observer coverage is enough to adequately estimate bycatch.

[23] Morrell, T. (2019). Analysis of 'Observer Effect' in Logbook Reporting Accuracy for U.S. Pelagic Longline Fishing Vessels in the Atlantic and Gulf of Mexico. HCNSO Student Theses and Dissertations. https://nsuworks.nova.edu/occ_stuetd/511

intelligence trials are already underway, including in Commonwealth fisheries, with the major limiting factor being the extent of the image library required to train the artificial intelligence software.

Electronic monitoring trials have been conducted in Queensland fisheries including the East Coast Inshore Fishery and the Spanner Crab Fishery from 2018 to 2020 as part of the Advance Queensland Small Business Innovation and Research challenge[17, 24]. Two companies, Anchor Lab and Fish-e were awarded nearly $900,000 for a feasibility study and proof of concept trial to develop electronic monitoring systems and artificial intelligence software for Queensland fisheries. While these trials were largely considered successful in testing the proof of concept for electronic monitoring, artificial intelligence software was not considered reliable enough for deployment at this stage. However, following the completion of these trials the rollout of electronic monitoring has stalled, with no further implementation of electronic monitoring systems on fishing vessels operating under a Fisheries Queensland managed program.

Electronic monitoring is not new, these systems have been trialled and implemented in fisheries worldwide for more than 20 years[25]. In Australia, electronic monitoring has been a mandatory requirement since 2015 in the Commonwealth managed Eastern Tuna and Billfish Fishery (ETBF), Western Tuna and Billfish Fishery, the Southern and Eastern Scalefish and Shark Fishery (SESSF) Gillnet, Hook and Trap sector and the Midwater trawl sector of the Small Pelagic Fishery. Commonwealth protocols require a minimum of 10% of footage to be reviewed to validate logbooks and provide data on catch and bycatch. The New Zealand Government has recently invested NZ$68m to rollout electronic monitoring systems on up to 300 inshore fishing vessels comprising 85% of total catch, the program has prioritised high risk fisheries such as gillnet and trawl fisheries, with the program to include longline and purse seine vessels in the coming years[26].

One of the main advantages of electronic monitoring as an IOM tool is that it is significantly more cost effective at scale. Best practice IOM identifies that 100% of vessels operating within a fishery should have IOM coverage[21,22,23,25]. For a fishing fleet the size of the Queensland East Coast and Gulf of Carpentaria Inshore Fisheries or the East Coast Trawl Fishery, Electronic Monitoring is the only feasible option to provide full coverage. Course *et al* 2020[21] estimate electronic monitoring costs to be approximately $9,000 per vessel per year (including system purchase, maintenance, data storage and footage review) and assuming 100% of footage is reviewed at speed to identify TEPS interactions. Using these estimated costs for the trawl fleet gives an estimated cost of $2.7m per year, significantly less than the $30m required for full observer coverage.

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[24] https://statements.qld.gov.au/statements/86831

[25] van Helmond, A.T.M., Mortensen L.O., Plet-Hansen K.S., Ulrich C., Needle C.L., Oesterwind D., Kindt-Larsen L., Catchpole T., Mangi S., Zimmermann C., Olesen H.J., Bailey N., Bergsson H., Dalskov J., Elson J., Hosken M., Peterson L., McElderry H., Ruiz J., Pierre J.P., Dykstra C., and Poos J.J. (2020). Electronic monitoring in fisheries: Lessons from global experiences and future opportunities. Fish and Fisheries 21: 162–189.

[26] https://www.mpi.govt.nz/fishing-aquaculture/commercial-fishing/fisheries-change-programme/on-board-cameras-for-commercial-fishing-vessels/

With modern 4k cameras, electronic monitoring systems have been demonstrated to be as effective as independent scientific observers in identifying most species that make up the catch and bycatch in Queensland commercial fisheries. Another advantage of electronic monitoring systems is the absence of observer effects if implemented across an entire fleet. Innovative management responses to TEPS bycatch can also be implemented where compliance and enforcement actions are focussed on vessels where TEPS bycatch is high or where compliance with regulations is low[21]. Electronic monitoring has also been demonstrated to improve the accuracy of self-reporting in logbooks and fishery compliance. In the ETBF the introduction of electronic monitoring led to more than a 750% increase in reporting of protected mammal discards and more than a 300% increase in protected turtle discards[21,,27]. Despite only 10% of footage being reviewed, the risk of footage being reviewed and differences between reported interactions and data captured by cameras led to dramatically improved logbook reporting of TEPS interactions, increasing the confidence in data collected within the fishery.

Drawbacks of electronic monitoring systems include difficulties in identifying some species such as sea snakes and small elasmobranchs to a species level due to an inability for a reviewer to observe an appropriate image of an individual sufficient to identify it accurately, for example by conducting scale counts to differentiate similar sea snake species[20]. Unlike independent scientific observer programs, scientific samples cannot be taken, however, with appropriate training these samples can often be taken by crew members willing to participate in research.

At present, Commonwealth fisheries require data to be stored on external hard drives and posted to the management authority and its reviewers. This can be problematic due to the risk of data being tampered with, loss or damage of hard drives and the significant time lag associated with data being sent to management authorities after long fishing trips. Many electronic monitoring systems have capability to store and send data via mobile internet or onboard wifi, greatly reducing these risks.

Electronic monitoring programs also generate large amounts of data, and it is important that sufficient protocols are established for the secure storage and privacy of this data.

Fundamental Requirements of an IOM Program

In high risk fisheries such as gillnet and trawl fisheries, where the bycatch of TEPS poses an unacceptable risk to the survival and recovery of these species, we recommend that IOM is implemented on all vessels within a fishery. Full coverage will ensure that there are no observer effects and that accurate data is collected on catch and bycatch which can be used to validate commercial fisher logbook data. For fleets the size of those found in these fisheries, electronic monitoring is the only feasible option.

In lower risk fisheries, such as the Reef Line Fishery, full IOM coverage across the fleet is not consistent with the risk profile of the fishery and not a responsible use of limited government

[27] Emery, Timothy & Noriega, Rocio & Williams, Ashley & Larcombe, James. (2019). Changes in logbook reporting by commercial fishers following the implementation of electronic monitoring in Australian Commonwealth fisheries. Marine Policy. 104. 135-145. 10.1016/j.marpol.2019.01.018.

funding. That does not mean that an IOM program is not required, but that IOM implementation should be tailored to the risk profile of the fishery. For lower risk fisheries 100% coverage is likely not required, and representative coverage may instead be suitable at three to five year intervals dependent on program findings.

We note that the literature recommends a minimum of 50% review to detect rare interactions with TEPS, however with the increased costs this is likely to incur we therefore recommend a minimum of 20% of electronic monitoring footage is reviewed. This will deliver accurate data on TEPS interactions and likely lead to significant improvements in logbook reporting. We further recommend continued investigation of artificial intelligence and the use of footage collected as part of the program to train artificial intelligence systems, their implementation will significantly reduce costs, increase the speed of review and provide for 100% of footage review.

IOM must be independent of commercial fishers to ensure the validity and public confidence in the data collected. Options such as body-worn cameras or crew member observer programs are not independent or tamper-proof and will not meet the objectives of the Sustainable Fisheries Strategy. In addition data collection and analysis must be tamper-proof to ensure that it is not manipulated to remove undesirable footage.

TEPS interaction data obtained from IOM programs must be transparent and made publicly available in a reasonable timeframe. Inconsistencies between logbook data and IOM should also be made publicly available. We recommend that quarterly reports are published with a maximum of a three month delay.

Appropriate privacy controls must be put in place to protect the privacy of fishers present in video footage.

National and International Independent Onboard Monitoring Expectations
Regulatory bodies, international agencies and seafood consumers are paying ever-increasing attention to seafood sustainability and the impact of wild-caught seafood on threatened species populations. Queensland has a number of commitments to the Commonwealth through joint management of the Great Barrier Reef Marine Park, as well as via Wildlife Trade Operation (WTO) Accreditations to establish IOM on Queensland fisheries.

The Reef 2050 Long-Term Sustainability Plan is the Australian and Queensland Government's overarching framework for protecting and managing the Great Barrier Reef to 2050. The Reef 2050 Plan 2021-2025 includes a number of strategic actions to reduce impacts from fishing activities, verify data and improve understanding to strengthen management of fishing activities[28]. These include:

"Develop and implement robust systems of independent data validation for the mesh net and trawl fisheries, including independent verification of levels of interaction with species of conservation concern, potentially including electronic monitoring.

[28] Reef 2050 Long-Term Sustainability Plan 2021–2025, Commonwealth of Australia 2023

Undertake a proof of concept for independent data validation, including electronic monitoring, for commercial mesh net and trawl fisheries"

WTO accreditations are required by the Commonwealth under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) in order for a species to be exported internationally and to allow interactions with listed threatened species with indemnity from prosecution. In accrediting a fishery as a WTO, the Department of Climate Change, Environment and Water undertakes an assessment of the fishery against the Guidelines for the Ecologically Sustainable Management of Fisheries. Accredited fisheries often have conditions placed on them to ensure that they meet these guidelines and if a condition is not met the Federal Environment Minister must revoke the WTO. The Queensland Sustainable Fisheries Strategy has a 2027 target of maintaining all WTO accreditations. At present, four fisheries have had their WTO accreditation revoked, while a fifth, Spanish mackerel, was voluntarily rescinded by Fisheries Queensland. The fisheries in the table below have conditions requiring IOM in their current or most recent accreditation.

Fishery	Condition	Status of accreditation
Blue Swimmer Crab Fishery	7. The Queensland Department of Agriculture and Fisheries progress the development and implementation of an independent data collection and validation program including: a. Assess feasibility and complete proof of concept trials for electronic monitoring by December 2019. b. Implement an independent data collection and validation program in the Blue Swimmer Crab Fishery from January 2021 (this may include electronic monitoring or alternative interim solutions).	Revoked
Mud Crab Fishery	7. The Queensland Department of Agriculture and Fisheries progress the development and implementation of an independent data collection and validation program including: a. Assess feasibility and complete proof of concept trials for electronic monitoring by December 2019. b. Implement an independent data collection and validation program in the Mud Crab Fishery from January 2021 (this may include electronic monitoring or alternative interim solutions).	Revoked
Commercial Trawl (Fin Fish) Fishery	6. By 31 August 2024, the Queensland Department of Agriculture and Fisheries must develop and implement an annual robust, independent, quantitative, and validated monitoring and data collection program in the Queensland Commercial Trawl (Fin Fish) Fishery. This may involve the use of electronic monitoring, onboard observers, or other means. The information collected must be sufficient to reliably demonstrate the accuracy of all reported catch, effort and	Active

	protected species interaction data collected via logbooks. This program needs to gather suitable data on the level of catch, discards and interactions in the fishery to inform the sustainable management of target, byproduct and bycatch species (including protected species). 3 Performance of the program, including comparative analyses of fishery dependent and independent data sources must be included in annual reports provided to the Department of Climate Change, Energy, the Environment and Water as part of condition 4.	
East Coast Inshore Fishery	6. The Queensland Department of Agriculture and Fisheries to continue to develop an improved data collection and validation approach that supports the strategy outlined in Condition 4, and facilitates monitoring and management of all target, bycatch and protected species impacted by the fishery.	Revoked
East Coast Otter Trawl Fishery	7: By 20 May 2024, the Queensland Department of Agriculture and Fisheries must develop and implement a statistically robust, independent, quantitative and validated monitoring and data collection regime in the Queensland East Coast Otter Trawl Fishery. This may involve the use of electronic monitoring, onboard observers, or other means. The information collected ·must be sufficient to reliably demonstrate the accuracy of all reported catch, effort and protected species interaction data collected via logbooks. This regime needs to gather suitable data on the level of catch, discards and interactions in the fishery to inform the sustainable management of target, byproduct and bycatch species (including protected species)	Active
Gulf of Carpentaria Developmental Fin Fish Trawl Fishery	5. The Queensland Department of Agriculture and Fisheries must ensure that an observer is carried onboard each fishing boat in the Gulf of Carpentaria Developmental Fin Fish Trawl Fishery on each boat's first fishing trip of each year, and every third trip thereafter. Within eight weeks of the completion of each observed trip, the Queensland Department of Agriculture and Fisheries must provide a copy of the observer trip report to the Department of Agriculture, Water and the Environment. The observer trip report must include: a) Description of the trip and the fishing gear used b) Retained catch by species per shot (estimated weights) with at least one shot per day recording actual weights c) Retained volume of legal-size catch by species per shot and sub-legal size catch by species per shot (estimated weights) with at least one shot per day recording actual weights d) Discarded catch identified where possible to species level, per shot (estimated weights) with one shot per day recording actual weights. Any interactions with the benthos must also be reported. This includes for example organisms like corals, sponges,	Active

	gorgonians, as well as substrate such as rock. e) Effort (shot location, number of shots by grid/site, hours trawled) f) Protected species interactions (species, individuals and estimated weights, and lifestatus (dead, injured, alive) per shot.	
Gulf of Carpentaria Inshore Fishery	5: The Queensland Department of Agriculture and Fisheries progress the development and implementation of an independent data collection and validation program including: a. Assess feasibility and complete proof of concept trials for electronic monitoring by December 2019. b. Implement an independent data collection and validation program in GoCIFFF from January 2020 (this may include electronic monitoring or alternative interim solutions)	Revoked (For failure to meet condition 5b)
River and Inshore Beam Trawl Fishery	Note this is a recommendation not a condition: 1. The Queensland Department of Agriculture and Fisheries progress the development and implementation of an independent data collection and validation program including: a) assess feasibility and complete proof of concept trials for electronic monitoring by December 2019. b) implement an independent data collection and validation program in Queensland River and Inshore Beam Trawl Fishery from January 2020 (this may include electronic monitoring or alternative interim solutions, and c) ensure catch composition is sufficiently monitored and understood to ensure that all stocks impacted by the fishery are sustainably managed, not overfished or subject to overfishing.	Expired

In March 2022, UNESCO and IUCN, scientific advisors to the World Heritage Centre undertook a reactive monitoring mission to assess the health and management of the Great Barrier Reef World Heritage Area. In November 2022 they published their Reactive Monitoring Mission (RMM) report. The RMM report recommended that the Great Barrier Reef be listed as 'World Heritage In Danger' due to the impacts of climate change, water pollution and unsustainable fishing[29]. The RMM report contains a clear set of 22 recommendations outlining what the Australian and Queensland governments must do to protect the Reef and, by extension, protect its World Heritage status.

Recommendation O7 states:

Develop and implement appropriate mandatory independent mechanisms for discard and bycatch monitoring, such as e-monitoring via vessel-based cameras, on all gill-net and trawl vessels within the property.

[29] Carter, E. & Thulstrup, H. (2023) REPORT ON THE JOINT WORLD HERITAGE CENTRE/IUCN REACTIVE MONITORING MISSION TO THE GREAT BARRIER REEF (AUSTRALIA) FROM 21 TO 30 MARCH 2022

The RMM report also states that it is their view that full coverage of vessels within the gillnet and trawl fisheries is achievable.

The Australian and Queensland Governments must report back to UNESCO in February 2024 to demonstrate their progress in meeting the recommendations of the RMM report prior to further consideration of the Great Barrier Reefs World Heritage status later in 2024.

Proposed IOM Fisheries Act Amendment

AMCS and WWF support the proposed amendments to the Fisheries Act to establish a framework for IOM requirements. However, we recommend that Section 76ZG that stipulates that electronic monitoring equipment not be interfered with should be expanded to include data collected by electronic monitoring equipment, specifically that data should not be edited or deleted and all data should be sent to the appropriate authority.

Amendments Regarding Repeated Interactions with Threatened Species

As noted above, a number of fisheries, and in particular high risk fisheries such as the East Coast Inshore and Gulf of Carpentaria Inshore Fisheries and the East Coast Otter Trawl Fishery have unacceptable levels of bycatch of threatened species.

However, threatened species bycatch varies in space and time, while another key influence is the knowledge, skill and operations of the fisher. A recent study of vessel bycatch in Commonwealth fisheries found that bycatch rates are largely driven by individual vessel behaviour with more skilled fishers able to avoid high rates of bycatch whilst maintaining high catches of the target species[30].

In Queensland fisheries there is likely to be a subset of fishers that are responsible for much of the threatened species bycatch, some of which may be able to be avoided with changes to operations and adoption of best practice. In 2021, an operator in the East Coast Inshore Fishery was recorded letting their gillnet run dry on the beach with at least seven turtles entangled. The story made national media and increased scrutiny on the fishing practices within the fishery[31]. Yet two weeks later the same fisher was photographed fishing the same area on the same tide, perhaps with the same impact on threatened species.

One option to address these differences in performance relating to threatened species bycatch is to impose conditions upon a fishing license such as undertaking further training such as via a Best Management Practice program, develop a bycatch mitigation plan, or restrictions on the gear permitted to be used such as shorter nets, increased net attendance, or temporary or spatial restrictions. This individual accountability may improve the performance of fishers within a fishery and lead to reduced bycatch of threatened species, benefiting the environment and other fishers within the fishery.

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[30] Roberson, Leslie & Wilcox, Chris. (2022). Bycatch rates in fisheries largely driven by variation in individual vessel behaviour. Nature Sustainability. 10.1038/s41893-022-00865-0.

[31] https://www.abc.net.au/news/rural/2021-02-18/fishers-environmentalists-clash-over-ways-to-prevent-net-deaths/13163044

This concept is not new and already exists in Fisheries Queensland policy within the Protected Species Management Strategy (PSMS) for the East Coast Inshore Fishery. The aim of which is to reduce interactions with threatened species to as close to zero as possible, while allowing sustainable fishing practices[32]. The strategy identifies there is a need for greater accountability and stronger incentives for individual fishers to minimise interactions. To implement this the Strategy outlines how individual accountability will be delivered within the fishery. The table below is extracted from the PSMS.

Individual triggers	**Fisher and management response**
An interaction with any protected species.	The fisher must report the interaction by submitting a TEP animal interaction logbook report within 24 hours (electronically) or 7 days (paper) after the fishing operation ends. If the interaction is with a marine mammal, the fisher must report the interaction to the Wildlife Hotline on 1300 264 625 within 24 hours. If the interaction is with a species listed at Attachment A, the fisher must also report the interaction to Fisheries Queensland on (13 25 23 or at fisheriesmangers@daf.qld.gov.au) within 48 hours after the fishing operation ends (unless reporting logbooks electronically).
The first mortality event for any species listed in Attachment A within a calendar year.	The fisher must follow the responses outlined for ‘Any interaction’. Upon notification, Fisheries Queensland will contact the fisher and undertake an evaluation of the event with the fishers to better understand the circumstances of the event and discuss options for minimising the risk of further mortality events from fishing.
The second mortality event for any species listed in Attachment A within a calendar year.	The fisher must follow the responses outlined for ‘Any interaction’ Upon notification, Fisheries Queensland will assist the fisher in reviewing the fisher’s operation and, prior to recommencing fishing, require the fisher to develop an individual mitigation plan for approval prior to

[32] Protected species management strategy for the east coast inshore fishery, 2021. State of Queensland

	recommencing fishing. Information on mitigation plans is outlined in section 8.4.
Subsequent mortality event/s for any species listed in Attachment A within a calendar year.	The fisher must follow the responses outlined for 'any interaction'. Upon notification, Fisheries Queensland will review the fisher's individual mitigation plan with the fisher to help identify any improvements. In addition to previous requirements, the fisher will be subject to a show cause notice and may have the fisher's operation further conditioned. Remedial actions could include further conditioning of the fisher's operation (i.e. gear restrictions to reduce the risk for a nominated period of time), requiring monitoring (observer or electronic) on board to monitor the operation (at fisher's expense), or suspension from netting operations for up to 12 months.

The East Coast Inshore Fishery PSMS is fundamentally flawed as there is no requirement to have IOM within the fishery. The introduction of individual accountability has created a further disincentive for fishers to report interactions with threatened species as they will be held accountable for any mortalities. As such, since the introduction of the PSMS in September 2021 not a single mortality event has been reported by commercial fishers, despite evidence of gillnet mortalities within the Queensland Government Strandnet database and the implausibility of it based upon the estimated level of interactions within the fishery.

Individual accountability alone will not reduce interactions with threatened species to a level that does not have an unacceptable impact on their populations. For some species the loss of even a few individuals can have devastating impacts on the viability of a population, in particular those that live in small isolated populations such as snubfin or humpback dolphins. Regional thresholds for threatened species mortalities must be introduced, which when triggered lead to dynamic spatial closures for a biologically relevant period of time. Regional thresholds should be informed by the number of individuals that can be removed from a population by human causes without causing it to decline, known as Potential Biological Removal (PBR). PBR estimates exist for some populations such as dugongs and some inshore dolphins. Where PBR estimates do not exist, thresholds should be based on the precautionary principle, scientific evidence and expert opinion, so fishing does not contribute to the further decline of TEPS.

Regional thresholds and dynamic spatial closures are in place in the Commonwealth Southern and Eastern Scalefish and Shark Fishery and are implemented via the Australian Sea Lion Management Strategy[33]. Based on this strategy, if Australian sea lion mortalities exceed

[33] Australian Sea Lion Management Strategy Southern and Eastern Scalefish and Shark Fishery (2015). Australian FIsheries Management Authority

population informed thresholds, dynamic spatial closures of 18 months are implemented to protect that colony from further bycatch mortality. We strongly recommend that this approach is adopted in high risk Queensland fisheries to reduce the impact on TEPS.

Proposed Repeated Interactions with Protected Animals Act Amendment
AMCS and WWF support the proposed amendments to the Fisheries Act to create a head of power to enable the Chief Executive to impose conditions on a fishing authority following repeated interactions and mortalities of TEPS.

Conclusion
Seafood consumers and international and regulatory bodies are paying ever-increasing attention to seafood sustainability and the broader impacts of fishing on the environment. Many of Queensland's fisheries operate within the World Heritage Listed Great Barrier Reef, where fishing should be held to the highest standard. The incidental bycatch of threatened species is the most significant fisheries sustainability issue in Queensland and must be addressed.

However, despite mandatory reporting requirements, fishers are not accurately reporting interactions with TEPS. Known interaction levels are a high risk to many TEPS, and the scale is likely significantly higher than that reported. An IOM program focussed on the high risk gillnet and trawl fisheries is urgently required to collect accurate information on catch and bycatch, and provide for the independent validation of logbook data.

Our organisations support the proposed Fisheries Act amendments regarding IOM, and recommend an inclusion to ensure that the data collected is tamper-proof.

Some fishers are also likely having a disproportionate impact on TEPS through their bycatch levels. If significant, individual accountability is one option to address this, and is already part of Fisheries Queensland policy in the East Coast Inshore Fishery PSMS. However, to protect threatened species and ensure fishing is not contributing to the further decline of TEPS we recommend that regional thresholds and dynamic spatial closures informed by science are introduced to PSMS' in the relevant fisheries.

AMCS and WWF support the proposed Fisheries Act amendments regarding repeated interactions with TEPS.

Should further information be required, please contact the authors on the contact details provided.

Yours sincerely,

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