Vessel tracking consultation post implementation review

Chapter 4, Part 1 of the Fisheries (General) Regulation 2019

September 2022

Queensland Government

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The Department of Agriculture and Fisheries proudly acknowledges all First Nations peoples (Aboriginal peoples and Torres Strait Islanders) and the Traditional Owners and Custodians of the country on which we live and work. We acknowledge their continuing connection to land, waters and culture and commit to ongoing reconciliation. We pay our respect to their Elders past, present and emerging.

Summary

Background

Queensland's natural marine environment belongs to everyone. It is a public resource which provides broad benefits through economic, social and ecological means. Legislation and regulations are in place to govern the use of Queensland's fisheries resources and ensure the marine environment's sustainability (and the resulting public benefits).

The Fisheries (General) Regulation 2019 regulates many aspects of Queensland's fisheries. When introduced in September 2019, the regulation included Chapter 4, Part 1, the vessel tracking regulation.

The vessel tracking regulation outlines the requirements for vessel tracking units on commercial fishing vessels in Queensland. Fishers are required to have installed and operate vessel tracking units on primary boats and tender boats when at sea. GPS data is polled from the vessel tracking units and provided to the Department of Agriculture and Fisheries (DAF). The data collected from vessel tracking units across the commercial fleet is used to inform specific aspects of the fisheries management, assist with compliance activities and in turn providing a sustainable resource going forward.

DAF is undertaking a post implementation review (PIR) of the vessel tracking regulations contained within Chapter 4, Part 1 of the Fisheries (General) Regulation 2019. The PIR considers the impacts of the vessel tracking regulation since it was introduced and any recommendations for the regulation looking forward.

A timeline of the consultation and regulatory process that led to the introduction of the vessel tracking regulation can be found at Appendix A.

Initial problem

In 2017, it was widely acknowledged that the existing management of the Queensland fisheries was too complex and inadequate for dealing with modern challenges faced by the fisheries[1]. The *Queensland Sustainable Fisheries Strategy 2017-2027* (QSFS) identified ten specific problems with the existing legislation and management. Two of the ten problems were identified as:

1. Monitoring and research are inadequate to inform management decisions
2. Inherent challenges in current compliance approaches and limited capacity to enforce regulations

[1] Department of Agriculture and Fisheries 2017, *Queensland Sustainable Fisheries Strategy 2017-2027,* <*https://www.publications.qld.gov.au/dataset/queensland-sustainable-fisheries-strategy/resource/319c7e02-f07b-4b2e-8fd5-a435d2c2f3c9*>

Vessel tracking was identified as an effective method for collecting data which could then be used to improve monitoring and research activities and more effectively conduct compliance activities across the fisheries. Without the introduction of effective management practices, including vessel tracking on commercial fishing boats, the above problems would continue to exist leaving the sustainability of Queensland's fisheries at risk.

Further problems identified since the introduction of the vessel tracking regulation

Since the initial identification of the above problems, additional problems have also been identified since the introduction of the vessel tracking regulations. Specifically:

1. Access to the Great Barrier Reef Marine Park (GBRMP) – The Great Barrier Reef Marine Park Authority (GBRMPA) has confirmed that high resolution vessel tracking data is essential for informing their compliance activities and in turn ensuring the protection of the marine park. GBRMPA has also indicated that if vessel tracking were not in place on commercial fishing vessels, access to the GBRMP would be difficult to maintain.

2. Ability to meet *Environment Protection and Biodiversity Conservation (EPBC) Act* approvals – the use of vessel tracking has assisted to meet certain requirements of the *EPBC Act* approvals. Failure to meet these requirements would mean fishers in the listed industries would not be able to export product to international markets.

Objectives of the vessel tracking regulation

The objective of Chapter 4, Part 1 of the Fisheries (General) Regulation 2019 was to implement vessel tracking on a broader range of commercial fishing fleets. The implementation of vessel tracking on commercial vessels would provide valuable (timelier and more accurate) data that could be used for the following purposes:

1. Independently validated data (specifically logbook catch and effort data) for use in monitoring and research activities; and
2. Real-time data for use in an intelligence-based compliance approach (real-time, locational data used to direct and carry out targeted compliance checks on the water) which complements the existing 'boots on the ground' approach (patrol boats on the water randomly intercepting boats for compliance checks).

Both outcomes seek to contribute to a more proactive and accurate monitoring and research program as well as a more effective compliance approach thus working to overcome the identified problems associated with these pillars of fisheries management. It is against these objectives that the effectiveness of the legislative amendments has been assessed in this PIR.

Observed impacts of the vessel tracking regulation

Consultation carried out to inform this Consultation PIR has identified several impacts which have resulted from the introduction of vessel tracking.

With respect to the objectives of the regulation, consultation has provided the following:

1. The data from vessel tracking provides a significantly richer data set which can be used to better understand effort by commercial fishers. This data is currently being used to develop more accurate models of total catch and fish stocks with the outcomes of these activities set to achieve a Total Allowable Catch (for commercial fishers) which is closer to the Recommended Biological Catch (RBC). What this means is that commercial fishers will be allocated a more optimal annual allowable catch than what is currently provided. Further, the richer data set provided by vessel tracking is also currently being used in other applications to ascertain a better understanding of the fish resources and the activity of the commercial fishers such that further improvements to management strategies can be made. Improvements in this area directly contribute to ensuring a sustainable fishery for all participants.
2. The availability of vessel tracking data and real-time identification of the location of individual boats has enabled a more intelligent and proactive approach to compliance that also reduces the compliance burden on fishers (less compliance checks for those commercial fishers doing the right thing) and works with other measures to reduce compliance costs and increase compliance capacity. It has also demonstrated an increased capacity for authorities to spend time in other areas of compliance outside of the commercial fisheries thus delivering flow-on benefits in these areas (for example, recreational fishing and black-marketing activities). Again, improvements in compliance activities directly contribute to ensuring a sustainable fishery for all participants.

Additional benefits and costs have been identified from the consultation to date. A summary of all impacts identified through consultation to date are provided at Table 1 below. All impacts are discussed in detail under Section 5 of this Consultation PIR.

Table 1 Summary of the impacts of the regulation

Benefits	Costs
• More effective fisheries monitoring and research through the development of improved fisheries models. These models are used to inform fishers management decisions around access and use of the fisheries which have historically resulted in favourable benefits to commercial fishers. • Improved approaches to compliance activities that have resulted in a reduction in some compliance costs and a reduced	• Upfront technology and ongoing polling costs to fishers • Opportunity costs related to fishers being unable to fish when vessel tracking malfunctions • Additional financial costs to the Queensland Government through the rebate scheme which sought to offset the fishers' upfront costs • Additional financial costs to the

Benefits	Costs
compliance burden to commercial fishers • Increased voluntary compliance by fishers • Assists some fisheries to meet certain requirements of their *Environment Protection and Biodiversity Conservation Act 1999* approvals • Assists in maintaining commercial access to GBRMP fishing grounds • A relaxation and repeal of other regulations or part thereof which has provided greater flexibility to commercial fishers with respect to how they carry out their commercial fishing operations • Increased availability of real-time data for fishers which can be used to monitor and manage vessels in their fleet • May be beneficial to help direct responses in the event of emergencies	Queensland Government through ongoing annual costs of running vessel tracking, maintaining access to Trackwell and employing staff to manage the system. • Additional financial costs to the Commonwealth through the rebate scheme which sought to offset the fishers' upfront costs • Technology issues (including issues with suppliers of the technology) that have impacted implementation and link into opportunity costs relating to fishers being unable to fish (as identified above) • Data privacy and ownership concern • Emotional impacts to the fishers through the use of tracking systems

Recommendations

Queensland's fisheries represent a unique resource: one which is common property. The Queensland Government has allocated commercial entitlements and is responsible for managing the fisheries on behalf of the broader community. Everyone has a part to play in the management of the fisheries to ensure the continued sustainability of the resource.

Feedback from the consultation process to date has identified that the vessel tracking regulation has achieved the objectives it sought to achieve. In other words, it has been reported that the vessel tracking regulation has successfully provided meaningful data that is being used to improve the modelling and research, and compliance aspects of fisheries management. As per the QSFS, any improvements to the management of the fisheries are done so to improve the long term sustainability of Queensland's fisheries which have an estimated $770 million annual value to Queensland[2] [3] [4] (for the year ended 30 June 2019). The sustainability of the overall fishery in turn provides for the sustainability of the individual

[2] Department of Agriculture and Fisheries 2020, *Summary economic and social indicators for Queensland's commercial fisheries, 2017/18 and 2018/19,* https://www.publications.qld.gov.au/dataset/fisheries-economic-and-social-indicators-financial-years-2018-and-2019/resource/9f9cd923-892e-49ab-a78f-94d9df50926d>

[3] Department of Agriculture and Fisheries 2021, *Economic contribution of recreational fishing by Queenslanders to Queensland,* <https://www.daf.qld.gov.au/business-priorities/fisheries/monitoring-research/data/economic-contribution-of-recreational-fishing>

[4] Department of Agriculture and Fisheries 2020, Economic and social indicators of the Queensland charter fishery, 2017/18 and 2018/19, <https://www.publications.qld.gov.au/dataset/fisheries-economic-and-social-indicators-financial-years-2018-and-2019/resource/7ac87916-a5f8-44e5-9d0a-9d422a0a44d2>

fishing businesses which have recently been estimated to be worth on average $219 000 per year in gross income[2] (i.e. the businesses of the fishers). A contribution to the overall sustainability of the fisheries and in turn the individual fishing businesses is a benefit that far outweighs the identified costs of the vessel tracking regulation.

Additional benefits not sought under the original objectives have also been realised by the commercial fishers including relaxation/repeal of other regulations that enable fishers greater flexibility in relation to how they conduct their fishing operations, improved data availability to monitor their commercial fishing operations, the ability to demonstrate that they meet certain requirements of current *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) approvals which enables fisheries product to be exported and continued access to the GBRMP for commercial fishing. Table 2 provides a summary of the net benefits by stakeholder.

Table 2 Summary of the net quantified benefit by stakeholder

Stakeholder	Quantified operational costs per annum	Quantified one-off cost (rebate scheme)	Quantified benefits (cost saving) per annum	Quantified benefits of maintaining export approvals and access to GBRMP	Net Benefit (per annum) ongoing
Fishers	$3 006 711	N/A	$689 633	$99 500 000	~ $97 182 922
Government (both State and Federal)	$1 124 857	$3 100 000	$1 451 400	N/A	~ -$2 773 457
				Total	**~ $94 626 909**

Despite the vessel tracking regulation largely achieving the desired objectives and demonstrating a net benefit, unintended outcomes have also resulted from the introduction of the regulation.

Therefore, to ensure the benefits realised to date continue to be realised, alongside those that are expected to materialise as current efforts in these areas progress, the recommendation of this Consultation PIR is that the vessel tracking regulation remain as it currently stands.

However, this recommendation is only provided on the basis that the following actions are carried out to address specific unintended costs identified from the consultation to date:

1. Introduce a temporary exemption system that allows fishers the ability to fish while the unintended technology issues experienced during implementation are resolved and to gather sufficient data to consider the costs and benefits of such a system longer term. Specifically, it is recommended that the short term risk-based exemption system either as proposed by DAF (Appendix C), or similar to that proposed by DAF,

be implemented and used for a period of 12 months to provide ‘cover’ for fishers while the technology issues are resolved and to gather sufficient data to clearly quantify the benefits and costs of such a proposed approach longer term. An interim review of the exemption process and its effectiveness should be carried out at 6 months with a complete review at the end of the 12-month period. This will inform whether regulation amendment is required to legislate a long-term exemption system should it be warranted.

2. Continually review and update the Vessel Tracking Installation and Maintenance Standard to identify and incorporate new vessel tracking unit that is found to meet the requirements for use in Queensland fisheries. Given technology constantly evolves over time, it is expected that this approach would continue to increase the current selection.
3. Conduct a review of the current and existing arrangements in place to share, use and protect the vessel tracking data and, if required, establish any additional arrangements between DAF, the service providers and the fishers that ensures that the data generated from the vessel tracking regulation is protected across the entire course of its creation, holding and use.

Next steps

This is a Consultation PIR. It sets out DAF's conclusions based on the available evidence. The release of the Consultation PIR is an opportunity for any interested parties to provide a written submission to DAF on the findings and conclusions of this report.

All submissions will be reviewed and a Decision PIR will be produced which updates this Consultation PIR in response to the feedback provided. The Decision PIR will then be approved by the Cabinet to decide on the future of the regulation.

Consultation focus areas:

Impacts

We are seeking your feedback on the impacts realised since the introduction of the vessel tracking regulation. Some questions to prompt this consultation process include:

- Have you realised any of the impacts described above? If yes, to what extent?
- Are there any other impacts (positive, negative, unintended) that you have realised because of the introduction of the vessel tracking regulations?

If possible, please quantify the impact (cost and benefit) realised by you and provide evidence to support your feedback. To this extent, we are keen to hear about hours /petrol saved due to the regulation being introduced (i.e. no longer having to go round a green zone), increased catch by volume and value (i.e. from dories being able to fish further afield), removal of 1, 3 and 6 hourly prior notice requirements, and any other impacts your business has experienced (e.g. vessel tracking polling confirmation method).

Recommendations

We are seeking your feedback on the recommendations made with respect to future aspects of the vessel tracking regulation. Some questions to prompt this consultation process include:

- Do you agree or disagree with the recommendations made? Please explain why you either agree or disagree.
- Do you have any other ideas or recommendations that could work to provide similar or improved outcomes which would work to deliver robust fisheries management (specifically with respect to monitoring and research, and compliance aspects of management) and in turn, sustainable fisheries?

Lodging a submission

You are invited to have your say about the impact, effectiveness and continued relevance of the vessel tracking regulations contained within Chapter 4, Part 1 of the Fisheries (General) Regulation 2019.

Submissions should be made:

- Via vessel tracking portal
  Website/Portal: Department of Agriculture and Fisheries | Vessel Tracking Review – Engagement Portal (engagementhub.com.au)

- Via email to this address
  Email address: VTEngagement@daf.qld.gov.au

- Via telephone
  Phone Number: 13 25 23

- Via post to this address
  Postal address: GPO Box 46, Brisbane QLD 4001

All submissions must be received by **5pm, Wednesday 14 December 2022** (extended from the original consultation end date of 30 November 2022).

Submissions may be published in the Decision PIR unless otherwise provided in confidence. If material is provided in confidence, this should be clearly marked “IN CONFIDENCE”.

Call 13 25 23 or email VTEngagement@daf.qld.gov.au for any questions about this consultation process.

Contents

Abbreviations and acronyms

AFMA	Australian Fisheries Management Authority
AMSA	Australian Maritime Safety Authority
DAF	Department of Agriculture and Fisheries
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
FFA	Pacific Islands Forum Fisheries Association
FRDC	Fisheries Research and Development Corporation
GBR Agreement	*Great Barrier Reef Intergovernmental Agreement 2015*
GBRMP	Great Barrier Reef Marine Park
GBRMPA	Great Barrier Reef Marine Park Authority
GBRMPA Act	*Great Barrier Reef Marine Park Act 1975*
GSP	Gross State Product
GVP	Gross Value of Production
PIA	Preliminary Impact Assessment
PIR	Post Implementation Review
QBFP	Queensland Boating and Fisheries Patrol
QRIDA	Queensland Rural and Industry Development Authority
QSFS	*Queensland Sustainable Fisheries Strategy*
RBC	Recommended Biological Catch
RIA	Regulatory Impact Analysis
TAC	Total Allowable Catch
The Reef 2050 Plan	*Reef 2050 Long Term Sustainability Plan*
VT	Vessel Tracking
VMS	Vessel Monitoring System

1 Regulatory assessment and review

1.1 Purpose of this review

The Department of Agriculture and Fisheries (DAF) committed to commissioning a post implementation review (PIR) of vessel tracking following the recommendations of the State Development, Natural Resources and Agricultural Industry Development Committee's examination of the Fisheries (Sustainable Fisheries Strategy) Amendment Bill 2018. The PIR is undertaken in accordance with the Queensland Government Guide to Better Regulation. This document is the Consultation PIR released for public feedback.

1.2 Regulatory impact analysis

Regulatory impact analysis (RIA) is a critical element in developing best practice regulation. RIA is a systematic approach that critically assesses the impacts of proposed regulatory policy options. Several steps are carried out under the RIA, two of importance are the preliminary impact assessment (PIA) and the regulatory impact statement (RIS).

If a RIS is not conducted (for the reasons outlined in The Queensland Government's Guide to Better Regulation), a PIR may be required to be carried out.[5]

1.2.1 Post implementation review

The purpose of a PIR is to assess the impacts, effectiveness and continued relevance of the regulations that have been recently made and are in force, specifically to understand:

- whether a problem (requiring regulation) still exists
- the actual (rather than expected) impacts of a proposal
- whether there were any unintended consequences from the regulation's implementation
- whether the regulation should continue, including whether any amendments should be made.

In conducting the PIR, several key matters must be addressed, including:

- consideration of the original problem and objectives—what was the initial problem that the regulation intended to solve? What were the objectives of government action? Why was the policy (that became the regulation) preferred over other options? Does the problem still exist and has it changed over time?
- assess the impacts of the regulation—what are the observed impacts (costs and benefits) of the regulation since implementation? Are there any unintended consequences?

[5] Queensland Treasury 2019, *Queensland Government guide to better regulation,* <https://www.treasury.qld.gov.au/resource/queensland-government-guide-better-regulation/>

- effectiveness of the regulation—is the regulation working as intended? Has the regulation solved (or made progress towards solving) the problem? Is it meeting the original policy objectives?
- should the regulation be retained? Is there a genuine need for continued regulation? If yes, is the current regulation the best option? What impacts would arise if the regulation expired / were repealed?
- proposed amendments—list any proposed improvements to the regulation (especially if the problem is not being adequately addressed) and discuss potential impacts.

The PIR involves a two-stage process:

1. Preparation and release of a Consultation PIR
2. Preparation and release of a Decision PIR

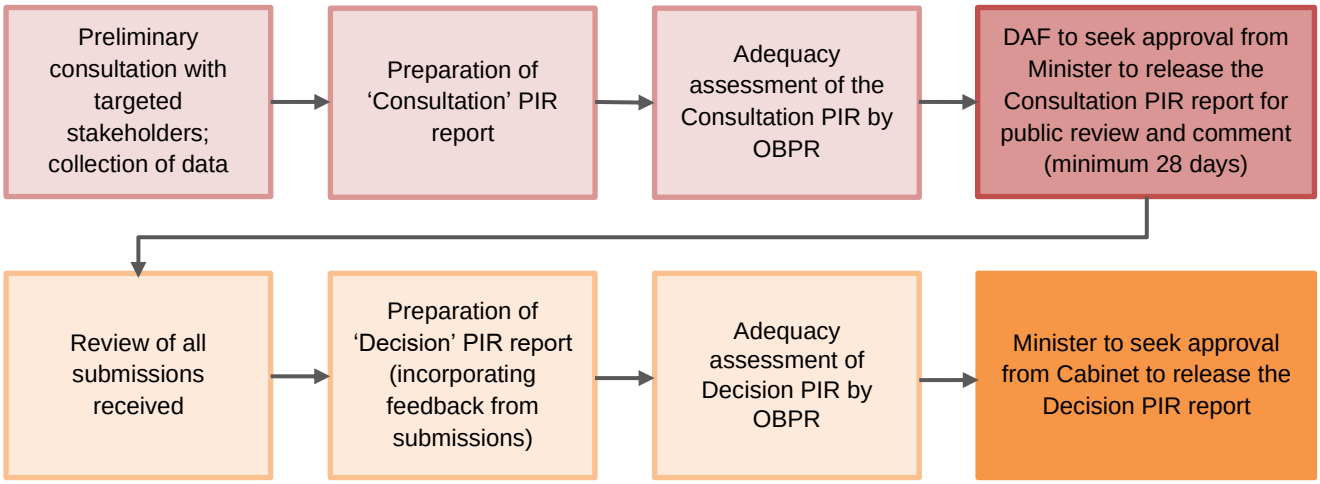

Figure 1 Process for completing a PIR

Consultation with affected parties and the broader public is carried out throughout the PIR process.

The Decision PIR is used to support any proposed amendments to the regulation, to support repeal of the regulation, or to confirm that the regulation is working as intended.

A PIR must be commenced within two years and completed within three years of the implementation date of the regulation. It must be carried out in accordance with the Queensland Government Guide to Better Regulation. The Office of Best Practice Regulation (OBPR) assesses both the Consultation PIR and Decision PIR for adequacy against the Queensland Government Guide to Better Regulation.

For further information on PIR see:

- The Queensland Government Guide to Better Regulation <*https://www.treasury.qld.gov.au/resource/queensland-government-guide-better-regulation/*>
- Guidance note: Post implementation review <*https://s3.treasury.qld.gov.au/files/Guidance-Note_PIR_1509-2021.pdf*>

1.3 Consultation to date

The Vessel Tracking Working Group comprising commercial industry members, departmental staff and other federal government entities is the primary stakeholder group that had provided feedback during preliminary consultation to assist in preparing the Consultation PIR report. The consultation to date has been through:

1. Vessel Tracking Working Group monthly meetings (from July 2021 to December 2021)
2. Further targeted consultation with Vessel Tracking Working Group members. This included one-on-one sessions with those willing to participate in this consultation (offer for consultation was extended to all members).

This document constitutes the Consultation PIR which has now been publicly released. Any interested person or organisation is invited to provide a written submission. All submissions will be reviewed and used to inform the Decision PIR.

2 The vessel tracking regulation

2.1 Overview of the Queensland fishing industry

Queensland is home to over 7,000 kilometres of coastline, half of which is adjacent to the unique and remarkable Great Barrier Reef World Heritage Area. Queensland's natural marine environment belongs to everyone. It is a public resource which provides broad benefits through economic, social and ecological means. Administering legislation is in place to govern the use of Queensland's fisheries resources and ensure the marine environment's sustainability (and the resulting public benefits).

With such an extensive natural resource here in Queensland, the fisheries are diverse. The commercial fishing industry currently comprises 2016 commercial fisher licence holders and 1684 primary commercial fishing licence holders[6] operating regional businesses along the entire coastline providing employment to thousands, fresh seafood for local and export markets and an estimated $400 million to the State's economy per year[7]. Recreational fishing by Queenslanders in Queensland generated an estimated $333.7m in total Gross State Product (GSP) throughout the State's economy (i.e. including direct and flow-on contributions), $209.5m in total household income and 3,136 FTE jobs[8]. Aboriginal and Torres Strait Islands people have practised fishing for millennia and it has an important cultural significance, especially to coastal indigenous communities.

[6] Department of Agriculture and Fisheries, *FishNet Public,* viewed July 2022, <*https://fishnet.fisheries.qld.gov.au/Content/Public/LicenceAndPermitAuthorities.aspx*>

[7] Department of Agriculture and Fisheries 2020, *Summary economic and social indicators for Queensland's commercial fisheries, 2017/18 and 2018/19, https://www.publications.qld.gov.au/dataset/fisheries-economic-and-social-indicators-financial-years-2018-and-2019/resource/9f9cd923-892e-49ab-a78f-94d9df50926d*>

[8] Department of Agriculture and Fisheries 2021, *Economic contribution of recreational fishing by Queenslanders to Queensland, <https://www.daf.qld.gov.au/business-priorities/fisheries/monitoring-research/data/economic-contribution-of-recreational-fishing*>

Queensland's extensive fisheries provide a significant contribution to the state's economic, cultural, and social way of life. Its common-property and open-access nature means all stakeholders have a responsibility to protect the fisheries from over-exploitation and sustain a viable resource for future generations.

As the benefit of the fisheries in Queensland is widespread, ensuring the sustainability of the fisheries is paramount. The Queensland Government is responsible for managing the fisheries on behalf of all Queenslanders. This is done so by Fisheries Queensland under DAF. With the international significance of the Great Barrier Reef, the responsibility is heightened.

The *Fisheries Act 1994* is the primary legislative instrument for the management, use, development and protection of the Queensland fisheries resources and fish habitats[9]. Its objectives focus on balancing the use, conservation, and enhancement of the resource. Other state regulations and declarations also support the management of the fisheries alongside the Act.

In addition to state-based legislation, federal legislation and agreements must also be upheld by Queensland's fisheries. In particular, the *Great Barrier Reef Intergovernmental Agreement 2015*, the *Great Barrier Reef Marine Park Act 1975* (The GBRMP Act) and the *Environmental Protection and Biodiversity Conservation Act 1999* (The EPBC Act).

[9] Queensland *Fisheries Act 1994* <https://www.legislation.qld.gov.au/view/html/inforce/current/act-1994-037>

2.2 The Sustainable Fisheries Strategy and the introduction of the vessel tracking regulation

In June 2017, the Queensland Government released the *Sustainable Fisheries Strategy 2017-2027*[10] (QSFS) outlining its vision for the future management of Queensland's fisheries resources. The QSFS outlined 10 key areas of reform and several actions, which once implemented will align Queensland's fisheries management framework with current best practice principles. One of the key initiatives of the strategy relates to vessel tracking requirements in Queensland's fisheries, specifically:

Action 9.6 states: "Require installation of vessel monitoring system (VMS) on all commercial boats by 2020, with a priority to install VMS on net, line and crab boats by 2018".

More information on the fisheries reform process can be found at Appendix A.

2.3 Vessel tracking regulation

Fisheries Act 1994

Section 80 of the *Fisheries Act 1994* provides the authorisation to require vessel tracking unit to be installed on certain commercial vessels. Commercial fishers must use a Fisheries Queensland approved vessel tracking unit and comply with the Vessel Tracking Installation and Maintenance Standard when configuring, installing and maintaining vessel tracking units. All approved units must be purchased from an approved provider and associated with an approved polling rate and data plan.

Section 80 of the *Fisheries Act 1994* provides that:

- Relevant vessels that must have approved equipment installed;
- The approved equipment must be working;
- And a person must not interfere with the vessel tracking unit

Definition of approved vessel tracking unit, for a boat, means vessel tracking unit—

a) of a kind approved by the chief executive and published on the department's website[11]; and
b) whose serial number or other identifying details have been given to, and recorded by, the chief executive for the boat.

[10] Department of Agriculture and Fisheries 2017, Queensland Sustainable Fisheries Strategy 2017-2027, <*https://www.publications.qld.gov.au/dataset/queensland-sustainable-fisheries-strategy/resource/319c7e02-f07b-4b2e-8fd5-a435d2c2f3c9*>

[11] Department of Agriculture and Fisheries 2020, *Approved vessel tracking units,* <*https://www.daf.qld.gov.au/business-priorities/fisheries/sustainable/vessel-tracking/approved-units*>

Fisheries (General) Regulation 2019

Chapter 4 Part 1 of the Fisheries (General) Regulation 2019 specifies the detailed vessel tracking requirements, summarised below:

- General matters
    - Commercial fisheries and boats to which the requirements apply
    - Installation requirements
    - Period when the vessel tracking unit must be operational
- Requirements if vessel tracking unit malfunctions
    - When commercial fishers are aware of malfunction
    - Requirements for primary boats
    - Requirements for tender boats

General matters

- Vessel tracking requirements apply to majority of commercial fisheries i.e. net, line, crab, trawl and harvest fisheries. (See Table 3 for the detailed list of fisheries.)
- Primary boats and any tender boats with an engine power of more than 3kW must have approved vessel tracking unit installed in accordance with the Vessel Tracking Installation and Maintenance Standard.
- The vessel tracking units must be polling at the required interval (5 or 15 minutes depending on fishery type) from the start until the end of the commercial fishing operation.

Requirements if vessel tracking unit malfunctions

- Commercial fishers must ensure that their vessel tracking units are operational before commencing a trip. This can be achieved via one of the following:
    - Confirmation text message sent by DAF
    - Calling the Automated Interactive Voice Response (AIVR) telephone system to confirm
    - Commercial fishing app (for fisheries in scope of the app)
    - Checking unit polling in the online tracking platform given by their vessel tracking provider
- The licence holder or commercial fishers must provide a boat contact for DAF to communicate with the person in control of the boat. The alternative way of communication must not involve the use of vessel tracking equipment and must allow communication to be received on the boat instantaneously.
- If a vessel tracking unit on the primary boat malfunctions during a trip, the commercial fisher in control of the operation must manually report the position of the primary boat:
    - every hour if the boat is being used in the east coast trawl fishery
    - every 4 hours for all other fisheries.
- The commercial fisher must ensure the boat travels to a landing place within 5 days, or longer if permitted by the chief executive, from the day the malfunction is identified.
- For trawl operators in the M1, T1 or T2 fisheries within the major scallop area, the commercial fisher in control of the operation must ensure the boat travels to a landing place as soon as practicable.
- If the vessel tracking unit on a tender boat malfunctions during a trip, the tender boat must remain attached to the primary boat and must not be used to take any fish for the remainder of the trip.
- If a vessel tracking unit starts operating again on a primary or tender boat, and the person in control of the operation receives a confirmation that the unit is working properly, normal fishing operations may resume. If the unit is on a primary boat, the requirement to return to port no longer applies.
- Vessel tracking units may be moved between primary and tender boats, as well as between primary commercial fishing licences held by the same licence holder.

The regulation was effective for commercial net, line and crab fisheries from 1 January 2019 with all remaining commercial harvest and inshore trawl fisheries (excluding the charter fishery) commencing from 1 January 2020. Table 3 below shows the list of fisheries and the relevant fishery symbols to which vessel tracking requirements apply.

Table 3 Fisheries to which vessel tracking requirements apply

Fisheries that require vessel tracking*		**Fisheries that do not require vessel tracking****	
Fishery symbol	**Fishery**	**Fishery symbol**	**Fishery**
A1, A2	Aquarium fish fishery	P	Pearl fishery
B1	Sea cucumber (beche-de-mer) fishery	E	Eel fishery (adults)
C1	Crab fishery (other than spanner crab)	F	Shell fishery
C2, C3	Crab fishery (spanner crab)	G	Shell grit fishery
D	Coral fishery	H	Star sand fishery
J1	Trochus (east coast)	JE	Juvenile eel fishery
K1, K2, K3, K4, K5, K6, K7, K8	Net fishery (ocean beach)	O	Oyster fishery
L1, L2, L3, L4, L8	Line fishery	W1	Worm fishery (beachworm)
M1	Moreton Bay trawl fishery	W2	Worm fishery (bloodworm)
M2	Moreton Bay trawl fishery	Y	Yabby fishery
N1, N2, N3, N4, N10, N11, N12, N13	Net fishery		
R	Crayfish and rock lobster fishery		
T1, T2	Trawl fishery		
T4	Trawl fishery (fin fish)		
T5, T6, T7, T8, T9	Trawl fishery (river and inshore)		

* Number of primary commercial fishing licences with fishery symbols that require vessel tracking = 1475
**Number of primary commercial fishing licences with fishery symbols that do not require vessel tracking = 209

The data collected by vessel tracking systems consists of GPS position information that is reported at a regular rate, depending on the fishery in question. Largely data is polled either every 5 or 15 minutes.

For context, the approved vessel tracking units by fisheries and the required reporting rates are listed below in Table 4.

Table 4 Current approved units and their polling intervals

Equipment	Approved fisheries	Polling interval
SPOT Trace	Net, crab, and trawl (T5, T6, T7, T8 and T9 only)	• 5 minutes for net, crab and trawl (T5, T6, T7, T8 and T9 only)
Rockfleet	Net, line, crab, trawl, and harvest	• 5 minutes for net, line, crab and trawl (T5, T6, T7, T8 and T9) • 15 minutes for trawl (T1, T2, T4, M1 and M2) and harvest
IDP690/ST6100 (AFMA approved)	Net, line, crab, trawl, and harvest	• 5 minutes for net, line, crab and trawl (T5, T6, T7, T8 and T9) • 15 minutes for trawl (T1, T2, T4, M1 and M2) and harvest
IDP800	Net, line, crab, trawl, and harvest	• 5 minutes for net, line, crab and trawl (T5, T6, T7, T8 and T9) • 15 minutes for trawl (T1, T2, T4, M1 and M2) and harvest
CLS Triton ADV (AFMA approved)	Net, line, crab, trawl, and harvest	• 5 minutes for net, line, crab, and trawl (T5, T6, T7, T8 and T9) • 15 minutes for trawl (T1, T2, T4, M1 and M2) and harvest

Should a vessel tracking unit malfunction, the person in control of the boat must send the boat's location to the chief executive every hour in the east coast trawl fishery, and every 4 hours in other fisheries.

3 The problem addressed by the vessel tracking regulation

3.1 The problem as identified prior to the introduction of the vessel tracking regulation

As discussed in the Section 2 and Appendix A of this Consultation PIR, in 2017, it was widely acknowledged that the existing management of the Queensland fisheries was too complex and inadequate for dealing with modern challenges faced by the fisheries[12].
The QSFS identified ten specific problems with the existing legislation and management. While each problem identified was communicated in the QSFS to be relevant and significant when considering the development of an overarching sustainable strategy going forward, two of the ten problems were interlinked and relevant to the introduction of the vessel tracking regulation: monitoring and research, and enforcement of regulations (compliance).

Underpinning various aspects of the reform was the adoption of new technologies. Electronic monitoring technologies or vessel tracking was identified as a means for collecting data which could be used to inform the management of the fisheries. Specifically, under the seventh area of reform in the *Green Paper on Fisheries Management Reform in Queensland*[13] (the Green Paper), it outlined that there are limited mechanisms available to validate commercial catch and effort reporting. Under the ninth area of reform, the Green Paper identified that information captured by vessel tracking could be used in compliance activities to redirect efforts in the current on-ground approach to a more sophisticated information-driven compliance effort as well as increasing compliance with area closures.

These problems are considered in more detail below.

3.1.1 Monitoring and research

Through the review process leading up to the development of the QSFS, it was identified that the existing information base available to fisheries managers in Queensland was weak in several key areas. Of particular relevance, the information was largely self-reported information with no independent verification, paper-based and not-reported in real time. Limited cross checking of information submitted through commercial logbooks and limited verification of logbooks through existing means (for example, buyer returns) was carried out. Note that quantified costs relating to these activities were not available for this assessment. A weakness in the information and data which informed key decisions, for example quotas and fish stock, reduced the overall capacity to achieve a sustainable resource. Alternatively, future measures would be to establish quotas/reduce quotas across individual fisheries to counter the weakness in data and, in turn, ensure the sustainability of the fisheries.

[12] Department of Agriculture and Fisheries 2017, *Queensland Sustainable Fisheries Strategy 2017-2027,* <*https://www.publications.qld.gov.au/dataset/queensland-sustainable-fisheries-strategy/resource/319c7e02-f07b-4b2e-8fd5-a435d2c2f3c9*>
[13] Department of Agriculture and Fisheries 2016, *Green paper on fisheries management reform in Queensland,* <*https://www.publications.qld.gov.au/dataset/green-paper-on-fisheries-management-reform-in-queensland*>

3.1.2 Enforcement of regulations – compliance

Consultation through the review process revealed a strong concern about illegal fishing and black marketing. It was also acknowledged that the current 'boots of the ground' approach was limited in its ability to effectively enforce compliance. Grid based data otherwise received from logbook information after the event was not sufficient to drive change in this approach.

Broadly it is accepted across industry and fisheries management (as confirmed during the consultation process discussed at Appendix A) that Queensland's fisheries require good compliance to ensure the commercial viability of the industry and maintain the brand strength of the Australian seafood industry. The large coastline and large number of fishers dictate a smarter approach to compliance which incorporates sophisticated, risk and intelligence driven methods to support the traditional 'boots on the ground' approach. Data from vessel tracking could be used to facilitate the movement from a 'boots on the ground' approach to an intelligent compliance approach which uses the real-time data produced from vessel tracking to identify fishers and facilitate a more targeted and effective compliance approach. The vessel tracking itself would also help to facilitate a voluntary compliance approach to adhering to other fishing regulations (for example, deterring fishers from entering green zones and illegally fishing), thus delivering additionality for achieving industry compliance.

Without a smarter approach to compliance, increased costs would need to be incurred to sufficiently enforce compliance (i.e. from more patrol boats and more compliance officers), costs that would in turn need to be covered by Queensland Fisheries and industry at large. Without this, the sustainability of the fisheries would be at risk as identified during the review. As concluded during the review, doing nothing was not an option.

3.2 Problems identified since the regulation has been introduced

While the work done prior to the implementation of the vessel tracking regulations specifically identified and articulated the problems discussed in section above, additional problems have since been identified that are relevant to the continued consideration of the vessel tracking regulations or potential other solutions.

With respect to each of the problems identified below, they specifically identify vessel tracking as part of the solution/agreed management practices and do not currently consider other options for achieving a similar outcome.

1. Access to the Great Barrier Reef Marine Park (GBRMP)

   The GBRMP is protected under federal law through the *GBRMP Act* and the *EPBC Act.* The high court has determined that the Commonwealth has jurisdiction over waters to the edge of the territorial sea (12 nautical miles from the low water mark, under international law). The Offshore Constitutional Settlement[14] between the states and the Commonwealth gives the states some control over the coastal waters (3 nautical miles from the low water mark) and is implemented through legislation such as the *GBRMP Act* and the *EPBC Ac*t. Queensland and the Commonwealth have signed the *Great Barrier Reef Intergovernmental Agreement 2015*[15] (GBR Agreement) which outlines how control of the reef will be split between the federal and state jurisdictions, and through the agreement both parties agree to enact the *Reef 2050 Long Term Sustainability Plan*[16] (The Reef 2050 Plan).

   The purpose of the GBR Agreement is to ensure an "integrated and collaborative approach by the Commonwealth and Queensland" and outlines the principles under which the jurisdictions collaborate to solve issues. The GBRMP Act outlines zoning rules that are required to be enforced across the fisheries. Neither specifically dictate that vessel tracking is required for access to the GBRMP however, the GBRMP Act identifies that vessel tracking assists with enforcing the zoning rules. Further, the agreement refers to The Reef 2050 Plan, which further references the QSFS and the implementation of vessel tracking as one of the priorities of that strategy.

   Essentially the requirements of access to the GBRMP align with and leverage the content of the QSFS to satisfy itself of the appropriate use of the GBRMP. While not specifically dictated by the GBRMP Act, GBRMPA has confirmed that higher resolution vessel tracking data is essential for informing their compliance activities and in turn ensuring the protection of the marine park. GBRMPA has also indicated that if vessel tracking were not in place on commercial fishing vessels, access to the GBRMP would be difficult to maintain. An estimated annual commercial catch of $89.4 million derived from the GBRMP would be affected. Calculation of this estimated value is shown in Section 5.3.3 below.

[14] Australian Attorney-General's Department, *Offshore Constitutional Settlement,* <*https://www.ag.gov.au/international-relations/international-law/offshore-constitutional-settlement*>

[15] Department of Climate Change, Energy, the Environment and Water 2022, *Great Barrier Reef Intergovernmental Agreement,* <*https://www.environment.gov.au/marine/gbr/protecting-the-reef/intergovernmental-agreement*>

[16] Department of Climate Change, Energy, the Environment and Water, *The Reef 2050 Plan,* <*http://www.environment.gov.au/marine/gbr/long-term-sustainability-plan*>

2. Approvals under the EPBC Act

Since 2000, approvals for Wildlife Trade Operations have been issued under the EPBC Act by the Australian Government environment minister. These accreditations last between 2-10 years and allow products from specific fisheries to be exported overseas.

Currently 16 fisheries are accredited under the EPBC Act[17]. For some fisheries, the implementation of vessel tracking has formed a component in the analysis of the fishery performance against the guidelines used by the federal government to assess a fishery, thus contributing to enabling DAF to maintain export approvals for some Queensland fisheries. Vessel tracking (also known as vessel monitoring systems) are considered in the *EPBC Act* approvals for the following fisheries:

- Aquarium fin fish
- Commercial trawl (fin fish)
- East coast otter trawl
- East coast Spanish mackerel
- Gulf of Carpentaria line
- Queensland coral reef fin fish
- Sea cucumber

For the following fisheries, vessel tracking was considered in the analysis for initial approval, but that approval has since been revoked for other reasons:

- Blue swimmer crab
- East coast inshore fin fish
- Gulf of Carpentaria inshore fish
- Mud crab

Vessel tracking as a means to assist with compliance activities, and to facilitate validation of fishing effort data has been used as an example to demonstrate alignment with some of the guidelines, thus contributing to maintaining export approvals.

While not well defined as an original problem that would be addressed by the introduction of the vessel tracking regulation, it would be difficult for the state and all fishers under the industries listed that have or had active approvals to meet the requirements of the EPBC Act approvals. Failure to meet these requirements would mean fishers in the listed industries would not be able to export product to international markets.

The total export value for the affected fisheries is estimated to be $10.1 million per annum as presented in Section 5.3.4 below.

[17] Department of Climate Change, Energy, the Environment and Water, *Queensland managed fisheries,* viewed July 2022, <https://www.environment.gov.au/marine/fisheries/qld>

3.3 Evidence that the existing regulation was not adequately addressing the problem

Prior to the release of QSFS, vessel tracking was a requirement to several specific fisheries from 1999 (under the repealed Fisheries Regulation 1995 and Fisheries Regulation 2008). For the most part, these fisheries were required to have vessel tracking to provide critical effort-based data which was used for effort monitoring (i.e. to track how much the trawl fishery was fishing in line with their effort units held). In addition, for specific industries considered to be at high risk of non-compliance, vessel tracking was considered a risk reduction measure. In other words, vessel tracking was already successfully being used in a subset of industries for the purposes of monitoring and research that led to informed management decision, and compliance activities of the fisheries management.

The industries that were required to implement vessel tracking prior to 1 January 2019 are identified in Table 5 below.

Table 5 Fisheries with vessel tracking requirement prior to 1 January 2019

Fishery symbol	Fishery
B1	Sea cucumber fishery
N4, N12 and N13	Net fisheries (large net)
T4	East coast fin fish trawl fishery
T1, T2 and M1	East coast trawl fishery

The concept of vessel tracking (i.e. approach, type of data collected) referred to here is the same concept of vessel tracking as the current vessel tracking regulation.

Published studies on vessel tracking benefits

In January 2007, the Queensland Government and the Australian Government jointly published a report discussing the findings of a Fisheries Research and Development Corporation project that investigated the use of VMS and electronic logbooks for stock assessments and effort mapping in Queensland's fisheries[18].

Since most VMS implementations recorded only vessel location at set time intervals with no regard to vessel activity, the project sought to develop a methodology to determine which position data corresponded to fishing activity (i.e. to identify strings of position data that were characteristic of trawling or 'trawl signatures').

Given the availability of VMS data at the time was largely limited to the trawl industry, the efforts of the project were focused on trawl VMS data and developing approaches for the specific subindustries of scallops, eastern king prawns and tiger/endeavour prawns.

More broadly the project sought to empower the Queensland trawl industry and fishery managers to meet present and future challenges specifically through providing the following three key outcomes:

1. Better information about the status and sustainability of the resource
2. Reliable information on the distribution of trawled and untrawled areas
3. Tools to help make informed strategic decisions.

In summary, the overarching goal of the project was to enable better trawl fishery management by using VMS data to provide better quality global information which led to changes in management arrangements.

Importantly the project achieved several key outcomes that were considered beneficial to not only the immediate goal of using VMS data for the purposes of stock assessments and effort mapping but also the end goal of improved fisheries management. Specifically, the project reported the following benefits:

- The use of high-resolution VMS data enabled the enhancement of the basic concepts and computer algorithms that will drive the future development of fisheries resource assessment.
- Acceptance by the fishing industry of the importance of VMS data in fishing effort mapping and resource assessment as demonstrated by the 2005 Queensland Seafood R&D Award from the fishing industry to the VMS project (awarded by the Queensland Seafood Industry Association)
- Improved tools to help make informed strategic decisions about the fisheries.

The project's VMS mapping and trawl signature recognition algorithms/software were adopted by the (then) fisheries management unit.

Other broader benefits of the project and the outcomes achieved have been the use of the methods developed by the project to produce maps detailing the amount of Gross Value of Production (GVP) lost because of the introduction of the Representative Areas Program. This work was done specifically for the then Australian Government Department of Environment and Heritage and aided the development of a structural readjustment package to compensate fishers where the program had adversely affected commercial fishers.

[18] Gribble et al. 2007, Innovative stock assessment and effort mapping using VMS and electronic logbooks, *Fisheries Research and Development Corporation*

In addition to the above, vessel tracking data has also been used to verify the footprint of an industry in a particular region where this information can then be used to inform and enable access to particular areas[19]. In 2007, the then Department of Agriculture, Fisheries and Forestry (DAFF) used vessel tracking from trawl vessels (under the earlier vessel tracking regulations) for this very reason. In this instance, vessel tracking data was used to analyse spatial patterns over time and create an accurate footprint for the trawl industry. This more accurate footprint supported the position that trawlers did not have the impact otherwise thought and thus could remain in the Great Barrier Reef Marine Park.

As demonstrated by the above studies and research projects, for the Queensland trawl fishery, vessel tracking data has proven invaluable to improve stock assessments, provide continuing access to the marine park areas, provide quantitative data to assess risks due to trawling, improve compliance activities and compliance rates in the fishery. Vessel tracking has also resulted in management changes through the use of regional effort caps to manage individual stocks across the fishery which has been a big step forward. By only having vessel tracking in the select fisheries and not all fisheries, the benefits of vessel tracking which have been observed in Queensland are not currently observed across all fisheries.

3.4 The base case

The impacts of any regulation are assessed against a base case. A base case represents a scenario where the regulation does not exist. In the case of the vessel tracking regulation, this is only appropriate for those fisheries that were not required to have vessel tracking before the regulation was introduced.

For clarity, prior to implementation of vessel tracking in 2019, positional data collected from the impacted fisheries was manually submitted after the fishing operation via logbook, which has the following challenges:

1. Logbook information is estimation-based which indicated a single vessel location reported as a region (the region most likely fished in on a given day's fishing trip)
    - Reported by grid (30 x 30 nautical miles) and site (6 x 6 nautical miles)
2. The requirement of only providing one set of grid and site for a day where fishing mostly occurred
3. No validation of accuracy of logbook information (i.e. where and when fishing occurred)

Where vessel tracking regulations were in place prior to the introduction of the Fisheries (General) Regulation 2019, specifically for the sea cucumber fishery, some net fisheries and the east coast trawl fishery, the base case is with reference to the prior vessel tracking regulations contained under Fisheries Regulation 2008. The earlier regulation required these industries to operate vessel tracking, providing data to the then DAFF for the purposes of

[19] Roy et al. 2005, Can vessel monitoring system data also be used to study trawling intensity and population depletion? The example of Australia's northern prawn fishery, *Canadian Journal of Fisheries and Aquatic Sciences*

monitoring, research, and compliance purposes (as discussed in Section 2). For these fisheries, DAF was paying for the polling costs (approximately $200k/annum).

4 Objectives of the vessel tracking regulation

As per *the Fisheries (General) (Vessel Tracking) Amendment Regulation 2019 Explanatory notes*[20], the objective of the vessel tracking regulation is to deliver in line with the relevant actions and targets outlined in the QSFS. Specifically, the implementation of vessel tracking across all commercial boats by 2020 would support a more responsive, evidence-based approach to fisheries management.

To deliver on this objective, real-time data collected from the commercial fishing fleet was identified by the explanatory note to be used to:

- Monitor the use of quota in near real time
- Monitor compliance with fishing rules, area and seasonal closures
- Provide intelligence and evidence for investigations
- Assist with validating logbook information on where and when fishing occurred
- Provide more accurate information on fishing effort that is used in stock assessments
- Estimate the biomass of a fish stock
- Help inform future fishery management arrangements.

In summary, the implementation of vessel tracking across the commercial fleet of fishing vessels was largely identified to provide data which could enhance compliance capabilities and contribute to improving monitoring and research activities.

Delivering on the regulation's specific objective would directly contribute to achieving the overarching objective of the *Fisheries Act 1994*, that being the sustainability of Queensland's fisheries. A sustainable fishery benefits not only the commercial fishers from the various industry sectors with strong fish populations but also the broader group of stakeholders which access the fisheries (i.e. recreational and cultural).

It is against these objectives that the effectiveness of the legislative amendments has been assessed in this PIR.

[20] Fisheries (General) (Vessel Tracking) Amendment Regulation 2019 Explanatory notes for SL 2019 No. 180 <*https://cabinet.qld.gov.au/documents/2019/Aug/Fish/Attachments/FishVessExNotes.PDF*>

5 Impacts of the vessel tracking regulation to date

This section identifies the intended and unintended impacts of the regulation based on consultation to date.

5.1 Limitations

In collecting feedback to inform this Consultation PIR, it must be noted that efforts were made to quantify the size of the impacts reported. Despite this, it has proven difficult to quantify the impacts reported due to several reasons:

- Targeted consultation with a representative sample of impacted parties has been carried out (as required by the Consultation PIR process to date)
- As outlined in the background (Section 2 and Appendix A) of this Consultation PIR, several reforms have been introduced through recent changes to legislation and regulations. As previously mentioned, the purpose of these reforms was to improve the management of the fisheries for the purpose of ensuring the future sustainability of the fisheries. It has been communicated that it is difficult to appreciate the quantum of the impacts realised from the introduction of the vessel tracking regulation given this was not the sole change introduced over the reform period. Instead, other items from the reform were also introduced which are contributing to data points or the broader reform pillars of monitoring and research, and compliance, which in turn contribute to the overall objective of the fisheries management and the sustainability of the fisheries.
- As the various fisheries reform items introduced seek to ensure the future of these resources, it is difficult to attribute the value of the resource without in fact considering the resource as a whole and the value that is derived from this. While it is not correct to attribute the entire value of the resource to any one initiative or act of management, collectively these acts are done for the purpose of ensuring the value and benefit of the resource into the future.

During public consultation, stakeholders are encouraged to quantify the impact they report. For example, this could be a breakdown of the specific individual costs incurred to date or a report of the number of lost fishing days due to vessel tracking malfunctions. Where possible, it is encouraged that evidence be provided to support your feedback.

5.2 Costs

Based on consultation to date, the aggregated costs to both government and industry in FY20-21 through the introduction of the vessel tracking regulation is estimated to be approximately $4 364 104. Table 6 below provides an overall cost of the regulation by key stakeholder.

Table 6 Overall cost of the regulation

Stakeholder	FY17-18	FY18-19	FY19-20	FY20-21
Industry	0	$3 032 021*	$2 934 703	$3 025 303
Government	$419 057	$4 075 830**	$979 156	$1 419 585
Total	**$419 057**	**$7 107 851**	**$3 913 859**	**$4 444 888**

* includes net initial cost of vessel tracking units after deducting vessel tracking rebate amount claimed as of 30 June 2022

** includes DAF vessel tracking administration cost and rebate contribution from state and federal governments

A further breakdown of the costs presented in Table 6 above is provided in the sections immediately below.

5.2.1 Costs to industry

Costs have been and are expected to continue to be incurred by industry as a result of the vessel tracking regulation. These costs are described below.

5.2.1.1 Financial costs

In implementing the vessel tracking regulations, it was acknowledged that commercial fishers would incur costs through the introduction of vessel tracking technology. These costs would largely relate to the purchase, installation and polling of the vessel tracking units.

Prior to the introduction of the regulation, in June 2018, the costs of equipment prescribed by the Vessel Tracking Installation and Maintenance Standard are presented in Table 7. A fisher’s choice of equipment for their vessel would determine the cost incurred.

Table 7 Cost of equipment at the time the regulation was introduced

Items	SPOT Trace	Rockfleet (also known as YB3i)	IDP690 (ex GST)	IDP800 (ex GST)
Equipment cost	$169	$280.50	$750	$957
Installation cost	NA	$206.50	NA	NA
Other fees	Extended warranty $65 (optional)	Activation fee $20	Activation $36.60 Freight $121 Hosting service $120 (year) Unit registration $150	Activation $36.60 Freight $121 Hosting service $120 (year) Unit registration $150
Airtime monthly fee (12 monthly contracts)	$33.30	$44 (5 min polls) $41.80 (15 min polls) $8 when not in use	$77.55 (5 min polls) $56.10 (15 min polls) Subject to AUD/USD exchange rate fluctuation	$77.55 (5 min polls) $56.10 (15 min polls) Subject to AUD/USD exchange rate fluctuation

Following the release of the pricing structure, an update was provided to the fishers in November 2018 to reflect price reductions made by Pole Star. Largely these changes related to airtime monthly costs and activation charges. These updated prices are provided at Table 8 below.

Table 8 Updated Pole Star pricing structure (prices are excluding GST)

Items	IDP690	IDP800
Equipment cost	$750	$750 – unit with internal antennae $895 – unit with external antennae
Installation cost	NA	NA
Other fees	Activation $33 Freight $121 Hosting service $120 (/year) Unit registration $150	Activation $33 Freight $121 Hosting service $120 (/year) Unit registration $150
Airtime monthly fee (12 monthly contracts)	$49 (5 min polls) $42 (15 min polls)	$49 (5 min polls) $42 (15 min polls) Subject to AUD/USD exchange rate fluctuation

As demonstrated in Table 7 and Table 8 above, fishers could either select a less expensive option in either the SPOT Trace or the Rockfleet, or a more expensive option in the IDP690 or the IDP800. This optionality catered to the broad spectrum of fishers enabling them to select units that are suitable for their fishing operations and businesses. On average it was

expected that the cost (cost of equipment, activation and freight) for implementing vessel tracking on an individual boat would be between $169 and $507 upfront for the less expensive options and between $994.40 and $1153.90 upfront for the more expensive options. Ongoing costs such as polling and hosting costs were identified to be between $33.30 and $55 per month depending on the equipment selected and frequency of the polling required.

It must also be noted that a rebate was offered to commercial fishers to offset the original purchase and installation costs of the vessel tracking units. Fishers were able to access a rebate of $300-$750 for equipment costs and $220 for installation costs, reducing the initial outlay costs. This rebate was only available for licence owners (not for those that lease the licence from licence owners) for initial purchase and installation of equipment. Note for the purpose of the assessment, the total number of leases is unknown as well as the cost of the lease arrangements between the parties. Fishers can operate under a private lease arrangement not known to DAF. Some of these fishers may purchase their own vessel tracking units; some may be using the licence owners' vessel tracking units. As of 30 June 2022, approximately 750 rebate applications totalling $730,213 were approved and paid to fishers. Using the total number of primary commercial fishing licences with relevant fishery symbols that require vessel tracking as the comparison measure, approximately 50% uptake of the rebate was realised. Reasons for why fishers did not apply for the rebate included:

- it was not worth the effort for such a small cost
- fishers have not applied as yet but intend to apply before the rebate offer ends (extended to 30 June 2024).
- fishers already had vessel tracking unit so not needing to buy another and thus apply for the rebate
- fishers were not eligible given the licence was leased and the owner of the licence (eligible claimant) would not pass on the rebate.

For those fisheries that were already operating vessel tracking units under the earlier Fisheries Regulation 2008, no additional outlay for equipment was required as they were able to continue using their existing units however, the cost of polling moved from DAF (which had been historically paying these costs) to the fisher aligning with the broader approach to the updated vessel tracking regulation. Therefore, the additional cost to these fisheries is the ongoing polling costs.

It appears that the costs identified at the commencement of the regulation largely remain consistent with the costs experienced by industry, however, the following exceptions have been identified:

1. The cost of the Rockfleet has significantly increased with a current price point around $600.
2. With respect to the Rockfleet equipment, a replacement unit can be arranged in the event the original unit is found to be faulty and must be returned. The cost for this service is $85 and the user is provided with a refurbished unit. While optional, fishers have been utilising this service at the identified cost to prompt a faster replacement option for faulty units.
3. Backup Rockfleet equipment purchased at the expense of the fishers must also incur a secondary airtime monthly standby fee of $8.

4. Polling rates have increased to $55 per month with the provider Pivotel (provider of Rockfleet and SPOT Trace) representing a 10% increase from the initial polling costs when the regulation was introduced
5. Duplicate installation costs incurred for backup equipment purchased where this equipment was not installed.
6. One provider charged fishers for equipment that were never delivered, meaning the fishers were required to purchase another unit.[21]
7. A fifth Pacific Islands Forum Fisheries Agency (FFA) approved unit, CLS Triton, has since been included on the Vessel Tracking Installation and Maintenance Standard. DAF has recorded only a couple of fishers currently using this equipment (and it is understood that one of the fishers already had this equipment installed for vessel tracking purposes).

Fishers would also be required to pay for replacement units when the units have reached their end of life. The lifetime of vessel tracking units differ among different types of units. Factors such as installation and operating conditions also affect the unit lifetime. Information from vessel tracking providers indicate that the estimated lifetime of Rockfleet and IDP690/ST6100/IDP800 may range from 5 to 10 years; while estimated lifetime of CLS Triton may range from 7 to 8 years. Estimated lifetime of Spot Trace is unknown. To provide an estimated replacement unit cost, assumptions are made that the replacement of Rockfleet and IDP690/ST6100/IDP800 to occur every 5 years; while replacement of Spot Trace to occur every 2 years.

Overall, the common consensus across the group was that the costs of vessel tracking were not prohibitive to continuing operations, however, it was another bill (fixed cost) (and alongside the many other business costs) which was required to be paid each month regardless of operations that month. Note the industry experiences varying rates of profitability with some fisheries experiencing negative profitability (for example charter, east coast trawl, Moreton Bay trawl and rocky reef). In FY18-19, the average profit at full equity across the Queensland commercial industry was $16 563.[22]

5.2.1.2 Opportunity costs

The largest cost to fishers that has been reported in all consultation sessions held to inform this Consultation PIR, is the cost of not being allowed to fish if the vessel tracking unit is not correctly polling, effectively an opportunity cost. While technology faults have largely been reported as the reason why vessel tracking unit cannot correctly poll, in some instances, outages in the satellite network, which is responsible for providing the accurate polling information and which verifies that the vessel tracking unit is working, has been the root cause.

[21] DAF offered funding assistance to fishers for out-of-pocket expenses in this respect. This was done so as part of their role in actively managing issues with vessel tracking units. Further fishers were allowed to operate without vessel tracking units while these early issues were resolved (no polling charges were incurred by the fishers during this time).

[22] Department of Agriculture and Fisheries 2020, *Summary economic and social indicators for Queensland's commercial fisheries, 2017/18 and 2018/19, https://www.publications.qld.gov.au/dataset/fisheries-economic-and-social-indicators-financial-years-2018-and-2019/resource/9f9cd923-892e-49ab-a78f-94d9df50926d*>

It is worth noting, seven commercial fishing industry members were interviewed during the targeted consultation to date and only two instances of lost fishing days due to a failure of vessel tracking units were reported. However, as reported in the paragraph above, all fishers saw the potential for lost fishing days to be a significant cost. The cost varies among commercial fishing operations as it depends on factors such as fishery type, value of different species, size of operation and fishing frequency.

While it has been particularly difficult to quantify the cost to fishers of not being able to fish if their vessel tracking unit is not operational/correctly polling, specific examples have been provided through the consultation process which provide further insight into the costs associated with not being able to fish. These examples are provided in Table 9 below.

Table 9 Reported instances of fishing effort missed due to equipment failures

Fisheries	Days missed	Cost per day	Annualised cost
Mud crab	6 days per year	$500-$4000	$3 000-$24 000
Line - Spanish Mackerel	14 days in a 6 month period	$1500 - $3000 (+ an additional cost of $6750 in fuel costs to steam to port unscheduled, the same applies to steam back to sea)	$34 500-$55 500 (fishing was only carried out for 6 months of the year)

Note: These are two specific instances provided during initial targeted consultation for the PIR.

Further comment has also been provided in relation to the setback which is realised if fishers miss a day fishing in some fisheries. Consultation to date has not been able to quantify this cost.

Further exacerbating this impact is the lack of service available to solve technology problems at the times required to be solved. Specifically, fishing is a 24/7 industry where early mornings and late nights are common. It has been reported that there is a lack of afterhours support from the vessel tracking providers in the event of a malfunction to transfer over to backup equipment (i.e. activate backup equipment in the event they are required) and simply troubleshoot problems with the technology. The same is experienced by fishers when trying to contact DAF outside of traditional business hours to troubleshoot problems with changing over equipment and resolving potential issues. This lack of support also results in lost fishing days as it is often too late to head out once assistance is available due to specific circumstances (e.g. high tide has now been and gone and access to the crab pots is no longer available).

This regulation has had a greater impact on those that live in regional areas. This is due to little or no access to technical support in the event of technology issues and lengthy delays when equipment is required to be shipped back to the vessel tracking provider (it takes longer for this to happen from remote areas). While backup equipment is an option, feedback has confirmed that given the issues with the technology, often the backup can also be down with lengthy delays experienced to receive replacements or repair the backup.

Further impacts with respect to the technology (the vessel tracking unit) is described in Section 5.4.1 below.

5.2.1.3 Aggregated costs to industry

The estimated aggregated costs to industry are presented in Table 10 below.

Table 10 Estimated aggregated costs to Industry

Cost type	FY18-19	FY19-20	FY20-21
Initial set up costs (hardware and installation)	$178 102*	0	0
Ongoing polling costs	$897 139	$977 923	$977 923
Opportunity costs	$1 956 780	$1 956 780	$1 956 780

Note: *Net initial set up costs after deducting total rebate amount claimed as of 30 June 2022. For calculation purpose, assumptions are made that initial units for all commercial fisheries were purchased in FY18-19 and all units remain polling monthly consistently.

The calculation of the estimated aggregated costs to industry is shown in Table 11 below.

The annual cost of vessel tracking on a commercial fishing boat is estimated to be $2129. The number of commercial fishing boats used in a commercial fishing operation typically ranges from 1 to 8. This means the estimated annual cost of vessel tracking for a commercial operation may range from $2129 to $17 032.

Table 11 Calculation of estimated costs to industry

Unit type	Item	Annual cost/unit ($)	Estimated annual cost by unit type ($)									
			Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Spot Trace	Unit cost	169	51038	0	0	0	0	0	0	0	0	0
	Annual polling fee	399.6	120679	120679	0	0	0	0	0	0	0	0
	Replacement unit cost	300	0	0	90600	0	90600	0	90600	0	90600	0
	Replacement unit annual polling cost	399.6	0	0	120679	120679	120679	120679	120679	120679	120679	120679
	Opportunity cost (assume 7 loss days/year; $2250/day)	15750	285390	285390	285390	285390	285390	285390	285390	285390	285390	285390
Rockfleet	Unit cost (OA pricing)	507	310284	0	0	0	0	0	0	0	0	0
	One-off fee (activation $20 based on OA pricing)	20	12240	0	0							
	Installation cost	300	91800	0	0	0	0	0	0	0	0	0
	Annual polling fee (OA pricing $44/mo)	528	323136	0	0	0	0	0	0	0	0	0
	Annual polling fee (Pivotel pricing $55/mo)	660	0	403920	403920	403920	403920	0	0	0	0	0
	Replacement unit (Pivotel pricing)	615	0	0	0	0	0	376380	0	0	0	0
	Replacement unit annual polling fee (Pivotel pricing $55/mo)	660	0	0	0	0	0	403920	403920	403920	403920	403920
	Opportunity cost (assume 7 loss days/year; $2250/day)	15750	1542240	1542240	1542240	1542240	1542240	1542240	1542240	1542240	1542240	1542240
IDP690/ ST6100/ IDP800	Unit cost	825	338250	0	0	0	0	0	0	0	0	0
	One-off fees (activation $36.3 + freight $55)	91.3	37433	0	0	0	0	0	0	0	0	0
	Installation cost	300	61500									
	Annual polling fee ($53.90/mo)	646.8	265188	265188	265188	265188	265188	0	0	0	0	0
	Replacement unit cost	825	0	0	0	0	0	338250	0	0	0	0
	Replacement unit one-off fees (activation $36.3 + freight $55)	91.3	0	0	0	0	0	37433	0	0	0	0
	Replacement unit installation cost	300	0	0	0	0	0	61500				
	Replacement unit annual polling fee ($53.90/mo)	646.8	0	0	0	0	0	265188	265188	265188	265188	265188
	Opportunity cost (assume 7 loss days/year; $2250/day)	15750	129150	129150	129150	129150	129150	129150	129150	129150	129150	129150
Inmarsat C	Unit cost (units already on boats pre 2019)	0	0	0	0	0	0	0	0	0	0	0
	Annual polling fee ($180/mo)	2160	185760	185760	185760	185760	185760	0	0	0	0	0
	Replacement unit cost (assume IDP/ST)	825	0	0	0	0	0	70950	0	0	0	0
	Replacement unit one-off fees (activation $36.3 + freight $55)	91.3						7852	0	0	0	0
	Replacement unit installation cost	300	0	0	0	0	0	12900	0	0	0	0
	Replacement unit annual polling fee ($53.90/mo)	646.8						55625	55625	55625	55625	55625
CLS Triton	Unit cost	2420	4840	0	0	0	0	0	0	0	0	0
	One-off fees (activation $33 + freight $132)	165	330	0	0	0	0	0	0	0	0	0
	Installation cost	300	600	0	0	0	0	0	0	0	0	0
	Annual polling fee ($99/mo)	1188	2376	2376	2376	2376	2376	0	0	0	0	0
	Replacement unit cost	2420	0	0	0	0	0	4840	0	0	0	0
	Replacement unit one-off fees (activation $33 + freight $132)	165	0	0	0	0	0	330	0	0	0	0
	Replacement unit installation cost	300	0	0	0	0	0	600	0	0	0	0
	Replacement unit annual polling fee ($99/mo)	1188	0	0	0	0	0	2376	2376	2376	2376	2376
Estimated annual cost to industry			**3762234**	**2934703**	**3025303**	**2934703**	**3025303**	**3715603**	**2895168**	**2804568**	**2895168**	**2804568**
Actual vessel tracking rebate claimed as of 30 June 2022			730213									
Estimated annual cost to industry less rebate			3032021	2934703	3025303	2934703	3025303	3715603	2895168	2804568	2895168	2804568
Estimated average annual cost			3006711									
Estimated average annual cost/unit			2129									

Note:

- The estimated annual cost by unit type is calculated based on the average total number of units polling which is 1412 and the following breakdown:
  - Number of Spot Trace (21.4%) = 302
  - Number of Rockfleet (43.3%) = 612
  - Number of IDP690/ST6100/IDP800 (29.1%) = 410
  - Number of Inmarsat C (6.1%) = 86
  - Number of CLS Triton (0.1%) = 2
- Replacement cost
  - Lifetime of vessel tracking units vary dependent on type, installation and working condition.
  - Warranty period of Spot Trace is 1 year; warranty period for Rockfleet, IDP690/ST6100/IDP800 and CLS Triton is 2 years.
  - Information from providers indicate the following estimated lifetime: Rockfleet 5 to 10 years; IDP690/ST6100/IDP800 5 to 10 years; CLS Triton 7 to 8 years. For calculation purpose, assumption is made that replacement of Rockfleet, IDP690/ST6100/IDP800, Inmarsat C and CLS Triton to occur every 5 years.
  - Assumption is made that the same type of unit is purchased as the replacement unit. Assumption is also made that Inmarsat C (grandfathered) would be replaced with IDP690/ST6100/IDP800.
  - Estimated lifetime of Spot Trace unknown. For calculation purpose, assumption is made that replacement of Spot Trace will occur every 2 years.
- Opportunity cost (due to malfunction that result in loss of fishing days)
  - Opportunity cost from two instances were reported during targeted consultation with vessel tracking working group members – see Table 9.
    - Estimated average cost/day is $2250. Estimated number of lost fishing days range from 6 to 14 days.
  - Opportunity cost varies among different commercial operations due to factors such as fishery type, value of species, size of operation and fishing frequency. For calculation purpose, assumption is made that the number of annual lost fishing days per unit is 7 days, taking into consideration time taken to replace a malfunctioned unit.
  - The annual opportunity cost is calculated using the malfunction rate information presented in Table 21.
- Cost of unit, activation, freight and polling
  - Costs are calculated based on providers' pricing structure

Unit	**Monthly polling costs**
Spot Trace	$33 (5-min polling)
Rockfleet (Option Audio)	$44 (5-min polling)
Rockfleet (Pivotel)	$55 (5-min or 15-min polling)
IDP690/ST6100/IDP800	$53.90 (5-min polling); $46.20 (15-min polling)
CLS Triton	$99 (5-min or 15-min polling)

  - Annual polling costs for Spot Trace, Rockfleet, IDP690/ST6100/IDP800 and CLS Triton are calculated based on 5-minute polling pricing structure from providers.
  - Annual polling cost for the Inmarsat C units (mainly used in trawl vessels) is calculated based on 15-minute polling pricing structure from Pole Star.
    - Airtime for Inmarsat C units is charged by number of polls. Monthly 15-min polling is approximately $180.
  - For Rockfleet, Option Audio's polling fee was used to calculate annual polling cost for the first year. Annual polling costs for subsequent years are calculated using Pivotel's polling fee.
  - Assumption is made that the costs remain constant yearly.
- Installation cost
  - Assumption is made that professional installation only applies to Rockfleet, IDP690/ST6100/IDP800 and CLS Triton.
  - Approximately 350 installation rebates have been claimed in the first 4 years of the vessel tracking rebate scheme. Based on this and industry knowledge about the units, assumption is made that professional installation applies to 50% of Rockfleet and IDP690/ST6100/IDP800; 100% for CLS Triton.
  - Installation cost ranges from $200 to $400. For calculation purpose, assumption of $300 installation cost is made.
- Other assumptions
  - The average number of units polling and types of approved units remain constant yearly.
  - Units are on monthly polling plan 12 months of the year consistently without going into standby mode.
  - All initial units were purchased in year 1.

5.2.2 Costs to government

Costs have been and are expected to continue to be incurred by government as a result of the vessel tracking regulation. These costs are described below.

5.2.2.1 Financial costs to the state government

It was expected that there would be a financial cost to DAF for the implementation and ongoing management of the vessel tracking regulation. Given the challenges that were present with the rollout of vessel tracking (specifically technology and supplier issues), DAF has experienced a much higher administrative burden than originally expected. While some of this additional administrative burden has been resolved, DAF is still investing heavily in resolving other administrative issues with the rollout of vessel tracking (e.g. the process of registering vessel tracking units to boats and assisting industry with such processes). In FY20-21, the direct costs associated with managing vessel tracking by DAF totalled $1 419 585. This figure covers wages and other employee expenses for the staff members in the vessel tracking team as well as administrative costs, software licenses and software development required to administer vessel tracking by DAF. The costs to the state government in previous financial years are presented in Table 12 below.

Table 12 Costs associated with managing vessel tracking by DAF

FY17-18	FY18-19	FY19-20	FY20-21
$419 057	$975 830	$979 156	$1 419 585

In addition, DAF contributed around $900 000 to the cost of the vessel tracking rebate program. These funds have not been exhausted, and the amounts spent in each financial year are listed below.

The amount that was spent under the vessel tracking rebate scheme and the value of the rebates claimed is listed in the Queensland Rural and Industry Development Authority's (QRIDA) annual reports[23] and presented in Table 13 below. The total amount of rebate claimed since its introduction in 2018 until June 2022 is $730 213.

Table 13 Vessel tracking rebate uptake

	FY18-19	FY19-20	FY20-21	FY21-22
Rebate amount	$358 006	$270 695	$77 248	$24 264
Number of applications approved	415	226	73	25 (approximate)

[23] Queensland Rural and Industry Development Authority, *QRIDA Annual Reports,* <*https://www.qrida.qld.gov.au/annual-report*>

5.2.2.2 Financial costs to the federal government

The federal government, through GBRMPA, contributed $2.2 million to the cost of the vessel tracking rebate program. This was a once-off contribution and is separate to any funds reported or contributed by DAF.

5.2.2.3 Aggregated costs to government

The aggregated costs to government at both the state and federal level are presented in Table 14 below.

Table 14 Aggregated costs to government

FY17-18	FY18-19	FY19-20	FY20-21
$419 057	$4 075 830*	$979 156	$1 419 585

Note: * includes rebate contribution from the state and federal governments

5.3 Benefits

Based on consultation to date, the aggregated cost saving benefit to both government and industry through the introduction of the vessel tracking regulation is estimated to be approximately $2 million. Other benefits of vessel tracking include contributing to maintaining commercial access to GBRMP fishing ground (commercial catch value of approximately $89 million per annum), maintaining fisheries export (EPBC Act) approval (export value of approximately $10 million per annum). Overall, vessel tracking contributes to the sustainability of Queensland's $400 million commercial fishery. Table 15 below provides the overall benefits of vessel tracking.

Table 15 Overall benefits of the vessel tracking regulation

Benefits	Quantified value
Cost savings per annum to government	$1.4 million
Cost savings per annum to commercial fishers	$689 633
Contributing to maintaining commercial access to GBRMP fishing ground	Assists to maintain $89.4 million per annum of GBRMP commercial catch
Contributing to maintaining fisheries export (EPBC Act) approvals	Assists to maintain fisheries export approvals worth $10.1 million per annum in export revenue across fisheries
Contributing to a sustainable Queensland fishery	Contributes to the sustainability of Queensland's $413 million per annum commercial fishery

When introducing the vessel tracking regulations, it was intended that the benefits would be substantial. The most important intentional benefit of vessel tracking technology was that the data generated would enable real-time monitoring of commercial fishing fleets and facilitate more responsive and evidence-based decision making which would support monitoring and research efforts and compliance activities. This supported the *Fisheries Data Validation Plan*[24] released in March 2018 and provided a mechanism for cross-checking self-reported logbook data.

5.3.1 Monitoring and research

Monitoring and research activities are carried out by DAF to inform the management of the fisheries, with the end goal of ensuring sustainable fisheries that provide sustainable fish stocks for commercial fishers to continue to utilise.

Vessel tracking provides data which is superior to earlier data capture prior to the vessel tracking regulation being introduced (i.e. logbooks), specifically data which includes / is:

- Spatial location by longitude and latitude
- Real-time data at a high frequency.

The data is also independently generated removing any potential for error in reporting.

The data provides a significantly more precise measure of fishing activity by commercial fishers and consequently, improves the evidence base available to inform management strategies with respect to harvest/access controls. This has been demonstrated through earlier studies as discussed in Section 3.3.

A summary of the applications for which the data has been used / is being used and the realised benefit is summarised in Table 16 below.

Table 16 Applications of vessel tracking for monitoring and research

Application	Benefit
Improving understanding of catch rates	The data captured to date is currently being used in specific projects that will develop effort models/maps. Once these models are developed, these will be used to inform how the resource is being used and for the purpose of conducting more accurate stock assessments (with comparison to stock assessments that do not include VMS data). As per the benefits realised from earlier projects of this nature (as discussed in Section 3.3), it is expected that the results from this application will produce effort models and maps that have a higher accuracy.

[24] Department of Agriculture and Fisheries 2018, *Fisheries data validation plan (March 2018),* <*https://www.publications.qld.gov.au/dataset/queensland-sustainable-fisheries-strategy/resource/dfbddda3-f0e4-47a2-ba25-644b999734d8*>

	A higher accuracy will in turn provide more accurate information for future management decisions relating to effort quotas and similar which seek to ensure the sustainability of the resource while also optimising fishers' quotas. Vessel tracking data has been used to understand the spatial distribution of different prawn species and identify fine resolution of information not available from commercial logbooks.
Enhance population modelling	Similar to the application above, work is currently underway to use the data to improve model confidence for Recommended Biological Catch (RBC). With an improved model confidence, the Total Allowable Catch (TAC) can be set closer to RBCs enabling an optimised fishing effort by industry to be provided (i.e. effort quotas will be optimised for industry). An example of how vessel tracking has been used to date with respect to population modelling is with respect to the scallop fishery. Since the vessel tracking data has become available, the data has been used in the scallop fishery to understand how quickly scallop abundance is depleted at the opening of the season. This application would not have been possible without the use of vessel tracking data and provides valuable insight into how the scallop fishery can be managed sustainably.
Alternative management arrangements	Vessel tracking has allowed implementation of alternative management arrangements that allow for sustainable use of the resource and continued access. A recent example is the management arrangement which was put in place on 1 January 2021 to allow trawl fishers who possess scallop to traverse through the scallop closure area to access their home port. Without vessel tracking this arrangement may not have been allowed and operators would be forced to unload at an alternative port to their home port which may incur mooring fees, transport fees to transport scallop to home port, accommodation and more time away from family.

Given the relative recency of the data received as a result of the vessel tracking regulation and the time required to develop the proposed models using the data (i.e. the mathematical relationships and associated modelling algorithms), it must be noted that the broader benefits which stem from vessel tracking data are still in their relative infancy. However, given sufficient time, the demonstrated benefits of vessel tracking data when used for monitoring and research purposes (as reported in Section 3.3) are also expected to be realised across the Queensland commercial fisheries as the current activities in this area continue to progress.

As per earlier research and early benefits already identified from the introduction of the vessel tracking regulation, along with other management improvements, the use of vessel tracking data in monitoring and research activities contributes to the overarching effective management of the fisheries and the long-term sustainability of the commercial fishing industry, which had an annual contribution of around $400 million[25] to the Queensland economy in FY18-19.

[25] Gross State Product (GSP) value $413.1 million for commercial fisheries in FY18-19 as reported in Department of Agriculture and Fisheries 2020, *Summary economic and social indicators for Queensland's commercial fisheries,*

5.3.2 Compliance

5.3.2.1 Compliance activities carried out by delegated agencies

Queensland Boating and Fisheries Patrol (QBFP) is a business unit within Fisheries Queensland and delivers compliance and enforcement functions on behalf of Fisheries Queensland. Compliance with the fisheries laws not only ensures the sustainability of Queensland's fisheries but also to ensure the safe use of Queensland's waterways.

QBFP adopt a risk-based compliance approach in order to ensure the most effective use of its limited resources (limited in comparison to the 7000km of coastline, hundreds of inland fishing areas, 250 000 recreational vessels, 639 000 recreational fishers and over 1400 commercial fishing vessels). A risk-based approach means that the resources available are directed towards addressing the highest risks where risks are assessed for individual fisheries based on those which threaten the:

- sustainability of target fish stocks, including by-product species
- environment, ecology, and conservation value of the fishery ecosystem, including fishery bycatch and protected species
- social and community impacts
- profitability of compliant industry participants.

The compliance strategy also focuses on encouraging voluntary compliance from the fishers.[26] All compliance activities are carried out for the purpose of ensuring the sustainability of the fisheries and the ensuing benefit to Queenslanders.

Data collected from vessel tracking is used by QBFP to observe in real time the commercial fishing fleet (identified down to an individual fishing vessel) in order to:

- monitor compliance with closures
- monitor real-time movement of vessels for at sea and landing inspections
- manage compliance of reporting obligations such as logbooks.

Overall, it has been reported by QBFP that data from vessel tracking has enabled QBFP to improve its compliance activities in line with its risk-based compliance approach. While QBFP acknowledge that there have been many changes to the *Fisheries Act 1994* and fisheries regulations in line with the introduction of the vessel tracking regulation (e.g. other reform items introduced in the QSFS, COVID, etc), a comparison of data from individual fisheries before and after the introduction of vessel tracking identifies a pattern of less patrol days (and less patrol/man hours), a reduction in vessels inspected and an increase in the number of acts of non-compliance caught by QBFP (i.e. an increase in identified acts of non-compliance).

2017/18 and 2018/19, https://www.publications.qld.gov.au/dataset/fisheries-economic-and-social-indicators-financial-years-2018-and-2019/resource/9f9cd923-892e-49ab-a78f-94d9df50926d>

[26] Department of Agriculture and Fisheries 2015, *Managing fisheries compliance in Queensland,* <*https://www.daf.qld.gov.au/__data/assets/pdf_file/0018/284112/fisheries-compliance-qld.pdf*>

Several specific examples of the changes to individual compliance approaches which have delivered known benefits, and which can be seen to directly feed into the statistics before and after the implementation of vessel tracking are discussed in Table 17 below.

Table 17 Applications of vessel tracking for compliance purposes

Application	Benefit
Monitoring the commercial fleet and adopting an intelligent approach to compliance inspections	Vessel tracking data is used to monitor 24/7 the fleet of commercial vessels and prioritise routine compliance inspections in line with the risk framework. Using vessel tracking data, officers can identify high risk industries, areas, or fishers. Using this 'intel', officers can directly approach higher risk fishers and conduct compliance checks in this space. An example of significant gains which have been observed through an intelligent compliance approach is with respect to the offshore fisheries. Traditional methods of conducting compliance investigations in this industry would involve a QBFP patrol steaming out to the offshore location at night and approaching vessels as they identified them. Unfortunately, given the nature of at-sea operations, the vessel being approached and thus chosen for a compliance check was unable to be identified until the vessel had been reached and boarded. Now officers can investigate historic vessel tracking data to identify vessels which are considered high risk and more efficiently locate and board the individual vessel to conduct a compliance inspection. Not only does this approach offer a significant time saving and in turn increased capacity for QBFP patrols (there is no longer the need to find a needle in a haystack as per the old approach of searching for boats at sea) but also ensures those that are more likely to benefit from a compliance check are in fact reached and those that are doing the right thing, may not be interrupted with a compliance check. In other words, QBFP is better able to focus limited resources on higher risk activities. Overall, this provides an improved accuracy with respect to the compliance activities and a reduced workload on both QBFP and commercial fishers (those doing the right thing can get on with their fishing activities). In addition to being able to adopt a risk based approach to compliance, QBFP has been able to develop an alert based system that identifies specific incursions, vessel tracking failures (for any reason) and other activities that alleviates the need for round-the-clock on-the-water monitoring by inspectors. Instead, incursions can be investigated as they are identified in real time.
Fishing in closed fishing waters	QBFP officers are able to monitor the location of an individual fishing vessel and track their position to identify if they enter closed fishing areas. Using this approach and by way of example, QBFP has recently identified a vessel which was appearing in a closed fishing area (closed to the take of a specific species). QBFP was able to directly approach the vessel on the water and conduct a compliance investigation. Compliance based activities of this nature help to keep

	the playing field level for all commercial fishers. Traditional approaches would see a QBFP patrol out on the water hoping to 'run into' fishers fishing in a closed area.
Investigating complaints from the public	The general public is able to lodge a complaint about suspected illegal fishing through the FishWatch hotline. QBFP is tasked with investigating these reports. With vessel tracking, when a complaint is received about a commercial vessel, QBFP can use the real-time vessel tracking data to identify the individual vessel that is the subject of the report. If at this time it is confirmed that the vessel has the necessary licences to conduct the reported fishing activities at the location in question, no further time or cost investment is required to resolve the matter. This significantly reduces the need for in-person inspections that can occur out-of-hours and which significantly increase the cost of compliance (at least two QBFP officers and a vessel per inspection which is likely to take up to 6 patrolling hours). Further, it provides a positive benefit to fishers as it reduces the number of unnecessary compliance investigations (which are often seen as a negative by fishers when they are doing the right thing). On the other hand, this approach also quickly identifies reports which need to be investigated and which lead to identifying illegal fishing activities (i.e. those where the vessel tracking data cannot identify a lawful fishing vessel/activity). This is in contrast to historical methods that would see physical compliance investigations carried out for complaints and thus the associated costs of two officers and the vessel being incurred for the investigations.
Prioritisation of compliance activities	Port checks are a routine part of compliance with QBFP approaching and conducting compliance checks on vessels as they dock at port. Given the finite resources of QBFP, it is regularly the case that two vessels are approaching port at the same time and officers must choose which vessel they approach for compliance checks. Real-time vessel tracking data has enabled QBFP to conduct preliminary analysis of where and when fishing occurred and duration of the fishing trip for those vessels, allowing QBFP to apply a risk-based approach in determining which vessel to inspect. Prior to vessel tracking, officers would apply no specific framework and simply choose to approach one of the boats. Similar to the example directly above, this approach provides a positive benefit to fishers as it reduces the number of compliance investigations on likely compliant fishers.
Compliance audits	Compliance audits are carried out across the fisheries to investigate whether fishers are compliant. Two examples of compliance audits are in the crab and net fisheries. Crab apparatus (i.e. crab pot) audits are carried out by QBFP in order to confirm the fishers are operating as per their licence (e.g. not exceeding number of crab pots permitted). With the introduction of vessel tracking, QBFP officers are able to review historic vessel tracking locations and the surrounding areas (given vessel tracking

	unit polls every 5 minutes) to identify pots. Using this approach audits can be conducted by two officers in a day. Previously, a crab pot audit would require six to eight officers and take around two days. It should be noted that apparatus audits are not a routine exercise. They are conducted in response to complaints or intelligence developed. In the net fishery, QBFP is able to use vessel tracking data in order to approximately identify where the nets are set and identify instances where equipment has been used in a non-compliant way. Such an approach would have proven impossible without vessel tracking.
Prosecuting offences	Vessel tracking data is used by QBFP to provide positional information allowing for monitoring of and prosecution of regulated waters offending. Already vessel tracking data has been used as evidence to confirm the location of a given vessel and prosecute against vessels that are in restricted waters (i.e. legislation prohibits vessels from entering these areas). Vessel tracking data is also used to validate logbooks. In this application, inconsistencies between logbook data and vessel tracking data are identified. Prosecution actions have been instituted based on these inconsistencies (the outcomes of these prosecutions are still pending).

Overall, the introduction of vessel tracking and access to the real-time data it provides has enabled QBFP to enhance intelligence-based compliance activities in addition to its more traditional 'boots on the ground' approach. What this means is that QBFP is able to identify and track the location of individual vessels on the water and strategically set about conducting compliance investigations on higher-risk fisheries and operations. This is in contrast to prior methods that could not selectively target higher-risk vessels but instead conducted the same compliance-based checks on all vessels that QBFP encountered during their patrols. As demonstrated in the examples provided above, time savings have been realised across its compliance activities meaning an increased capacity and efficiency has been realised. A flow-on benefit has been realised by commercial fishers through a reduction in unnecessary compliance checks being carried out on compliant fishers.

Prior to vessel tracking, if QBFP needed to inspect a specific commercial operation, an assumption could be made that it may take up to three trips to successfully intercept the operation. Using vessel tracking information, this could be achieved in one trip. Using the assumptions that a trip involves 6 patrolling hours and two QBFP officers, the labour cost associated with one patrol trip is equal to $492[27]. By only undertaking one trip to intercept a specific commercial operation using vessel tracking data, the labour cost saving is equal to $984. If each licence holder is inspected once a year, the annual labour cost saving is estimated

[27] Based on the wage for Technical Officer (TO3-1) of $41/hour in the State Government Entities Certified Agreement 2019 - Wages Determination - Certified Agreement reprint (CB/2020/78) <*https://www.qirc.qld.gov.au/sites/default/files/2020_cb78_reprint.pdf?v=1616728595*>

to be $1 451 400[28]. This does not include costs associated with use of a boat, fuel and allowances. The estimation provided above may vary depending on individual circumstances.

As a secondary benefit, with a more efficient commercial compliance program, QBFP has reported an increased capacity for compliance activities in other areas. Specifically, QBFP has identified that due to the time savings presented by its more intelligence-based compliance approach, more time can be spent on compliance activities in other high-risk areas which compromise the sustainability of the fisheries including the fishers that operate within. One area which has benefitted and for which more time is now able to be dedicated to compliance efforts is black marketing activities (for example, non-licenced fishers catching and selling commercial quantities of fish species). QBFP has anecdotally reported an increase in time able to be spent in investigating black marketing fishing activities since the introduction of vessel tracking. As identified in the fisheries review conducted in 2014, black marketing activities pose a significant risk to the sustainability of fisheries and the viability of commercial fishers in the industry.

A second authority which also has access to the vessel tracking data for compliance purposes is GBRMPA. Under an information sharing agreement established under Section 217 of the *Fisheries Act 1994*, GBRMPA is provided vessel tracking data to be used for compliance purposes. Compliance activities in this sense only relate to those which are undertaken in the GBRMP and which relate to enforcing the Great Barrier Marine Park Zoning Plan[29]. As the location of every commercial fishing boat can now be accurately determined in real time, GBRMPA can use this information to aid the identification of acts of non-compliance (e.g. fishing in a green zone). This represents an advancement from prior methods (e.g. fly overs which can only be conducted during the day) as data to inform the compliance activities is available in real time and 24/7.

Given the improvements that have been observed with respect to using vessel tracking data for facilitating compliance activities in the commercial fishing sector, GBRMPA has also realised an increase in capacity which has enabled them to target other areas under its mandate, specifically:

- compliance-based activities for recreational fishers
- preventing damage to indigenous cultural sites.

In summary, the availability of vessel tracking data has enabled not only an improvement to the nature of the compliance activities carried out but an increase in the breadth of compliance activities able to be carried out by the relevant compliance agencies.

5.3.2.2 Voluntary compliance and general deterrence

It has been reported by both state and federal government authorities that an increase in voluntary compliance and general deterrence was realised with the introduction of vessel tracking. That is, commercial fishers are more likely to do the right thing on the basis that they

[28] Based on 1475 primary commercial fishing licences required to have vessel tracking since 2019.
[29] Great Barrier Reef Marine Mark Authority 2003, *Great Barrier Marine Park Zoning Plan 2003,* <*https://elibrary.gbrmpa.gov.au/jspui/handle/11017/382*>

know they are being monitored. One example of how this has practically translated is through a reduction in fishers in green zones meaning an increased compliance by fishers with regulations that prevent fishing in these areas. This finding is consistent with results published by studies in the commercial fishing sector[30] and, more broadly, studies which demonstrate an increased rate of voluntary compliance when participants are being 'watched' either by camera or an authoritative figure[31].

5.3.3 Maintaining access to GBRMP fishing ground

GBRMPA has indicated that higher resolution vessel tracking data is essential for informing their compliance activities and in turn ensuring the protection of the marine park. GBRMPA has also indicated that if vessel tracking were not in place on commercial fishing vessels, access to the GBRMP would be difficult to maintain. Table 18 identifies the commercial catch in the GBRMP to be worth an estimated $89.4 million. Vessel tracking has assisted these fisheries to maintain access to the GBRMP fishing ground and continue to yield economic benefit from the world heritage area.

Table 18 Annual average value of GBRMP catch

Fishery	Annual average GVP*	Average catch by weight from GBRMP**	Annual average value of GBRMP catch
Coral harvest	$14.9 million	100%	$14.9 million
East coast inshore fin fish	$18.2 million	30%	$5.5 million
East coast Spanish mackerel	$3.9 million	89%	$3.5 million
Marine aquarium	$1.9 million	64%	$1.2 million
Line fishery (reef)	$32.8 million	97%	$31.8 million
Line fishery (rocky reef)	$1 million	42%	$0.4 million
Mud crab east coast	$22.1 million	80%	$17.7 million
Spanner crab	$10.1 million	9%	$0.9 million
Other harvest	$13.7 million	99%	$13.5 million
Total	**$118.6 million**		**$89.4 million**

* based on commercial fisheries GVP values in FY18-19, FY19-20 and FY20-21[32,33]

** based on commercial fishers' logbook information

[30] Thoya et al. 2019, Trawling effort distribution and influence of vessel monitoring system (VMS) in Malindi-Ungwana Bay: Implications for resource management and marine spatial planning in Kenya, *Marine Policy*

[31] Jansen et al. 2018, The influence of the presentation of camera surveillance on cheating and pro-social behavior, *Frontiers in Psychology*

[32] Department of Agriculture and Fisheries 2020, *Summary economic and social indicators for Queensland's commercial fisheries, 2017/18 and 2018/19,* <https://www.publications.qld.gov.au/dataset/fisheries-economic-and-social-indicators-financial-years-2018-and-2019/resource/9f9cd923-892e-49ab-a78f-94d9df50926d>

[33] Department of Agriculture and Fisheries 2022, *Summary economic and social indicators for Queensland's commercial fisheries in 2019/20*, <https://www.publications.qld.gov.au/dataset/fisheries-economic-and-social-indicators-2019-20/resource/14a32b86-096d-4b17-ae5a-2cbc94a133a3>

5.3.4 Meeting export approval requirements under the EPBC Act

In Australia, Part 13A of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) regulates the:

- import and export of specimens protected under the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES);
- exports of Australian native specimens; and
- imports of live specimens.

Export approval under the EPBC Act must be obtained in order to export Australian native animal or plant specimens and/or Convention on International Trade in Endangered Species (CITES) listed specimens for commercial purposes. These specimens must come from an approved program such as a wildlife trade operation, of which commercial fishery is categorised under. Assessment and approval of a wildlife trade operation are conducted by the then federal Department of Agriculture, Water and the Environment (now Department of Climate Change, Energy, the Environment and Water) based on a set of guidelines[34] that outline specific principles and objectives designed to ensure a strategic and transparent way of evaluating the ecological sustainability of fishery management arrangements. The implementation of vessel tracking has formed a component in the analysis of a fishery performance against the guidelines, thus contributing to enabling DAF to maintain export approvals for some Queensland fisheries.

For example, the guidelines require that the fisheries management regime to "contain the means of enforcing critical aspects of the management arrangements". Vessel tracking as a means to track commercial fishing vessel locations, validate reported fishing activity and enhance DAF's capacity to undertake vessel inspections has formed a component to demonstrate alignment with this criteria[35].

In addition, the guidelines also require that "there is a reliable information collection system in place appropriate to the scale of the fishery. The level of data collection should be based upon an appropriate mix of fishery independent and dependent research and monitoring". In other words, independent data validation of fisheries catch and effort data is required. Vessel tracking data is able to assist with validating fishing effort, thus has demonstrated partial alignment to this criteria[35]. It should be noted that vessel tracking data is unable to validate catch or bycatch data and options to achieve this are being considered by DAF.

[34] Department of Climate Change, Energy, the Environment and Water, *Guidelines for the Ecologically Sustainable Management of Fisheries 2007*, <*https://www.dcceew.gov.au/sites/default/files/documents/Guidelines%20for%20the%20ecologically%20sustainable%20management%20of%20fisheries.pdf*>

[35] Assessment reports prepared by the then Department of Agriculture, Water and the Environment for the following fisheries: Queensland aquarium fin fish 2021, commercial trawl (fin fish) 2020, east coast otter trawl 2021, east coast Spanish mackerel 2018, Gulf of Carpentaria line 2019, coral reef fin fish 2021 and sea cucumber 2021 – assessment reports downloadable from https://www.dcceew.gov.au/environment/marine/fisheries/qld

Vessel tracking has been considered in the EPBC Act approvals for the following fisheries:

- Aquarium Fin Fish
- Commercial Trawl (Fin Fish)
- East Coast Otter Trawl
- East Coast Spanish Mackerel
- Gulf of Carpentaria Line
- Queensland Coral Reef Fin Fish
- Sea Cucumber

For the following fisheries, vessel tracking was considered in the analysis for initial approval, but that approval has since been revoked for other reasons:

- Blue Swimmer Crab
- East Coast Inshore Fin Fish
- Gulf of Carpentaria Inshore Fish
- Mud Crab

The value of the exports under each of these fisheries is presented in Table 19 below.

Table 19 Value of exports to individual fisheries

Fishery[36] [37]	**Average export value FY17-18, FY18-19 and FY19-20***
Aquarium Fin Fish	$1 million in exports per annum
Commercial Trawl (Fin Fish)	$2.4 million in exports per annum
East Coast Otter Trawl	$0.7 million in exports per annum
East Coast Spanish Mackerel	$0
Gulf of Carpentaria Line	$0
Queensland Coral Reef Fin Fish	$9.1 million in exports per annum
Sea Cucumber	$0 **
Total export value for all above fisheries	$13.2 million per annum
Total export value for fisheries that only require vessel tracking since 2019	$10.1 million per annum

*Export values include only the value of transactions that were directly made between the fisher and its immediate customer where the customer was an international customer for FY17/18 and FY18-19. Sales destination of subsequent transactions between fishers and immediate domestic customers are only considered in the reported figures for FY19-20.

** data only publicly available for all other harvest fisheries of which the sea cucumber fishery is part of. While it is known that this fishery does export and thus there is an average export value this cannot be disclosed publicly due to privacy restrictions.

[36] Department of Agriculture and Fisheries 2020, *Summary economic and social indicators for Queensland's commercial fisheries, 2017/18 and 2018/19, <https://www.publications.qld.gov.au/dataset/fisheries-economic-and-social-indicators-financial-years-2018-and-2019/resource/9f9cd923-892e-49ab-a78f-94d9df50926d>*

[37] Department of Agriculture and Fisheries 2022, *Summary economic and social indicators for Queensland's commercial fisheries in 2019/20, <https://www.publications.qld.gov.au/dataset/fisheries-economic-and-social-indicators-2019-20/resource/14a32b86-096d-4b17-ae5a-2cbc94a133a3>*

In summary, the vessel tracking regulation contributes to the above identified fisheries maintaining their EPBC Act approvals. In turn, these fisheries can continue to export their product, realising approximately $10.1 million in potential exports to the Queensland economy every year. It is expected that without the vessel tracking, and with no other means introduced to satisfy the relevant requirements of the EPBC Act approvals, the value of the current export markets may not have been realised. Whilst these operators could seek alternative domestic buyers, domestic prices may not be as high to offload the excess supply.

Note that commercial trawl (fin fish), east coast otter trawl, and sea cucumber fisheries required vessel tracking pre-2019, therefore were the 2019 vessel tracking regulation to be repealed there may not be a reduction in export value in these fisheries.

5.3.5 Relaxation and removal of other regulations

The introduction of the vessel tracking regulation has contributed to several other regulations or part thereof being repealed or relaxed. These regulations were repealed or relaxed partly on the basis that vessel tracking data could be used to better understand the fishing activities carried out and facilitate compliance activities. These regulations are:

1. Fishers are no longer required to give a prior notice to report their catch of quota species 1, 3 or 6 hours[38] before landing at a landing location to facilitate landing compliance checks (all fisheries)
2. Fishers in the C1 and east coast inshore net fisheries are no longer required to have their assistant fishers under direction within 800m of the commercial fisher.
3. Fishers in the reef line fishery are no longer required to have their tender vessels within 5 nautical miles of their primary vessels under fisheries legislation.
4. The size of tender boats has increased from 7 meters to 10 meters.

In all instances, the removal or relaxation of the above regulations has provided more freedom and flexibility to commercial fishers around how they conduct their fishing operations. Further, they provide a larger range to be achieved by their fishing operations (specifically due to a larger tender boat size and a longer distance between their primary and tender boats).

There are approximately 1344 primary commercial fishing licences that may operate in a quota-managed fishery since 1 September 2021. The removal of the 1-hourly, 3-hourly and 6-hourly prior notice requirement before landing is estimated to result in annual labour cost saving of $689 633 for commercial fishers. This estimated saving is calculated using the Fairwork minimum wage of $21.38/hour[39] and based on the assumptions that 12 commercial fishing trips are undertaken per year per licence, each operation will wait at the landing locations for 1 hour before leaving the landing locations and there are two crew members in each operation. The estimation above may vary depending on individual commercial fishing operations and factors

[38] Prior notice deadline in previous regulation was 1 hour for landing places south of latitude 15°50.30' south and 3 or 6 hours for landing places above latitude 15°50.30' south.

[39] Minimum wages as of 1 July 2022 – Fair Work Ombudsman <*https://www.fairwork.gov.au/pay-and-wages/minimum-wages*>

such as fishery type, size of operation, fishing frequency, location, phone reception and weather. It does not include other potential cost saving benefits derived from the reduced wait time, for example, cost to maintain fish quality (i.e. cold chain management) and managing health and safety (i.e. fatigue management).

It is difficult to estimate the expected savings from a relaxation of regulations around the need for direction of assistant fishers or the range and size increases now available to tender boats given this represents a smaller component of the industry with no data on the prior and after fishing behaviours of the fishers impacted by the changes to these regulations (i.e. no knowledge of how many tender boats have been upgraded, duration of fishing undertaken by tender boats under direction, etc).

It is encouraged that fishers provide the value of the savings realised due to the changes in other regulations.

5.3.6 Data for fishers

To a lesser extent, it was reported by commercial fishers that the data received from vessel tracking was providing further benefits to the fishers individually. Specifically, it was reported that the data was being beneficially used for the purposes of:

- Observing the location of a fisher for the purposes of confirming where they are (i.e. a partner of the fisher on land could view the vessel tracking data and identify that the fisher was still moving and just running late home rather than experiencing issues at sea).
- Where a fleet of vessels were owned, the location of all vessels could be observed when at sea. This is beneficial for fleet managers to monitor performance of their fishers (employees) and the fishing operation.

It must be noted that this feedback was not consistent for all stakeholders interviewed for the purposes of the Consultation PIR with some fishers reporting that they saw no personal value in the data.

DAF has also received positive stories about commercial fishers using vessel tracking information to successfully retrieve stolen vessels, enabling them to continue to fish with minimal financial and time losses.

5.3.7 Maritime safety

A side benefit of vessel tracking is that it provides useful locational data to assist marine search and rescue incidents in Queensland waters.

The Australian Maritime Safety Authority (AMSA) is Australia's national agency responsible for maritime safety and maritime aviation search and rescue. AMSA administers legislation including the *Maritime Safety (Domestic Commercial Vessel) National Law Act 2012* (Cth) and

its associated subordinate legislation. AMSA regulates safety with respect to commercial fishing operations.

DAF is responsible for administering the *Fisheries Act 1994* and its associated subordinate legislation to ensure fisheries resources are managed in a manner that is ecologically sustainable, socially acceptable and economically viable to Queenslanders. Vessel tracking was implemented by DAF under the QSFS to help modernise fisheries management in Queensland, leading to more informed and responsive decision-making to protect fish stocks. Although DAF is not responsible to monitor safety in relation to fishing vessels in Queensland, DAF has always taken steps to ensure that timely vessel tracking data is made available to appropriate authorities such as AMSA by providing its last known positions of vessels and information on nearby vessels to assist with search and rescue operations in Queensland waters.

DAF has received advice from AMSA that the emergency position-indicating radio beacon (EPIRB) station satellite detection system remains the best and most reliable distress system, but that vessel tracking data will provide extremely valuable complementary information on the position of any vessel in distress as well as nearby vessels that can also assist in search and rescue efforts. The EPIRB system is monitored at all times (24 hours per day and seven days per week) by AMSA and is actioned in a matter of minutes. Combined, it is hoped that these measures will significantly improve the effectiveness and efficiency of search and rescue efforts in a coordinated manner across agencies in Queensland.

5.4 Unintended consequences

5.4.1 Vessel tracking equipment issues

The Vessel Tracking Installation and Maintenance Standard prescribes a list of vessel tracking units which can be selected by fishers for installation and use. Despite initial trials being conducted with the equipment (including by industry fishers), feedback received through the consultation to date has identified that there are certain reliability issues with some of the equipment. Feedback received is presented in Table 20 below. It is understood that this is in no way exhaustive, however, it goes some way to illustrating the reliability issues of the equipment.

Table 20 Known reliability issues with vessel tracking units

Equipment	Reliability issues
SPOT Trace	• Cabling issues where cables were not made with suitable materials for the environment in which they would be exposed to • Insufficient waterproofing to deal with the environment it operates in (water and humidity)
Rockfleet	• Unable to identify when the equipment is successfully working (i.e. light on equipment) • Cabling issues where cables were not made with suitable materials for

	the environment in which they would be exposed to • Power supply issues - discrepancies between the power supply advertised and the actual power supply realised in operation • Unreliable where the reset required a magnet needed to be swept across the equipment in a specific direction • Not charging from the battery supply • Back up battery insufficient for duration at sea if power failure occurs • Insufficient waterproofing to deal with the environment it operates in (water and humidity)
The IDP690 to IDP 800	• Difficulties with use in vessels with 12V power systems

With respect to the Spot Trace, all equipment was replaced between the period November 2019 and April 2020 due to issues with the equipment and cabling. This was done at no cost to the fishers, with fishers requested to transfer their equipment over once replacements were provided (i.e. to ensure no lost fishing time).

Table 21 and Table 22 illustrate the malfunction information provided by the current vessel tracking providers (Pivotel and Pole Star) current as of end 2021.

Table 21 Malfunction rate by vessel tracking unit type

Provider	Type	Number dispatched	Number of malfunctions [i]	Malfunction rate (%)
Pivotel	Rockfleet	880 [ii]	137	16%
	Spot Trace	643 [iii]	36	6%
Pole Star	Rockfleet [iv]	38	1	3%
	IDP690 [v]	53	0	0%
	ST6100 [v]	629	12	2%
	IDP800 (with internal antenna) [v]	25	0	0%
	IDP800 (unit only without antenna) [v]	43	1	2%
	External antenna for IDP 800 [v]	56	3	5%

[i] Equipment was assessed by the providers and a fault was found

[ii] Equipment dispatched from June 2019

[iii] Equipment dispatched from May 2020 (after mass replacement program of Spot Trace)

[iv] Equipment dispatched from April 2019

[v] Equipment dispatched from 1 January 2019

Table 22 Causes of equipment malfunctions

Provider	Type	Number of malfunctions	Equipment failure [i]	Customer caused failure [ii]	Supplier - installation issues
Pivotel	Rockfleet	137	76%	2%	22%
	Spot Trace	36	50%	50%	N/A
Pole Star	Rockfleet	1	100%	0%	N/A
	IDP690	0	0%	0%	N/A
	ST6100	12	83%	17%	N/A
	IDP800 (with internal antenna)	0	0%	0%	N/A
	IDP800 (unit only without antenna)	1	0%	100%	N/A
	External antenna for IDP 800	3	0%	100%	N/A

[i] Failure with internal parts or configuration

[ii] Damage caused by customer, improper installation, customer caused water ingress, incorrect use of AAA batteries for Spot Trace

As mentioned above, the regulation has had a greater impact on those that live in regional areas. This is due to little or no access to technical support in the event of technology issues and lengthy delays when equipment is required to be shipped back to the supplier (it takes longer for this to happen from remote areas). While backup equipment is an option, feedback has confirmed that given the issues with the technology, often the backup can also be down with lengthy delays experienced to receive replacements or repair the backup.

Technology issues with the vessel tracking units was an unintended consequence of the regulation implementation that intrinsically links to other unintended impacts.

5.4.2 Data privacy and ownership issues

Almost all industry stakeholders that provided feedback identified that data leakage was a concern. The data captured through vessel tracking provides a complete set of reference points for where a vessel has been on a given trip. This includes the identification of specific fishing marks (productive fishing locations) that are considered to be the intellectual property of the fisher who identified them (largely through years of experience). While this is not considered an issue for some fisheries for example, crabbing (pots are already easily identifiable in the water), it is considered an issue for other fisheries (e.g. line and net fisheries).

Fishers have also expressed concerns about data held by the vessel tracking airtime providers (i.e. those providing the vessel tracking monthly polling) and how this data might be used by these third parties. While dependent on the contracts signed between the fisher and the vessel tracking airtime providers (not DAF), fishers are concerned that the providers have access to and can use the data collected from the vessel tracking. Further it was also reported that the data is being retained by the original provider when contracts from one provider are transferred over to another (such as with contracts that were originally entered into with Option Audio).

While it is acknowledged by the fishers that the government bodies which receive and use this data have specific protocols in place to ensure the data remains confidential and is not shared beyond the specified use for that government body, fishers have reported that they have observed new fishers appearing at highly guarded fishing marks, sparking concerns that this may have come from inappropriate vessel tracking data access. Evidence to support these claims has not been provided to date through the consultation process.

During public consultation, fishers are encouraged to bring forward evidence to support claims of inappropriate access of vessel tracking data by authorities, if applicable.

Compounding the issues associated with data privacy, it has been identified that there is no clear understanding of who owns the data which is generated. Again, this is an unintended consequence of the regulation.

5.4.3 Emotional impacts

Several fishers described the vessel tracking legislation as emotionally confronting. The idea of being tracked electronically is associated with criminals, so a similar approach to fishers has prompted additional emotional load. This represented an unintended impact of the regulation.

5.4.4 Competition impacts

Prior to the introduction of the vessel tracking regulation, DAF engaged in a market search and also allowed vessel tracking providers to contact them and arrange to become an approved vessel tracking provider. Trials were undertaken at the government's expense, the result of which identified only a small number of businesses that were able to provide the necessary vessel tracking units and airtime services to assist Queensland's fishers in fulfilling their vessel tracking obligations. The vessel tracking units provided by these providers were identified in the Vessel Tracking Installation and Maintenance Standard.

Since the introduction of the vessel tracking regulation, one original vessel tracking provider has left the market resulting in a limited pool of available providers.

While not the intent, the process adopted has resulted in difficulties for fishers to move between vessel tracking providers to meet their vessel tracking obligations.

5.5 Assessment against the objectives

The objective of the *Fisheries Act 1994* is to provide for the use, conservation and enhancement of the community's fisheries resources and fish habitats in a way that seeks to—

(a) apply and balance the principles of ecologically sustainable development; and
(b) promote ecologically sustainable development.

The objective (as outlined in Section 6) of the vessel tracking regulation was to implement vessel tracking on the vast majority of commercial vessels to provide valuable (more timely and accurate) data that could be used for monitoring and research and compliance activities. The resulting outcomes would seek to contribute to a more proactive and accurate monitoring and research program as well as a more effective compliance approach across the fisheries and lead into the overarching objective of ensuring the sustainability of Queensland's fisheries, which will benefit the marine resources upon which many operators and regional communities are dependent.

Based on the feedback gathered from the consultation process informing this Consultation PIR, it appears that the regulation has achieved its objective. There is now an improved approach to compliance activities which provides greater capacity for authorities across their compliance activities and a reduced compliance burden on commercial fisheries that are compliant. Improvements to how monitoring and research activities are carried out have also been realised with early stage benefits observed and clear future benefits articulated.

Overall, the introduction of the vessel tracking regulation has been shown to contribute to improved fisheries management which in turn provides for an ecologically sustainable fishery.

5.7 Consistency with other policies and legislation

Regulations must be consistent with Clause 5 of the Competition Principles Agreement and the fundamental legislative principles as defined by Section 4 of the *Legislative Standards Act 1992*. This was handled in the explanatory memorandum of the Fisheries (General) Regulation 2019.[40]

"Section 84 provides that the vessel tracking unit on a boat is to be installed in a way stated in the vessel tracking standard. The potential Fundamental Legislative Principles issue is whether the legislation has sufficient regard to the institute of Parliament by allowing an external document that is not subject to Parliamentary scrutiny to prescribe an approved facility.

A standard for the way vessel tracking unit must be installed can be an extensive, technical document dealing with various types of equipment which is more suited to a standard published by DAF. It would be impractical to include the details of installation of equipment in legislation to the degree required to ensure enforceability. It would also be overly burdensome on Parliament's time to consider changes to a vessel tracking standard each time they occur. It is therefore more practical and timelier for DAF to make and amend vessel tracking standards based on DAF's expertise and knowledge."

Consultation focus

We are seeking your feedback in relation to the impacts realised since the introduction of the vessel tracking regulation. Some questions to prompt this consultation process include:

- Have you realised any of the impacts described above? If yes, to what extent?
- Are there any other impacts (positive, negative, unintended) that you have realised because of the introduction of the vessel tracking regulations?

If possible, please quantify the impact realised by you and provide evidence to support your feedback.

[40] Fisheries (General) Regulation 2019, Explanatory notes for SL 2019 No. 179 <*https://www.legislation.qld.gov.au/view/pdf/published.exp/sl-2019-0179*>

6 Looking forward

6.1 Consideration of the original problem

It has been a period of approximately 3 years since vessel tracking was introduced across the majority of Queensland's fisheries. Industry reports published by the department in this time have identified an industry with an overall decreased in gross value of production reported between the 2017/2018 financial year and the 2018/2019 financial year[41]. The impacts on fishing exports and domestic markets from COVID-19[42] highlights the vulnerability of commercial fishers, resulting from years of low profitability and a need to modernise access to fisheries resources and improve fishing efficiency. There is continued international concern about the health of the Great Barrier Reef.[43] [44] Consequently, there is increased scrutiny of the management of fisheries that operate within the Great Barrier Reef World Heritage Area. These challenges were widely recognised by stakeholders that led to the introduction of the QSFS that set out actions aiming to move Queensland's wild harvest fisheries to a modern, responsive and consultative approach to fisheries management.

Further to this, it is widely acknowledged that negative consequences result if a public marine resource is not carefully managed.[45] [46] Specifically, it has been demonstrated that if fisheries are not carefully managed, the trophic structure and productivity of ecosystems may be impacted by long-term declines in populations of target and non-target species.[47] Further, degradation of habitats by commercial fishing can also result from poor management.[48]

The effects of climate change are also introducing greater pressures on marine ecosystems with significant and lasting effects on the marine environment. The recent Intergovernmental Panel on Climate Change report[49] has shown that the world has a limited amount of time to drastically reduce emissions to avoid a global rise in temperature of at least 1.5 degrees Celsius or otherwise face widespread impacts to its marine ecosystems and environments. Various

[41] Department of Agriculture and Fisheries 2020, *Summary economic and social indicators for Queensland's commercial fisheries, 2017/18 and 2018/19*, <https://www.publications.qld.gov.au/dataset/fisheries-economic-and-social-indicators-financial-years-2018-and-2019/resource/9f9cd923-892e-49ab-a78f-94d9df50926d>

[42] Department of Agriculture and Fisheries 2022, *Summary economic and social indicators for Queensland's commercial fisheries in 2019/20*, <https://www.publications.qld.gov.au/dataset/fisheries-economic-and-social-indicators-2019-20/resource/14a32b86-096d-4b17-ae5a-2cbc94a133a3>

[43] Great Barrier Reef Marine Park Authority 2019, *Outlook report 2019*, <https://www.gbrmpa.gov.au/our-work/outlook-report-2019>

[44] BBC News 2021, *Why is the Great Barrier Reef in trouble? A simple guide*, <https://www.bbc.com/news/world-australia-57938858>

[45] Jackson et al. 2001, Historical overfishing and the recent collapse of coastal ecosystems, *Science*, vol. 293, pp.629-637.

[46] Halpern et al. 2009, Mapping cumulative human impacts to California Current marine ecosystems, *Conservation Letters*, vol. 2, pp. 138-148.

[47] Brodeur et al. 2017, New perspectives on the feeding ecology and trophic dynamics of fishes, *Environmental Biology of Fishes*, vol. 100, pp. 293-297.

[48] Jennings & Kaiser 1998, The effects of fishing on marine ecosystems, *Advances in Marine Biology*, vol. 34, pp. 201-212, 212e, 213-352.

[49] Intergovernmental Panel on Climate Change, *Climate Change 2021: The Physical Science Basis,* <https://www.ipcc.ch/report/ar6/wg1/>

publications[50] [51] [52] [53] [54] have illustrated the negative impact of climate change to the marine ecosystems, jeopardising the economic, social and cultural contributions that the fisheries resource provides to communities.

Given the pressures of climate change and global warming on Queensland's fisheries, fisheries which are already under significant stress may not have the resilience to deal with such a large-scale threat.[51] While DAF and the broader commercial fishing industry is unable to directly manage the effects of climate change due to the large scale and widespread nature of these effects, any actions which can be made to enhance the sustainability of the fisheries could assist with preserving the fisheries. These actions lead back to effective management of the fisheries echoed in the actions set out in the QSFS that aims to build more sustainable fish stocks and provide greater resilience of fisheries into the future. This will assist to reduce the vulnerability of fisheries to climate change and enable more timely responses to projected changes in the dynamics of marine resources and ecosystems.

Challenges aside, well-managed and sustainable fisheries present opportunities to the commercial fishing industry as demand for sustainable wild harvest seafood continues to grow due to increasing awareness regarding sustainable seafood.[55] [56] Consumers will increasingly make choices based on the traceability and environmental impact of their seafood. Moreover, the news of Brisbane being awarded hosting rights for the 2032 Olympic and Paralympic Games has further created opportunities for the State to showcase sustainable seafood sourced locally. This is in line with the International Olympic Committee's sustainable sourcing requirements and move towards a more consistent and sustainable approach to sourcing goods and services for the Games.[57]

The Queensland government has allocated rights to our public fisheries resources for commercial purposes in accordance with the current legislative framework. Given the public nature of the fisheries and the broad benefit the fisheries provide to Queenslanders, there is a valid community expectation to ensure the sustainability of the fisheries with a focus on

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[50] Hoegh-Guldberg et al. 2007, Coral Reefs Under Rapid Climate Change and Ocean Acidification, *Science;* Duke et al. 2017, Mangrove Floristics and Biogeography Revisited: Further Deductions from Biodiversity Hot Spots, Ancestral Discontinuities, and Common Evolutionary Processes, *Mangrove Ecosystems: A Global Biogeographic Perspective;*
Hoegh-Guldberg et al. 2007, Coral Reefs Under Rapid Climate Change and Ocean Acidification, *Science*

[51] Sumaila et al., 2011 Climate Change Impacts on the Biophysics and Economics of World Fisheries, *Nature Climate Change*

[52] Hoegh-Guldberg et al. 2007, Coral Reefs Under Rapid Climate Change and Ocean Acidification, *Science*

[53] Steffen et al. 2017 Trajectories of the Earth System in the Anthropocene, *PNAS*

[54] Holbrook & Johnson 2014, Climate change impacts and adaptation of commercial marine fisheries in Australia: A review of the science, *Climatic Change*

[55] Marine Stewardship Council 2020, *Understanding seafood consumers*, <*https://www.msc.org/understanding-seafood-consumers*>

[56] MarketWatch 2022, *Sustainable seafood market growth size 2022: Competitive landscape, leading players analysis, key dynamics, business strategies, statistics and developments forecast to 2028*, <*https://www.marketwatch.com/press-release/sustainable-seafood-market-growth-size-2022-competitive-landscape-leading-players-analysis-key-dynamics-business-strategies-statistics-and-developments-forecast-to-2028-2022-08-01*>

[57] Olympic World Library 2019, *Olympic Games guide on sustainable sourcing*, <https://library.olympics.com/Default/doc/SYRACUSE/186083/olympic-games-guide-on-sustainable-sourcing-international-olympic-committee?_lg=en-GB>

transparency and effective management and use of the resource. Vessel tracking is a means to provide improved management of the fisheries. In doing so, it can increase the social licence for fishers based on the improved management and in turn sustainability benefits vessel tracking has been shown to deliver through broader research and studies (as per Section 3.3).

When considering the historical and recent pressures, as well as opportunities that exist for the Queensland commercial fisheries and more broadly the natural resource, effective management of the resource is required now more than ever. Therefore, when considering whether the problem still exists for which the vessel tracking regulation was originally brought in to address, it is reasonable to conclude that this problem still exists today. For clarity, the problem that still exists today is that the requirement for strategies that deliver good management of the fisheries is still a requirement for Queensland's fisheries. Broadly speaking, a reduction in effective management strategies is not an option going forward as it will not ensure the presenting problems and ensure the future sustainability of the resource.

7 Recommendations

A number of options are considered as part of the recommendations section of this Consultation PIR. Table 23 outlines the options considered as part of the recommendations.

Table 23 Options considered

Option A	Legislation repealed (base case reinstated)
Option B	Alternative Options (e.g., smart phone app, drones, etc)
Option C	Regulation remains without/with amendment (e.g. improvements to address impacts)

7.1 Option A - Should the legislation be repealed?

The vessel tracking regulation was initially introduced in order to provide more valuable data (higher resolution, independent and real-time) which could be used for monitoring and research and compliance activities, which in turn informed the management of the fisheries and sought to ensure the overall sustainability of the fisheries. It must be noted that there have been no alternative means for gathering more valuable fishing locational data which could be used for monitoring and research, and compliance activities since the introduction of the vessel tracking regulation (i.e. no other means for solving the problem have been introduced either directly or indirectly).

As highlighted in Section 6 it is evident that the original problem for which the regulation was otherwise introduced has only become more apparent. That is, it is more apparent than ever that improved management practices are required to ensure sustainable fisheries (i.e. improved management strategies that improve the ability to ensure efficient and effective monitoring and research and compliance activities for the fisheries).

If the regulation were to be repealed, the data which is currently collected would be lost. As this data is used for a myriad of different reasons (described in Section 5), the benefits derived by the use of this data would also be lost if the regulation were to be repealed. Specifically, the quantified benefit estimated to approximately $10.1 million per annum (identified at Table 19 in Section 5) is expected to be lost if the regulation was to be repealed. Whilst these operators could seek alternative domestic buyers, domestic prices may not be as high to offload the excess supply. The additional qualitative benefits identified in Section 5 would also be lost.

In addition to this, if the regulation were to be repealed it is also expected that access to GBRMP may be difficult to maintain by GBRMPA. Around two thirds of the 344 400 square kilometer GBRMP is open to some form of commercial fishing. It is estimated that approximately $89.4 million, approximately 75% of the total annual gross value of production of the Queensland fisheries catch from GBRMP, may be affected.

Figure 2 Great Barrier Reef catchment areas and general reference map (photo courtesy of GBRMPA). *Notes: Around two thirds of the 344 400 square kilometer GBRMP is open to some form of commercial fishing.*

It is expected that, if not all, a vast majority of industry will not continue to voluntarily implement vessel tracking and provide this data to DAF. This is based on feedback received from consultation to date where 100% of participants have indicated that they would not voluntarily adopt vessel tracking. Regardless, if any fishers were to continue with vessel tracking in a voluntary capacity, data collected would only represent a small portion of the industry resulting in incomplete and non-representative data sets. It is not recommended that an incomplete approach to gathering data of this nature be adopted given this would be unlikely to correctly inform management decisions (i.e. calculation of industry effort when only part of the picture is available).

The vessel tracking regulation has delivered against its objective, providing an improved approach to both monitoring and research activities, and compliance activities that have in turn contributed to a more effective management of the fisheries. Further, the quantified benefits

delivered by the regulation (as identified in Section 5) clearly outweigh the costs (also Section 5). The net benefits are provided in Table 24 below.

Table 24 Summary of the net quantified benefit by stakeholder

Stakeholder	Quantified operational costs per annum	Quantified one-off cost (rebate scheme)	Quantified benefits (cost saving) per annum	Quantified benefits of maintaining export approvals and access to GBRMP	Net Benefit (per annum) ongoing
Fishers	$3 006 711	N/A	$689 633	$99 500 000	~ $97 182 922
Government (both State and Federal)	$1 124 857	$3 100 000	$1 451 400	N/A	~ -$2 773 457
				Total	**~ $94 626 909**

Effective management of the fisheries was (as identified by the original problem) and continues to be a critical pillar which ensures the long term sustainability of Queensland's fisheries which are estimated to be worth $770 million annually[58] [59] [68]. A contribution to the overall sustainability of the fisheries is a benefit that far outweighs the identified costs of the vessel tracking regulation.

When further considering the benefits with respect to the costs, a proportion of net and ongoing costs reside with the fishers. Despite this, it has not been identified through the consultation process to date that these costs are materially impacting the commercial fishing operations carried out. Regardless, a consideration of the costs of vessel tracking against the individual benefits received by the fishers is also relevant.

Commercial fishers require a sustainable resource in order to continue to maintain their current business's economic value (i.e. maintain catch rates that derive income). It is appropriate to consider the vessel tracking regulation as a single contributing factor (among many) that results in a sustainable fishery. This, in turn, delivers continued sustainability to the fishing businesses which operate within these waters. A recent report commissioned by the DAF has calculated the average gross income for business activity in Queensland's commercial fisheries to be $219 000 in 2018/19[60]. Accordingly, the vessel tracking regulation can be considered a contributing factor (among many) to ensuring the average business value of $219 000 per

[58] Department of Agriculture and Fisheries 2020*, Economic and social indicators of the Queensland charter fishery, 2017/18 and 2018/19*, <*https://www.publications.qld.gov.au/dataset/fisheries-economic-and-social-indicators-financial-years-2018-and-2019/resource/7ac87916-a5f8-44e5-9d0a-9d422a0a44d2*>

[59] Department of Agriculture and Fisheries 2021, *Economic contribution of recreational fishing by Queenslanders to Queensland,* <*https://www.daf.qld.gov.au/business-priorities/fisheries/monitoring-research/data/economic-contribution-of-recreational-fishing*>

[60] Department of Agriculture and Fisheries 2020, *Summary economic and social indicators for Queensland's commercial fisheries, 2017/18 and 2018/19,* *https://www.publications.qld.gov.au/dataset/fisheries-economic-and-social-indicators-financial-years-2018-and-2019/resource/9f9cd923-892e-49ab-a78f-94d9df50926d*>

annum. This value is significantly higher than the cost of the vessel tracking regulation reported and incurred by fishers (as reported in Section 5.2.1) which would lead to support for a recommendation that stipulates that the vessel tracking regulation should remain with no changes.

There is inherent complexity in repealing the current vessel tracking regulation due to the incorporation of earlier vessel tracking regulations already in existence across the fisheries prior to the introduction of the current vessel tracking regulations. Repealing the current vessel tracking regulation would not only remove the vessel tracking requirements from the additional fisheries that were required to implement vessel tracking under the current vessel tracking regulation, but also remove vessel tracking requirements from a broader subset of fisheries that were required to operate vessel tracking prior to the introduction of the current legislation, and fisheries that derive their commercial catches from quota amounts reported through vessel tracking data. Repealing the regulation would effectively repeal the current situation back, not to the base case, but to a situation circa 2008. For this reason, if the regulation were to be repealed, the vessel tracking legislation in place prior to this regulation (as described in Section 2.3) would need to be reinstated in order to return the legislation to its prior state (pre-2019).

A regulatory approach to the management of Queensland's fisheries is consistent with that used in other jurisdictions both nationally and internationally and remains the most appropriate means for ensuring the long-term sustainability of Queensland's fisheries resources. Further, the vessel tracking regulation is consistent with regulations in other states and territories in Australia, the Commonwealth and internationally.

Vessel tracking in other jurisdictions

Given the island nature of Australia, vessel tracking requirements (as implemented in Queensland Fisheries, i.e. real-time, independent data) are common across almost all of Australia's eight states and territories and at the federal government level. While the adoption and implementation of vessel tracking across Australia's individual fisheries is varied with respect to the breadth of its application, vessel tracking unit and subsequent data collection is present in all jurisdictions except for NSW.

Jurisdiction	VMS requirements
TAS[61]	Required in the giant crab, abalone, and scallop fisheries
WA[62]	Required in most major fisheries

[61] Department of Natural Resources and Environment Tasmania, *Vessel monitoring systems,* <*https://nre.tas.gov.au/sea-fishing-aquaculture/commercial-fishing/commercial-fishing-licences-and-seasons/compliance-and-vms*>

[62] Department of Primary Industries and Regional Development Western Australia, *Vessel Monitoring System,* <*https://www.fish.wa.gov.au/Fishing-and-Aquaculture/Commercial-Fishing/Commercial-Fishing-Management/Pages/Vessel-monitoring-system.aspx*>

SA[63]	Required for giant crab, northern zone rock lobster, sardine, southern zone abalone fisheries
VIC[64]	Required for abalone, banded morwong, corner inlet, giant crab, inshore trawl, ocean and dive scallop, octopus, rock lobster, sea urchin and Western Port/Port Phillip bay fisheries
NT[65]	Required in most major fisheries
Commonwealth[66]	Required on all commercial fishing vessels.

Vessel tracking on commercial vessels is also common practice for other seafaring nations with fisheries management organisations introducing similar requirements to those in Australia.

Jurisdiction	VMS requirements	Reasons
The Pacific Islands Forum Fisheries Association[67]	Required on every fishing vessel operating in Forum Fisheries Association territory	Control of illegal, unreported and unregulated fishing activities
Norway[68]	Vessel tracking is required on all vessel greater than 15m (12m in some areas)	Increase transparency of fishing industry, to reduce the risk of illegal fisheries and for improved compliance
The European Union[69]	Vessel tracking is required on all vessels greater than 12m	Protection of fish stocks and access rights of fishers, and monitoring for possible illegal activities
Indonesia[70]	VMS required on all vessels exceeding 30 Gross Tonnage	Increase transparency of fishing industry and to reduce risk of illegal activities

Demonstrated benefits of vessel tracking

[63] Department of Primary Industries and Regions South Australia, *Vessel monitoring system,* <*https://www.pir.sa.gov.au/fishing/commercial_fishing/licensing_registration/vessel_monitoring_system*>

[64] Victorian Fisheries Authority 2019, *Implementing VMS in Victorian commercial fisheries,* <*https://vfa.vic.gov.au/__data/assets/pdf_file/0008/494918/VMS-fact-sheet.pdf*>

[65] Northern Territory, *Fisheries Regulations 1992,* <*https://legislation.nt.gov.au/en/Legislation/FISHERIES-REGULATIONS-1992*>

[66] Australian Fisheries Management Authority 2020, *Know your VMS Requirements,* <*https://www.afma.gov.au/news-media/news/know-your-vms-requirements*>

[67] Pacific Islands Forum Fisheries Agency (FFA) 2008, *FFA vessel monitoring system,* <*https://www.ffa.int/vessel_registration*>

[68] Directorate of Fisheries Norway 2015, *Electronic reporting systems,* <*https://www.fiskeridir.no/English/Fisheries/Electronic-Reporting-Systems*>

[69] European Commission, *Inspections, monitoring and surveillance,* <*https://ec.europa.eu/oceans-and-fisheries/fisheries/rules/enforcing-rules/inspections-monitoring-and-surveillance_en*>

[70] Global Fishing Watch 2017, *Indonesia VMS joint statement,* <*https://globalfishingwatch.org/news-views/republic-of-indonesia-vms-joint-statement/#:~:text=Indonesia%20requires%20VMS%20on%20all,trackable%20by%20any%20other%20means*>

In addition to the benefits discussed in Section 3.3, research studies and published literature identifies a number of benefits from the use of vessel tracking. These also confirm that vessel tracking delivers a critical element under the ongoing effective management of the fisheries (i.e. continues to deliver a solution to the ongoing problem of effective fisheries management).

Similar to the findings of the local FRDC project discussed, other studies have also demonstrated benefits from the use of vessel tracking systems to fisheries management and commercial fishers. The benefits demonstrated are across both the monitoring and research, and compliance aspects of fisheries management. A brief summary of reported benefits from published studies is provided below.

Study	Reported benefits
Gonzalez-Mirelis et al., 2014, Using Vessel Monitoring System Data to Improve Systematic Conservation Planning of a Multiple-Use Marine Protected Area, the Kosterhavet National Park (Sweden)[71]	When considered in a conservation setting, the study found that the use of VMS data could warrant an almost 10% gain of fishing grounds for a fishery while still achieving the required conservation targets (when compared to a scenario that did not utilise VMS data). Vessel tracking data was being used to improve the monitoring and research capabilities of the fisheries management.
Thoya et al., 2019, Trawling effort distribution and influence of vessel monitoring system (VMS) in Malindi-Ungwana Bay: Implications for resource management and marine spatial planning in Kenya[72]	When considered in a compliance setting, the introduction of VMS in the trawl fleet was found to significantly reduce fishing effort in a no-trawl area by about 90% within 1 year. The study identified the important marine spatial planning and technology (VMS) on enhancing compliance with fishing area regulations, reducing resource use conflicts, and promoting sustainable fisheries.
Watson et al., 2018, Vessel monitoring systems (VMS) reveal an increase in fishing efficiency following regulatory changes in a demersal longline fishery [73]	The study demonstrated how VMS data can provide a suite of metrics (such as effort) for improving inputs to stock assessments, dynamic delineation of fishing grounds, and evaluation of regulatory or other (e.g., climatic) impacts on fisher performance.
Emery et al. 2019, Changes in logbook reporting by commercial fishers following the implementation of electronic	The study discovered that following the implementation of vessel tracking within a suite of EM requirements in southern Australia, fishers more accurately reported their actions on the water leading to a higher rate of

[71] Gonzalez-Mireli et al. 2014, Using vessel monitoring system data to improve systematic conservation planning of a multiple-use marine protected area, the Kosterhavet National Park (Sweden), *PMC*

[72] Thoya et al. 2019, Trawling effort distribution and influence of vessel monitoring system (VMS) in Malindi-Ungwana Bay: Implications for resource management and marine spatial planning in Kenya, *Marine Policy*

[73] Watson et al. 2018, Vessel monitoring systems (VMS) reveal an increase in fishing efficiency following regulatory changes in a demersal longline fishery, *Fisheries Research*

monitoring (EM) in Australian Commonwealth fisheries[74]	compliance with required logbook reporting.

The vessel tracking requirements provide additional certainty surrounding the protection of an important Queensland public resource. The vast majority of stakeholders consulted appreciated that vessel tracking provides benefits to the broader industry and agreed on its continued use in some form.

7.2 Option B - Alternative options

For completeness, it is important to consider if other options are available which could provide similar data to inform management decisions and contribute to the sustainability of the fisheries.

Table 25 identifies alternative options as well as an analysis of the expected outcomes from these options. The options have been analysed in line with the key features of the data currently produced by vessel tracking systems, specifically real-time, independent and richness of information (i.e. ability to provide fishing location at regular intervals) however, include other pertinent considerations that could present from a given option. The cost of the proposed options has also been considered.

Table 25 An analysis of alternative options to vessel tracking

Option	Analysis of option
1. Observers on boats Historically, observer programs have been used across the fishing industry to carry out specific programs of work and research activities. In these instances, an independent observer (often from DAF or similar) is engaged to alight a boat with the industry fisher and shadow that fisher on a given fishing trip. Information is collected by the observer during	**Quality of data produced:** The use of observers can provide detailed information on the details of a fishing trip, specifically, the location and actions of a boat. Accordingly, if set up appropriately, observers could provide a high resolution of information as currently provided by vessel tracking and potentially at an increased rate if data points such as fishing activities were recorded. **Independent nature of the data produced:** The data collected could be done so independently so long as the structure of such an approach was set up to accommodate this (i.e. observers were independent to the fishers which they work alongside). **Real-time nature of the data:** It is unlikely that this type of approach could provide real-time information given the challenges reported by fishers with respect to reception and the ability to communicate in real time outside of established satellite systems (the systems on which vessel tracking technology operate). It is likely that this information is only collected

[74] Emery et al. 2019, Changes in logbook reporting by commercial fishers following the implementation of electronic monitoring (EM) in Australian Commonwealth fisheries, *Marine Policy*

Option	Analysis of option
the fishing trip and reported back typically at the end of the fishing trip (i.e. when technology facilitates this).	at sea and provided post trip as access to reception is reinstated. **Likely costs:** Given this method requires a person to be on board a vessel for all trips taken by industry (and for the duration of the trip), the workforce required to execute such an approach across the entire fishing industry would be aligned to the number of vessels operating across the industry (this would include tender boats as well as primary vessels). The cost of such an approach, if referencing the minimum wage for workers in Australia[75], would be $21.38 an hour. If for example, a fisher went on a daily fishing trip for an 8 hour period the cost of employing the observer for the period of the trip would be $171.04 ($21.38 multiplied by 8). There would also be inherent challenges with respect to meeting workers' rights and entitlements for longer fishing trips which could see this cost escalate in a nonlinear manner. **Analysis:** Observers on boats may have the potential to provide a similar or higher resolution of relevant data akin to the data produced by vessel tracking systems. However, it is unlikely to deliver real-time data or the breadth of data at a reduced cost to stakeholders than current vessel tracking systems. As such, while this approach might provide additional benefits for the purposes of monitoring and research activities (i.e. a richer data set that could potentially further improve stock assessment models), it is unlikely that such an approach would provide the suite of benefits observed with respect to compliance activities given the lack of real-time information generated by such an approach. It is also likely that these outcomes would be realised at a significantly higher cost than alternative options, including the current vessel tracking approach.
2. Smartphone applications A solution that has been identified by both Fisheries Queensland and the fishers for the purpose of collecting information on fishing trips is the use of a mobile application operated from a fisher's smart phone. A mobile application has	**Quality of data produced:** The use of a mobile application could provide detailed information on the details of a fishing trip, specifically, the location of a boat. However, the polling frequency of 5 or 15 minutes may not be feasible due to the amount of phone battery it will consume. **Independent nature of the data produced:** The data collected would be independent given the app would be pulling from GPS functionality on the phone. **Real-time nature of the data:** It is unlikely that this type of approach could provide real-time information given the challenges reported by fishers with respect to reception and the ability to communicate in real-time using

[75] Minimum wages as of 1 July 2022 – Fair Work Ombudsman <https://www.fairwork.gov.au/pay-and-wages/minimum-wages>

Option	Analysis of option
been developed and released by DAF that links into the existing smart phone functionality (i.e. GPS) to report specific information about a fishing trip.	traditional mobile reception. It is likely that this information is only collected at sea and provided post trip as access to reception is reinstated. **Likely costs:** An application that is capable of recording the location of a boat has been developed and released by Fisheries Queensland. The application also performs other functions (i.e. electronic reporting of logbook information and quota activity notices) outside of collecting information on boat location. The cost for the development and maintenance support of the commercial fishing app over 3 years is approximately $900 000. This application is provided to fishers free of charge and thus the only cost to fishers for being able to access this type of technology would be the cost of a smart phone and the monthly connection costs. It is acknowledged that for most fishers these costs are already incurred under their typical course of business and thus would provide no additional cost to access this solution. However, as the consultation process has discussed this option for various reasons, it has confirmed that there is a population of fishers that do not already have access to a smartphone (and are simply relying on more traditional means of mobile phone technology). For these fishers, there would be an initial outlay cost in the order of $150-2000[76] and likely additional monthly connection costs to cover data. **Analysis:** A mobile application may have the potential to provide a similar resolution of relevant data akin to the data produced by vessel tracking systems. However, it is unlikely to deliver real-time data. As such, this approach might provide similar benefits to those identified from vessel tracking for the purposes of monitoring and research activities (i.e. a richer data set that could potentially further improve stock assessment models), it is unlikely that such an approach would provide the full suite of benefits observed with respect to compliance activities given the lack of real-time information generated by such an approach. Moreover, without real-time vessel tracking data, relaxation, or removal of other regulations (i.e. removal of the requirement to give prior notice 1, 3, or 6 hours before landing) will need to be rolled back. Polling frequency of 5 minutes or 15 minutes may increase the phone battery consumption rate and may affect the performance of the phone, and the reliability and consistency of data. This option would likely be at a reduced or nil cost to industry, however a higher cost to fisheries management. Similar to other costs incurred for the management of the fisheries, there is the potential that fisheries management could pass these costs on to industry through an increase in licence fees (it is worth

[76] JB Hifi, *Mobile Phones,* <https://www.jbhifi.com.au/collections/mobile-phones>

Option	Analysis of option
	noting however that the DAF does not adopt a net cost model for managing the fisheries: this means that there is the potential that the costs remain with management and are not passed on to the fishers).
3. Logbook information Under the *Fisheries Act 1994*, fishers operating in Queensland must provide information on fishing trips through manually reported logbook information. While this approach is paper based in Queensland, other fisheries (for example Commonwealth fisheries) also utilised electronic logbook reporting.	**Quality of data produced:** The logbook information currently provided only reports a single location for any given fishing trip. The location is reported as a grid location (i.e. an area rather than a single accurate location) with only the grid where the most time spent fishing is reported (i.e. lesser time spent in other locations is not provided). For clarity, the current information collected by logbook information does not provide exact boat location at frequent intervals for the duration of a fishing trip. This was recognised as a limitation by the initial review of the fisheries and an item which flagged richer information was required for the purpose of effective fisheries management. In order to address the previously identified limitation, information would need to be provided through logbook reporting which included the location of the vessel at the desired frequency (i.e. every 5 or 15 minutes of the trip). This would require someone on board the vessel to report this information either through the paper logbook or through an electronic means throughout the duration of the fishing trip. **Independent nature of the data produced:** The data collected by logbooks is not independent. Data is reported by the fisher rather than an independent source. **Real-time nature of the data:** It is unlikely that this type of approach could provide real-time data. Paper logbook records are traditionally submitted after a fishing trip and with electronic information stored in the electronic portal during the fishing trip and reported at the end or near the end of a fishing trip. Electronic logbooks would also encounter the same challenges of only being able to be sent when reception is available. **Likely costs:** Reporting through manual means by someone on board the vessel at the frequency required of current rates (as frequent as every 5 minutes) would bear similar costs to that of the observer approach. Given the frequency of the reporting that would be required, it is likely that in order to meet this, a dedicated person would be required to be on board in order to meet the reporting requirements. Accordingly, the cost of such an approach, if referencing the minimum wage for workers in Australia[77], would be $21.38 an hour.

[77] Minimum wages as of 1 July 2022 – Fair Work Ombudsman <*https://www.fairwork.gov.au/pay-and-wages/minimum-wages*>

Option	Analysis of option
	If for example, a fisher went on a daily fishing trip for an 8 hour period the cost of employing the observer for the period of the trip would be $171.04 ($21.38 multiplied by 8). There would also be inherent challenges with respect to meeting workers' rights and entitlements for longer fishing trips (given the manually intensive nature of such an approach) which could see this cost escalate in a non-linear manner. **Analysis:** Logbook data is currently used in areas of fisheries management. However, for the purposes of providing the resolution, real-time and independent data sought for the purpose of informing/driving intelligent compliance activities and more accurate monitoring and research activities, its application is limited (as demonstrated by its historical use). Further, it is expected that significant costs would be incurred by fishers in order to improve the current limitations of logbook data which would otherwise be onerous to fishers.
4. Other Technologies - Drones Drones have been used for the purpose of compliance activities in order to improve the ability to target and meet vessels out on the water.	**Quality of Data produced:** Information collected by drones would only relate to information on vessels within the 'view' of the drone during a given flight path. For various reasons (over a water body, vastness of the area, etc) it would be impossible to develop a network of drones which covers the entire Queensland fishery meaning the data produced from drones would only ever cover a small area and thus represent an incomplete data set. The data would also not be reporting down to the level of an individual boat (i.e. identify the specific boat by licence owner). **Independent nature of the data produced:** Drones are currently operated by DAF for the purpose of fisheries management[78]. It would be reasonable to expect that DAF would undertake additional drone-based operations meaning the data collected would be from an independent source. The same could be said for GBRMPA should they be involved in drone operations. **Real-time nature of the data:** Such an approach can provide real-time information so long as technology was used to collate and report to end users the data received by the drone. **Likely costs:** It is hard to estimate the cost of such an approach given it is unlikely that such an approach can be all encompassing. In order to develop suitable strategies for using drones to collect information on boat location, the number of drones and thus size of the support

[78] The Queensland Cabinet and Ministerial Directory, *Taking to the skies to protect our fisheries,* <*https://statements.qld.gov.au/statements/87673*>

Option	Analysis of option
	workforce to facilitate these operations would need to be developed. The cost of drones is highly variable depending on size and capability, with costs per drone ranging from thousands to hundreds of thousands of dollars[79]. The drones would also have to be controlled by trained operators, which would add to the cost of this approach. Given the drone operations would be carried out by either fisheries management or other delegated authorities (e.g. GBRMPA), this would be a cost to the fisheries management. Similar to other costs incurred for the management of the fisheries, there is the potential that fisheries management could pass these costs on to industry through an increase in licence fees (it is worth noting however that DAF do not adopt a net cost model for managing the fisheries: this means that there is the potential that the costs remain with management and are not passed on to the fishers). **Analysis:** The use of a drone to collect vessel location information could easily provide independent data on boat location. However, the incomplete nature of the data set is likely to reduce the benefit of such an approach. Specifically, given the information would be incomplete (not all boats) and of a lower resolution (i.e. only provide the position of a boat while it is in the view of the drone rather than for the entire trip and for a specific individual boat) it is unlikely that this information could provide similar benefits under the monitoring and research stream that more consistent and higher resolution data could provide. Further, despite the real-time nature of the information, its lack of accuracy, completeness, and inability to identify specific boats would also offer limited compliance benefits. This is consistent with the reported challenges already experienced by the authorities that use such techniques for compliance purposes.

A summary of analysis provided in the table above for each explored option is provided in Table 26.

Table 26 Summary of options considered against the existing vessel tracking regulation

Option	Consideration with reference to existing vessel tracking regulation

[79] Drone Life 2017, *How Much Should I Spend on a Professional Drone?,* <*https://dronelife.com/2017/04/04/much-spend-professional-drone/*>

	Quality of data (including data frequency, accuracy of location and coverage)	Independent nature of data	Real-time nature of data	Cost	Overall
Observers on boats	↓ / ↔	↔	↓	↑↑	↓
Smartphone applications	↓ / ↔	↔	↓	↓ / ↔	↓
Logbook information*	↓ / ↔	↓	↓	↑↑	↓
Other Technologies - Drones	↓↓	↔	↔	↑	↓

↑ more than existing vessel tracking regulation
↓ less than existing vessel tracking regulation
↔ on par with existing vessel tracking regulation
* manual recording of boat coordinates every 5 or 15 minutes

With respect to the identification of other alternative options, this has been a discussion point at the Vessel Tracking Working Group meetings since the group commenced meetings in July 2021 (6 monthly meetings have been conducted). Similar to the analysis conducted above, these discussions have not identified a 'silver bullet' that could provide similar benefits to that provided by vessel tracking but at reduced costs to stakeholders.

If the vessel tracking regulation was to be repealed, it is unlikely that there is an alternative solution that could be transitioned to and which provides similar benefits at reduced costs.

7.3 Option C - Can the legislation be improved?

Through initial consultation, a number of options for changing the regulation were identified that have the potential to address impacts observed since the regulation was introduced and improve the regulation. Alongside this, other considerations and options for improving the regulation are discussed in the sections below.

7.3.1 Should the regulation be expanded?

Currently, the regulation includes a list of licence symbols (representing specific fisheries) that are required to implement vessel tracking. As mentioned throughout this Consultation PIR, some of these fisheries were already required to operate vessel tracking prior to the introduction of this regulation.

The fisheries that are currently not required to implement vessel tracking are considered to be low risk fisheries for several reasons. For example, some of these fisheries are shore fisheries that do not run boats for fishing purposes. Therefore, a recommendation to expand the regulation to additional fisheries would add an increased cost burden to all stakeholders with little or no benefit realised.

Feedback from stakeholders to date did not identify any material gaps in the regulation such that changing the scope of the regulation should be considered with merit.

7.3.2 Should the regulation be amended?

The considerations below may provide options for resolving some of the unintended impacts of the regulation.

7.3.2.1 Reduced polling frequency to address industry operating costs

The following are the current legislative vessel tracking polling requirements:

- 5 minutes for net, line, crab and trawl (T5, T6, T7, T8 and T9) fisheries
- 15 minutes for trawl (T1, T2, T4, M1 and M2) and harvest fisheries

Fishers have enquired whether the 5-minute polling frequency can be decreased to reduce ongoing polling cost. The cost and benefit analysis of this option is described below. For this analysis, the hypothetical alternative polling requirement of 15 minutes for all fisheries is explored using the current pricing structure available from vessel tracking providers in Table 27 below.

Table 27 Monthly polling costs of vessel tracking units

Unit	Airtime provider	5-minute polling	15-min polling
Spot Trace	Pivotel	$33	Not available
Rockfleet	Pivotel / Pole Star	$55	$55
IDP690/ST6100/IDP800	Pole Star	$53.90	$46.20
CLS Triton	CLS Oceania	$99	$99

The Spot Trace units are currently used for 5-minute polling and no pricing information is available for 15-minute polling. There is no difference in cost for 5-minute or 15-minute polling for the Rockfleet and CLS Triton units. Specific to the IDP690/ST6100/IDP800 units, the cost difference between 5-minute and 15-minute polling is $7.70/month (14% saving).

Under the current legislative polling requirement, as described earlier in Section 5.2.1.3 and Table 11, the annual overall cost of vessel tracking on a commercial fishing boat is estimated to be $2129. Specific to polling, the annual polling cost to industry is estimated to be $904 777.

Under the hypothetical polling requirement of 15 minutes for all fisheries, the annual overall cost of vessel tracking on a commercial fishing boat is estimated to be $2099. Specific to polling, the annual polling cost to industry is estimated to be $861 304. The calculation is shown in Table 28 below.

Table 28 Calculation of estimated costs to industry for 15-minute polling for all fisheries

Unit type	Item	Annual cost/unit ($)	Estimated annual cost by unit type ($)									
			Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Spot Trace	Unit cost	169	51038	0	0	0	0	0	0	0	0	0
	Annual polling fee	399.6	120679	120679	0	0	0	0	0	0	0	0
	Replacement unit cost	300	0	0	90600	0	90600	0	90600	0	90600	0
	Replacement unit annual polling cost ($33/mo)	399.6	0	0	120679	120679	120679	120679	120679	120679	120679	120679
	Opportunity cost (assume 7 loss days/year; $2250/day)	15750	285390	285390	285390	285390	285390	285390	285390	285390	285390	285390
Rockfleet	Unit cost (OA pricing)	507	310284	0	0	0	0	0	0	0	0	0
	One-off fee (activation $20 based on OA pricing)	20	12240	0	0	0	0	0	0	0	0	0
	Installation cost	300	91800	0	0	0	0	0	0	0	0	0
	Annual polling fee (OA pricing $41.80/mo)	501.6	306979	0	0	0	0	0	0	0	0	0
	Annual polling fee (Pivotel pricing $55/mo)	660	0	403920	403920	403920	403920	0	0	0	0	0
	Replacement unit (Pivotel pricing)	615	0	0	0	0	0	376380	0	0	0	0
	Replacement unit annual polling fee (Pivotel pricing $55/mo)	660	0	0	0	0	0	403920	403920	403920	403920	403920
	Opportunity cost (assume 7 loss days/year; $2250/day)	15750	1542240	1542240	1542240	1542240	1542240	1542240	1542240	1542240	1542240	1542240
IDP690/ ST6100/ IDP800	Unit cost	825	338250	0	0	0	0	0	0	0	0	0
	One-off fees (activation $36.3 + freight $55)	91.3	37433	0	0	0	0	0	0	0	0	0
	Installation cost	300	61500	0	0	0	0	0	0	0	0	0
	Annual polling fee ($46.20/mo)	554.4	227304	227304	227304	227304	227304	0	0	0	0	0
	Replacement unit cost	825	0	0	0	0	0	338250	0	0	0	0
	Replacement unit one-off fees (activation $36.3 + freight $55)	91.3	0	0	0	0	0	37433	0	0	0	0
	Replacement unit installation cost	300	0	0	0	0	0	61500	0	0	0	0
	Replacement unit annual polling fee ($46.20/mo)	554.4	0	0	0	0	0	227304	227304	227304	227304	227304
	Opportunity cost (assume 7 loss days/year; $2250/day)	15750	129150	129150	129150	129150	129150	129150	129150	129150	129150	129150
Inmarsat C	Unit cost (units already on boats pre 2019)	0	0	0	0	0	0	0	0	0	0	0
	Annual polling fee ($180/mo)	2160	185760	185760	185760	185760	185760	0	0	0	0	0
	Replacement unit cost (assume IDP/ST)	825	0	0	0	0	0	70950	0	0	0	0
	Replacement unit one-off fees (activation $36.3 + freight $55)	91.3	0	0	0	0	0	7852	0	0	0	0
	Replacement unit installation cost	300	0	0	0	0	0	12900	0	0	0	0
	Replacement unit annual polling fee ($46.20/mo)	554.4	0	0	0	0	0	47678	47678	47678	47678	47678
CLS Triton	Unit cost	2420	4840	0	0	0	0	0	0	0	0	0
	One-off fees (activation $33 + freight $132)	165	330	0	0	0	0	0	0	0	0	0
	Installation cost	300	600	0	0	0	0	0	0	0	0	0
	Annual polling fee ($99/mo)	1188	2376	2376	2376	2376	2376	0	0	0	0	0
	Replacement unit cost	2420	0	0	0	0	0	4840	0	0	0	0
	Replacement unit one-off fees (activation $33 + freight $132)	165	0	0	0	0	0	330	0	0	0	0
	Replacement unit installation cost	300	0	0	0	0	0	600	0	0	0	0
	Replacement unit annual polling fee ($99/mo)	1188	0	0	0	0	0	2376	2376	2376	2376	2376
Estimated annual cost to industry			3708193	2896819	2987419	2896819	2987419	3669772	2849338	2758738	2849338	2758738
Actual vessel tracking rebate claimed as of 30 June 2022			730213									
Estimated annual cost to industry less rebate			2977980	2896819	2987419	2896819	2987419	3669772	2849338	2758738	2849338	2758738
Estimated average annual cost			2963238									
Estimated average annual cost/unit			2099									

Note:

- The estimated annual cost by unit type is calculated based on the average total number of units polling which is 1412 and the following breakdown:
  - Number of Spot Trace (21.4%) = 302
  - Number of Rockfleet (43.3%) = 612
  - Number of IDP690/ST6100/IDP800 (29.1%) = 410
  - Number of Inmarsat C (6.1%) = 86
  - Number of CLS Triton (0.1%) = 2
- Replacement cost
  - Lifetime of vessel tracking units vary dependent on type, installation and working condition.
  - Warranty period of Spot Trace is 1 year; warranty period for Rockfleet, IDP690/ST6100/IDP800 and CLS Triton is 2 years.
  - Information from providers indicate the following estimated lifetime: Rockfleet 5 to 10 years; IDP690/ST6100/IDP800 5 to 10 years; CLS Triton 7 to 8 years. For calculation purpose, assumption is made that replacement of Rockfleet, IDP690/ST6100/IDP800, Inmarsat C and CLS Triton to occur every 5 years.
  - Assumption is made that the same type of unit is purchased as the replacement unit. Assumption is also made that Inmarsat C (grandfathered) would be replaced with IDP690/ST6100/IDP800.
  - Estimated lifetime of Spot Trace unknown. For calculation purpose, assumption is made that replacement of Spot Trace will occur every 2 years.
- Opportunity cost (due to malfunction that result in loss of fishing days)
  - Opportunity cost from two instances were reported during targeted consultation with vessel tracking working group members – see Table 9.
    - Estimated average cost/day is $2250. Estimated number of lost fishing days range from 6 to 14 days.
  - Opportunity cost varies among different commercial operations due to factors such as fishery type, value of species, size of operation and fishing frequency. For calculation purpose, assumption is made that the number of annual lost fishing days per unit is 7 days, taking into consideration time taken to replace a malfunctioned unit.
  - The annual opportunity cost is calculated using the malfunction rate information presented in Table 21.
- Cost of unit, activation, freight and polling
  - Costs are calculated based on providers' pricing structure

Unit	**Monthly polling costs (15-min polling)**
Spot Trace	Not available. Current $33 for 5-min polling is used
Rockfleet (Option Audio)	$41.80
Rockfleet (Pivotel)	$55
IDP690/ST6100/IDP800	$46.20
CLS Triton	$99

  - Annual polling cost for the Inmarsat C units (mainly used in trawl vessels) is calculated based on 15-minute polling pricing structure from Pole Star.
  - For Rockfleet, Option Audio's polling fee was used to calculate annual polling cost for the first year. Annual polling costs for subsequent years are calculated using Pivotel's polling fee.
  - Assumption is made that the costs remain constant yearly.
- Installation cost
  - Assumption is made that professional installation only applies to Rockfleet, IDP690/ST6100/IDP800 and CLS Triton.
  - Approximately 350 installation rebates have been claimed in the first 4 years of the vessel tracking rebate scheme. Based on this and industry knowledge about the units, assumption is made that professional installation applies to 50% of Rockfleet and IDP690/ST6100/IDP800; 100% for CLS Triton.
  - Installation cost ranges from $200 to $400. For calculation purpose, assumption of $300 installation cost is made.
- Other assumptions
  - The average number of units polling and types of approved units remain constant yearly.
  - Units are on monthly polling plan 12 months of the year consistently without going into standby mode.
  - All initial units were purchased in year 1.

Table 29 below shows the cost-benefit/impact comparison between the current legislative polling requirements and the hypothetical requirement of 15-minute polling for all fisheries.

Table 29 Cost-benefit comparison between current polling requirements and 15-min requirement for all fisheries

Polling frequency	Estimated annual polling costs	Estimated annual cost of vessel tracking per boat	Benefits / other impacts
Current legislative requirements: 5 minutes for net, line, crab and trawl (T5, T6, T7, T8 and T9) fisheries 15 minutes for trawl (T1, T2, T4, M1 and M2) and harvest fisheries	$904 777	$2129	• 5-minute polling provides the ability to identify and distinguish types of fishing activity (searching / traversing / active fishing), especially for high-speed vessels. • It enables effective validation of fishing effort and consequently, improves the evidence base available to inform management strategies with respect to harvest/access controls. • It also assists compliance to monitor vessel positions and movement, especially small vessels that can move on average between 20kn to 25kn (37km/h to 46km/h).
Hypothetical polling requirement: 15 minutes for all fisheries	$861 304 (saving of 4.8%)	$2099 (saving of 1.4%)	• Changing the polling frequency from 5 minutes to 15 minutes may reduce the ability to distinguish different types of fishing activity (searching / traversing / active fishing), especially for high-speed vessels. • This may result in reduced ability to validate fishing effort that may then impact on the evidence base available to inform management strategies. • This may also affect compliance ability to monitor high-speed vessels. High-speed vessels can cover a significant distance in 15 minutes and any changes in course or landing locations are not easily detected. For example, for boats moving at 20kn (37km/h), the distance covered under 15-minute polling is 5nm (9km) in comparison to 1.6nm (3km) under 5-minute polling.

The polling frequency was determined based on the nature of the fishery, size of boats used, monitoring and compliance needs. Changing the polling frequency from the current legislative requirements to 15 minutes for all fisheries may result in an estimated aggregated annual cost saving of 1.4% to industry (estimated annual cost saving of $30 per commercial fishing boat). Based on the current polling pricing structure from vessel tracking providers shown in Table 27, cost saving under this option is only applicable to the IDP690/ST6100/IDP800 units that constitutes 29.1% of vessel tracking units currently used by industry. On the other hand, changing the polling frequency to 15 minutes for all fisheries may reduce the effectiveness of validating fishing effort to inform management strategies, as well as compliance ability to monitor vessel positions and movement, especially for high-speed vessels. Although this option may reduce ongoing polling costs for users of the IDP690/ST6100/IDP800 units, the overall cost saving is relatively minor. In comparison to the potential negative impact and risks to achieving the objectives of vessel tracking, this option is not considered feasible.

During public consultation, stakeholders are encouraged to propose options to reduce ongoing vessel tracking operating costs while maintaining the ability to achieve the objectives of vessel tracking. Where possible, it is encouraged that quantifiable data be provided to support your feedback.

7.3.2.2 Potential changes to address current opportunity costs

The following are the current legislative requirements when a vessel tracking unit malfunctions.

- Commercial fishers must ensure that their vessel tracking units are operational before commencing a trip.
- If a vessel tracking unit on the primary boat malfunctions during a trip, the fisher in control of the operation must manually report the position of the primary boat:
    - every hour if the boat is being used in the east coast trawl fishery
    - every 4 hours for all other fisheries.
- The fisher must ensure the boat travels to a landing place within 5 days, or longer if permitted by the chief executive, from the day the malfunction is identified.
- For trawl operators in the M1, T1 or T2 fisheries within the major scallop area, the fisher in control of the operation must ensure the boat travels to a landing place as soon as practicable.
- If the vessel tracking unit on a tender boat malfunctions during a trip, the tender boat must remain attached to the primary boat and must not be used to take any fish for the remainder of the trip.
- If a vessel tracking unit starts operating again on a primary or tender boat, and the person in control of the operation receives a confirmation that the unit is working properly, normal fishing operations may resume. If the unit is on a primary boat, the requirement to return to port no longer applies.

- Vessel tracking units may be moved between primary and tender boats, as well as between primary commercial fishing licences held by the same licence holder.

As previously stated, the fishing industry operates 24 hours, 365 days a year, meaning a fisher could be forced to 'stop fishing' at any time on any given day due to vessel tracking unit malfunctions.

Keeping a backup and transferring over to this when a primary vessel tracking unit malfunctions is not as straightforward or cost effective as it might seem due to:

- The administration requirements of transferring one vessel tracking unit over to another which can only be done during standard working hours (8:30pm-5pm); and
- In some instances, additional costs may be incurred by fishers for keeping a backup registered with the airtime provider and 'ready to go'.

In order to address the identified opportunity costs of not being able to fish when vessel tracking is malfunctioning, a potential improvement would be to amend the regulation to legislate an exemption system that could, under certain circumstances, allow fishers to fish if vessel tracking unit is malfunctioning.

Given the technology issues experienced to date, the concept of an exemption system has been identified as a potential solution that could enable fishers to fish while the technology issues are resolved. The merit of an exemption process is more beneficial when a high incidence of technology issues outside of the fishers' control continue to be present versus when these technology issues are largely resolved. However, it could also be seen to contribute to resolving the current misalignment between the operational hours of the fisheries (24/7) versus the operational support provided by vessel tracking providers and DAF (which is largely standard business hours).

Typically, the vessel tracking providers are required to assist fishers in the event of equipment malfunction or equipment needs to be transferred out and a new one initiated. Accordingly, there is little that can be done in order to change the service offering provided by the providers and thus achieve a 24/7 support approach in this respect. Given the reliance on the providers to bring fishers back online and reinstate functional vessel tracking unit, there is little benefit from proposing a 24/7 hotline offered by DAF.

Instead, a possible approach which could be adopted, and which could seek to 'get fishers back out on the water', is the introduction of a risk-based exemption process. Such a process would enable fishers to fish for the given period of time in the event of a malfunction, so long as a set of predefined criteria are met. It is recommended that an exemption process utilises an alternative method of reporting similar to the manual reporting requirements employed for boats where the equipment malfunctions while at sea (every hour for east coast trawl, and every 4 hours for all other fisheries). A more stringent and independent reporting process could be

utilised with the Commercial Fishing Smart Phone Application[80] which is capable of recording locations using the phone's GPS systems and storing this information for release once mobile phone reception is regained (or at regular intervals where reception is not interrupted).

While an exemption system would go some way to providing a means for fishers to fish when their vessel tracking systems are not working (thus overcoming one of the key costs identified in this Consultation PIR), this approach presents several critical risks:

1. **Requirements of such a system –** To align with the 24/7 nature of the industry and the high likelihood that fishers would require an exemption outside of traditional office hours (i.e. up at dawn to start the day, find out the vessel tracking is not working), an exemption system would need to acknowledge this. Without such an approach, the proposed improvement does not resolve the current misalignment with operating times and the missed fishing days due to the inability to resolve vessel tracking unit issues when they need to be resolved.
2. **Potential for higher incidence of non-compliant fishing activities –** By providing an opportunity to fish without vessel tracking, there is a legitimate concern that non-compliant acts of fishing could be introduced given the lack of transparency of fishing location and fishing effort. While this could potentially be managed by an exemption-based system which identifies those fisheries that would benefit from such an exemption, but which would not impose serious concern to the legitimacy of fishing operations carried out by the fishers, it is likely that such an approach could provide an uneven playing field for some across the broader industry.
3. **Incomplete and post event data –** the objective of the regulation was to provide real-time, independent data which, with certainty, provides essential insight into the actions of commercial fishers for the purposes of effectively managing the fisheries. An approach that provides a method of post event and/or non-verified data to be provided in place of the current real-time, independent data that is delivered by the regulation potentially compromises the integrity of the broader data set and has flow on impacts to compliance activities. Given there is no current legislated exemption system and there is a lack of quantifiable data to understand and appreciate the broader impact of lost fishing days, it is difficult to quantify this impact and whether it would be significant enough to impact data integrity or compliance activity could be compromised.

Through consultation at the working group meetings, in December 2021, DAF released an interim exemption process (provided at Appendix C) which seeks to serve as a temporary measure allowing fishers to fish when experiencing technology malfunctions. The exemption system is designed to provide a leniency to fishers while the historic technology issues are resolved, balancing the needs of the fishers and other stakeholders. To date, the temporary exemption has been granted to eight fishers (requested as a result of equipment malfunction).

[80] The Queensland Commercial Fishing Smart Phone Application was released in December 2021. It currently applies to the net, line, crab and trawl fisheries. More fisheries will be included in subsequent app releases.

Currently, there is little data available to clearly determine and quantify the potential costs of an exemption system long term. Accordingly, a change to the regulation to incorporate an exemption is not recommended. Instead, it is recommended that the current short term exemption system be implemented and used for a period of 12 months to provide ‘cover’ for fishers while the technology issues are resolved and to gather sufficient data to clearly quantify the benefits and costs of such a proposed approach longer term. An interim review of the exemption process and its effectiveness should be carried out at 6 months with a complete review at the end of the 12-month period. The review should include analysing the data gathered during this period including carrying out further consultation with a sample of fishers who have participated. If after this period, a clearer picture of the costs and benefits of such a system can be understood, it may be recommended that the concept of an exemption system as a longer term solution be considered and legislated.

7.3.2.3 Alternative approaches to the vessel tracking unit and provider arrangement

A large proportion of the problems that have been experienced since the introduction of vessel tracking have been the result of technology issues with the approved vessel tracking units. Vessel tracking costs and provider arrangements relating to units and polling requirements has also been consistently identified by industry members in the Vessel Tracking Working Group as a priority issue and discussed at various working group meetings. This section explores the alternative vessel tracking unit and provider arrangements to address these concerns. Analysis of these options are outlined in Table 30 below.

Table 30 Analysis of various vessel tracking unit and provider arrangements

Options	Pros	Cons	Estimated annual cost
1. **Current vessel tracking unit and provider arrangement (status quo arrangement)** • DAF to determine list of approved vessel tracking units and associated airtime provider • Fishers to choose a vessel tracking unit and provider from the approved list and establish a contract with the airtime provider • Fishers pay for their own polling. • DAF to conduct ongoing review of the current approved list and update the list accordingly • Any potential vessel tracking providers can approach DAF to have a vessel tracking unit and airtime service assessed	• Fishers to select a unit suitable for their operation from a selected range in the approved list • Flexibility for fishers to control data usage and save cost (e.g. standby option if not fishing for an extended period) • Potential for list of approved units and providers to be expanded • New units can be assessed anytime	• Approved list of units and providers may be too restrictive • If a unit is phased out (e.g. due to outdated technology), fishers will need to purchase another unit	**Cost to industry:** • $2129 per commercial fishing boat **Cost to state government:** • $1 124 857
2. **Standards-based approach** • DAF to provide a set of minimum requirements for vessel tracking units and provider that would include – polling frequency of 5 or 15 minutes depending on fisheries and ability for polling data to be integrated to DAF platform (Trackwell) • Fishers can purchase any units available on the market. Under this option DAF would not maintain a list of approved units and airtime providers	• Provides fisher with greater choice of units and providers suitable to their individual business • Flexibility for fishers to control data usage and save cost (e.g. standby option if not fishing for an extended period) • No need for Fisheries Queensland to maintain/update approved units list	• Fisher has to research unit and provider packages to identify which one is most suitable for their circumstances	**Cost to industry:** • Varies depending on choice of units selected by fishers. Dependent on market price • Estimated to be similar to status quo arrangement if fishers keep using existing units (i.e. $2129 per commercial fishing boat) **Cost to state government:** • Estimated to be similar to status quo arrangement as DAF will continue maintaining

Options	Pros	Cons	Estimated annual cost
			current system (i.e. $1 124 857)
3. Airtime contract between DAF and an airtime provider and cost recovery via licence fees • DAF to establish a contract with an airtime provider via a tender process • DAF to determine a list of approved units that can be hosted by the airtime provider • The cost of establishing and administering the contract will be recouped from fishers • DAF will pay for airtime and recover cost from fishers via licence fees • Will require a legislative and fee review process	• Fishers do not need an airtime provider contract • Less administratively burdensome for fishers • Fishers to select a unit suitable for their operation from a selected range in the approved list • Potential to monitor/manage pricing	• Complexity in administering cost recovery due to variations between fishing operations (e.g. number of boats used, periods of active fishing) • Compared to the status quo, there will be limited choice of units that the airtime provider supplies. As a result, many fishers may be required to change units. The new units may be more expensive. • If a unit is phased out (e.g. due to outdated technology), fishers will need to purchase another unit	**Cost to industry:** • If fully cost recovered via licence fees, cost is estimated to be higher than status quo arrangement after taking into consideration recovering cost of establishing and administering the contract between DAF and provider (i.e. more than $2129 per commercial fishing boat) • It may be unequitable for fishers due to variations between fishing operations (some pay more; some pay less) **Cost to state government:** • Estimated to be similar to status quo arrangement as DAF will continue maintaining current system (i.e. $1 124 857)
4. Service level agreement between DAF and providers • DAF to determine list of approved units and associated airtime providers through a tender process • DAF to establish a service level agreement with providers to ensure an appropriate level of service is provided to program participants	• Fishers to select a unit suitable for their operation from a selected range in the approved list • Flexibility for fishers to control data usage and save cost (e.g. standby option if not fishing for an extended period)	• Approved list of units and providers may be too restrictive • If a unit is phased out (e.g. due to outdated technology), fishers will need to purchase another unit	**Cost to industry:** • Estimated to be similar to status quo arrangement if fishers keep using existing units (i.e. $2129 per commercial fishing boat) **Cost to state government:**

Options	Pros	Cons	Estimated annual cost
and that the fees for services are approved by DAF • Fishers to choose a unit and provider from the approved list and establish a contract with the airtime provider • Fishers pay for their own polling directly with providers • May require legislative amendment	• Potential for list of approved units and providers to be expanded • New units can be assessed anytime • Service level agreement between DAF and providers can assist to ensure appropriate level of service is given by providers to fishers and that fees for services are approved by DAF		• Estimated to be higher than status quo arrangement taking into consideration additional administrative costs to establish and maintain service level agreement with providers (i.e. more than $1 124 857)

In the status quo arrangement, DAF determines a list of approved vessel tracking units and airtime providers based on an assessment of units against a list of criteria and a trial. The approved list is listed in the Vessel Tracking Installation and Maintenance Standard. Fishers will need to purchase a unit from the approved list and establish an airtime contract with the provider. Fishers will pay for own polling directly to the providers. DAF conducts ongoing review of the approved units and providers. Potential vessel tracking providers can also approach DAF anytime to request to assess their units to add to the approved list. In this approach, fishers have reported dissatisfaction with the approved units (performance, reliability, cost concerns) as described in Section 5.2.1 and 5.4 above.

To overcome the inherent issues with an approved equipment approach, an alternate approach to ensure fishers have compliant vessel tracking units is to introduce a standards-based approach (option 2 in Table 30). Instead of DAF approving specific equipment, the basic requirements or specific standards that must be met by vessel tracking units could be used to guide industry. Examples of basic requirements or specific standards for the equipment include the ability to poll every 5 or 15 minutes, accuracy of GPS positions and the ability to integrate the polling data with DAF's system. In this approach, a fisher has the flexibility to choose a vessel tracking unit that suits their operation as long as it meets these basic requirements or standards. While a standards-based approach to enabling fishers to adopt suitable vessel tracking units seems appropriate, feedback from the consultation process to date has vehemently opposed such an approach on the basis that this only transfers the problem to the fishers and delegates a decision to someone who is an 'expert in fishing, not an expert in technology'.

Option 3 in Table 30 involves DAF establishing a contract with an airtime provider via a tender process and cost recover from industry via licence fees. In this approach, DAF will determine a list of vessel tracking units compatible with the airtime provider selected. Fishers will need to purchase one of these units suitable for their operation but will not be paying polling costs directly to the airtime provider. DAF will pay for the airtime and recover cost from fishers via licence fees. This removes some administrative burden from fishers. On the other hand, the unit selection may be restricted to those that are compatible with the airtime provider only, limiting choices to fishers. This option may be difficult to implement because of the complexity in administering cost recovery due to variations among fishing operations. Some fishers operate more boats than the others; some are more active in fishing than the others. It is challenging to achieve a level of equity in establishing the appropriate amount of fee increase. Feedback from the consultation process indicates that this option as being cost shifting and not of benefit to fishers.

Option 4 in Table 30 involves DAF determining a list approved vessel tracking units and airtime providers via a tender process and establishing a service level agreement with the providers. This will assist to ensure appropriate levels of service are provided to fishers and that the fees for provided services are as approved by DAF. Fishers will need to purchase a unit from the approved list and establish an airtime contract with the provider. Fishers will pay for own polling directly to the providers. This approach is similar to the status quo arrangement, with the

addition of a service level agreement between DAF and the providers. This would be a new role that DAF is not currently involved in.

Feedback from consultation with the Vessel Tracking Working Group members has not indicated any preference to any of these options. Costs and reliability of vessel tracking units could be summarised as the two key criteria from a business perspective. It was also suggested that any new units should be rigorously tested before being approved.

The problem is not in itself the approach to how vessel tracking units that meet the requirements are identified but rather a lack of suitable and inexpensive options available which cater to a broader cross section of fisheries. Therefore, the alternative options described above may go some way to solving the problem of vessel tracking technology issues, however, is unlikely to solve the overarching problem.

It is recommended that no change to the approach for identifying appropriate vessel tracking units be adopted, however, it is recommended that DAF continually review and update the approved vessel tracking unit list in the Vessel Tracking Installation and Maintenance Standard to identify and incorporate new vessel tracking units that are found to meet the requirements for use in Queensland fisheries. Given technology constantly evolves over time, it is expected that this approach would continue to increase the current selection, providing fishers with a much broader set of options and enabling fishers to make decisions based on their risk appetite (i.e. purchasing cheap and cheerful equipment that has a limited warranty or a more expensive, tried and tested option that comes with a longer warranty and security around performance). Based on the implementation experience, DAF has applied continuous improvement to the vessel tracking unit and provider selection process to ensure the criteria and trial process are fit-for-purpose and rigorous.

While this is a recommended improvement to the current regulation, it does not require changes to the regulation in order to enact the recommendation given the vehicle for delivery is the Vessel Tracking Installation and Maintenance Standard rather than the regulation.

During public consultation, stakeholders are encouraged to propose options of vessel tracking unit and provider arrangement to address concerns of costs and unit reliability.

7.3.2.4 Alternate cost approaches

Under the prior regulation where vessel tracking was only required for boats in a small subset of fisheries (as outlined in Section 2.3), the cost of polling was paid for by DAF. When first introduced, this arrangement was recommended to only be provided for a short term period (approximately 2 years) to aid the transition for impacted fisheries. Regardless of the original intent, the transition of polling costs from DAF to the fishers was never successfully completed as per the original intent. When the old regulation was repealed and incorporated into the current vessel tracking regulation, this process has effectively transitioned the polling costs to the fishers and executed on the original intent.

Feedback from the consultation to date has identified that newly impacted fisheries would like the same arrangement offered to earlier adopters of vessel tracking.

While earlier precedent has the capacity to influence future approach, this is not considered to be the appropriate approach in this situation given the original intention of the earlier vessel tracking implementation was to transfer the cost of polling to the fishers following a short transition phase.

It must be acknowledged that fisheries are a public resource, where the costs of managing that resource should be paid for by those who commercially benefit from it, specifically the commercial fishing industry. If DAF were to take up and pay the polling costs on behalf of industry, the only way to ensure that these costs (the costs of managing the fisheries) are not borne more broadly by the general public would be to recharge this cost to fishers through another mechanism such as licence fees or levies. This is deemed a redundant and an inefficient approach to fisheries management and is not recommended.

No recommendation is provided to change the current cost structure associated with costs incurred by fishers in order to meet their obligations under the vessel tracking regulation.

7.3.2.5 Data management

Feedback from the consultation process to date has identified that data privacy is a concern for the fishers. Largely this has been due to the increase in competition in favourable fishing areas, however the underlying reason for causing this outcome has not been proven and it is speculated that other factors may be at play beyond the misuse of vessel tracking data (for example, wider and cheaper access to deep sea fishing equipment and use of radar by fishers to identify fishing spots). Regardless, there is merit in further investigating the current data access and management arrangements in order to arrive at an appropriate recommendation.

The vessel tracking data which is produced by fishers in the course of meeting their obligations under the vessel tracking regulations is currently subject to the following information flow and governance arrangements:

Vessel tracking data flow

- Vessel tracking data is generated by the fishers
- Vessel tracking data generated by the fishers is shared at the time it is captured with the vessel tracking airtime providers. This is enabled through the contractual arrangements between the fishers and the providers.
- Vessel tracking data is collected by DAF under the *Fisheries Act 1994*. The contractual arrangement between the fishers and service providers enables (through a declaration provided by the fishers) the service providers to share a copy of the vessel tracking data with DAF.
- DAF has information sharing agreements in place with GBRMPA, the Queensland Police Service, the Department of Environment and Science, and Parks Australia. Under these

arrangements, vessel tracking data is primarily shared for compliance purposes and search and rescue (specific to Queensland Police Service).

Governance of use

- The vessel tracking data that is being used by DAF is protected by the *Information Privacy Act 2009 (Qld)* and the *Fisheries Act 1994 (Qld)*. Appropriate safeguards have been established to protect fishers from misuse of their information. In particular, Section 217B of the *Fisheries Act 2014* provides an offence for disclosing confidential information obtained in the administration or performance of a function under that Act, unless the performance of a function or exercise of a power under the Act is with the consent of the person to whom the information relates, or otherwise required or permitted by law. These are safeguards in addition to the protections against the use of personal information provided for in the *Information Privacy Act 2009 (Qld).*
- Management of data security by the vessel tracking airtime providers is governed by the *Privacy Act 1988 (Cth)* and the *Telecommunication Act 1997 (Cth)*. DAF has also established a deed of confidentiality and privacy with the providers that specify requirements to keep data secure and confidential and ensure it is not used for personal gain. Under the deed of confidentiality and privacy, personal information handled by the providers is subject to the terms of the *Information Privacy Act 2009 (Qld)*, as if the provider were DAF (this includes personal information and the polling locations as collected against an individual fisher).
- Section 217A of the *Fisheries Act 1994* provides that the chief executive may enter into an information-sharing arrangement with a prescribed government entity for the purpose of sharing or exchanging information. Section 217A(2) of the *Fisheries Act 1994* provides the information sharing arrangement may only relate to information that helps the chief executive or an inspector perform functions under the Act; or the prescribed government entity or an employee of the entity to perform functions under their legislation. Information shared with either external state agencies or external federal agencies, is governed by the relevant State's privacy act, the *Privacy Act 1988 (Cth)* and information sharing agreements that are in place with each entity.

The vessel tracking data flow and the relevant data security governance mechanisms are depicted in Figure 3 below.

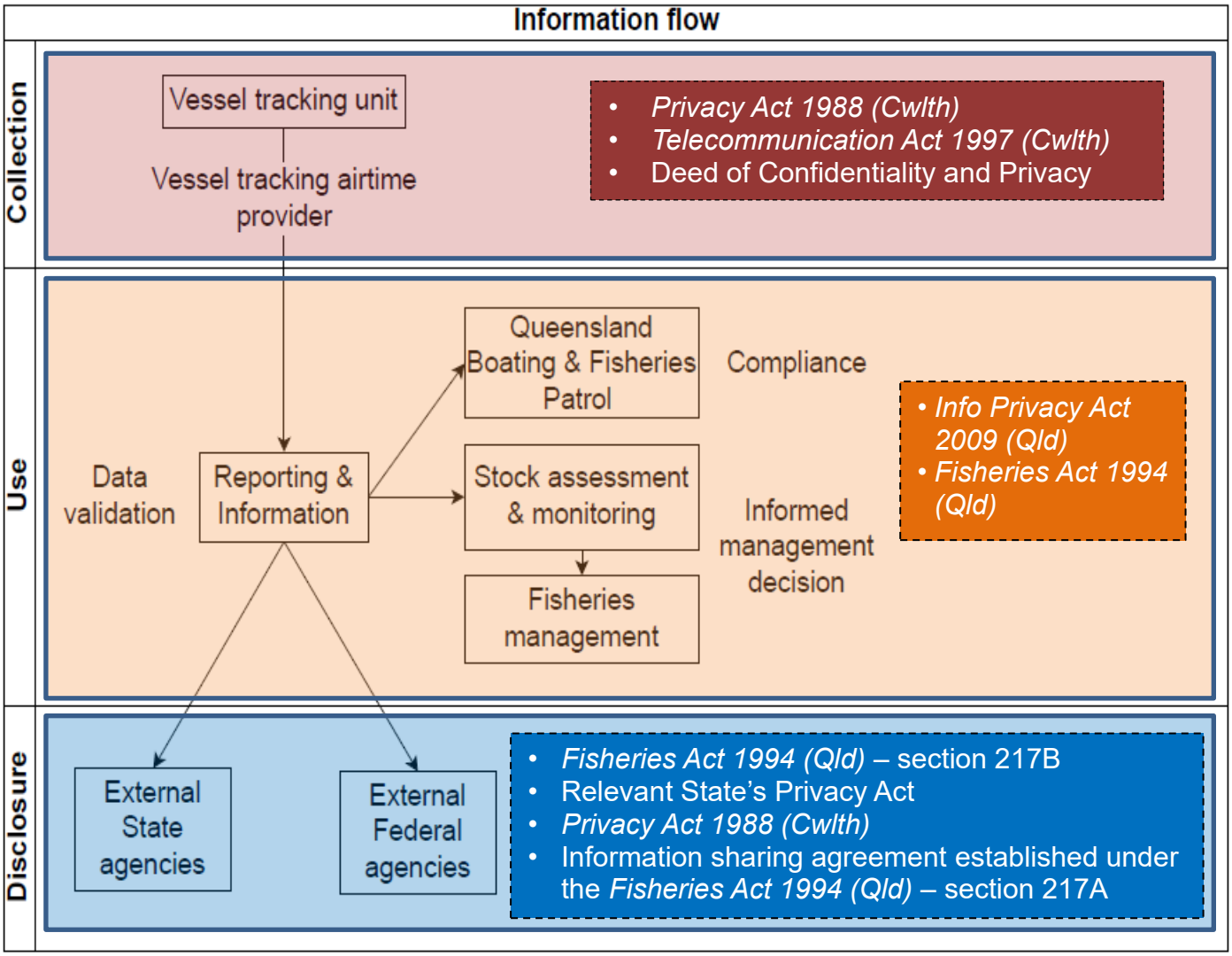

Figure 3 Vessel tracking information flow and governance of data security

The above information flow and governance mechanisms in place to protect the vessel tracking data has been shared with the vessel tracking working group to address initial concerns relating to data privacy. It has also been uploaded onto the vessel tracking engagement portal.

In summary, there are specific data privacy protocols in place to protect the entire life cycle of the data as it is generated and used by the relevant government departments and bodies. However, as there are additional clauses within the agreements between the fishers and the vessel tracking airtime providers, there is the potential for variations to these general privacy protocols. While these variations to the arrangements are subject to agreement between the fishers and the providers (not DAF), these arrangements only exist due to the vessel tracking regulations.

To address the identified impacts relating to data privacy, it is recommended that DAF seek to conduct a review of all current and existing arrangements in place to share, use and protect the vessel tracking data and, if required, establish any additional arrangements between DAF, the vessel tracking airtime providers and the fishers that ensures that the data generated from the vessel tracking regulation is protected across the entire course of its creation, holding and use.

While this is a recommended improvement to the current regulation, it does not require changes to the regulation to enact the recommendation. To this end, it would be beneficial to action this recommendation outside of the current PIR process such that a further delay is not experienced.

7.4 Recommended policy option

Queensland's fisheries represent a unique resource: one which is common property. The Queensland Government is responsible for managing the fisheries on behalf of the broader community. Everyone has a part to play in the management of the fisheries to ensure the continued sustainability of the resource.

As introduced earlier in this Consultation PIR, it is widely acknowledged that negative consequences result if a public marine resource is not carefully managed.[45] [46] Through the QSFS it was acknowledged that the most significant reform to the fisheries was required to improve the management of the fisheries and deliver world class fisheries management which centred on achieving a sustainable resource which optimised benefits to the community.

Largely, feedback from the consultation process to date has identified that the vessel tracking regulation has achieved the objectives it sought to achieve. In other words, it has been reported that the vessel tracking regulation has successfully provided meaningful data that is now used to improve the modelling and research, and compliance aspects of fisheries management. As per the QSFS, any improvements to the management of the fisheries are done so to improve the long term sustainability of the Queensland Fisheries and in turn the sustainability of the individual fishing businesses (i.e. the businesses of the commercial fishers).

Additional benefits not sought under the original objectives have also been realised by the commercial fishers including relaxation/repeal of other regulations that enable fishers greater flexibility in relation to how they conduct their fishing operations, improved data availability to monitor their commercial fishing operations and the ability to demonstrate that they meet the requirements of current EPBC Act approvals which will enable them to sell product in export markets (relevant to those sectors which are subject to the EPBC Act Approvals). It is also expected that continued use of vessel tracking on commercial fishing vessels will assist with continued access to the GBRMP for commercial fishing activities.

A summary of the net benefits has been provided in Section 7.1 and replicated below in Table 31.

Table 31 Summary of the net quantified benefit by stakeholder

Stakeholder	Quantified operational costs per annum	Quantified one-off cost (rebate scheme)	Quantified benefits (cost saving) per annum	Quantified benefits of maintaining export approvals and access to GBRMP	Net Benefit (per annum) ongoing
Fishers	$3 006 711	N/A	$689 633	$99 500 000	~ $97 182 922
Government (both State and Federal)	$1 124 857	$3 100 000	$1 451 400	N/A	~ -$2 773 457
				Total	**~ $94 626 909**

As an options analysis does not provide any alternative options which can provide the same or close to the same benefits identified from the vessel tracking regulation with less cost incurred by the stakeholders (i.e. an alternative option that provides for an improved cost-benefit ratio), the recommendation of this Consultation PIR is to retain the vessel tracking regulation in Chapter 4, Part 1 of the Fisheries (General) Regulation 2019. However, this recommendation is only provided on the basis that the following actions are carried out to address specific costs identified from the consultation to date:

1. ***Introduce a temporary exemption system that allows fishers the ability to fish while the unintended technology issues experienced during implementation are resolved and to gather sufficient data to consider the costs and benefits of such a system longer term. Specifically, it is recommended that the short term risk-based exemption system either as proposed by DAF (Appendix C) or similar to that proposed by DAF be implemented and used for a period of 12 months to provide 'cover' for fishers while the technology issues are resolved and to gather sufficient data to clearly quantify the benefits and costs of such a proposed approach longer term. An interim review of the temporary exemption process and its effectiveness should be carried out at 6 months with a complete review at the end of the 12-month period. This will inform whether regulation amendment is required to legislate a long-term exemption system should it be warranted.***
2. ***Continually review and update the Vessel Tracking Installation and Maintenance Standard to identify and incorporate new vessel tracking units that are found to meet the requirements for use in Queensland fisheries. Given technology constantly evolves over time, it is expected that this approach would continue to increase the current selection.***
3. ***Conduct a review of the current and existing arrangements in place to share, use and protect the vessel tracking data and, if required, establish any additional arrangements between DAF, the service providers and the fishers that ensures***

that the data generated from the vessel tracking regulation is protected across the entire course of its creation, holding and use.

Consultation focus

We are seeking your feedback in relation to the recommendations made with respect to future aspects of the vessel tracking regulation. Some questions to prompt this consultation process include:

- Do you agree or disagree with the recommendations made? Please explain why you either agree or disagree.
- Do you have any other ideas or recommendations that could work to provide similar or improved outcomes which would work to deliver robust fisheries management (specifically with respect to monitoring and research and compliance aspects of management) and in turn, sustainable fisheries?

8 Next steps

This is a consultation PIR. It sets out DAF's conclusions based on the available evidence. The release of the Consultation PIR is an opportunity for interested parties to provide a written submission to DAF on the findings and conclusions of this report. All submissions will be reviewed, before finalising a Decision PIR, which updates this PIR in response to the feedback provided. The Decision PIR will then be approved by Cabinet to decide on the future of the legislation.

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10 Legislative materials

10.1 Commonwealth

Environment Protection and Biodiversity Conservation Act 1999
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10.2 State

Fisheries Act 1994
Fisheries Regulation 2008 [Repealed]
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Appendix A – Fisheries reform

A.1 Fisheries review

In 2014, the Queensland Minister for Agriculture, Fisheries and Forestry, Hon. Dr John McVeigh announced a wide-ranging review of fisheries management in Queensland. The Minister indicated that the review had arisen to "simplify fisheries management, cutting red tape and improving environmental sustainability." Minister McVeigh publicly stated that "*the Queensland Government had commenced a wide-ranging review of fisheries management in Queensland to deliver a better system for the State's Commercial, recreational fishers and Indigenous fishers. The aim of the review is to modernise and simplify fisheries management systems and cut red tape. This will provide the flexibility for industry to prosper, ensure recreational and traditional fishers have reasonable access to the resource, and ensure Queensland's lifestyle is maintained*."[81]

The Minister indicated that an "Independent specialist would be engaged to lead the review to provide greater transparency…. There will be an opportunity for people to provide feedback throughout the review".[28] MRAG Asia Pacific (MRAG) was commissioned to undertake the review, using a Review Team led by Professor Glenn Hurry, and comprising Duncan Souter, Tom McClurg and Dr Michael Sissenwine. As part of the review, the Review Team conducted extensive consultation with stakeholders including 17 public meetings from the Gold Coast to the Torres Strait, with over 500 attendees in total. In addition, around 280 written submissions were received from fishers, environmentalists, government agencies and others.[82]

The review by MRAG resulted in a report (**report**) 'Taking Stock: Modernising Fisheries Management in Queensland'[82]. The report noted that fisheries management systems in Queensland have evolved over time and become complex with excessive regulation, and this was impacting on commercial fishers and recreational operators alike. The report found unilateral support from all fishers, irrespective of sector, that the health of Queensland's fish stocks and environments are at the centre of all stakeholder's interests and that reform of the fisheries management practices was necessary to achieve best practice management and a sustainable future.

Accordingly, the report proposed a new framework to set out '*a clear central strategy for the management of fisheries, based on maximising benefits from the use of Queensland's fish stocks, and is supported by a fisheries management system of integrated components that work together to achieve the objectives of the strategy'*. It went on to identify a number of key

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[81] Letter from Minister McVeigh to The Clerk of the Parliament, Mr Neil Laurie (dated 21 March 2014), <*https://apps.parliament.qld.gov.au/E-Petitions/Home/DownloadResponse/a4745507-ce6e-46cf-a759-88297340c8a0*>

[82] MRAG Asia Pacific 2014, *Taking Stock: modernising fisheries management in Queensland,* <*https://www.publications.qld.gov.au/dataset/fisheries-management-review/resource/2a97571b-60cf-4a4f-bf8f-306a95833b70*>

messages regarding the structure of a fisheries management system as well as recommendations for how Queensland could progress with its future strategy and management practices.

The report proposed a conceptual fisheries management system to represent the interconnected nature of the main components underpinning the management strategy. Put simply, each of the component is required for the system to work effectively.

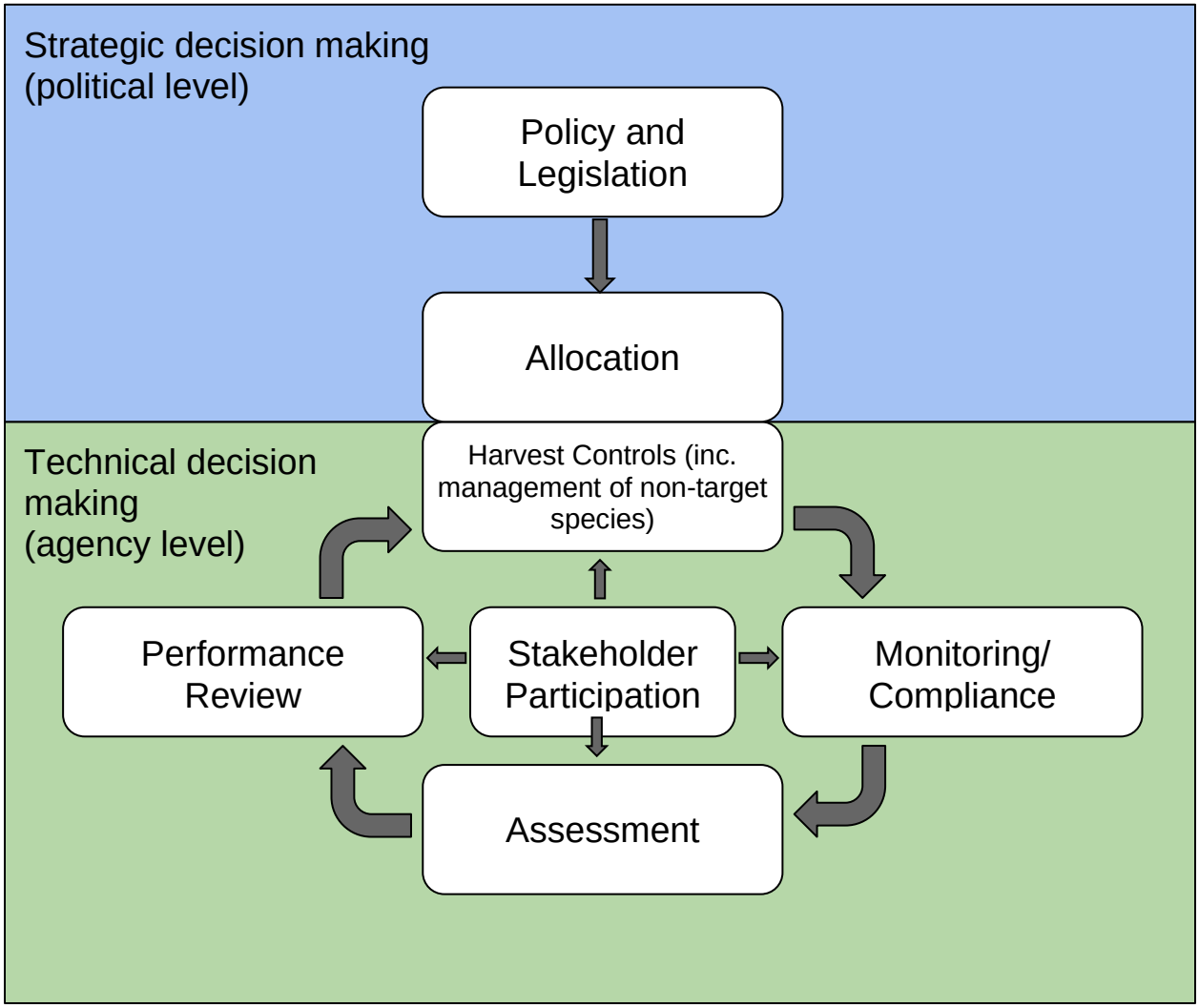

Figure 4 Conceptual fisheries management system with component parts working together to achieve defined goals and objectives. (Source: MRAG Asia Pacific 2014, *Taking Stock: modernising fisheries management in Queensland*[82])

The report provided detail on how the findings of the report should be used to develop a clear policy statement for the future management of Queensland's fisheries. Leveraging the findings of the report and the recommendations around the structure of a "good fisheries management system", the report provided the following recommendations in relation to future policy, legislation and decision making:

a) overarching objectives for Queensland's fisheries;
b) principles for catch setting, including the use of target stock sizes, harvest strategies and reference points;
c) principles for catch sharing;
d) preferred approaches to the management of each sector's share of the fishery;
e) management of non-target species and ecosystems;
f) systems to allow for stakeholder participation in management/decision making;
g) approaches to compliance;
h) performance review;
i) resourcing;
j) protection of fisheries habitats;
k) interaction between fisheries and marine protected areas."

Further, eight main components were identified as required in any *"good fisheries management system"*. To this end, the following components were identified in relation to monitoring, information collection and assessment:

"Provides the information to manage fisheries the way we want them to be managed (right information, at the right time, at the right scale, in the right level of detail)."
"Well-managed fisheries have monitoring and assessment systems that deliver information in a timeframe, at a level of detail and at a scale that meets management objectives and compliance."

"Ensures integrity of management arrangements by ensuring everyone plays by the rules Well-managed fisheries have compliance systems that balance voluntary compliance and deterrence, and are informed by risk-assessment, intelligence and information analysis;"

The report acknowledged that VMS[83] were already used in discrete sub industries (specifically the east coast trawl fishery) for the purposes of providing effort-based verification. It was identified that VMS (implemented as currently used) could provide broader benefits to monitoring, information collection and assessment and compliance activities in line with these key areas of a fisheries strategy.

[83] The Fisheries Regulation 2008 [Repealed] referred to VMS (Vessel Monitoring Systems) whereas the new regulation refers to Vessel Tracking, we have used VMS when speaking about previous regulations and used the term vessel tracking when talking about the present regulation and future changes.

A.2 Fisheries reform

Acknowledging the significant recommendations of the fisheries industry review, DAF sought to take action and deliver the necessary changes to fisheries management. In July 2016, DAF released the *Green Paper on Fisheries Management Reform in Queensland*[84] *(**The Green Paper**)*. The intent of *The Green Paper* was to leverage the findings and recommendations from the review and start a discussion around five goals and ten underlying areas for reform that would enable Queensland to best manage access to, and use of, Queensland fisheries. According to the Green Paper, the reforms were designed to give commercial fisheries *"a more stable, transparent and strategic operating environment"*, as well as provide significant ecological benefits that would contribute to the sustainability of the fisheries long term. The five goals and ten areas of reform as introduced by the Green Paper are highlighted in the below figure.

<table>
<tr><td>Vision</td><td colspan="5">Fishing is a low risk to Queensland's aquatic resources and these are shared to optimise benefits to the community</td></tr>
<tr><td>Reform Goals
What we are seeking to achieve</td><td>Long-term sustainability and resilient stocks</td><td>Economic returns to the community and access for all users</td><td>Clear and unambiguous regulatory framework</td><td>Enhance systems to support fisheries management</td><td>Investment in fisheries management</td></tr>
<tr><td rowspan="3">10 areas for reform
How we will get there</td><td colspan="3">1. Managing target stocks to maximise overall benefits to the community, optimise catch rates, and secure community support for fishing</td><td></td><td></td></tr>
<tr><td>2. Managing impacts on ecosystem and non-target species, to maximise benefits to the community</td><td></td><td></td><td></td></tr>
<tr><td></td><td colspan="2">3. Clarify resource-sharing arrangements between sectors, to provide certainty about resource use.</td><td></td><td></td></tr>
</table>

[84] Department of Agriculture and Fisheries 2016, *Green paper on fisheries management reform in Queensland, <https://www.publications.qld.gov.au/dataset/green-paper-on-fisheries-management-reform-in-queensland>*

		4. Review authorities for access to the resources, to ensure equity and value for current and future generations		
	5. Optimise decision-making framework, to ensure responsive, fit-for-purpose management arrangements			
	6. Adopt harvest strategies that have the flexibility to maximise benefits, for both the community and the ecosystem			
	7. Improved data and information to underpin best-practice management arrangements			
		8. Improved consultation and engagement, to include stakeholders in the development and implementation of management arrangements		
	9. Fisheries compliance upgrades to underpin all management objectives			
	10. As the fisheries reform program develops, considerations will be given to how the costs of improved management will be met			

Figure 5 The 10 areas and 5 goals of fisheries management reform. (Source: Department of Agriculture and Fisheries 2016, *Green paper on fisheries management reform in Queensland*[84])

Underpinning various aspects of the reform was the adoption of new technologies. Electronic monitoring technologies or vessel tracking[85] was identified as a means for collecting data which could be used to inform the management of the fisheries. Specifically, under the seventh area of reform, The Green Paper introduced the application of electronic monitoring technologies and identified that these technologies could be used to facilitate programs that seek to improve the accuracy and timeliness of catch reporting (an independent source to verify catch and effort data. Under the ninth area of reform, The Green Paper identified that information captured by vessel tracking could also be used in compliance activities to redirect efforts in the current on-ground approach to a more sophisticated information-driven compliance effort as well as increasing compliance with area closures.

Publication of The Green Paper also invited consultation that was driven by both active interaction between DAF and key stakeholders (including industry, government, research etc.) across Queensland as well as more passive channels of feedback (for example, online surveys and written submissions). According to The Green Paper, the message received from the consultation process was that all stakeholders wanted reform in the way Queensland manages

[85] The MRAG review and the previous regulation referred to VMS, whereas vessel tracking has been used in the new regulations and all later government documents.

its fisheries. There was strong support from all sectors for better fishery monitoring, more effective engagement, more responsive decision making and greater fisheries compliance.

The Green Paper led to development of the QSFS, released by the Queensland Government in June 2017, which outlined the long term strategy for fisheries management in Queensland. The QSFS was considered to represent the most comprehensive fisheries reform in Queensland's history with the primary purpose of ensuring healthy fish stocks that will support thousands of Queensland jobs. It outlined a clear plan for transitioning from the existing management approach to the desired future management approach, ultimately to improve management of Queensland fisheries using best practice tools. In outlining this transition plan, the QSFS specifically acknowledged the issues and problems with the current management approach, as outlined in Table 32 below, and included a plan to transition the industry to a desired future state; namely "where we want to be".

Table 32 The current management approach versus the desired future management approach

2017 Where we are now	2027 Where we want to be
Basic elements are missing	Management built on firm foundations
Monitoring and research are inadequate to inform management decisions	Fisheries monitoring and research is robust, regular and builds confidence
Ongoing debate about interpreting performance of fish stocks	Sustainable limits are defined for all key stocks/regions
No formal process for seeking stakeholder views	Effective engagement between all stakeholders
No clear system for management of impacts on non-target species	A sound risk-based approach is used to assess impacts on non-target species.
Limited options for management tools	Access to best practice tools
Ongoing debate about acceptable harvest levels.	All major fisheries are managed by harvest strategies with defined targets
Rules excessively complicated, too much reliance on input controls	Fishing rules are clear, practical, and appropriate
Ongoing conflict between sectors over access to the resource	Transparent process for resource allocation
Decision-making is slow and criticised for excessive political influence	Responsive and evidence-based decision-making with clear management actions
Implementation is reactive	Implementation is strategic
Limited resources or capacity to forward plan	Management and reform are adequately

	funded
Limited capacity to enforce regulations (e.g. black market, crab pot raiding)	Education and compliance are effective and provides confidence

Source: Department of Agriculture and Fisheries 2017, *Queensland Sustainable Fisheries Strategy 2017-2027*[10]

Leveraging the themes of *The Green Paper*, ten key areas of reform were identified to help transition fisheries management.

Table 33 The three types of reform

Type	Reform Area
Foundation reforms	1. Improved engagement
	2. Improved monitoring and research
	3. Sustainable catch limits
	4. Impacts on non-target species
Reform tolls	5. Resource Allocation
	6. Harvest strategies
	7. Fishing rules and access
	8. Responsive Decisions
Implementing reforms	9. Resourcing
	10. Compliance

Source: Department of Agriculture and Fisheries 2017, *Queensland Sustainable Fisheries Strategy 2017-2027*

A total of 33 actions across the ten reform areas were presented in the QSFS of which two included the introduction of either a broad concept of monitoring technologies or, specifically, vessel tracking for the purposes of gathering improved and validating collected data to facilitate improved monitoring and research activities and compliance outcomes. Timelines for the actions were set and vessel tracking was scheduled to be installed on all boats by 2020, with a priority to install vessel tracking on net, line, and crab boats by 2018.

Consultation during the reform process

From 2014 to 2017, DAF consulted widely as part of the review of fisheries management in Queensland and the development of the *Queensland Sustainable Fisheries Strategy 2017-2027* (QSFS).

Since the release of the QSFS in 2017, continued consultation has been carried out to inform and execute on the 10 key areas of reform for fisheries management as identified in the strategy. This includes Fishery-specific working groups and a Sustainable Fisheries Expert Panel (the Panel).

With respect to the specific action item of implementation of vessel tracking across all commercial fisheries and charter boats, DAF consulted with affected stakeholders in the development of the "Vessel Tracking Policy" and "Vessel Tracking Guidelines" in early 2018. Officers met with more than 280 people at 143 meetings across 22 locations in Queensland. A total of 128 responses were received in reply to an online survey, including by letter, telephone, and email. Other bodies and agencies were also included in the consultation process including Great Barrier Reef Marine Park Authority (GBRMPA). The 'Vessel tracking consultation report – Feedback on draft policy and guidelines' is available on DAF website[86].

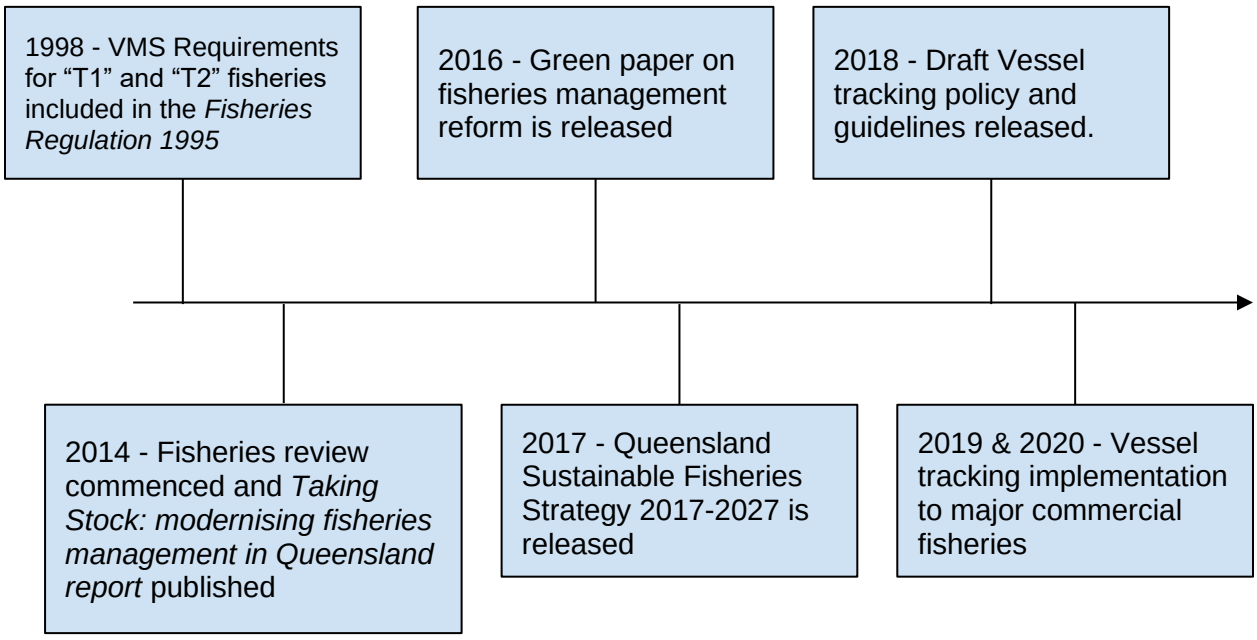

Figure 6 Summary of the consultation that took place along the way to regulation being introduced

[86] Department of Agriculture and Fisheries 2018, *Vessel tracking consultation report 2018,* <*https://www.publications.qld.gov.au/dataset/vessel-tracking/resource/a7aadf39-a3e2-47f7-80fe-33e470911376*>

Appendix B - Implementation of the vessel tracking regulation

Following the extensive process of review and consultation that resulted in the release of the QSFS, necessary steps were taken to introduce legislation which implemented identified actions under the ten reform areas.

In 2017, DAF undertook a selection process (outlined below) to approve vessel tracking units for use in Queensland fisheries. Further details of the trial can be viewed in the published trial summary report[87].

- Determination of vessel tracking units and provider specifications
- Market scanning of available vessel tracking units
- Assessment of vessel tracking units against the specifications
- Trialling of the vessel tracking units on commercial fishing vessels for up to 10 months
- Analysis of trial vessel tracking data and trial participants' feedback to inform approval decision

The draft Vessel Tracking Policy and Guidelines were released on 2 January 2018. The policy outlined the objectives of the proposed vessel tracking regulations, as well as the obligations for commercial fishing and charter boats to which the regulation applied. Accompanying the draft policy and guidelines was information on the types of equipment available for purchase that would meet the vessel tracking requirements, the initial costs of such equipment (including installation) and ongoing polling costs per month. As per the review process to date, a process of consultation followed the release of the policy and guidelines.

Following the release of the draft policy and guidelines, a rebate scheme was introduced to provide funding to fishers to cover the upfront equipment and installation costs of vessel tracking units. The Vessel Tracking Rebate Scheme provided $3 million in funding, jointly supported by the Queensland Government and the Great Barrier Reef Marine Park Authority (GBRMPA)[88]. Reimbursement was provided for part or all of the costs of the equipment from $300-$750 and installation costs of up to $220.

The final Vessel Tracking Policy was released on 7 June 2018 alongside the final Vessel Tracking Guidelines[89] and Vessel Tracking Installation and Maintenance Standard[90], the latter of which outlined in more detail the specific requirements for vessel tracking in Queensland including approved vessel tracking units and polling rates.

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[87] Department of Agriculture and Fisheries 2018, *Results of vessel tracking unit trial, June 2018,* <*https://www.publications.qld.gov.au/dataset/vessel-tracking/resource/5339089f-4e66-4f03-83fd-80431d2d241d*>

[88] Queensland Rural and Industry Development Authority, *Vessel tracking rebate scheme,* <*https://www.grida.qld.gov.au/program/vessel-tracking-rebate-scheme*>

[89] Department of Agriculture and Fisheries 2018, *Vessel tracking guideline* <*https://www.publications.qld.gov.au/dataset/vessel-tracking/resource/702f9e15-d3f1-48dd-919d-daea3bd20d76?truncate=30&inner_span=True*>

[90] Department of Agriculture and Fisheries 2020, *Vessel Tracking Installation and Maintenance Standard*, <*https://www.publications.qld.gov.au/dataset/vessel-tracking/resource/c82988cd-e1ee-4f36-a05d-badb543d340d*>

Implementation of vessel tracking to commercial fisheries was staged across 2019 and 2020. The first stage of implementing the vessel tracking requirements was delivered through the Fisheries (Vessel Tracking) Amendment Regulation 2018 authorised under section 118 and 223 of the *Fisheries Act 1994*. It implemented vessel tracking in the commercial net, line, and crab fisheries from 1 January 2019. The vessel tracking installation and maintenance requirements that were used for fisheries that were already required to have vessel tracking (i.e. east coast trawl, large mesh net and sea cucumber) was updated and standardised to align with the broader rollout of vessel tracking.

The second stage of implementing the vessel tracking requirements was delivered through the Fisheries (General) (Vessel Tracking) Amendment Regulation 2019. It extended vessel tracking requirements to all remaining commercial harvest and inshore trawl fisheries, excluding the charter fishery, commencing from 1 January 2020.

Appendix C - Vessel tracking exemption procedure

Vessel tracking unit malfunction interim procedure when in port

Purpose of the interim procedure

Fisheries Queensland has developed this interim procedure in response to industry concerns raised during the vessel tracking review. The interim procedure enables fishers to apply to Fisheries Queensland for temporary permission to start a fishing operation if a vessel tracking unit has malfunctioned on a primary boat.

This interim procedure will operate from 17 December 2021 until June 2022 or until the vessel tracking post implementation review is completed.

Vessel tracking unit on a primary boat malfunctions in port

Process for fishers

- If a vessel tracking unit on a primary boat malfunctions and reasonable troubleshooting does not resolve the malfunction, fishers must contact Fisheries Queensland to request for temporary permission to start a fishing operation without a working vessel tracking unit.
    - Phone 13 25 23, and
    - Provide information outlined in Appendix 1.

Assessment of temporary permission requests

- Fisheries Queensland may provide a temporary permission up to 48 hours for fishers to start a fishing operation without a working vessel tracking unit on a primary boat where:
    - a vessel tracking unit has failed on the primary boat
    - the fisher has conducted reasonable steps to have the unit repaired or replaced.
    - fishers have provided information requested in Appendix 1.
- Fisheries Queensland may provide a temporary permission greater than 48 hours however, these requests will only be processed during business hours and be assessed based on additional supporting evidence, for example:
    - email confirmation from the provider about the malfunction and timeframe required to repair / replace the unit
    - other evidence to support the request e.g. postage receipt to demonstrate that the unit has been returned to the provider for assessment / repair.

Conditions

- The temporary permission will be in effect until the earlier of the following:
    - end date of the temporary permission given by Fisheries Queensland, or
    - such time when the fishers receive a replacement unit from the provider.
- Fishers must ***manually record or report*** the position (latitude and longitude) of the primary boat:
    - at the start of the fishing operation
    - while fishing or steaming
        - every hour for the east coast trawl fishery
        - every 4 hours for all other fisheries
    - at the end of the fishing operation.

- Manual reporting of positions can be completed using one of the following means:
    - commercial fishing app (if available for your fishery) – ***preferred method***
    - Automated Interactive Voice Response (AIVR) system – (07) 3017 0083
    - If positions have been recorded during the operation (Appendix 2), email vesseltracking@daf.qld.gov.au or call 13 25 23 at the end of fishing operation.
- Where fishers are landing individual transferable quota (ITQ) or competitive quota species, a ***prior notice*** must be submitted 1 hour before landing.
- Fishers operating in the east coast trawl fishery must not cause the relevant trawl boat to enter the Major Scallop Area (MSA) while operating under a temporary permission.

Vessel tracking unit on a tender boat malfunctions in port

- The tender boat cannot be used to start a fishing operation.
- Fishers must have operational vessel tracking units on tender boats before starting a fishing operation.
- If the vessel tracking unit on the primary boat is working, you may move the unit onto the tender boat and request temporary permission for the primary boat.

More information

Failure to comply with the conditions of the interim Malfunction Procedure may result in enforcement action being taken.

For more information about the vessel tracking unit malfunction procedure, email vesseltracking@daf.qld.gov.au or call 13 25 23.

Revision to interim procedure

Fisheries Queensland may review the interim Malfunction Procedure at any time to address any operational or compliance risks identified during implementation.

Appendix 1: Request for temporary permission to start a fishing operation without a working vessel tracking unit

1. Licence and contact details

Full name of commercial fisher in control:			
Primary commercial fishing licence number:		**Boat mark:**	
Phone (mobile preferred):			
Email:			

2. Details of malfunctioned vessel tracking unit

Vessel tracking unit type:	☐ Spot Trace ☐ IDP800 ☐ CLS Triton ☐ Rockfleet / YB3i ☐ IDP690 / ST6100
Vessel tracking provider:	☐ Pivotel ☐ Pole Star ☐ CLS Oceania
Serial number:	
Installation:	☐ Self installation ☐ Professional installation
Boat with malfunctioned unit:	☐ Primary boat ☐ Tender boat* *Permission to start a fishing operation without a working unit **does not** apply to tender boats.
Details about the malfunction, including cause of malfunction if known:	
Steps you have undertaken to address the malfunction:	

3. Details of fishing operation during temporary permission

Fishery you operate in (e.g. reef line):		**Fishery symbol (e.g. L1):**	
Areas you will be fishing in (e.g. Gladstone) :			
Length of temporary permission requested:			
Fishing operation:	☐ Day trip	☐ Extended trip (days)	
For T1, T2, M1 or M2 fishers, include the trawl management region for effort deduction:	☐ Northern ☐ Central ☐ Southern Inshore	☐ Southern Offshore A ☐ Southern Offshore B ☐ Moreton Bay	

4. Supporting evidence*

Do you have email confirmation from the provider about the malfunction and timeframe required to repair / replace the unit?	☐ Yes* ☐ No If yes, please provide a copy to Fisheries Queensland.
Do you have postage receipt or other evidence to demonstrate that the unit has been returned to the provider for assessment / repair?	☐ Yes* ☐ No If yes, please provide a copy to Fisheries Queensland.

***Supporting evidence must be provided for temporary permission longer than 48 hours**

Appendix 2: Manual reporting of positions

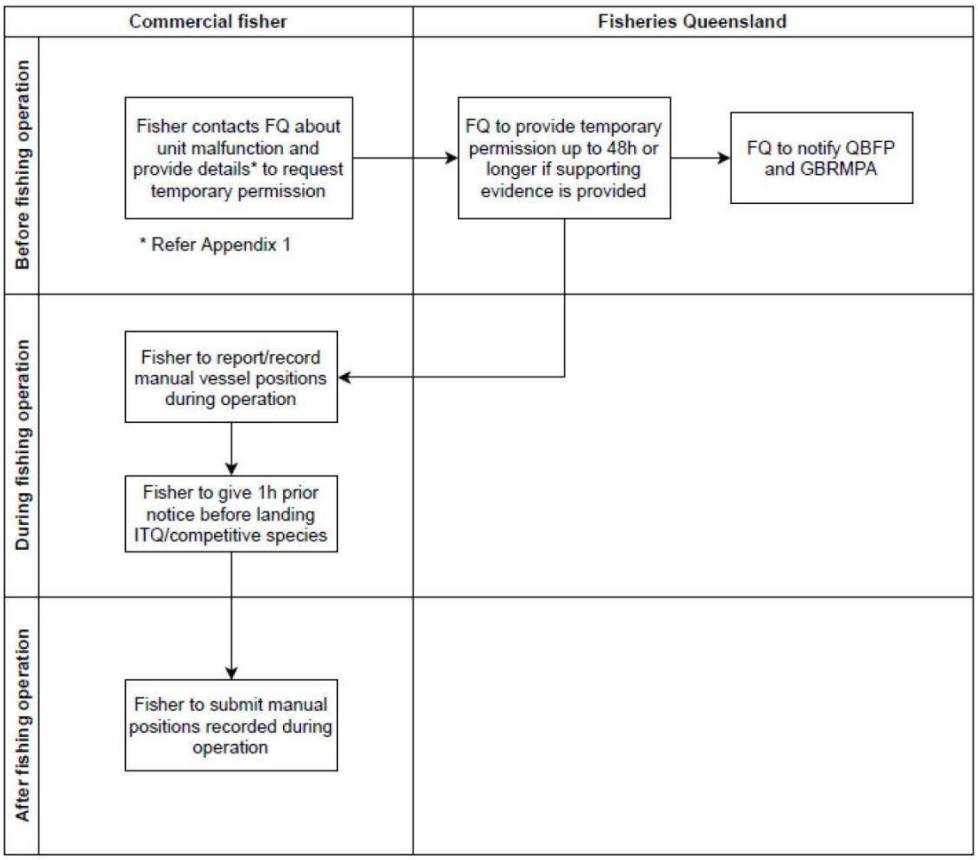
1. Licence and boat details

Commercial fisher in control:						**Boat mark:**		**Fishery type:**			
For T1, T2, M1 or M2 fishers, include the trawl management region for effort deduction:	☐ Northern	☐ Central	☐ Southern Inshore	☐ Southern Offshore A	☐ Southern Offshore B	☐ Moreton Bay					

2. Positional information

Position date	Position time	Latitude Select the correct format: ☐ Degrees, minutes, seconds ☐ Decimal degrees ☐ Degrees, decimal minutes	Longitude Select the correct format: ☐ Degrees, minutes, seconds ☐ Decimal degrees ☐ Degrees, decimal minutes	Notes Please indicate start and end of fishing operation (if applicable)

Appendix 3: Summary workflow



Appendix D - Vessel tracking regulation (excerpt)

https://www.legislation.qld.gov.au/view/html/inforce/current/sl-2019-0179#ch.4-pt.1

Part 1 Vessel tracking

Division 1 Preliminary

82 Definitions for part

In this part—
malfunction see section 80(6) of the Act.
relevant authority see section 83(1).
relevant boat, for a relevant authority, means a boat prescribed for the authority by section 83(2).
relevant period means the period prescribed by section 85.
vessel tracking standard means the document called 'Vessel tracking installation and maintenance standard' published on the department's website.

Note— The vessel tracking standard is also available for inspection, free of charge, by arrangement with the chief executive.

working properly see section 80(6) of the Act.

Division 2 General matters

83 Authorities and boats in relation to which requirements apply

(1)Section 80 of the Act applies in relation to each primary commercial fishing licence (a ***relevant authority***) that has any of the following symbols written on it—

- 'A1' or 'A2'
- 'B1'
- 'C1', 'C2' or 'C3'
- 'D'
- 'J1'
- 'K1', 'K2', 'K3', 'K4', 'K5', 'K6', 'K7' or 'K8'
- 'L1', 'L2', 'L3', 'L4' or 'L8'
- 'M1' or 'M2'
- 'N1', 'N2', 'N3', 'N4', 'N10', 'N11', 'N12' or 'N13'
- 'R'
- 'T1', 'T2', 'T4', 'T5', 'T6', 'T7', 'T8' or 'T9'.

(2) For section 80 of the Act, each of the following boats is prescribed for a relevant authority (and under section 80(1)(b) of the Act is a relevant boat for the authority)—

(a)the primary boat for the relevant authority; and

(b)each tender boat with an engine power of more than 3kW authorised under the Act to be used under the relevant authority.

84 Way equipment must be installed

For section 80(2)(a) of the Act, the way for installing approved vessel tracking equipment on a boat stated in the vessel tracking standard is prescribed.

85 Periods during which equipment must be working properly

(1) For section 80(2)(b) of the Act, each period the relevant boat is used under the relevant authority, starting and ending as mentioned in subsection (2) or (3), is prescribed.

(2) If the relevant boat is a boat other than a tender boat, the period the relevant boat is used under the authority—

(a) starts when the fishing operation in which the boat is used starts; and

(b) ends when the fishing operation in which the boat is used ends.

(3) If the relevant boat is a tender boat, the period the relevant boat is used under the authority starts and ends at the same times as the start and end of the period the tender boat's primary boat is used under the authority.

Division 3 Requirements if equipment malfunctions

Subdivision 1 Preliminary

86 Purpose and application of division

(1) This division prescribes, for section 80(4) of the Act, requirements that apply if approved vessel tracking equipment installed on a relevant boat used under a relevant authority malfunctions during a relevant period.

(2) The requirements are—

(a) if the relevant boat is a boat other than a tender boat—

(i) the holder of the relevant authority, or another person acting under the authority, has given the chief executive a boat communication notice under subdivision 2 for the boat; and

(ii) subdivision 3 is complied with; and

(b) if the relevant boat is a tender boat—subdivision 4 is complied with.

87 Definition for division

In this division—

approved way, for giving a notice to the chief executive, means the way—

(a) approved by the chief executive; and

(b) published on the department's website.

88 When person in control of a boat is aware of malfunction

(1) For this division, the person in control of a relevant boat being used under a relevant authority is taken to be aware of a malfunction of approved vessel tracking equipment installed on the boat if—

(a)the person receives a notice from the chief executive or an inspector that the equipment is malfunctioning; or

(b) the person becomes aware the chief executive is not receiving details of the boat's position and operation from the equipment, including, for example, because the person does not receive a confirmation of the receipt of the details from the chief executive that the person is, or ought reasonably to be, expecting.

(2) Subsection (1) does not limit the circumstances in which the person in control of a relevant boat becomes aware of a malfunction of approved vessel tracking equipment installed on the boat.

89 Notices given by chief executive or inspector under division

The chief executive or an inspector may give a notice in relation to a relevant boat under this division—

(a) orally in person; or

(b)by an alternative way of communication stated in the boat communication notice given for the relevant boat under subdivision 2.

Subdivision 2 Alternative way of communication

89A Application of subdivision

This subdivision applies if the relevant boat is a boat other than a tender boat.

90 Notice of alternative way

(1) The holder of the relevant authority, or another person acting under the authority, must, before or as soon as possible after approved vessel tracking equipment is installed on the relevant boat, give a notice (a ***boat communication notice***) to the chief executive.

(2) The boat communication notice must—

(a) be given to the chief executive in the approved way; and

(b) state an alternative way (an ***alternative way of communication***) in which the chief executive or an inspector may communicate with the person in control of the boat whenever that person is on the boat.

(3) The alternative way of communication—

(a) must not involve the use of vessel tracking equipment; and

(b)must allow a communication to be received on the boat instantaneously after it is sent by the chief executive or inspector.

Examples of alternative ways of communication—
a facsimile, mobile phone, radiophone or satellite phone

(4) More than 1 alternative way of communication may be stated in a boat communication notice.

91 Changing alternative way

(1) The holder of the relevant authority, or another person acting under the authority, may change an alternative way of communication stated in a boat communication notice by giving the chief executive a notice stating another way (a ***changed way***) of communication.

(2) A notice given to the chief executive under subsection (1) must be given in the approved way.

(3) However, if the holder of the relevant authority, or another person acting under the authority, gives a notice under this section, the changed way of communication must not be used until the chief executive has advised the holder or other person that the chief executive has received the notice.

Subdivision 3 Manual reporting and landing requirements for boats other than tender boats

92 Application of subdivision

This subdivision applies if the person in control of a relevant boat, other than a tender boat, being used under a relevant authority during a relevant period becomes aware of a malfunction of approved vessel tracking equipment installed on the boat.

93 Manual reporting requirement

(1) The person in control of the relevant boat must give a notice stating details of the boat's location to the chief executive—

(a) in the approved way; and

(b) at the following intervals—

(i) if the boat is being used in the east coast trawl fishery—every hour;

(ii) otherwise—every 4 hours.

(2) The requirement under subsection (1) continues to apply until the earliest of the following happens—

(a) the relevant boat is taken to a landing place under section 94 or 95;

(b) the relevant period ends;

(c) the approved vessel tracking equipment stops malfunctioning.

94 Requirement to take relevant boat to landing place—boat used under particular authority in particular area

(1) This section applies in relation to the relevant boat if—

(a) the relevant authority under which it is being used has an 'M1', 'T1' or 'T2' fishery symbol written on it; and

(b) the malfunction of the approved vessel tracking equipment happens inside the area within the following boundary—

- from latitude 22º10.80' south, longitude 149º48.00' east to latitude 22º13.20' south, longitude 152º00.00' east
- to latitude 24º13.80' south, longitude 153º33.00' east
- to latitude 24º42.00' south, longitude 153º16.20' east
- to latitude 25º06.00' south, longitude 153º12.00' east
- to latitude 25º18.00' south, longitude 152º43.20' east
- to latitude 22º10.80' south, longitude 149º48.00' east.

(2) The person in control of the relevant boat must—

(a) stop the use of fishing apparatus from the boat; and

(b) cause the boat to travel to a landing place as soon as practicable.

(3) Subsection (2) stops applying to the person if the chief executive or an inspector gives the person notice that compliance with subsection (2) is not required.

(4) The chief executive or an inspector may give a notice under subsection (3) if the chief executive or inspector is satisfied—

(a) the approved vessel tracking equipment is working properly; and

(b) it is unnecessary for the relevant boat to be taken to a landing place.

95 Requirement to take relevant boat to landing place—other circumstances

(1) This section applies in relation to the relevant boat if section 94 does not apply in relation to the boat.

(2) The person in control of the relevant boat must cause the boat to travel to a landing place within the following period—

(a) 5 days;

(b) if the chief executive has given the person a notice allowing a longer period—the longer period.

(3) Subsection (2) stops applying to the person if the chief executive or an inspector gives the person notice that compliance with subsection (2) is not required.

(4) The chief executive or an inspector may give a notice under subsection (3) if the chief executive or inspector is satisfied—

(a) the approved vessel tracking equipment is working properly; and

(b) it is unnecessary for the relevant boat to be taken to a landing place.

96 Further requirement if relevant boat taken to landing place

(1) This section applies if the relevant boat is taken to a landing place under section 94 or 95.

(2) The person in control of the boat must not cause or allow the boat to be used for fishing unless the chief executive has given the person a notice that the approved vessel tracking equipment is in a condition that allows it to work properly.

Subdivision 4 Requirements for tender boats

96A Application of subdivision

This subdivision applies if the person in control of a relevant boat that is a tender boat being used under a relevant authority during a relevant period becomes aware of a malfunction of approved vessel tracking equipment installed on the boat.

96B Requirement to stop fishing

(1) The person in control of the relevant boat must—

(a) stop the use of fishing apparatus from the boat; and

(b) attach the boat to its primary boat; and

(c) ensure the boat remains attached to its primary boat, and is not used for fishing, for the remaining part of the relevant period.

(2) Subsection (1)(c) stops applying to the person if the chief executive gives the person a notice that the approved vessel tracking equipment is in a condition that allows it to work properly.