



# **Integrated Electronic Monitoring and Reporting System**

**Regulatory Impact Statement**

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**May 2017**

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# Impact Statement

## 1 General information

### Initiative title

This Regulatory Impact Statement (RIS) provides an analysis of options and scenarios to support the introduction of an Integrated Electronic Monitoring and Reporting System (IEMRS) in New Zealand commercial fisheries.

### Advising agency

The Ministry for Primary Industries (MPI) is solely responsible for the analysis and advice set out in this Regulatory Impact Statement. This analysis and advice has been produced for the purpose of informing final decisions to proceed with a policy change to be taken by Cabinet.

### Key Limitations or Constraints on Analysis

MPI has followed standard cost/benefit and risk analysis procedures in preparing this RIS. This RIS applies a multi-criterion analysis supported by a partial cost-benefit analysis, specifies objectives and decision criteria and sets out the costs and benefits MPI has been able to quantify (and identifies those we have not been able to quantify).

Our underlying assumptions are that the fisheries management system is fundamentally sound and that there is broad support for the Quota Management System (QMS).

IEMRS is one of the options identified in the “Future of our Fisheries” consultation in 2016. The purpose of the Future of Or Fisheries is to strengthen the New Zealand fisheries management system, to ensure that it is fit for purpose now and in the future. This consultation<sup>1</sup> included three strategic proposals (maximising value from our fisheries, better fisheries information, agile and responsive decision-making); and two regulatory change proposals, IEMRS and Enabling Innovative Trawl Technologies (EITT).

There are some constraints on the analysis:

- *Key gaps in the data:*
  - *Rationalisation of fishing effort* – One of the key “unknowns” is the extent to which some fishers may exit the industry either because they are unable to afford IEMRS technology (cameras in particular) or because they are opposed to its deployment on their vessels. Through the consultation process, MPI received a number of submissions from commercial fishers along these lines. Apart from this anecdotal evidence, MPI has not been able to quantify the extent of this rationalisation of fishing effort. For the purposes of the Regulatory Impact Statement, we have identified certain factors that may impact any potential rationalisation, such as the age of vessels and permit holders, fish landed and number of days fished.
  - *Capability of service providers* – At present, there are not sufficient suppliers in

<sup>1</sup> *The Future of Our Fisheries*, Volumes 1-1V, <http://www.mpi.govt.nz/news-and-resources/consultations/future-of-our-fisheries/>

New Zealand to outfit all the vessels in the commercial fishing fleet with IEMRS technology, particularly cameras. MPI anticipates that once there is certainty that cameras will be deployed, then such a market will be created. However, this does create some uncertainty around implementation from the target date for cameras of 1 October 2018.

- *Cost of IEMRS technologies* – MPI approached a number of potential suppliers, in New Zealand and overseas, for information on the indicative costs of IEMRS technologies. MPI received responses from 5 suppliers. While we have been able to make some estimates of overall costs based on these responses, we anticipate that there are other suppliers whose costs may differ, meaning that we could be under- or over-estimating the costs of deployment.
- *Time constraints:* The Minister for Primary Industries indicated in May 2016 that the Government wants MPI to fast-track the work to install electronic monitoring on all commercial fishing vessels. MPI is therefore aiming to have electronic reporting and geospatial position reporting in place on 1 October 2017 and electronic monitoring phased in from 1 October 2018.
- *Further work is required before any policy decisions can be implemented:* MPI will work with the Parliamentary Counsel Office to develop regulations. MPI will also undertake consultation on technical standards and specifications, which will be issued via circular by the Director-General of MPI.

**Responsible Manager (signature and date):**

Bryan Wilson, Deputy Director-General, Regulation and Assurance

**Quality Assurance Reviewing Department:**

Treasury Regulatory Impact Analysis Team (RIAT)

**Quality Assurance Assessment:**

**Reviewer Comments and Recommendations:**

## 2 Executive summary

1. The purpose of this Regulatory Impact Statement is to analyse the potential impact of two reform options against the status quo.
2. MPI proposes to amend fisheries regulations to support the introduction of an Integrated Electronic Monitoring and Reporting System (IEMRS) across the commercial fleet. The purpose of IEMRS is to provide accurate, integrated and timely reporting and monitoring data on commercial fishing activity in order to inform decisions of fisheries managers in Government and Industry.
3. IEMRS forms part of the Future of our Fisheries Programme. Our fisheries management system, built around the Quota Management System (QMS), is designed to ensure the sustainability of our fisheries. The QMS is 30 years old and the Fisheries Act 1996 is over 20 years old. There has been considerable social and economic change during the intervening years, alongside significant developments in how fisheries and aquatic ecosystems are managed around the world. In response, MPI initiated the Future of our Fisheries programme, with the purpose of strengthening the fisheries management system to ensure that it is fit for purpose now and in the future.
4. Consultation on a number of proposals was undertaken in late 2016. This included:
  - a) Three strategic proposals (maximising value from our fisheries, better fisheries information, agile and responsive decision-making); and
  - b) Two regulatory change proposals (IEMRS and Enabling Innovative Trawl Technologies).
5. Under IEMRS, MPI proposes that all permit holders will be required to:
  - a) Complete event-based electronic catch reporting in a timely manner (ER);
  - b) Provide automated geospatial position reporting (GPR) of the locations of fishing events (this will include some land-based operations, e.g., eel fishing); and
  - c) Operate automated cameras (EM) on fishing vessels.
6. MPI also proposes that licensed fish receivers are required to provide their returns electronically.
7. MPI needs comprehensive and accurate information on fishing activity in order to provide for the utilisation of fisheries resources while ensuring sustainability. More specifically, we need information on the total removals of target and non-target species from fisheries, and associated catch rates.
8. MPI currently gathers this information from a variety of sources, including commercial fishers' catch-effort reporting, Government observers on fishing vessels, and geospatial vessel position reporting by those vessels carrying Vessel Monitoring Systems. The catch-effort reporting system is paper-based, which can cause delays of 3 - 4 months until data is available to end-users.

9. While MPI has collected a substantial body of fisheries information over time, addressing our information needs is currently hindered by low levels of:
  - a) Observer coverage;
  - b) Timely catch-effort reporting;
  - c) Real-time geospatial position reporting; and
  - d) Information from other sources, such as shed sampling and surveys by research vessels or tagging studies.
10. These issues are particularly prevalent in the inshore fishery.
11. There are also international drivers for change. International experience, for example in Australia, indicates that feedback to fishers comparing their ER and EM data has resulted in significant improvements in fisher reporting (i.e., a reduction in discrepancies between ER and EM datasets over time).
12. MPI's overall objective in addressing these problems is to support efficient and sustainable use of the fisheries resource. In order to do so, we wish to future-proof the fisheries monitoring and reporting system to:
  - a) Ensure that MPI is able to collect high-quality verifiable and independent information on fishing activity;
  - b) Build social licence and the support of the public, international markets, and all users of commercial fisheries;
  - c) Create opportunities to add value across the sector by improving access to existing markets and enabling access to new market opportunities;
  - d) Improve compliance with the requirements of the fisheries management regime; and
  - e) Ensure that it is consistent with trends internationally and domestically.



13. This Regulatory Impact Statement analyses three options:

<b>Option</b>	<b>Key points</b>
1) Status Quo	Some mandatory position reporting, voluntary ER and EM
2) Electronic reporting and automated geospatial position reporting by all permit holders from 1 October 2017	Standards and specifications to be determined in a separate consultation process with Industry and service providers. Lead-in period from promulgation of regulations before they come into effect.
3) Electronic reporting and automated geospatial position reporting by all permit holders from 1 October 2017, and phased introduction of electronic monitoring on all permit holders' vessels from 1 October 2018	As for Option 2, and, EM to be rolled out on a phased basis.

14. The IEMRS proposal may result in significant rationalisation of the Industry. Anecdotal information from commercial fishers during the consultation process indicated that the cost of cameras in particular could cause some fishers to exit the industry. It is not possible to quantify the number of fishers who may do so, given the wide disparity of fishing operations and fleets and the lack of information on income. Significant improvements to the fisheries management system have resulted in rationalisation in the past. For example, substantial rationalisation occurred when the QMS was introduced in 1986.

15. However, we may draw some inferences from the age of vessels, the value of landings, the number of days fished per year, and the age of individual permit holders. For instance:

- a) The inshore fleet is aging –12 percent of commercial fishing vessels are 50 years or older, with some having been built prior to the Second World War;
- b) One sixth of the commercial fishing fleet may be marginally viable at best, judging by the information that MPI holds on the value of fish landed and the number of fishing days reported. Many of the fishers operating these vessels could be characterised as “lifestyle” fishers;
- c) The cost of cameras appears likely to have significant impacts for at least some operations, given that the cost in some cases exceeds the reported value of the amount of fish landed per annum; and
- d) The age profile of permit holders, with nearly 40% of individual permit holders 60 years or over, would suggest that some may choose to retire from the industry rather than continue with learning and implementing the requirements for IEMRS technologies.

16. Where rationalisation has occurred in the past, catching capacity has been redistributed amongst remaining operators. This would lead MPI to believe that while there will be some rationalisation of effort resulting from the requirement to carry and operate cameras, this will not affect Industry's overall ability to catch commercial allowances. Potential

rationalisation will in any effect be mitigated by the phased-in implementation of cameras on a fishery-by-fishery basis, using a risk-based approach, e.g., an evaluation of risks to sustainability, concerns about incidental catch of protected species.

### 3 Problem definition and objectives

#### 3.1 WHAT REGULATORY SYSTEM(S) DOES THE PROBLEM OR OPPORTUNITY RELATE TO?

17. The problem this proposal is addressing relates to the fisheries management regulatory system.
18. The objectives of this system are to provide for the utilisation of fisheries resources while ensuring sustainability<sup>2</sup>.
19. The system's key legislation includes the Fisheries Act 1996. The regulations made under the Act include those relating to reporting and satellite monitoring.
20. Other agencies that have a substantive interest in the system include the Department of Conservation, the Ministry for the Environment, Te Puni Kokiri, Maritime New Zealand, and the Ministry for Business, Innovation and Employment.
21. While the fisheries management system is generally sound, the Fisheries Act 1996 has been in place for over 20 years, and the Quota Management System (QMS) for over 30 years. There are concerns about adherence to fisheries rules, and these need to be addressed. Technology has advanced and society's expectations of how fisheries management should operate over time have changed accordingly.
22. The Future of our Fisheries programme will build on the foundations of the QMS and Fisheries Act 1996 and aims to ensure that the system is future-proofed to maintain sustainable fisheries for current and future generations.

#### 3.2 WHAT IS THE POLICY PROBLEM OR OPPORTUNITY BEING ADDRESSED?

##### Background

23. New Zealand's wild capture commercial fisheries generated over \$1.375 billion in export value for the year to the end of June 2016. (Aquaculture generated over \$391 million in the same period). Seafood export earnings are expected to grow to over \$2.1 billion in the year ending June 2020, mainly due to rising prices as the New Zealand dollar is expected to depreciate further, and increased aquaculture production.<sup>3</sup>
24. The Quota Management System (QMS) helps ensure sustainable utilisation of fisheries resources through the direct control of harvest levels for each species in a nominated

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<sup>2</sup> Refer section 8(1) of the Fisheries Act 1996

<sup>3</sup> MPI Situation and Outlook for Primary Industries 2016

<https://piritahi.cohesion.net.nz/Sites/CC/PUB/Corporate/SOPI%202016/2016%20SOPI%20main%20report%20web.pdf>

geographical area. New Zealand currently has about 100 species (or species groupings) subject to the QMS. These species are divided into 638 separate stocks. Each stock is managed independently to help ensure the sustainable utilisation of that fishery.

25. Quota is the property right of a stock represented as shares that can be bought and sold. They are generated when a stock is introduced into the QMS. Quota generates annual catch entitlement (ACE) at the start of each fishing year. Quota share holdings are guaranteed by the Crown and are able to have mortgaged and other securities registered against them. The permit holder of the fishing vessel is responsible for balancing ACE against catch.

### **Features of the Market (New Zealand's Commercial Fishing Fleet)**

26. 1,172 fishing vessels are registered to fish commercially in New Zealand waters (as at September 2016).<sup>4</sup> There are currently 1,019 fishing permit holders.<sup>5</sup> The vast majority of permit holders (689) have just one registered vessel, while two permit holders have 36 registered vessels between them. 44 vessels fish in the deepwater. A further 3 vessels primarily fish inshore, but also fish for deepwater species for part of the year. Two vessels fish under the Western Central Pacific Fisheries Commission (WCPFC) arrangements inside and outside our EEZ. The remainder fish in the inshore.
27. There are also 204 licensed fish receivers, and 1,357 quota owners.<sup>6</sup>
28. Seventy percent of fish caught in our wild fisheries are taken in deepwater fisheries, the major species being squid, hoki, ling, oreo dories, orange roughy and silver warehou. Approximately one-third of the fleet target paua, rock lobster and scallops.

### **The Problem**

29. MPI lacks verifiable information on the total removals of target and non-target fish species and protected species.
30. The Quota Management System (QMS) was introduced in 1986 as a tool to promote sustainable management of New Zealand's fisheries. Generally, the QMS is considered to be a success story. However, a major concern is that unintended side effects have arisen over time as a consequence of activities associated with commercial fishing. These unintended consequences include bycatch of undersize and damaged fish and protected species. MPI's ability to independently monitor these effects is currently severely constrained. The impacts of these effects are not being internalised by Industry as a result of the combination of the incentives created by the QMS and MPI's inability to fully monitor these effects.
31. So while the overarching framework of the QMS is sound, there are some issues that still need to be addressed as follows.

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<sup>4</sup> All vessels that are used to take fish, aquatic life or seaweed for sale from NZ waters must be registered.

<sup>5</sup> Any person or company wishing to fish commercially must hold a fishing permit.

<sup>6</sup> As at 7/12/16.

## ***Information***

32. There are conflicting claims from stakeholder groups about the extent of discarding and misreporting in the commercial fishing industry. While a significant body of fisheries information has been collected over time, MPI's ability to confirm or refute these claims is severely hindered by low levels of:
- a) Independent on-vessel fisheries monitoring, e.g. as provided by observer coverage;
  - b) Timely catch-effort reporting; and
  - c) Real-time geospatial position reporting.
33. These issues are particularly prevalent in inshore fisheries.
34. In the absence of Observers, there is currently no sure way of monitoring or verifying catch-effort reporting from vessels, particularly given the incentives to maximise economic returns by discarding small or damaged fish. Similarly, protected species reporting most often cannot be verified.
35. The low levels of timely reporting limit the speed at which MPI can analyse information and take action where required. Information needs are also hindered by an inefficient and outdated catch-effort system.<sup>7</sup>

## ***Regulation***

36. The current reporting system is no longer fit for purpose and is outdated.
37. Currently, the catch-effort system is still largely paper-based. Errors occur on 17% of the paper forms submitted by permit holders.<sup>8</sup> Common errors include the wrong year, vessel name, client number and invalid fish stocks.
38. In contrast, the error rate detected amongst electronic reporting is approximately 4%. This is primarily because with electronic reporting there is upfront validation of such fields as name and client number, meaning there is less room for basic errors. Where errors have occurred, correction is simple and quick. The current catch-effort database is able to accept data electronically and in real time (i.e. fishers submit daily).
39. The process for correcting paper forms is slow and cumbersome. FishServe mails back the forms to permit holders for correction within 14 days. For some forms, more than one mail-back is required. This is increasingly impractical with reduced postal services. It also results in substantial postage costs to FishServe – costs which are ultimately recovered from Industry through the cost recovery levy process.
40. Given timeframes for reporting and required error-checking, catch effort information reported on paper forms may be unavailable to end-users (scientists, fishery managers, industry, etc.) for three to four months after it was collected.

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<sup>7</sup> The "catch effort system" refers both to a technological system (databases, front ends, hardware and software) and to the regulations, form types, data fields etc.

<sup>8</sup> In 2014/15, the number of forms submitted by permit holders was 122,290. The number of forms sent back for correction was 20,519, or 16.78%.

41. FishServe estimates that the cost of electronic reporting is about 50% less than paper-based reporting. Since the introduction of voluntary electronic reporting, FishServe has advocated for electronic reporting to the Industry. Some fishers have been reluctant to adopt electronic reporting over time due to (amongst other reasons) the initial requirement for an encrypted USB drive (subsequently superseded by the use of password protection) and because it is not possible to use tablets. (These requirements may not apply to technology introduced under IEMRS).
42. In addition to ongoing issues with paper-based reporting, the Catch Effort database first developed in the 1990s and used to store this information is no longer fit-for-purpose.

### ***Compliance***

43. There are monitoring problems with the current system, especially problematic as fishing in most cases is not subject to independent verification.
44. It is impractical to extend Observer coverage significantly beyond current levels for cost and logistical reasons. This results in low levels of coverage of the fishing fleet. Currently, approximately 8.4% of the commercial fishing activity is monitored by observers in New Zealand. Around 60% of Observer days are allocated to monitoring offshore (deepwater) fisheries in the 2016/17 coverage plan, to achieve coverage rates of 8-100% of fishing effort depending on the fishery. In contrast, Observer coverage in inshore fisheries in 2016/17 amounts to about 20% of Observer sea days, monitoring < 5% of fishing effort. (The remaining 20% of coverage is allocated to observing highly migratory species fisheries, compliance purposes and other activities). Levels of monitoring below at least 20% are recognised internationally as inadequate to effectively monitor fisheries catch, including protected species bycatch (e.g., seabirds).
45. The cost and logistical factors are elaborated on below.
46. Large scale coverage is only really practical on deepwater fishing vessels. These vessels typically fish at sea for weeks at a time, and have room to accommodate 1-2 Observers. Observer coverage of the 1,000 or so smaller inshore vessels that head out for one to several days from a myriad of small ports around the coast is far more problematic, for the following reasons:
  - a) MPI has an inadequate understanding of where these vessels are operating – in many cases, vessels are less than candid to Observer shore staff about where they are planning to fish;
  - b) MPI is unable to place Observers on some vessels due to the size and crew levels of some inshore vessels. Fishing vessels operate under a Maritime Transport Operator Certificate (administered by Maritime NZ), which specifies a maximum number of crew that a vessel can safely carry;
  - c) The Observer Programme has struggled to meet planned coverage targets. This can be partly attributed to recruitment and retention, with some observers not prepared to undertake inshore coverage for reasons including safety concerns.

However, wider placement and coordination issues continue to frustrate Observer managers with those issues more focused in the inshore programme<sup>9</sup>.

- d) The nature of inshore trips is quite different to the deepwater – most are one to several days in length. Observers typically spend time onshore in between trips to sea. Time ashore can be substantial as inshore fishing activity is heavily dependent upon weather conditions or other factors. Often trips don't take place at the dates and times notified. The Observer Programme pays accommodation costs for Observers, meaning onshore costs (and the resultant cost per fishing day of monitoring achieved) can increase substantially compared to the deepwater fleet.

47. There are well-documented studies that identify the differences between catch reported by vessels with and without Observers.<sup>10</sup> Research commissioned by MPI highlights the substantial margins of error in estimates of protected species catch<sup>11</sup>, resulting in part from low levels of observer coverage.

48. The MPI Observer Programme has documented the issues associated with Observer coverage in the inshore fleet.

49. The problems associated with the catch-effort system (e.g. errors in paper-based reports, the Catch Effort database running on an unsupported software platform) have been documented in internal MPI reports and in MPI's discussions with FishServe (the service provider for the current system).

### **3.3 WHAT IS THE INTENT OF ADDRESSING THIS PROBLEM OR OPPORTUNITY?**

50. The above problems result in:

- a) Critical risks to the integrity of the Quota Management System, for example, uncertainty surrounding discarding and other sources of mortality means that management settings (the Total Allowable Commercial Catch (TACC) and recreational and customary allowances) may not be set at optimum levels;
- b) Constrained progress in resolving key management issues, such as discarding and protected species by-catch;
- c) Undermined confidence amongst the public, some international consumers and users of wild fisheries that commercial fishers are operating with minimal or acceptable impacts on the environment and protected species. This may also be described as social licence, or the levels of approval from the community that the commercial sector has to conduct its activities;
- d) Limited opportunities to create and add value to wild fisheries harvest. Low monitoring levels, particularly amongst inshore fisheries, restrict MPI's ability to verify reported catch information and the current catch reporting is not always able to support traceability through supply chains. Many fishstocks cannot meet the requirements of third-party sustainability assessments that support access to

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<sup>9</sup> The difficulties experienced in New Zealand are also well documented amongst observer programmes operating in inshore fisheries internationally.

<sup>10</sup> For instance, *Fish discards and non-target fish catch in the trawl fisheries for hake, hoki, and ling in New Zealand waters*, NIWA Report No.48, 2010

<sup>11</sup> <https://data.dragonfly.co.nz/psc/>

premium markets and where boat-to-plate chain-of-custody tracking is required<sup>12</sup>;  
and

- e) Long turn-around times with inaccurate paper-based reporting limits the commercial sector and MPI from leveraging off accurate near-real time reporting.

- 51. Any solution will necessarily take some time to implement and further delay will hinder our ability to address these problems.
- 52. Given the incentives to the sector to maximise economic returns, MPI wants to verify catch-effort reporting by vessels (of fish, non-fish and protected species catch), and minimise the incentives to discard small or damaged fish.
- 53. MPI, in its role as regulator, protects our marine resources through science and research, and by monitoring the commercial fishery to ensure that reporting and monitoring is timely and accurate to inform the decisions of Government and the commercial sector.

### ***Objectives***

- 54. The high-level objectives are to:

- a) Support utilisation of fisheries resources while ensuring sustainability<sup>13</sup>,
- b) Ensure that MPI is able to collect verifiable and independent information on fishing activity and the environmental impacts of this activity;
- c) Restore social licence and the support of consumers, other fishers and the wider community in the management of New Zealand's commercial fisheries;
- d) Create opportunities to add value across the sector by improving access to existing markets and enabling access to new market opportunities;
- e) Future-proof the fisheries monitoring and reporting systems to ensure consistency with trends domestically and internationally; and
- f) Increase compliance with fisheries regulations, including those relating to the discarding of fish.

- 55. The following decision criteria have been derived to assess the options:

**Decision criteria 1: effectiveness** – Likely effectiveness in achieving objectives;

**Decision criteria 2: certainty** – any new regulations will aim to ensure that the obligations of the fishing industry are clear and readily enforceable and the new rules are likely to be complied with;

**Decision criteria 3: cost** – new costs to industry in terms of both money and time; and

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<sup>12</sup> Species or fishery specific traceability systems exist for some fisheries in which New Zealand is active, e.g., southern Bluefin tuna (operating under the Commission for the Conservation of Southern Bluefin Tuna) and Antarctic fisheries for toothfish (operating under CCAMLR)

<sup>13</sup> Refer Section 8(1) purpose and principles of the Fisheries Act 1996

**Decision criteria 4: Social licence** - Consumer, stakeholder and public confidence in the commercial fisheries management regime is secured.

### 3.4 WHO IS AFFECTED?

56. The stakeholders that will be directly impacted (either positively or negatively) by the proposal are:

- a) Fishing permit holders – who will be required to pay for, install and maintain IEMRS technologies on their vessels and will have to ensure that reporting occurs;
- b) Vessel masters or operators – who will be required to report electronically;
- c) Licensed fish receivers – who will be required to report electronically.

57. Consultation on the IEMRS proposal was supported by a communications strategy and took the form of a submissions process, public meetings and hui:

#### *Submissions*

58. The consultation document “*The Future of our Fisheries*”, which includes a chapter on IEMRS, was released on MPI’s website for public submissions on 11 November 2016. Consultation closed at 5:00pm on Friday 23 December 2016.

#### *Public meetings*

59. Fifteen public meetings were held across the country. Over 300 people attended the public meetings primarily representing recreational and commercial fishers. The lowest attendance was in Greymouth with 8 people. The highest number of people in attendance was at Tairua (Coromandel) with 42 people. The greatest number of commercial fishers in attendance was in Invercargill (98% of the 40 people attending).

60. MPI staff met with other agencies on 15 December to provide an overview of the Future of our Fisheries work programme and initial insights from the public consultation.

61. MPI staff have also met on request with fishing industry representatives, including Fisheries Inshore New Zealand, Seafood New Zealand and Te Ohu Kai Moana (TOKM), to specifically discuss IEMRS.

#### *Hui*

62. Thirteen hui have been held with iwi across the country.

#### *Communications*

63. We promoted all public meetings through the MPI website, social media (primarily Facebook and Twitter), local radio and local newspapers. We had a strong response through Facebook advertising (with an average of 33 people responding to each Facebook event ad). We also promoted the consultation and public meetings through stakeholder lists, including the general fishery stakeholder list, the recreational fishing lists and our fisheries science groups.

64. MPI intends to make the submissions available on our website once Cabinet has made decisions on regulations to support IEMRS.



### 3.5 WHAT IS THE RELEVANT HISTORY?

65. The Minister for Primary Industries, Hon Nathan Guy, announced in May 2016 that the Government had directed MPI to fast-track the work to install electronic monitoring and cameras on all commercial fishing vessels.<sup>14</sup>

66. The following issues are in and out of scope in the IEMRS proposal:

**Table I: Issues In and Out of Scope**

In Scope	Out of Scope
Amendments to fisheries regulations to support the new reporting and monitoring requirements	IEMRS technologies will be supported by a detailed set of service standards and specifications. MPI will consult on these in due course.
Transitional arrangements between the current system and IEMRS	Review of deemed value structures and processes <sup>15</sup> , or other components of the Quota Management System (QMS)
Cost recovery (however rules and levy rate to be dealt with in separate processes).	Discarding of fish
Requirement for new infringements relating to new reporting and monitoring requirements.	A broader review of fisheries operations: IEMRS will link to the Future of our Fisheries, observer and cost recovery reviews, but will retain its own focus on the delivery of reporting and monitoring services. Customary and recreational (including Amateur Charter Vessels – ACVs) fisheries reporting. Penalty regime for other specific offences.

67. IEMRS is one of two regulatory change proposals that form part of the wider Future of our Fisheries programme. The purpose of Future of our Fisheries is to improve our fisheries management system, ensuring that it is fit for purpose now and in the future.

68. In late 2016 MPI consulted on a package of proposals<sup>16</sup> that included:

- a) Three strategic proposals (maximising value from our fisheries, better fisheries information, agile and responsive decision-making); and

<sup>14</sup> Media release <https://www.beehive.govt.nz/release/faster-rollout-fisheries-monitoring> and article in *Seafood New Zealand magazine (August 2016)*, p.17 [http://www.seafoodnewzealand.org.nz/fileadmin/documents/SNZ\\_Magazine/Seafood\\_Magazine\\_August\\_2016\\_A5.pdf](http://www.seafoodnewzealand.org.nz/fileadmin/documents/SNZ_Magazine/Seafood_Magazine_August_2016_A5.pdf)

<sup>15</sup> Deemed values are set for each fish stock in the QMS. They are set at a level to discourage fishers from targeting fish in excess of ACE and at the same time encourage them to land and report unintended bycatch. When the amount of a fisher's reported catch is more than the amount of ACE owned, the fisher is issued with a deemed value invoice.

<sup>16</sup> Future of our Fisheries consultation document, MPI website <http://www.mpi.govt.nz/news-and-resources/consultations/future-of-our-fisheries/>

- b) Two regulatory change proposals:
  - i) IEMRS; and
  - ii) Enabling Innovative Trawl Technologies (EITT).

69. The two regulatory change proposals will allow for improvements in fisheries information and fishing technologies and can be implemented ahead of any other review changes. Their implementation will position fisheries management ready for other changes proposed through the wider Future of our Fisheries programme.

## 4 Options identification

### 4.1 WHAT OPTIONS HAVE BEEN CONSIDERED?

70. MPI has identified two feasible options likely to achieve the policy objectives better than the status quo (Option 1):

- a) *Option 2*: Electronic reporting and geospatial position reporting for all permit holders from 1 October 2017;
- b) *Option 3*: Electronic reporting and geospatial position reporting for all permit holders from 1 October 2017 and a staged introduction of electronic monitoring on commercial fishing vessels from 1 October 2018 (MPI's preferred option). Phased introduction will allow the supply market time to establish itself to service all of the commercial fleet (at present, the supply market is not large enough to do so). Electronic monitoring will be phased in based on an evaluation of the risks to the management regime, e.g., fishstock and protected species sustainability, compliance.

71. These two options would address the problem as follows:

- a) Option 2 – timely electronic reporting and geospatial position reporting would represent a major improvement in vessel-based reporting. The current delays in catch effort reporting and low levels of automated position reporting limit the speed and confidence with which MPI can analyse information and take timely action where required. However, while this option would improve on the current state, the lack of an electronic monitoring component would mean that a number of urgent fisheries management issues would not be addressed. Most notably, verification of fisher reports would remain extremely constrained and public confidence in fisheries would not be restored.
- b) Option 3 – timely electronic reporting, geospatial position reporting and electronic monitoring will address the problem by deterring illegal fishing practices, allowing for more accurate estimates of total catch and protected species bycatch, supporting third party certification of more New Zealand fisheries, allowing for a better estimation of risk-exacerbating behaviours, and increasing the confidence of stakeholders and the public more generally in the level of compliance by the commercial sector.

72. No new options were identified through stakeholder consultation. Some stakeholders, particularly commercial inshore fishers, expressed support for the status quo. Others expressed conditional support for the IEMRS concept with conditions including, for example, MPI providing more details on implementation, management of information and privacy issues, and compliance regimes.
73. While no new options were identified, consultation has influenced the implementation of IEMRS. For instance, MPI suggested in consultation the formation of a working group of MPI, the commercial sector and service providers to work on implementation issues. This has been welcomed by most submitters. Many submitters also expressed the view that fisheries such as crayfish and oysters are of lesser priority or should not be covered at all by EM under IEMRS. Again, MPI will take these comments into account in its phased implementation.
74. Stakeholder views are discussed in more detail in Section 7.
75. Options 2 and 3 essentially build on each other, with Option 2 a minimal option and Option 3 taking the elements of Option 2 and incorporating electronic monitoring. The data collected from the three system components (ER, GPR, EM) will be integrated in an information base that facilitates the cross-checking and verification of reported information across data sources.

#### **4.2 WHAT OTHER OPTIONS HAVE BEEN RULED OUT OF SCOPE, OR NOT CONSIDERED, AND WHY?**

76. MPI eliminated the following options from consultation because they were considered unlikely to satisfy the policy objectives:

##### *Voluntary measures:*

77. MPI considers the option of voluntary measures (e.g., Code of Practice) is not feasible because it would not satisfy the policy objectives outlined above. 100% uptake of electronic reporting must occur for it to be most effective. It is unlikely that all industry members would commit to, or rigorously follow, a voluntary code on ER, geospatial position reporting and EM if developed by industry with the support of MPI. Also, industry's standards and specifications may differ, and in particular be less stringent, than those developed by government. A further reason for consistent government standards is to meet international reporting and monitoring requirements.
78. Voluntary electronic reporting has been in effect since at least 2009. In the years since then, electronic reporting has been adopted by about 10% of vessels (27% of returns), mainly in deepwater fisheries. The main driver for permit holders to adopt electronic reporting up until now has been that some are required to report catch both to MPI and their company owners, and electronic reporting removes the need for duplication. It is unlikely that there will be significantly greater uptake in the absence of regulation.
79. MPI would have difficulty in asserting ownership of the data and imagery generated by voluntary electronic reporting and monitoring in the absence of regulation. Given past experience, this would be expected to result in issues with public confidence in the

transparency and credibility of the information if it is still owned by Industry as opposed to government.

*Increase in Observer coverage*

80. MPI has also considered the option of increasing Observer coverage, particularly in the inshore fishery. However, there are serious constraints on coverage of the inshore fleet for the reasons outlined in the problem definition section of this paper.
81. The cost of further increasing coverage substantially in inshore fisheries would likely be prohibitive. There are currently up to 96 Fisheries Observers (and this number has been as high as 105 in recent years) – this number would have to increase dramatically to substantially lift current rates of coverage, particularly in the inshore fisheries.

*Immediate imposition of IEMRS on all fishing vessels*

82. MPI considered the immediate imposition of IEMRS requirements (electronic catch reporting, electronic geospatial position reporting, and electronic monitoring, i.e., cameras) on all fishing vessels without the proposed phased-in approach set out in options 2 and 3.
83. This option is considered impractical because:
  - a) service providers of IEMRS technologies do not currently have the capacity to provide sufficient cameras and other equipment in a short timeframe;
  - b) For more than 90% of permit holders, IEMRS will entail a significant change in their activities, and will require training and operational changes that cannot be done overnight;
  - c) IEMRS will pose less change for those who already do some combination of electronic catch and position reporting and electronic monitoring (such as some big factory vessels), however these are a minority of the fleet.

## 5 Impact analysis

### 5.1 OPTION 1: CURRENT STATE

#### What unintended impacts is this likely to have?

84. Continuation of the current state would result in a number of unintended impacts as follows:

- a) The current patchwork situation would continue, with some industry members utilising ER, Geospatial and/or EM technologies to differing standards and specifications, with attendant uncertainty about government requirements – this could lead some companies to adopt technology that does not meet government standards and a potential cost to Industry in lost time, effort and money;
- b) Continuation of the current paper-based reporting system for catch-effort carries high transaction costs for Industry;
- c) The significant uncertainty associated with current catch and effort information may result in TACCs that are inappropriate to stock status, i.e., either insufficiently or unduly precautionary;
- d) Progress would continue to be constrained in resolving key management issues in some fisheries, such as discarding and protected species bycatch;
- e) Confidence will continue to be undermined amongst the public, international markets and users of wild fisheries that commercial fishing entities are catching their allocations with minimal or acceptable impacts on the environment and protected species. This is especially likely for fisheries with low levels of monitoring information; and
- f) There would continue to be limited opportunities to create and add value to wild fish harvest. Low monitoring levels restrict our ability to verify reported catch information and the catch documentation system is not able to support fine-scale traceability through supply chains<sup>17</sup>. Many fishstocks cannot meet the requirements of sustainability assessments that support access to premium markets and where boat-to-plate chain-of-custody tracking is required.

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<sup>17</sup> Exceptions exist in some cases, e.g. the Catch Documentation Scheme for Southern Bluefin Tuna that operates under the Commission for the Conservation of Southern Bluefin Tuna, or where traceability systems have been implemented by an industry operator.

## 5.2 OPTION 2: ELECTRONIC REPORTING AND GEOSPATIAL POSITION REPORTING FOR ALL PERMIT HOLDERS FROM 1 OCTOBER 2017

### What unintended impacts is this option likely to have?

85. The main features of Option 2 are:

- a) Electronic reporting and geospatial position reporting would be required from all permit holders;
- b) The standards and specifications for ER and GPR will be set in a circular. MPI has already a consultation process with the rock lobster and paua industry groups, and these discussions will continue with these and other groups;
- c) There will be a three-month transition period from the promulgation of the regulatory requirements in July 2017 through to their target commencement date of 1 October 2017 (although MPI will be working with Industry well before July on implementation requirements – see (b) above);
- d) Fishers will be required to retain their own records in the event that the ER and GPR technology malfunctions, and submit these when functionality is restored. This requirement will be triggered by an inability, caused by device malfunction, to complete the electronic return;
- e) ER and geospatial position reporting will be required of all permit holders – including those permit holders who don't fish from a vessel, e.g., eel fishers, who will be required to use hand-held technology;
- f) The MPI Director-General will approve new data requirements.

86. The main unintended impact of Option 2 might be that some permit holders either cannot afford ER and GPR, and/or choose to exit the industry rather than purchase and install the equipment. While submissions indicated that many fishers have reservations about aspects of ER and GPR, such as data confidentiality, there was relatively little concern expressed about the costs of purchasing, installing and operating ER and GPR technology.

#### *Costs*

87. Estimated costs to Industry are as follows:

- a) Initial minimum estimates of costs relating to ER and GPR are as follows. Hardware and installation costs for geospatial position reporting using Vessel Monitoring Systems are \$1,000 - 2,000 per vessel. On-going operating costs are estimated at \$800 – 1,000 per year (where standalone lease and service arrangements apply). Costs may be less where geospatial position reporting is part of an electronic reporting tool. Further, the costs for hand-held sets (e.g., practical if fishers are not operating from a vessel) are estimated at approximately \$800.

- b) For ER, costs are minimal provided fishers have a laptop notebook, smartphone or tablet (or similar) and download an app. Software packages are available from a number of service providers. One service provider quoted a monthly subscription of \$100 to download an app.

### *Benefits*

88. The benefits to Industry are:

- a) *More accurate estimates of catch limits* – due to the uncertainty surrounding catch reporting, MPI in most cases builds an estimate of “other sources of mortality” into the total allowable catch limits for fishstocks, based on an accumulation of information from Compliance and other sources. More accurate information from ER will provide greater confidence in the setting of catch limits and support greater confidence amongst Industry and other stakeholders that those limits are sustainable;
- b) *Ease of reporting* – reporting will be completed via a touch screen or mouse-click based interface, removing the need for handwritten entry of information into many small boxes;
- c) *Reduction in costs* – Delivery of electronic catch reports with fewer errors than paper forms will reduce data entry and data management costs. With an electronic system validation rules are built in at the front end of the process, hence greatly reducing the opportunities for error. Further, error correction is streamlined electronically. Estimated annual savings to Industry approximate \$420,000.
- d) *“Dashboards” summarising catch information* – Permit holders (and others by approval) will have access to catch-effort information via a log-in and structured permissions, allowing them to see reports and compiled information as reports are lodged;
- e) *Industry logistics* – At present, inshore fishers in particular are often unable to communicate their catches readily with Licensed Fish Receivers. Under ER, catch information will be available to LFRs and owners/companies on a timely basis, allowing for quicker and more precise placement of products in the market;
- f) *Event-based reporting* – ER will be event-based reporting, rather than time-based – thus the time and cost to Industry in reporting will be significantly reduced. Reporting will be more efficient;
- g) *Savings in time and postage costs* – The process for correcting paper forms is slow and cumbersome. FishServe mails back the forms to permit holders for correction within 14 days. Some corrections and clarifications require more than one mail-back. This is increasingly impractical with reduced postal services. It also results in substantial postage costs to FishServe – costs which are ultimately recovered from Industry through the cost recovery levy process. FishServe estimates that the cost of electronic reporting is about 50% cheaper than paper-based reporting;

89. The benefits to Government are:

- a) ER and GPR by all commercial fishing permit holders would represent a major improvement in reporting. The current low levels of real-time reporting limit the speed at which MPI can analyse information and take timely action where required. Lack of real-time catch-effort reporting and geospatial position reporting hinders the detection of misreporting and non-reporting of catch;
- b) ER and GPR support other Future of our Fisheries strategic initiatives, including fine-scale management, low information stocks, agile and responsive decision-making and ecosystem-based fisheries management; and
- c) However, the lack of any electronic monitoring component to IEMRS would fail to address a number of urgent fisheries management issues. Most notably, verification of fisher reports would remain constrained and public confidence in fisheries would not be restored.

### 5.3 SUMMARY TABLE OF COSTS AND BENEFITS – OPTION 2: ELECTRONIC AND GEOSPATIAL POSITION REPORTING FOR ALL PERMIT HOLDERS FROM 1 OCTOBER 2017

Affected parties (identify)	Comment: nature of cost or benefit (eg ongoing, one-off), evidence and assumption (eg compliance rates), risks	Impact \$m present value, for monetised impacts	Evidence certainty (High, medium or low)
<b>Costs, compared to status quo</b>			
<u>Regulated parties</u> Industry direct costs (purchase, installation and servicing of ER, GPR and EM, data transmission)	Note costs estimated over 15 year period 2018-32	28.6	Low
<u>Regulators</u> MPI costs (IEMRS implementation team (e.g. personnel), upgrade of catch effort database)	Note costs for IEMRS implementation team estimated over 4 year period 2018-21 Note costs for catch-effort database upgrade estimated over 15 year period 2018-32 These MPI costs are not subject to cost recovery	16.7	Medium
<u>Other parties</u> FishServe (building of ER receipt and aggregation systems)		1.6	Medium
<b>Total Monetised Cost</b>		46.9	



<b>Non-monetised costs</b>	Some level of industry rationalisation; loss of amenity value for small-scale fishers		
<b>Costs, compared to status quo</b>			
<u>Regulated parties</u>		0.4 per annum	Medium
Savings to Industry through fewer data errors and lower data entry costs)			
Regulators		N/A	
Wider government		N/A	
Other parties		N/A	
<b>Total Monetised Benefit</b>		0.4	
<b>Non-monetised benefits</b>	Dashboards summarising catch information Better ability to monitor catch through time Tighter Licensed Fish Receiver reporting More precision in TAC/TACC setting Market access better supported than for current state Better catch effort and position information for MPI Compliance to analyse and take timely action where required Currently, permit holders receive a deemed value bill for species caught without ACE, then source ACE to cover their catch. With ER providing near real-time information, the permit holder will be able to source ACE before balancing rather than retrospectively.	(High, medium or low)	

#### **5.4 OPTION 3: ELECTRONIC REPORTING AND GEOSPATIAL POSITION REPORTING FOR PERMIT HOLDERS FROM 1 OCTOBER 2017, AND A PHASED INTRODUCTION OF ELECTRONIC MONITORING ON VESSELS FROM 1 OCTOBER 2018 (MPI'S PREFERRED OPTION)**

##### **What unintended impacts is this option likely to have?**

90. The main features of Option 3 are as in Option 2, as well as:

- a) EM will be rolled out on a phased basis from 1 October 2018. EM will be phased in amongst willing adopters and other fisheries based on an evaluation of risks to the management regime (e.g., fishstock and protected species sustainability, compliance).

91. Important points to note about EM are that:

- a) The Fisheries Act 1996 provides legislative authority to require the installation of equipment to “observe fishing and transportation”.
- b) The Search and Surveillance Act 2012 allows for the placement of cameras on fishing vessels for the purposes of constant (24/7) monitoring, verification and compliance as long as regulations are made under sections 227A and 297(1)(ca) of the Fisheries Act 1996 to require the installation of cameras on fishing vessels (compulsory installation). Vessel operators would be required to install cameras and collect imagery, and then provide the imagery to MPI.
- c) While cameras can provide services analogous to many of the monitoring and verification functions an Observer carries out, there are some key differences in these capabilities. For example, cameras obviously cannot conduct biological sampling.
- d) Therefore, in some cases, Observers will still be placed on vessels that are required to carry EM. For example, observers may conduct research data collection (e.g., sampling of length frequencies, otoliths and so on). In addition, Observers may be placed where there may be compliance concerns, including with EM requirements.
- e) At the discretion of the Director-General of MPI, vessels carrying EM technology may be required to submit to MPI Vessel Specific Monitoring Plans (VSMP). The plans will set out the information on fishing activities that cameras will monitor (i.e. what cameras need to “see”) and how on-board practices will ensure the capture of this information (e.g., crew obligations regarding catch handling). Plans will be reviewed and approved by MPI. These plans will vary from vessel to vessel and with fishing method. To take an example, a typical VSMP for a longliner would include requirements to capture imagery showing setting and hauling, catch handling and discarding.

92. The main unintended consequence of Option 3 may be a short-term reduction in the profitability of some vessels and rationalisation of effort in the fishing industry, while the longer term benefits of IEMRS accrue.

93. By far the majority of permit holders are linked to a single vessel, therefore the costs of IEMRS will be spread across vessel operators.

94. The extent of potential rationalisation of fishing effort in the industry arising from the requirement to carry and operate IEMRS technology is impossible to quantify with any certainty. Some of the submissions from commercial fishers mentioned that the cost could cause them to exit the industry. However, MPI does not hold information on the profitability of fishing operations or the income that fishers derive from their activities.

95. However we are able to draw some inferences from a profile of the age of vessels, the value of landings, the number of days fished per year, and the age of individual permit holders.

**Table II: Age Profile of NZ fishing fleet 2014-2015 fishing year**

Decade vessel built	Number
Pre-1940s	10
1940s	15
1950s	19
1960s	98
1970s	212
1980s	242
1990s	273
2000s	226

**Table III: Age profile of permit holders 2017**

Age group	Number of individual permit holders <sup>18</sup>
0-39	80
40-49	114
50-59	196
60+	238
<b>Total</b>	<b>628</b>

96. During the 2014-15 fishing year, 154 vessels (all in the inshore fisheries) reported fishing for less than 20 days<sup>19</sup>, while 194 vessels reported landing less than \$20,000 worth of fish.

97. The conclusions we can draw from the above information are that:

- a) The inshore fleet is aging –12 percent of commercial fishing vessels are 50 years or older, with some having been built prior to the Second World War;
- b) One sixth of the commercial fishing fleet may be marginally viable at best, judging by the information that MPI holds on the value of fish landed and the number of fishing days fishers reported undertaking. Many of the fishers operating these vessels could be characterised as “lifestyle” fishers;
- c) The cost of cameras appears likely to have significant impacts for at least some operations, given that the cost in some cases exceeds the reported value of the amount of fish landed per annum; and
- d) The age profile of permit holders, with nearly 40% of individual permit holders 60 years or over, would suggest that some may choose to retire from the industry rather than continue with learning and implementing the requirements for IEMRS technologies.

<sup>18</sup> Note that this table refers only to individual permit holders, not companies. There are 629 permit holders that are individuals, partnerships or trusts. For the trusts and partnerships we have used the age of the oldest trustee or partner. There is one individual who did not record a date of birth so there are only 628 included in this table.

<sup>19</sup> Multiple vessel may be registered to one permit holder.

98. Significant improvements to the fisheries management system have resulted in rationalisation in the past. For example, substantial rationalisation occurred when the QMS was introduced in 1986. Over the course of 18 years from 1984-2002, the number of domestic vessels declined by over 1,000 (from 2,747 to 1,700).<sup>20</sup> A more recent example is that the number of vessels fishing for southern bluefin tuna reduced by 50% over a several years when the species was introduced into the QMS in 2004.
99. Therefore, where rationalisation has occurred in the past, catching capacity has been redistributed amongst remaining operators. This would lead MPI to believe that while there will be some rationalisation of effort resulting from the requirement to carry and operate cameras, this will not affect Industry's overall ability to catch commercial allowances. Potential rationalisation will in any effect be mitigated by the phased-in implementation of cameras on a risk-based approach (discussed in more detail in the implementation section of this RIS).

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<sup>20</sup> Statistics New Zealand

## 5.5 SUMMARY TABLE OF COSTS AND BENEFITS – OPTION 3: ELECTRONIC REPORTING AND GEOSPATIAL POSITION REPORTING FOR PERMIT HOLDERS FROM 1 OCTOBER 2017, AND A PHASED INTRODUCTION OF ELECTRONIC MONITORING ON VESSELS FROM 1 OCTOBER 2018 (MPI'S PREFERRED OPTION)

Affected parties (identify)	Comment: nature of cost or benefit (eg ongoing, one-off), evidence and assumptions (eg compliance rates), risks	Impact \$m present value, for monetised impacts	Evidence certainty (High, medium or low)
<b>Estimated Costs</b>			
<u>Regulated parties</u>			
Industry direct costs (purchase, installation and servicing of reporting tools and cameras, data transmission)	Note estimated over 15 year period 2018-32	28.6	Low
Industry costs through cost recovery (review of camera footage, data storage)	Note Estimated over 15 year period Based on a number of assumptions about approach to delivery and cost recovery (outlined in Annex II)	36.3	Low
<u>Regulators</u>			
MPI costs (implementation, upgrade of catch effort database)	Note costs for IEMRS implementation team estimated over 4 year period 2018-21 Note costs for catch-effort database upgrade estimated over 15 year period 2018-32 These MPI costs are not subject to cost recovery	16.7	Medium
<u>Other parties</u>			
FishServe (building of ER receipt and aggregation systems)		1.6	Medium
<b>Total Monetised Cost</b>	Estimated over 15 year period 2018-32	83.2	
<b>Non-monetisable costs</b>	N/A	(High, medium or low)	
Rationalisation of industry			

<b>Benefits, compared to status quo</b>			
<u>Regulated parties</u>			
Industry – higher wild catch volumes at current prices – resulting from better information leading to a less precautionary approach in setting of commercial catch limits	<ul style="list-style-type: none"> <li>● Conservative assumption – 5% increase in wild catch export values, starting in year 5 (2022) at 0.5% and increasing in 0.5% increments every 2 years</li> <li>● Evidence based on in-house assessment of number of low information stocks for which catch limits are set on a precautionary basis, i.e., potentially able to be increased above current levels, and ability to move rapidly to adjust TACC in-season in response to evidence of abundance.</li> </ul>	115.9	Medium
Premium realised on newly-certified fish exports	<ul style="list-style-type: none"> <li>● Conservative assumption – 15% increase in price realised for 5% of the currently non-certified wild-catch fish exports, starting in year 4 (2021) at 0.5% and increasing in 0.5% increments every 2 years</li> </ul>	15.1	Medium
Savings to Industry through fewer data errors and lower data entry costs, and through reduction in Observer costs	<ul style="list-style-type: none"> <li>● Evidence of premium of 20% on products certified as sustainable by MSC (Banks at al, 2016)</li> <li>● Estimated saving for data entry supplied by service provider</li> <li>● Evidence of cost savings in several studies of the impact of electronic reporting, position reporting and electronic monitoring</li> </ul>	27.6	High
<b>Total Monetised Benefit</b>		158.6	Medium/High
<b>Non-monetisable benefits</b>			High
Effectiveness of government processes	<ul style="list-style-type: none"> <li>● Fisheries management decisions are better informed, more targeted to stakeholder concerns and more cost effective</li> <li>● More efficient and timely delivery of monitoring services (IEMRS) and improved compliance outcomes (more effective compliance and enforcement action)</li> </ul>		

Improved public confidence (social licence to operate)

- More certainty over management decisions (IEMRS, flexible decision making)
- The new IEMRS data is expected in time to enable a longer time to elapse between physical research surveys for specific stocks, improving the efficiency of the Government's fisheries research spend.
- IEMRS, and potential changes to the discards policy (to be considered under the Future of Our Fisheries policy programme), will give public greater confidence in the operation of current management systems (and deliver on a Ministerial commitment)
- The government, as key management agency, undertaking EBFM, fine scale management and supporting a National Fisheries Advisory Council, would provide the public with greater confidence in fisheries management

## 6 Conclusions

### 6.1 WHAT PROBLEM OR COMBINATION OF OPTIONS, IS LIKELY BEST TO ADDRESS THE PROBLEM, MEET THE INTENT AND DELIVER THE HIGHEST NET BENEFITS?

100. Option 3 is MPI's preferred option.
101. This RIS includes a qualitative (multi-criteria) analysis and an indicative cost benefit analysis as set out in 5.4 above.
102. Table IV below provides a qualitative analysis and cost/benefit of policy options and scenarios against the decision criteria set out earlier in this RIS.



**Table IV: Summary of qualitative analysis of policy options and scenarios for IEMRS against decision criteria**

<p><u>Key</u>                  ++ = substantially better than status quo                  + = moderately better than status quo                  0 = same                  -- = imposes more obligations or burdens than status quo</p>
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Decision criteria	Option 1: Current state	Option 2: Electronic and Geospatial Position Reporting for all permit holders from 1 October 2017	Option 3: Electronic Reporting and Geospatial Position Reporting for all permit holders from 1 October and a phased introduction of Electronic Monitoring on vessels from 1 October 2018 (MPI's preferred option)
<p><b>1. Effectiveness – likely effectiveness in achieving objectives</b></p>	<p><b>0</b></p> <p><u>Qualitative Analysis</u>                      This option will not meet the objectives. This option would do nothing to address the information shortfall in the current system, i.e., the collection of timely, verifiable, and independent information on fishing activity. Public confidence in fisheries will not be restored.</p>	<p><b>+</b></p> <p><u>Qualitative Analysis</u>                      This option addresses the problem of an inefficient and outdated catch-effort reporting system.                      Allows MPI to analyse catch-effort and GPR information and take timely action where required.                      Better ability to monitor catch through time                      Tighter Licensed Fish Receiver reporting                      More precision in TAC/TACC setting                      Market access better supported than for current state                      Currently, permit holders receive a deemed value bill for species caught without ACE, then source ACE to cover their catch. With ER providing near real-time information, the permit holder will be able to source ACE before balancing rather than retrospectively.                      This option does not fully address the pressing problem of our inability to verify catch and effort information, due to cost and logistical limitations on increasing already low levels of Observer coverage, particularly in the inshore fishery.</p>	<p><b>++</b></p> <p><u>Qualitative Analysis</u>                      This option addresses concerns about the collection of timely, verifiable, and independent information on fishing activity.                      Over time, IEMRS information will support better management decision-making about sustainable utilisation.                      The data collected from the three system components will be integrated in an information base that facilitates the cross-checking and verification of reported information across data sources.                      Protected species captures will be better estimated given more comprehensive monitoring coverage provided by EM.                      Together with fine-scale spatial information, more comprehensive monitoring will improve Government's ability to manage the environmental effects of fishing.                      A strong disincentive to illegally dump fish due to increased detection of fish returned to the sea by EM would have a positive impact on sustainability and the marine ecosystem more generally.                      Encourage fishers and Licensed Fish Receivers to carry or obtain ACE packages better aligned with catch mix.                      Public confidence in fisheries can be restored.</p>

Decision criteria	Option 1: Current state	Option 2: Electronic and Geospatial Position Reporting for all permit holders from 1 October 2017	Option 3: Electronic Reporting and Geospatial Position Reporting for all permit holders from 1 October and a phased introduction of Electronic Monitoring on vessels from 1 October 2018 (MPI's preferred option)
<p><b>2. Certainty</b></p> <ul style="list-style-type: none"> <li>• Clarity and certainty of rules</li> <li>• Ease of compliance</li> </ul>	<p>0</p> <p><u>Clarity and certainty of rules</u> The current patchwork situation would continue, with some industry members utilising either ER, Geospatial and/or EM technologies to differing standards and specifications, with attendant uncertainty about government requirements – this could lead some companies to adopt technology that does not meet government standards.</p> <p><u>Likelihood of compliance</u> It is unlikely that industry would commit to, or rigorously follow, a voluntary code on electronic reporting and monitoring. Industry's standards and specifications may differ from Government's.</p>	<p>+</p> <p><u>Clarity and certainty of rules</u> This option would provide clear and certain rules around reporting requirements for electronic catch reporting and geospatial position reporting. The enabling framework will be set in regulation, and standards and specifications setting out the requirements for such things as ER software and reporting of latitude/longitude etc will be promulgated in tertiary regulation.</p> <p><u>Ease of compliance</u> MPI will work with Industry on implementation of IEMRS, and intends to run a working group for fishers and conduct port-based liaison in order to ensure capability and acceptance to the greatest degree possible. MPI will apply its VADE model with a focus on information and assistance where this is preferable, but strong enforcement where needed.</p>	<p>++</p> <p><u>Clarity and certainty of rules</u> This option would provide clear and certain rules around reporting requirements for electronic catch reporting, geospatial position reporting and camera monitoring. The enabling framework will be set in regulation, and standards and specifications setting out the requirements for such things as ER and EM software and details of information to be submitted to MPI etc will be promulgated in tertiary regulation.</p> <p><u>Ease of compliance</u> MPI will work with Industry on implementation of IEMRS, and intends to run training workshops, a working group, and port-based liaison for fishers in order to ensure capability and acceptance to the greatest degree possible. Some fishers have expressed strong opposition to camera monitoring. MPI will apply its VADE model with a focus on information and assistance where this is preferable, but strong enforcement where needed.</p>
<p><b>3. Cost - new costs to industry in terms of both money and time</b></p>	<p>0</p> <p>While there would be no new administration costs imposed on Industry if the status quo remained, the slow and cumbersome paper-based system indirectly entails substantial costs on Industry.</p> <p>Errors occur on 17% of the paper forms submitted by permit holders. Common errors include the wrong year, vessel name, client number and invalid fishstocks. This results in substantial costs to FishServe – costs which are ultimately recovered from the commercial sector through the cost recovery process.</p>	<p>--</p> <p>MPI recognises that new approaches to monitoring and reporting carries some cost, and seeks to minimise this wherever possible. MPI notes that managing costs of hardware is not within the scope of the project, i.e., industry will acquire hardware directly from service providers.</p> <p>Balanced against these costs, long-term benefits will accrue in terms of reduced data entry and management costs to Industry.</p>	<p>--</p> <p>See comment for Option 2.</p> <p>Also benefits in terms of higher wild catch volumes, premium realised on newly certified fish exports and savings to Industry are over time expected to significantly outweigh Industry direct costs and costs through cost recovery.</p>

Decision criteria	Option 1: Current state	Option 2: Electronic and Geospatial Position Reporting for all permit holders from 1 October 2017	Option 3: Electronic Reporting and Geospatial Position Reporting for all permit holders from 1 October and a phased introduction of Electronic Monitoring on vessels from 1 October 2018 (MPI's preferred option)
<p><b>4. Social licence - Consumer, stakeholder and public confidence in the commercial fisheries management regime is secured.</b></p>	<p>0 Retention of the status quo will do nothing to address lack of confidence amongst consumers, stakeholders and the public in the commercial fisheries management regime. It is expected that international market access for New Zealand's wild-caught seafood will diminish over time.</p>	<p>+</p> <p>This option will go some way towards addressing concerns about social licence, however the absence of any electronic monitoring element will limit transparency and the level of confidence in the fisheries management regime. Verification of catch effort reporting at scale will not be possible.</p>	<p>++</p> <p>Option 3, including camera monitoring, is the most likely to address consumer, stakeholder and public confidence in the management regime and secure New Zealand's access to international markets over time. Robust and more comprehensive information together with significant improvements in transparency provided by monitoring will support the development of social licence for the commercial fleet. Further, stakeholder confidence in the level of commercial sector compliance with regulatory frameworks will increase.</p>

*Costs and Benefits of Option 3 (preferred option)*

103. Costs of ER and geospatial position reporting specifically are set out in Option 2. Indicative costs of EM alone are set out below:

- a) To Government: Workstation and software including licence approximately \$6,000. Software licence (if alone) sold in low volumes at about \$2,000 lease per year. (This is based on costs cited by one provider – it may be less or more for other providers). There are opportunities for cost efficiencies if purchased in bulk. FTEs required to monitor EM imagery on shore will depend upon the hours of fishing time to be reviewed. MPI is considering two options for delivery of this function – either in-house or contracted out. Regardless of the option chosen, MPI will manage the reviewing function and ensure there are no conflicts of interest between the providers of EM hardware and the MPI-managed monitoring function.
- b) To Industry: Estimated \$5,000 - \$16,000 per vessel per year for installation, equipment, set-up, travel, labour and training. A number of service providers have provided cost information to MPI on condition of anonymity. These costs are set out below:

**Table V: Costs of purchase and installation of cameras**

Service Provider	Camera / System Technology (\$NZ)	Installation (\$NZ)	Maintenance (\$NZ) per year
Company A	1,067 per camera	Dependent on system requirements	Dependent on system requirements
Company B	11,513.89 – 14,819.44	1,666.66	2290.00
Company C	10,548.61	2,650.00	2000.00
Company D	11,111.00 – 16,666.00	2,777.00	Not provided
Company E	9,722.00 – 15,277.00	1,666.00 – 3,333.00	Not provided

Costs have been calculated based on \$US-NZ exchange rate of 0.72 as at 24/1/17

104. Note that these costs are based on a whole-of-system approach rather than a camera-by-camera approach (excluding Company A). The number of cameras that a vessel is required to carry is a key contribution to systems costs.

105. The benefits of this option are:

- a) *Deterrence of discarding* – Fishers, particularly inshore fishers, operate to the specific instructions of Licensed Fish Receivers (LFRs) as to what the LFR is prepared to purchase. This has the effect, whether intended or unintended, of species the LFR does not want in many cases being discarded because there is no market (or perceived market) for those “unwanted” species or fish of certain sizes. EM will deter this practice by providing the ability to verify catch and encourage both fishers and LFRs to consider how to make use of those species. It will also encourage operators to carry or obtain an ACE package that is better aligned with the expected catch mix.

- b) *More accurate estimates of catch limits* – Due to the uncertainty surrounding catch because of discarding fish and other illegal fishing, MPI in most cases builds an estimate of “other sources of mortality” into the total allowable catch limits for fishstocks, based on an accumulation of information from Compliance and other sources. With more accurate information from EM in particular, but also ER and GPR, the levels of uncertainty will be reduced in setting catch limits for all stocks. In one scenario, if better information supports an increase in Total Allowable Commercial Catch (TACC) or better utilisation of existing TACCs to achieve a 5% increase in finfish exports at existing prices, the potential increase in export earnings could be NZ\$43.2 m annually.
- c) *Fishery certification* – Inadequate information precludes fisheries being certified for sustainability. If better information supplied by IEMRS supports third-party fishery certification of more New Zealand fisheries, for example by the Marine Stewardship Council, the associated 20-30% price premium on another 5% of NZ’s exported seafood could generate an additional NZ\$8-12 m from exports markets annually. Certification has also been shown to facilitate market placement. Annex I sets out examples of benefits predicted or accrued in other jurisdictions in which electronic reporting and monitoring have been implemented or examined.
- d) *Observers* – IEMRS technology will in future focus on verification by electronic monitoring. In some cases, Observers will still be placed on vessels that are required to carry EM. For example, observers may conduct research data collection (e.g., sampling of length frequencies, otoliths and so on). In addition, observers may be placed where there may be compliance concerns, including with EM requirements. MPI expects that under the IEMRS regime, Observer at-sea deployments will be significantly reduced, as MPI’s information needs will be met by a more holistic monitoring approach taking account of integrated electronic monitoring, catch-effort reporting and vessel position reporting.

## **6.2 IS THE PREFERRED OPTION COMPATIBLE WITH THE GOVERNMENT’S (DRAFT) ‘EXPECTATIONS FOR THE DESIGN OF REGULATORY SYSTEMS’?**

- 106. Regulatory systems are seen as assets of value to New Zealanders, not liabilities, i.e., a regulatory system is intended to deliver, over time, a stream of benefits or positive outcomes for New Zealanders in excess of its costs or negative outcomes. High net benefit, durable outcomes are more likely when a regulatory system complies with these principles.
- 107. In a general sense, the options comply with the Government’s Principles of Good Regulatory Management. We believe that the options are linked to clear objectives derived from the governing legislation (the Fisheries Act 1996), and collecting verifiable and independent information on commercial fishing activity and the environmental impacts of this activity.
- 108. MPI acknowledges that permit holders will bear the cost of purchasing and installation of IEMRS technology, and that these costs will be a potentially substantial onus particularly on smaller inshore operators (and may result in some operators leaving the industry). However, we are aiming to achieve the objectives in a least-cost way by leaving equipment and installation of equipment to fishers and service providers, thus encouraging competition and efficiency.

109. The options will be flexible enough to allow rapid response to changing circumstances by ensuring that the technical details of IEMRS are set in circular rather than regulation.
110. The options are consistent with trends in international standards and practices. The use of electronic fisheries catch and effort reporting and electronic monitoring with on-vessel automated cameras is growing internationally, while at the same time the information requirements of international seafood markets and consumers are increasing.
111. By ensuring that all permit holders are required to carry and operate IEMRS technology, MPI is being proportionate, fair and equitable in its treatment of regulated parties. We will, wherever possible, take into account any issues with particular fishing fleets by a phased roll-out of cameras.

## 7 Implementation and operation

### 7.1 HOW WILL THE NEW ARRANGEMENTS WORK IN PRACTICE?

112. MPI is responsible for implementation of IEMRS.

#### Phased Implementation

113. There will be a phased implementation of IEMRS.
114. Electronic reporting and geospatial position reporting will come into effect for all permit holders on 1 October 2017.
115. Electronic monitoring on all vessels will be phased in from 1 October 2018. MPI is documenting monitoring requirements that will include the factors entering into MPI's decision to require cameras on particular types of vessels. These factors will include:
- a) MPI's evaluation of the risks to:
    - (1) the sustainability of QMS species or non-QMS species;
    - (2) concerns about incidental catch of protected species; and
    - (3) compliance concerns about the behaviour of particular vessels or fleets.
  - b) Individual fishing permit holders carrying and operating cameras on a "willing adopter" basis; and
  - c) The extent of adoption of cameras by all vessels in fleets or fisheries on a voluntary basis and consideration of whether those arrangements meet MPI's standards and specifications.
116. The regulations will specify those vessels required to install and operate cameras by method, size and/or area and from what date. There will be an initial group of vessels required to operate cameras from 1 October 2018, with further groups of vessels specified for later dates. The regulations will be gazetted in July 2017, thus allowing

permit holders well over a year to purchase and install camera technology on their vessels.

117. Circulars specifying the technical details for IEMRS will also be issued well in advance of the implementation date. MPI will consult with the commercial sector on the likely content of the circulars. Consultation with Industry will be critical for a smooth roll-out of camera technology.

### **Transitional Arrangements**

118. When IEMRS is introduced, it may change MPI's understanding of the true levels of fish catch in New Zealand's commercial fisheries. Therefore, the transition to IEMRS will require careful management to ensure the best use is made of information collected under the current regime and using the new reporting and monitoring tools.
119. With the transition to IEMRS, it is expected that for fish stocks that are assessed, ensuring appropriate TACs and TACCs will require the implementation of analytical and management approaches which are robust to uncertainty in historical catch and effort data.
120. For assessed stocks, fishery-independent information (for example, trawl surveys) provides a mechanism to continue assessments, incorporating information collected in the past. When fishery independent information is unavailable, novel methods may be required to support the determination of TACs and TACCs while IEMRS information streams are established and bed in (for example, for a period of five years).
121. For fish stocks that are not currently assessed, the way their catch limits are set would not be affected by the introduction of IEMRS in the short term. However, IEMRS will provide information to support assessments of stock status over time.
122. Discarding policies and practices may change in the future. IEMRS technologies may be required to capture reporting and monitoring needs invoked by these policies.
123. IEMRS technologies will support more efficient and effective compliance interventions. Under IEMRS, MPI will continue to conduct compliance interventions in accordance with the VADE (Voluntary, Assisted, Directed, Enforced) model.
124. Other agencies with a substantive interest in the proposal include MBIE, Maritime New Zealand and the Department of Conservation. MPI will consult with those agencies on an on-going basis as IEMRS is implemented.
125. The government expects regulatory agencies such as MPI to adopt a whole-of-system view, and a proactive, collaborative approach to the care of the regulatory system/s within which they have responsibilities. The regulatory stewardship role includes responsibilities for:
  - a) monitoring, review and reporting on existing regulatory systems;
  - b) robust analysis and implementation support for changes to regulatory systems;
  - and
  - c) good regulatory practice.

126. MPI has not confirmed or identified any concerns with our ability to implement IEMRS in a manner consistent with the Government’s (draft) ‘Expectations for regulatory stewardship by government agencies’.
127. An implementation cycle for the IEMRS project, with accountabilities for each stage, is set out in Figure 3 below.

Figure 3: IEMRS implementation cycle



## 7.2 WHAT ARE THE IMPLEMENTATION RISKS?

128. The feedback from stakeholders, and MPI’s response to the main concerns raised, is summarised below.
129. Industry bodies represent the interests of particular groups of quota holders and fishers such as the deepwater and inshore fleets and the rock lobster industry. These bodies made a collective submission expressing conditional support for IEMRS, subject to other matters being addressed first. These issues include:

- i) Linking fisheries management objectives to the specific objectives of IEMRS;



- ii) A clear definition of information deficiencies, fishstock by fishstock;
  - iii) Consideration of wider fisheries management and policy settings;
  - iv) A detailed cost benefit and risk analysis.
130. Industry bodies state that there is insufficient information on the costs of the proposed IEMRS system and how these costs would be recovered. They also state that there is no information about the particular regulatory changes that are required.
131. Industry consider that IEMRS has significant potential to provide valuable information that could improve fisheries outcomes, and support the establishment of a joint MPI/Industry/Maori working group on IEMRS.
132. MPI welcomes the Industry bodies' conditional support for IEMRS and the establishment of a working group with a focus on the development, implementation, monitoring and review of the new system. This RIS provides further information on the costs of the proposed IEMRS system.
133. One industry group also stated that IEMRS will exacerbate an already inadequate Crown cost recovery system, by forcing the implementation and maintenance cost of cameras and technology onto Individual Transferable Quota (ITQ) owners.<sup>21</sup>
134. Potential suppliers have indicated that they consider the IEMRS proposal to be technically feasible. They have pointed out certain technical limitations, including the amount of footage collected requiring very large storage devices, the quality of the images sometimes being low or blurry, and issues linking the footage to a particular report submitted by the skipper.
135. One supplier noted video observation involves a combination of cameras to collect video images and vessel management and fishing handling procedures that will allow the video images to be observed to produce useable data. The supplier stated that the view that the processes of vessel management, video image collection, and observation are independent is a misconception. They concluded that MPI, vessel operators, and service providers thus need to work to build confidence in the integrity of systems, rather than relying on perceptions of independence (or not).
136. Te Ohu Kai Moana (TOKM) broadly supports IEMRS as a means of gathering better information for fisheries management, but expresses similar concerns to the industry submission. TOKM's concerns relate to:
- a) the costs of IEMRS;
  - b) that EM (cameras) is not a panacea;
  - c) that there needs to be a change in the compliance and enforcement regime;
  - d) TOKM's support is conditional on direct engagement between industry and MPI on the design and development of the IEMRS system.
137. MPI welcomes TOKM's conditional support for IEMRS and notes its concerns. Some of those (such as changes to the compliance and enforcement regime) are outside the scope of the IEMRS project. The direct engagement between Industry and MPI will take place within the ambit of the working group.

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<sup>21</sup> Note that MPI's proposal is for permit holders to pay for IEMRS technology, not quota holders.

138. Most iwi groups expressed support for TOKM’s submission. Many iwi groups also expressed support for the idea that amateur charter vessels (ACVs) should be subject to the IEMRS system.
139. MPI stated in its discussion paper that ACVs were at present outside the scope of IEMRS.
140. Most individual inshore commercial fishers expressed opposition to the IEMRS proposal, particularly cameras. A minority were opposed to cameras but not electronic reporting, or not opposed in principle but consider it impractical or just about “catching fishers out.” Fishers’ areas of concern relate to:
- a) The rationale for IEMRS, as many fishers state that there is no problem with monitoring and reporting as it is;
  - b) Privacy issues, i.e, some fishers object to the idea of cameras being trained upon them on a constant basis. Rock lobster fishers in Southland have been particularly vocal about this;
  - c) The cost of IEMRS technology, i.e., many fishers state that the cost of equipping their vessels with IEMRS technology is prohibitive and will lead many to exit the industry;
  - d) The capability and training required to operate IEMRS technologies. Many fishers argue that their vessels are too small to accommodate the IEMRS technologies, or that their fishing operations are incompatible with IEMRS, e.g., some eel fishers expressed concern that cameras would be placed on their ute<sup>22</sup>. Some fishers have also expressed concern about the training available and capability required to operate IEMRS technologies.
141. MPI notes commercial fishers’ views, particularly in regard to privacy, cost and compatibility.
142. In regard to privacy, MPI is the owner of ER and GPR data and EM imagery as soon as it is received. MPI will also own data taken from EM imagery. MPI will collect, store, use and release information consistent with the Official Information Act 1982 and the Privacy Act 1993. The imagery collected will be encrypted and stored to Government Protective Security Requirement standards. MPI will protect the data with a security classification from the time it is received.
143. MPI recognises that new approaches to reporting and monitoring carries some costs, and will seek to minimise these wherever possible. MPI notes that managing costs of hardware is not within the scope of the project, i.e., industry will acquire hardware directly from service providers.
144. Regarding compatibility, the application of monitoring technologies will be considered fishery by fishery.
145. Submitters also expressed concern about the timeline to implement IEMRS, with some considering it too slow, while others considered it too ambitious.

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<sup>22</sup>Though such land-based fisheries were specifically excluded from MPI’s proposals.

146. MPI acknowledges that the implementation timeframe is ambitious, however we have developed an implementation approach that includes the establishment of a commercial sector and service provider working group to work on implementation. MPI welcomes the expressions of interest from industry and service providers in participating in this working group.
147. Environmental groups expressed support for the IEMRS proposal, and believe that it should be implemented more quickly. They support all efforts to better monitor fisheries, and support efforts for timely reporting given that stock assessments and the Total Allowable Catch (TAC) are critical for the marine environment.
148. Some environmental groups have expressed the opinion that any tendering process for IEMRS technologies should be open and transparent.
149. MPI will manage the reviewing function for cameras and ensure there are no conflicts of interest between the providers of EM hardware and the MPI-managed monitoring function.
150. Recreational groups expressed mixed support for the IEMRS proposal, with some strongly agreeing, some agreeing with electronic reporting but not cameras, and others opposed entirely.
151. Amongst those recreational groups expressing concerns about IEMRS, there is scepticism that IEMRS will improve fishstocks (but should rather be part of a fisheries plan that takes all factors into account), and that cameras are not able to do everything that Observers can.
152. MPI acknowledges that while cameras can provide services analogous to many of the monitoring and verification functions an Observer carries out, there are some key differences in these capabilities. For example, cameras cannot conduct biological sampling. Therefore, in some cases Observers will still be placed on vessels that are required to carry EM for the purposes of, for instance, research data collection, or where there may be compliance concerns.

### ***The Public***

153. Members of the public generally support the proposal.
154. One submission advocated that while the IEMRS proposal may have considerable merit in the finfish fisheries, it is not appropriate for commercial fishers in some unique fisheries such as the Bluff Oyster Fishery.
155. MPI notes that the application of monitoring technologies will be considered fishery by fishery.

### ***MPI Conclusion***

156. Overall, MPI believes that no new or unexpected issues or risks have been identified in consultation that would lead us to reconsider our preferred option.
157. Underlying assumptions and uncertainties concerning the cost and benefits of IEMRS are set out in Annex II.

## **Risks around Timing**

158. There are risks around the timeframe for implementation of the electronic reporting and GPR component of IEMRS. A considerable amount of work is required by MPI to the new catch-effort database and data management. There is some uncertainty about the ability of suppliers to provide the necessary electronic record-keeping and the ability of industry to adopt the new technologies.
159. MPI is actively monitoring risks on an on-going basis and will advise the Minister for Primary Industries as appropriate. As part of that effort, MPI is establishing a working group with industry participants and service providers, to progress the implementation of IEMRS, including the necessary technical specifications and implementation planning.
160. While the intended commencement date for new regulations for electronic reporting and GPR is 1 October 2017, the Minister for Primary Industries may consider a longer lead-in time if the risks identified above are realised. In that case, the effective date would become the earliest date to achieve the policy intent of the changes proposed.
161. The following table sets out the risks MPI has identified to ER, GPR and EM, whether those risks are high, medium or low, and what MPI proposes to do to mitigate those risks:

**Table VI: Risks – Electronic Reporting, Geospatial Position Reporting and Electronic Monitoring**

<b>Electronic Reporting and Geospatial Position Reporting</b>		
Risk	High, Medium, Low	Mitigation
Levels of knowledge of the new reporting framework amongst Industry members	High	<ul style="list-style-type: none"> <li>● MPI liaison staff to work with fishers.</li> <li>● Technology service providers to work with fishers on service requirements.</li> <li>● MPI has planned communications funding for resources supporting introduction of new requirements, for example, FAQs, information sheets.</li> <li>● Administrative service provider will liaise with fishers.</li> <li>● Build on lessons learned from old ER system.</li> <li>● MPI will emphasise advantages for sectors – they will want to collect and use data using the new tools.</li> </ul>
Levels of tolerance of the new reporting framework amongst Industry members	High	See above.
MPI infrastructure (technologies, people, processes) not in place, for example, catch-effort database and contract for administrative services.	Medium to Low	Robust project management tools in place.
<b>Electronic Monitoring</b>		
Levels of knowledge of the new monitoring framework amongst industry members.	High	See table above.
Levels of tolerance of the new monitoring framework amongst Industry members, for example, fisher interference with cameras or camera views.	High	See table above. Permit holders (and others by approval) will also have the ability to view footage from their vessels on request.
Capacity demands created by the need to address compliance issues at an unprecedented scale, particularly early on in the roll-out.	Medium	To be eased by phased-in implementation from 1 October 2018.
Capacity of service/hardware providers of EM technology.	Medium	To be eased by phased-in implementation from 1 October 2018.
MPI infrastructure – ensure continuity of data management as new systems are introduced.	Medium to Low	Smooth, documented transition processes and contingencies identified before problems arise.
Functionality issues with cameras while new systems bed in.	Medium	To be worked through with service providers.
Optimising monitoring ability – a need for fine tuning of camera angles and catch-handling operations to maximise the efficacy of camera views.	Medium to Low	To be worked through with service providers.
MPI provides consistent external advice on monitoring requirements.	Low	Eased by Vessel Specific Monitoring Plan. MPI liaison staff to work with fishers. Observer may be placed on vessel to work out issues.
Expertise of reviewers – expertise and judgement expected of those people reviewing and analysing EM information.	Medium to Low	<ul style="list-style-type: none"> <li>● Ongoing audit of reviewers.</li> <li>● Robust training.</li> <li>● Clear documentation on review processes.</li> </ul>

## 8 Monitoring, evaluation and review

### 8.1 HOW WILL THE IMPACT OF THE NEW ARRANGEMENTS BE ASSESSED?

162. In the short term, MPI will produce an End of project report – a final assessment of the project’s achievements, lessons learned and how/when benefits will be measured. This will be provided initially to the project’s governance group, then shared more widely with Industry and other stakeholders.
163. MPI will on an on-going basis:
- a) Generate an automatic message to the permit holder/company owner in the event that ER or GPR technology ceases to transmit;
  - b) Evaluate fishing patterns of vessels to ensure they are consistent and that there are no anomalies;
  - c) Work with service providers and fishers to quickly resolve any technical issues with the operation of ER and GPR technology;
  - d) Authorise any requests for dispensations to shut the technologies down temporarily in the event of technical issues or accidents;
  - e) Monitor the number of infringements and penalties of the new regulations issued to vessels;
  - f) Monitor any rationalisation of effort in the commercial fishing fleet, e.g., vessel registrations and fishing permits cancelled, as this may indicate that some portion of the fleet has been unable to comply with the new reporting requirements;
  - g) Ensure that the indicators of success are being met as expected;
  - h) Keep records of complaints and investigations, follow media-related articles and liaise with representative Industry bodies;
  - i) Keep track of early adopters of IEMRS technologies and ensure that their learnings are publicised to Industry more widely;
  - j) Keep track of how many vessels MPI is monitoring at any given time and assess comparative rates of accuracy;
  - k) Maintain ongoing contact with overseas jurisdictions on implementation of IEMRS here and similar systems overseas, to ensure learnings are integrated.
164. MPI will report to the Minister, Industry organisations and other stakeholders on a regular basis on the implementation and outcomes of IEMRS. MPI acknowledges that electronic monitoring will impact different fisheries in different ways, and undertakes to inform decision-makers of those impacts, particularly any potential rationalisation that may occur.

## 8.2 EVALUATION

165. MPI will evaluate the information available to it from the above sources. We will assess:
- a) Whether the ongoing impacts are as intended;
  - b) Whether there are any unintended consequences;
  - c) What have been Industry's main concerns;
  - d) The costs to industry of implementation are they as expected? More? Less?
  - e) What have been the positive impacts?
  - f) What have been the negative impacts?

## 8.3 REVIEW

166. The introduction of IEMRS technologies will be phased, with reviews undertaken at the end of each phase.
167. Similar to existing data collection and monitoring programmes, it is expected that information collected using IEMRS reporting and monitoring will be reviewed as it is incorporated into MPI's work programmes.

## Glossary

IEMRS	Integrated Electronic Monitoring and Reporting System
EM	Electronic Monitoring
ER	Electronic Reporting
GPR	Geospatial Position Reporting
LFR	Licensed Fish Receiver
LFRR	Licensed Fish Receiver Return
QMS	Quota Management System
TCEPR	Trawl Catch Effort and Processing Return
TOKM	Te Ohu Kaimoana - The Maori Fisheries Trust
VADE	Voluntary Assisted, Directed and Enforced (MPI's approach to compliance)
VMS	Vessel Monitoring System



# Annex I

Examples of benefits predicted or accrued in other jurisdictions in which electronic fisheries reporting and monitoring systems have been implemented or examined.

Jurisdiction	Summary of benefit	Reference
Western and Central Pacific Ocean	<p>USD\$63.5m – 120m benefit across fisheries comprising approximately 2,000 vessels<sup>23</sup>, including:</p> <ul style="list-style-type: none"> <li>• ~50% fewer on-land EM reviewers as at-sea observers</li> <li>• Savings of USD\$1.1m on human observer costs if 10% of EM imagery reviewed</li> <li>• Savings of \$2.2m on human observer costs if 20% of EM imagery reviewed</li> <li>• Improved compliance with conservation measures</li> <li>• Potential price premium of 20% on product certified as sustainable by Marine Stewardship Council</li> </ul>	Banks et al. 2016 <sup>24</sup>
Australia	<ul style="list-style-type: none"> <li>• AUD\$11m benefit over observers at 100% monitoring of catch for a 10-year period for fisheries comprising 220 vessels and 32,000 days fished per year</li> <li>• ~27% cost savings delivered by EM, on 10% observer coverage</li> <li>• Eastern Tuna and Billfish Fishery: 10 month trial, AUD\$1.6m cost-recovered from industry for management, cost savings generated by EM expected at ~\$0.27m, other benefits include improved logbook recording, better compliance, less ‘observer effect’</li> <li>• EM allows access to a gillnet fishery that would otherwise be closed due to protected species interactions (Australian sea lions)</li> </ul>	<p>Lara-Lopez et al. 2012<sup>25</sup></p> <p>GSGilason &amp; Assoc Ltd 2007<sup>26</sup></p> <p>M. Gerner, AFMA, pers. comm.</p>
USA	<ul style="list-style-type: none"> <li>• Herring/Mackerel fishery: Predicted costs of EM per sea day @ USD\$326, compared to the cost of an</li> </ul>	NOAA 2015a <sup>27</sup>

<sup>23</sup> Members of the Forum Fisheries Convention, French Pacific Territories, Indonesia, Philippines, Vietnam

<sup>24</sup> Banks, R., Muldoon, G., Fernandes, V. 2016. Analysis of the costs and benefits of electronic tracking, monitoring and reporting systems applied in FFA countries and identification of the required legislative, regulatory and policy supporting requirements. Poseidon Aquatic Resource Management Ltd, Port Douglas.

<sup>25</sup> Lara-Lopez, A.; Davis, J; Stanley, B. 2012. Evaluating the use of on-board cameras in the shark gillnet fishery in South Australia. FRDC Project 2010/049. Australian Fisheries Management Authority.

<sup>26</sup> GSGilason and Associates Ltd. 2012. Benefits and costs of E-Monitoring video technologies for Commonwealth Fisheries: Discussion document. Prepared for the Australian Fisheries Management Authority.

<sup>27</sup> NOAA. 2015a. A cost comparison of at-sea observers and electronic monitoring for a hypothetical midwater trawl herring/mackerel fishery. NOAA Fisheries Greater Atlantic Regional Fisheries Office and Northeast Fisheries Center. June 2015.

observer sea day @ USD\$479

- Groundfish fishery: Predicted costs of EM Year 1 @ USD\$2.9m, then Year 2+ @ \$1.2m/year; human observer services @ USD\$3.5m per year
- NOAA  
2015b<sup>28</sup>
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<sup>28</sup> NOAA. 2015b. A preliminary cost comparison of at sea monitoring and electronic monitoring for a hypothetical groundfish sector. NOAA Fisheries Greater Atlantic Regional Fisheries Office and Northeast Fisheries Center. June 2015.

# Annex II

## Assumptions and Uncertainties

To quantify the costs and benefits of the implementation of IEMRS, the following assumptions have been made:

### *Costs*

- 60% of fishers (vessels) require new tools to comply with the new requirements (across ER, GPR and EM), at an average cost of \$1,000 per tool (for some, this may be a smartphone or tablet; others may choose a Vessel Monitoring System (VMS) tool for GPR requirements)
- 50% of fishers (vessels) adopt tools like VMS that have an annual service fee; the remaining 10% of new users adopt one that does not have such a fee
- The number of cameras required varies with the length of the vessel, ranging from 2 to 5 camera systems.
- Camera installation across the entire commercial fishing fleet will take a total of 3 years, beginning in 2018/19 with the smaller vessels. This provides an initial focus on inshore fisheries, and ensures experience is gained before installation on larger, more complex vessels later. There is potential for slippage in this timeline depending on availability of hardware and/or installers.
- On-going servicing costs for camera systems of \$1,000-2,000 per year depending on the number of cameras.
- A number of assumptions have been made regarding the approach to reviewing the camera footage. It has been assumed that 25% of overall footage is reviewed, at a speed of 4 times real-time. It has also been assumed that the number of cameras affects the number of views onscreen at one time, rather than increasing the time for review which will depend on the fishing event itself. (An average length of fishing event has been assumed across all fishing events and all gear types.) These assumptions are all subject to review following consultation and further development of technical specifications.
- Regarding reviewing personnel, the assumption has been made that 75% of their time will be spent actively reviewing footage, with 25% spent on writing reports and other related activities. This is based on international experience where 15 minutes in every hour of work time was spent on non-viewing activities. A total of 37.2 FTEs is required on this basis, given the assumed hours of footage for review, plus two managers.
- An initial assessment of data storage required indicates a possible cost of \$360k per year. However, this is subject to review.
- It is assumed that the Crown will bear the cost of upgrading the Catch Effort Database and project implementation (as per the consultation document). Industry will directly bear the cost of ER/GPR tool purchase and servicing (to the extent they do not already have them); cost of camera purchase, installation, ongoing servicing and replacement

over time; cost of data transmission. The costs of data management and footage review will also be met by industry, through cost recovery.

- Savings will be realised by the industry in data entry and management (of around \$420k per annum) from the move to electronic reporting; and in lower observer costs. For the purposes of this CBA a reduction in observer costs of 60% has been assumed – however this is subject to confirmation of the ongoing need for observers in their science/research role as opposed to their monitoring services. Observers carry out other duties on board including physical sampling/measurement of fish, which cannot be replaced by visual tools alone.
- MPI's upgrade of the Catch Effort Database has been costed as a finance lease for this analysis, at \$1.6m per annum. An assumption has been made regarding the counterfactual cost of the Database upgrade that would have been required in any event, of \$0.37m per annum.
- MPI has assumed that most permit holders will pay for a software app and fees for transmission for electronic reporting and geospatial position reporting. FishServe may step in as a provider of last resort for small fisheries, but we have assumed that the software is generic enough to accommodate most fishers. A service provider has estimated the costs for an app and transmission fees as being a monthly subscription of \$100.00.
- Under current cost recovery settings, recovery of camera review costs would not be possible. MPI is currently progressing a review of cost recovery settings within the First Principles Review of cost recovery, which will aim to amend the Rules to enable full recovery of these costs.

### *Benefit assumptions*

A conservative approach was adopted regarding the benefits of IEMRS. Two separate quantities of benefit were quantified:

- An increase in the volume of finfish exports at current prices, resulting from better information leading to a less precautionary approach to the setting of commercial catch limits. This was quantified as a total increase in wild-catch fish exports of 5%, starting at 0.5% in Year 5 and growing by 0.5% every second year.
- An increase in the number of fisheries being certified (e.g. by MSC) as a result of improved information. This was quantified as a 15% price increase for exports of wild-catch fish, excluding those fisheries already certified or which are currently in the process of being assessed for certification. Again, this was assumed to apply to only 5% of such exports, starting at 0.5% in Year 4 and growing by 0.5% every second year.
- Other benefits that are expected to arise from IEMRS and its impact on compliance – in particular, increased abundance of fisheries where there is more active avoidance of potential bycatch (which in turn will reduce catch per unit effort for fishers); and the increased commercialisation of currently low value fish stocks, which are assumed to now be landed as opposed to discarded – have not been quantified at this stage.
- In addition, it is noted that fully realising these benefits is likely to require changes to current levels of research and/or compliance operations which have not been fully

incorporated into the project implementation costs, as these are also subject to change for other reasons. There is therefore a dependency between this element of the proposal and the broader proposals for change to the Fisheries Management regime.