SUBMISSION ON PROPOSALS FOR THE WIDER ROLLOUT OF ON-BOARD CAMERAS

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1. Introduction

1.1. This is a submission on proposals for the wider rollout of on-board cameras, as described in the Consultation Document released by Fisheries New Zealand (**FNZ**) on 11 October 2021.[1]

1.2. The Environmental Defence Society (**EDS**) is an independent not-for-profit organisation conducting interdisciplinary policy research and litigation. It was established in 1971 with the purpose of improving environmental outcomes in Aotearoa New Zealand. EDS has a special interest in coastal and marine ecosystems and is currently leading research on future options for oceans system reform.

1.3. EDS is familiar with the diverse challenges that must be addressed in decision-making on fisheries management in Aotearoa New Zealand. In 2018, EDS published a report on the effectiveness of the national fisheries management framework. Findings were informed by international best practice, national data on the status of fish stocks, and more than 60 interviews with key stakeholders.[2] More recently, EDS submitted on proposals to temporarily close fishery areas to the harvest of taonga species; and proposed sustainability measures for the management of wild fish stocks.[3]

2. Summary of submission

2.1. EDS supports the prompt rollout of regulated on-board cameras on all commercial fishing vessels operating in Aotearoa New Zealand.

2.2. EDS supports the proposed scope of on-board cameras, as a minimum requirement.

2.3. EDS requests that FNZ extend the proposed scope of on-board cameras to include all:

a) deepwater trawl vessels;

b) scampi trawl vessels; and

c) small (≤ 8 m) commercial set-net vessels.

2.4. EDS generally supports the proposed prioritisation and deployment schedule for the wider rollout of on-board cameras. EDS requests that the proposed deployment schedule be amended to include an extension to the scope of on-board cameras, with the prioritisation of scampi trawl vessels over purse seine, Danish seine, and deepwater trawl vessels.

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[1] Fisheries New Zealand (2021) "*Consultation: Wider rollout of on-board cameras – Fisheries New Zealand Consultation Document October 2021",* MPI Discussion paper No. 2021/20. Available from: www.mpi.govt.nz.

[2] Peart, R. (2018) "Voices from the Sea: Managing New Zealand's Fisheries", EDS, Auckland, New Zealand.

[3] Copies of recent submissions prepared by EDS are available from: https://www.eds.org.nz

3. Background

3.1. Fishing activities have long-term and widespread impacts on the marine environment. Due to the indiscriminate nature of most fishing methods, a key impact is the incidental capture of non-target species, or undesirable (e.g., undersized or damaged) target species (*bycatch*).[4] The latest report on the state of the marine environment in Aotearoa New Zealand advises that bycatch has declined since 2002, but remains a significant pressure for many of our taonga marine species including seabirds and marine mammals.[5]

3.2. Some bycatch is of commercial value and can be landed, but less desirable bycatch is often discarded at sea. The efficiency of different fisheries varies depending on the methods used to target species, and recorded discard levels are relatively high in some offshore trawl fisheries (e.g., arrow squid and scampi).[6]

3.3. In Aotearoa New Zealand, commercial fishers are required to report the incidental capture of protected species and other non-target species in accordance with the Fisheries (Reporting) Regulations 2017.[7] Data are independently verified by on-board commercial fisheries observers (in the cases where observers are present), and used to estimate fisheries risk to protected species; monitor change in bycatch through time; and to inform fisheries management (e.g., mitigation actions).[8]

3.4. The accuracy of bycatch records is essential for the effective management of fisheries impacts on protected species and the wider marine environment. However, due to incomplete and uncertain records, low observer coverage, and inconsistencies in the previous commercial fishing reporting framework, the reliability of bycatch assessments has been limited to date.[9]

Key challenges arising out of previous bycatch reporting approach

3.5. To understand the pressure protected species face from current fishing practices, scientists have used observer data to estimate the number of interactions occurring across different commercial fisheries in Aotearoa New Zealand.[10] The findings of these assessments have cast doubt on the accuracy of fisher-recorded catch data, which report significantly lower numbers of incidental captures.[11] For example, modelled estimates of seabird deaths across

[4] For example, bycatch impacts are recognised as a serious threat to vulnerable marine species in the following publications: Office of the Prime Minister's Chief Science Advisor ("**PMCSA**") (2021) "*The Future of Commercial Fishing in Aotearoa New Zealand: a report from the Office of the Prime Minister's Chief Science Advisor, Kaitohutohu Mātanga Pūtaiao Matua ki te Pirimia*", available from www.pmcsa.ac.nz; and Ministry for the Environment & Stats NZ (2019). "New Zealand's Environmental Reporting Series: Our marine environment 2019", available from www.mfe.govt.nz and www.stats.govt.nz.
[5] MfE & Stats NZ (2019), above n 4, at page 6.
[6] FNZ (2020), "Aquatic Environment and Biodiversity Annual Review 2019-2020", compiled by the Fisheries Science Team, Ministry for Primary Industries, Wellington, NZ, at Chapter 9 'Non-target fish and invertebrate catch', from page 321, available from www.mpi.govt.nz.
[7] In particular, refer the Fisheries (Reporting) Regulations 2017, s 8, which requires permit holders to complete a non-fish species or protected fish species (NFPS) catch report if seabirds, marine mammals, marine reptiles, protected fish species, or selected benthic organisms are caught.
[8] For example, previous seabird risk assessments have relied on best available bycatch data. Refer Richard, Y., Abraham, E.R., Berkenbush, K. (2020) "Assessment of the risk of commercial fisheries to New Zealand seabirds, 2006-07 to 2016-17" New Zealand Aquatic Environment and Biodiversity Report 237, available from www.mpi.govt.nz.
[9] A detailed summary of the limitations in available bycatch data is provided in PMCSA (2021), above n 4, from page 82.
[10] Ibid.
[11] Ibid.

the bottom longline fishery were 86% higher than the number of deaths recorded by commercial fishers for the same period.[12]

3.6. While the accuracy of records can be impacted by pragmatic considerations, including challenges with species identification and estimating potential rates of 'cryptic mortality',[13] experience has also indicated that bycatch can be intentionally underreported.[14] In 2016, media reports revealed observations of commercial vessels illegally discarding substantial quantities of non-target species at sea in Aotearoa New Zealand, without recording it.[15]

3.7. Questions around the reliability and certainty of fisher records has led to an increasing reliance on observer data.[16] Yet observer coverage and effort are highly variable across fishing methods and vessel sizes in Aotearoa New Zealand, and are biased towards offshore fisheries (> 12nm).[17] Observed capture data for the 2018-19 fishing year, indicates that coverage ranged from 2.3% in bottom longline fisheries to 19.6% in trawl fisheries.[18] Observer coverage was particularly low (approx. 3%) across commercial set net fisheries, and only slightly higher across surface longline fisheries (10%).[19]

3.8. The variable scope of observer coverage has constrained the accuracy of efforts to up-scale commercial-fisheries risk assessments to account for population or species effects. For example, there has been only one observed trawl capture of Hector's dolphins, but 13 fisher-recorded trawl capture events, including six "multiple capture" events where more than one dolphin was caught.[20] Consequently, spatial risk assessments must rely on estimated "multipliers" to account for the risk of multiple capture events, though the accuracy of such multipliers is uncertain.

A new approach: electronic monitoring of commercial fisheries

3.9. Studies have shown that the use of on-board cameras can improve the accuracy of bycatch reporting by fishers.[21] A pilot study in Aotearoa New Zealand investigated the efficacy of on-board cameras for the detection of black petrel captures in bottom long line fisheries in the Hauraki Gulf and Bay of Plenty areas.[22] It reviewed pre-trial capture records with trial capture records, and found the number of fisher-recorded black petrel captures doubled during the trial period. Similar findings were reported in an Australian study that found

[12] Note – this percentage was calculated based on information included in FNZ (2021), above n 1, at page 19.
[13] Refer FNZ (2020), above n 6, at pages 42 to 44, which describes the factors underpinning estimates of cryptical mortality, and how these are accommodated by risk assessment models.
[14] Morrah, M. (2016) "Exclusive: MPI reports reveal widespread illegal dumping of fish", Newshub, available from: https://www.newshub.co.nz/home/new-zealand/2016/05/exclusive-internal-mpi-reports-reveal-widespread-illegal-dumping-of-fish.html (last accessed on 6 December 2021.
[15] Morrah, M. (2016), above n 14.
[16] PMCSA (2021), above n 4, from page 82.
[17] Refer FNZ (2020), above n 6, at Chapter 9 'Non-target fish and invertebrate catch – Technical summary' from page 322.
[18] Ministry for Primary Industries ("**MPI**"), (date unreported), "Summary of observed captures", available from www.protectedspecies.nz (with summary data based on raw data held by MPI).
[19] Ibid.
[20] FNZ (2020), above n 6, at page 159.
[21] Tremblay-Boyer, L., and Abraham, E. R. (2020). Increased fisher-reporting of seabird captures during an electronic-monitoring trial. New Zealand Aquatic Environment and Biodiversity Report No. 238. 32 p.; and Emery, E., Noriega, R., Williams, A., and Larcombe W. (2019) "Changes in logbook reporting by commercial fishers following the implementation of electronic monitoring in Australian Commonwealth fisheries" Marine Policy, 104, pp 135-145.
[22] Tremblay-Boyer, L., and Abraham, E.R. (2020), above n 21.

there was a statistically significant increase in the number of reported vessel interactions with protected species following the rollout of electronic monitoring tools.[23]

3.10. While on-board cameras can provide a useful opportunity to independently verify bycatch records and compliance with required mitigation practices; these studies demonstrate that on-board cameras may also have a positive impact on the accuracy of fisher reporting.

The rollout of on-board cameras in Aotearoa New Zealand[24]

3.11. In August 2015, the (then) Minister for Primary Industries initiated a high-level review of the information-gathering system for commercial fisheries in Aotearoa New Zealand. The purpose of the review was to focus on improving the quality of information available to support fisheries management decisions, including opportunities created by the emergence of new electronic monitoring technologies.[25]

3.12. The review found that the existing reporting systems were not fit for purpose, and that the quality of fisheries data could be improved by *inter alia*:[26]

a) a shift to mandatory electronic reporting;

b) the collection of finer scale geographic information on commercial fishing activity; and

c) the installation of cameras on commercial fishing vessels.

3.13. The Minister obtained approval to develop a Digital Monitoring Programme for commercial fisheries in Aotearoa New Zealand, comprising electronic catch reporting; electronic vessel position reporting; and electronic camera monitoring of vessels.[27] The aim of the Digital Monitoring Programme was to improve information on commercial fishing to resolve key fisheries management issues, including (but not limited to) protected species bycatch and illegal disposal activities.[28]

3.14. In 2017, three separate Regulations were promulgated by the Governor-General under s 297 of the Fisheries Act 1996 to establish a mandatory framework for electronic monitoring of commercial fishing activities in Aotearoa New Zealand. The Fisheries (Electronic Monitoring on Vessels) Regulations 2017 (**EM Regulations**) formed one part of this framework, and required the installation of video cameras on all commercial fishing vessels.

3.15. The rollout of cameras on vessels has faced considerable delay and controversy. Although the EM Regulations came into force on 1 October 2018, exemptions were immediately granted for commercial fishing operators, pending clarification of technological requirements.[29] Subsequent delays and additional exemptions have meant that, three years

[23] Emery *et al*. (2019), above n 21.
[24] This section relies on the detailed summary described in *Commercial Fishers Whanau Inc v Attorney-General* [2019] NZHC 1204.
[25] Above n 24, at [8].
[26] Above n 24, at [9].
[27] Above n 24, at [10].
[28] Above n 24, at [11].
[29] MPI (2018), "Exemption from compliance with Part 1 of the Fisheries (Electronic Monitoring on Vessels) Regulations 2017", available from: https://www.mpi.govt.nz/dmsdocument/30927/direct.

on, the EM Regulations are operative in respect of only one group of commercial fishing vessels.

3.16. In May 2019, a group of 65 small commercial fishing operators (Commercial Fishers Whanau Inc) sought judicial review of the EM Regulations (and other regulations), on the basis that the requirement to install on-board cameras amounted to an "*unacceptable breach of their rights to privacy*" and was therefore *ultra vires*.[30] The High Court found that none of the grounds of challenge were made out, and the application was unsuccessful.[31]

3.17. On 1 November 2019, the EM Regulations took effect for 28 fishing vessels operating in the Māui dolphin habitat, off the West Coast of the North Island.[32] The EM Regulations require that all commercial trawl vessels (≤ 29m) and set net vessels (≥ 8m) operating in the area have on-board cameras.[33] This action was described as 'stage one' in the wider rollout of on-board cameras, and was funded by the Government as a proof of concept.[34]

Consultation on the wider roll out of on-board cameras

3.18. On 11 October 2021, FNZ released a Consultation Document on the wider rollout of on-board cameras across commercial fisheries in Aotearoa New Zealand. The Consultation Document specifically requests feedback on:

a) The proposed scope of vessels required to operate on-board cameras;

b) The proposed deployment schedule and prioritisation of different commercial fisheries; and

c) The fishing industry's contribution towards the costs of the wider rollout.

3.19. EDS supports the wider rollout of on-board cameras across commercial fisheries in Aotearoa New Zealand. EDS also supports the defined objectives for on-board cameras, which extend beyond the verification of bycatch to include audits of required or recommended mitigation practices.[35] EDS considers on-board cameras represent an innovative and pragmatic tool that will enhance fisheries management and therefore improve outcomes for our taonga marine species.

3.20. This submission comments on the proposed scope of on-board cameras; and the proposed deployment schedule. EDS supports the proposed cost recovery framework, and fishing industry's contribution towards the costs of the rollout, and therefore, detailed comments are not included on this matter.

4. Proposed scope of on-board cameras

Proposal

[30] Above n 24, at [70].
[31] Above n 24, at [105.
[32] Fisheries (Electronic Monitoring on Vessels) Regulations 2017, Schedule 1.
[33] MPI (2021) "The rollout of on-board cameras on 1 November 2019", available from: https://www.mpi.govt.nz/fishing-aquaculture/commercial-fishing/fisheries-change-programme/on-board-cameras-for-commercial-fishing-vessels/the-rollout-of-on-board-cameras-on-1-november-2019/#guidance-docs
[34] FNZ (2021), above n 1, at page 20.
[35] FNZ (2021), above n 1, at page 23.

4.1. The Consultation Document advises that on-board cameras will be prioritised on vessels which pose the greatest risk to protected species and / or have significant amounts of fish bycatch.[36]

4.2. The proposed criteria for "in-scope" vessels that will require on-board cameras is:[37]

a) Vessels using the method of trawling that are ≤ 32 m in overall length (excluding those which target scampi);

b) Vessels using the method of set netting that are ≥ 8 m in overall length; and

c) Vessels using the method of surface longline, bottom longline, Danish seine or purse seine.

4.3. Based on information contained in the Consultation Document, EDS understands the proposed scope of on-board cameras will exclude:[38]

a) 30 large (≥35 m) deepwater trawl vessels that primarily target squid, hoki, and orange roughy;

b) 11 medium sized (20-32 m) trawl vessels, which exclusively target scampi; and

c) Between 120 and 130 small (≤ 8 m) set net vessels, which generally target flatfish or mullet in semi-enclosed waters such as rivers, harbours or estuaries.

Comments on the proposed scope

4.4. EDS supports the proposed scope of regulated on-board cameras as a minimum requirement. EDS considers the proposed inclusion of all surface and bottom long-line fisheries particularly valuable, as these methods pose a significant risk to our highly vulnerable seabird populations. EDS has concerns about the potential for the proposed scope to create monitoring blind-spots across mid to deep water trawl fisheries and inshore set-net fisheries. Consequently, EDS supports an extension to the proposed criteria, to include on-board cameras on all trawl and set net fisheries.

Comments on the proposed exclusion of deepwater trawl fisheries

4.5. Bycatch from deepwater fishing activity is considerable, with nearly 65,000 tonnes caught each year, and 16,000 tonnes legally discarded.[39] Records indicate that observers monitor approximately 25% of deepwater trawls,[40] and coverage is highly variable between fisheries.

4.6. Chapter 9 of the latest Aquatic Environment and Biodiversity Annual Review 2019 to 2020 (**AEBAR**) summarises the best available information on observer coverage trends across deepwater fisheries in Aotearoa New Zealand.[41]

[36] FNZ (2021), above n 1, at page 30.
[37] FNZ (2021), above n 1, at page 30.
[38] FNZ (2021), above n 1, at page 29.
[39] FNZ (2020), above n 6, at page 322. Note that the cited value relates to best available data as of 2017.
[40] National Institute of Water and Atmospheric Research ("**NIWA**") (date unreported) "Trawl fisheries bycatch", available from https://niwa.co.nz/fisheries/tools-resources/deepwater-trawl-fisheries-bycatch-and-discards (last accessed on 6 December 2021).
[41] FNZ (2020), above n 6, from page 322.

4.7. The AEBAR summary illustrates observer coverage has been consistently high across the arrow squid fishery, ranging from 28% to 40% between 2006-07 and 2010-11, and then increasing to between 90% and 97%.[42] The level of coverage across the arrow squid fishery is distinct, and responds to concerns about the incidental capture of the nationally critical New Zealand sea lion.[43] The long-term level of coverage in the orange roughy, oreo, arrow squid, and southern blue whiting trawl fisheries has covered more than 18% of the targeted catch, with inter-annual variability in observer effort.[44] However, in comparison, observer coverage in the scampi fishery has been relatively low, at less than 12% of the targeted catch. The AEBAR notes that for the 2002–03 to 2015–16 period, annual coverage of the scampi fishery was below 10% in 8 of the 14 years.[45]

4.8. EDS considers the level of observer coverage is not high enough across most deepwater fisheries to warrant their exclusion from the proposed scope of regulated on-board cameras.

4.9. The foraging behaviours of seabirds means they are vulnerable to incidental capture by trawl gear. Interactions between seabirds and trawl nets in deepwater trawl fisheries have been responsible for a significant proportion of recorded seabird captures. The most recent assessment of seabird captures in New Zealand waters found the highest number of fishery-related seabird deaths occurred in trawl fisheries, with a total of 6,249 deaths occurring between 2002-03 and 2017-2018 (noting this assessment was limited to 10 species and species groups only, and therefore total bird captures are likely to be higher than this estimate).[46]

4.10. Over this extended period, the assessment indicates that the highest number of total estimated captures by trawl fishing activities were of the white-chinned petrel, followed by the sooty shearwater, white-capped albatross, Buller's albatrosses and Salvin's albatross.[47]

4.11. All of these seabird species, excluding the white-chinned petrel are identified as being threatened or at risk of extinction.[48] The nationally critical Salvin's albatross is assessed as facing an immediate, high risk of extinction.[49] The white-capped albatross and sooty shearwater populations are in decline, and it is evident that more effective mitigation measures are required to reduce the pressure exerted by commercial trawl fisheries on these iconic species.[50]

4.12. EDS considers the scope of on-board cameras should be extended to include deepwater trawl vessels. Observations of seabird captures are particularly uncertain because of the potential for 'cryptic mortality', whereby birds that are captured during fishing operations are lost to sea during hauling, and therefore unrecorded in bycatch data. Electronic monitoring practices cannot easily overcome the challenges of cryptic mortality, and therefore this uncertainty can only be accommodated by statistical modelling methods. To

[42] FNZ (2020), above n 6, at page 336.
[43] FNZ (2020), above n 6, at page 336.
[44] FNZ (2020), above n 6, at page 353.
[45] FNZ (2020), above n 6, at page 353.
[46] Abraham, E.R., and Richard, Y. (2020) "Estimated capture of seabirds in New Zealand trawl and longline fisheries to 2017-18" New Zealand Aquatic Environment and Biodiversity Report No. 249, at page 9, available from https://files.dragonfly.co.nz/publications/pdf/.
[47] Abraham, E.R., and Richard, Y. (2020), above n 46, at page 9.
[48] Refer to the threat classification summary in FNZ (2020), above n 6, at pages 222 to 226.
[49] Department of Conservation ("**DOC**") (date unreported) "Salvin's albatross", available from https://www.doc.govt.nz/nature/native-animals/birds/birds-a-z/albatrosses/salvins-albatross/, last accessed on 6 December 2021.
[50] Refer DOC (date unreported) "New Zealand's threatened birds", available from: https://www.doc.govt.nz/nature/conservation-status/threatened-birds/, last accessed on 6 December 2021.

minimise uncertainty in seabird risk assessments, and understand the impacts of commercial fishing-related mortality on seabird populations, it is therefore critical that fisher bycatch records are accurate and verifiable. On-board cameras provide an opportunity to improve this capacity across all deepwater trawl fisheries.

4.13. EDS considers the inclusion of deepwater trawl vessels within the scope of the proposed on-board camera regulations will also provide an opportunity for FNZ to better understand compliance with, and efficacy of, mandatory seabird mitigation measures (e.g., warp mitigation). It is important that effective technologies are developed to reduce fisheries pressure on vulnerable populations, and EDS considers the use of on-board cameras will provide a useful opportunity to gather information that enables the development of evidence-based mitigation approaches.

4.14. Seabirds are not the only protected species that are incidentally captured during deepwater trawl fishing operations. Between 2017-18 there were 80 observed captures of New Zealand fur seals across deepwater trawl fisheries (predominately the hoki and blue whiting fisheries).[51] In addition, there have been frequent reports of incidental captures of common dolphins by hoki and jack mackerel trawl fisheries.[52]

4.15. To improve protected species protection, EDS considers it is necessary to extend the scope of on-board cameras across the full extent of deepwater trawl fisheries. This will improve the accuracy of bycatch data, and inform effective decision-making on fisheries management.

Comments on the proposed exclusion of scampi trawl vessels

4.16. EDS does not support the proposed exclusion of scampi trawl vessels from the scope of regulated on-board camera, because:

a) as previously described, observer coverage is relatively low across the scampi trawl fishery (and frequently less than 10% of the target scampi catch);

b) the scampi trawl fishery has a high rate of bycatch and the highest discard ratio of any deep-water trawl fishery; and

c) the deepwater scampi fishery poses a risk to the nationally vulnerable New Zealand sea lion.

4.17. EDS considers the relatively low observer coverage reported across the scampi trawl fishery is concerning, because the fishery is characterised by relatively high bycatch and discard levels. The high levels of bycatch are typical of other shrimp trawl fisheries internationally, and are associated with the use of fine mesh trawl nets with codends.[53] Bycatch records show that such methods are not very selective, with scampi accounting for only 19% of the total estimated catch from observed trawls targeting scampi since October 2002, meaning that over 80% of the catch is of untargeted species.[54] Common non-target species impacted

[51] FNZ (2020), above n 6, at page 126.
[52] FNZ (2020), above n 6, at page 192.
[53] Hartill, B; Cryer, N and MacDiarmid, A (2006) Reducing bycatch in New Zealand's scampi trawl fisheries. New Zealand Aquatic Environment and Biodiversity Report No. 4. 53 p.
[54] FNZ (2020), above n 6, at page 354.

by scampi trawl methods include javelinfish, bony fish, rattails, rays, skates, sharks and dogfish.[55]

4.18. Most bycatch from scampi trawls is unwanted and is subsequently discarded at sea. The AEBAR reports that since 2002-03, total annual bycatch has ranged from about 2,400 t to 5,600 t, while annual discards have ranged from about 940 t in 2003-04 to 4,100 t in 2004-05 (i.e., the discard rate is highly variable between years).[56] Data indicates that the scampi trawl fishery is the least efficient deepwater fishery, discarding approximately 3.83 kilograms of marine species for every one kilogram of scampi landed ("utilisation rate").[57] This utilisation rate is substantially higher than all other deep-water fisheries, which range from 0.01 kilograms of discards (for oreo, jack mackerel, southern blue whiting trawl fisheries) to 0.24 kilograms of discards (arrow squid trawl fishery).[58]

4.19. Past experience has shown that a reliance on fisher-recorded bycatch levels can undermine the reliability of bycatch assessments and constrain our ability to understand the impacts of fishing practices on vulnerable species and the wider marine environment. EDS considers that on-board cameras are necessary on all scampi trawl vessels, to ensure bycatch and discard data is accurate.

4.20. EDS has concerns about the potential for interactions between the scampi trawl fishery and the nationally critical New Zealand sealion. Bycatch records indicate that 18 sea lions were incidentally captured by scampi trawlers operating near the Auckland Islands (sub Antarctic fishery) between 1992-93 and 2017-18 (an annual mortality rate of 0.7 sea lions).[59] Regulated fishing mortality limits and mitigation measures (Sea Lion Exclusion Devices) have been used to reduce fishing-related mortality of sea lions by the arrow squid trawl fishery; but no similar measures have been implemented to reduce incidental capture by scampi trawl vessels. Information in the AEBAR indicates that it is possible scampi target fisheries may now pose the greatest commercial fisheries risk to the Auckland Island sea lion population.[60] Consequently, EDS considers it is essential that on-board cameras are used to verify records of protected species captures in this fishery; and to identify potential opportunities for mitigation tools to reduce the risk of incidental sea lion capture.

Comments on the proposed exclusion of small set net vessels (≤8 m)

4.21. EDS does not support the proposed exclusion of small commercial set-net vessels that are less than 8 m in overall length.

4.22. Small commercial set-net fisheries are responsible for a relatively high proportion of inshore fishing activity,[61] and occur across shallow habitats that are frequented by a wide range of rare, endemic, and taonga marine species.

4.23. The best available information indicates that the species most susceptible to incidental capture by commercial set-net fisheries (i.e. marine mammals and seabirds) are already under imminent threat due to cumulative human-induced pressures, including coastal

[55] FNZ (2020), above n 6, at page 354.
[56] FNZ (2020), above n 6, at page 355.
[57] FNZ (2020), above n 6, at page 363.
[58] FNZ (2020), above n 6, at page 363.
[59] FNZ (2020), above n 6, at page 77.
[60] FNZ (2020), above n 6, at page 80.
[61] The Consultation Document advises that out-of-scope inshore fishing activities account fort 44% of fishing effort, which are dominated by small commercial set-net vessels. Refer FNZ (2021), above n 1, at page 30.

development, habitat loss, fishing impacts (e.g., bycatch and indirect effects on prey availability), and climate change effects (e.g., ocean warming and changes in ocean chemistry).[62] EDS considers accurate data on bycatch rates from commercial set-net fisheries requires the inclusion of small vessels. This data will improve the understanding of commercial-fishing related risk to protected species; and provide opportunities for the development of effective mitigation to reduce the risk posed to these species.

4.24. A range of protected marine species including seabirds, marine mammals and sharks are incidentally captured during commercial set netting practices in Aotearoa New Zealand.

4.25. Due to the biological characteristics and foraging behaviours of penguin, petrel and shag species, these seabirds are considered particularly susceptible to capture, injury, or death in set nets.[63] A recent seabird assessment undertaken in 2020 found that, between 2014-15 and 2016-17, estimated fishery-related deaths of seabirds in set-net fisheries were:[64]

- Shark: 56 birds (*with a 95% confidence interval of 34-83 birds*);
- Flatfish: 36 birds (*17-68*);
- Minor targets: 29 birds (*14-54*); and
- Mullet: 5 birds (*1-13*).

4.26. Although these numbers appear small, population trends of frequently captured species are alarming, and demonstrate that localised depletion could have a permanent impact on vulnerable populations. Further, although available data does not differentiate between large and small set net vessels, the Consultation Document advises that small vessels are more commonly used to target mullet and flatfish.[65] If the upper confidence levels are used to estimate potential catchability of seabirds, approximately 135 birds could have been caught by small vessels operating in nearshore and harbour environments during this period.[66]

4.27. The current Standard Operating Procedures for commercial set net fisheries in Aotearoa indicate that little blue penguin, yellow-eyed penguin, Fiordland crested penguin, king shag, black pied shag, and black petrel face the greatest risk of capture in commercial set nets.[67] All of these species are currently assessed as threatened, or at risk of, extinction under the National Threat Classification System. EDS considers the cumulative impacts of commercial set net fisheries could have severe consequences for these vulnerable and iconic species.

4.28. Penguin populations are in decline, and face increasing pressure due to changing environmental conditions and prey availability.[68] In the South Island, breeding pairs of the

[62] Refer to the latest conservation status assessment reports for marine mammals: Baker, C.S., Boren, L., Childerhouse, S., Constantine, R., van Helden, A., Lundquist, D., Rayment, W., and Rolfe, J.R. (2019) "Conservation status of New Zealand marine mammals, 2019" New Zealand Threat Classification Series 29; and seabirds: Robertson, H et al. (2016) "Conservation status of New Zealand birds, 2016"; both available from www.doc.govt.nz.
[63] FNZ (2020), above n 6, at page 229.
[64] Richard, Y. et al. (2020), above n 8, at page 10 (table 6).
[65] FNZ (2021), above n 1, at page 29.
[66] Note, this estimation purposely excludes the cited values for the set-net shark fishery as these are typically described as coastal set-net fisheries (e.g., school shark fishery), and occur further offshore.
[67] Fisheries Inshore New Zealand (2020) "Harbour and Coastal Setnet: Operational Procedures for Protected Species Risk Management" Version 2.0, available from: www.inshore.co.nz, last accessed on 6 December 2021.
[68] For general information on population trends in vulnerable penguin species, refer: DOC (date unreported) "Penguins", available from: https://www.doc.govt.nz/nature/native-animals/birds/birds-a-z/penguins/, last accessed on 6 December 2021.

nationally vulnerable yellow-eyed penguin have declined by 50% since 1991.[69] Declines have also been observed in the little blue penguin and Fiordland crested penguin populations.[70] Other species are at great risk because they are vulnerable to incidental capture across multiple fisheries. The black petrel was recently assessed as facing the highest risk ("very high risk") from commercial fishing activities, with particular risk from trawl and longline fisheries.[71] Consequently, the incidental capture of black petrel during commercial set net operations could have an adverse cumulative effect on the population.

4.29. Commercial set-netting practices pose a significant threat to the nationally critical Māui dolphin and nationally vulnerable Hector's dolphin. Māui and Hector's dolphins are only found in Aotearoa New Zealand, and are one of the world's smallest and rarest dolphins.[72] The dolphins breed slowly, and reproduce every 2 to 4 years.[73] Consequently, their populations can be threatened by only occasional deaths from human-induced pressures.[74]

4.30. The habitat range of Hector's and Māui dolphins include nearshore waters, mostly in areas with high water turbidity, around the full extent of the South Island and the west coast of the North Island.[75] Although current set net restrictions apply to a large area of coastal waters (approx. 31,500km^2), there are still areas of Māui and Hector's dolphin habitat that remain unprotected.[76] For example, seaward of restricted areas, and along the west coast of the South Island, where Hector's dolphins occur. Along this coast, set-net restrictions only apply to commercial fishers over summer months, meaning there is potential for commercial set-net activity to impact Hector's dolphins.[77]

4.31. Due to the significant impact commercial set-net fisheries have exerted on Hector's and Māui dolphin populations, and the need to ensure these taonga species can recover and thrive, EDS considers the proposed scope of on-board camera criteria should be extended to include all commercial set-net vessels. EDS recognises that the scope of current EM Regulations, which apply in the Māui dolphin habitat, do not include commercial set net vessels (≤8 m). EDS urges FNZ to consider extending the scope of the Regulations to include all commercial set net vessels.

4.32. EDS considers this is particularly important because recreational set-net activities are not subject to extensive observation or monitoring. There is a residual risk that incidental dolphin captures may not be reported by recreational fishers, and full coverage of commercial set-net vessels will therefore minimise uncertainty and improve the quality of bycatch data recorded.

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[69] Richard, Y. et al. (2020), above n 8, at page 19.
[70] DOC, above n 50.
[71] Richard, Y. et al. (2020), above n 8, at page 11.
[72] MPI (2021) "Protecting Hector's and Māui dolphins", available from: https://www.mpi.govt.nz/fishing-aquaculture/sustainable-fisheries/protecting-marine-life/protecting-hectors-and-maui-dolphins/#smallest-dolphin, last accessed on 6 December 2021.
[73] Slooten, E. (1991). "Age, growth and reproduction in Hector's dolphins". *Canadian Journal of Zoology*, 69:6, 1689–1700. doi: 10.1139/z91-234.
[74] Baker, A., Smith, A., and Pichler, P. (2002) "Geographical variation in Hector's dolphin: Recognition of new subspecies of *Cephalorhynchus hectori"*, Journal of the Royal Society of New Zealand. 32:4, 713-727.
[75] MPI (2021), above n 72.
[76] MPI (2021), above n 72.
[77] Analysis on the current extent of spatial restrictions is based on maps in FNZ (2021) "*Protecting South Island Hector's dolphins: further consultation on fisheries measures, October 2021*", Discussion Paper N:2021/22 (primary consultation document), at pages 16-17.

5. Proposed deployment schedule

5.1. The Consultation Document advises that it is anticipated to take more than two years to rollout on-board cameras across proposed in-scope vessels.[78] The proposed deployment schedule comprises 10 different "priority groups" representing different combinations of fishing method and area.[79]

5.2. EDS supports the swift roll out of regulated on-board cameras, particularly as there has been substantial delay since the EM Regulations were first enacted in 2017.

5.3. EDS generally agrees with the proposed prioritisation schedule. EDS recognises that if the proposed scope of regulated on-board cameras is expanded, the deployment schedule may need to be updated. **Table 1** includes a suggested approach if FNZ decide to increase the proposed scope to include all trawl vessels and all commercial set-net vessels. EDS considers the low observer coverage and high discard rate recorded in the scampi trawl fishery means this should be prioritised. Due to relatively high observer coverage (compared with inshore observer coverage) on trawls, EDS considers the rollout of cameras on the deepwater fleet is of low priority (but remains necessary).

Table 1. Proposed deployment schedule for roll out of on-board cameras (inserted priority groups are shaded grey, and proposed numbers have been struck through).

Proposed priority group		EDS comments
1	West coast North Island trawl and set net (approx. 58-62 vessels)	EDS requests the inclusion of small ≤ 8m commercial set-net vessels within this priority group.
2	Set net North, East and South Coast South Island (approx. 23 vessels)	EDS requests the inclusion of small ≤ 8m commercial set-net vessels within this priority group.
3	Inshore trawl North, East and South Coast South Island (approx. 60 vessels)	EDS supports.
4	Surface longline national fleet (approx. 28 vessels)	EDS supports.
5	Bottom longline Northern fleet (approx. 42 vessels)	EDS supports.
6	Bottom longline rest of Aotearoa New Zealand (approx. 27 vessels)	EDS supports.
7	Inshore trawl rest of Aotearoa New Zealand (approx. 24 vessels)	EDS supports.
8	Set net rest of Aotearoa New Zealand (approx. 14 vessels)	EDS requests the inclusion of small ≤ 8m commercial set-net vessels within this priority group.
9	Scampi trawl vessels (approx. 11 vessels)	EDS requests the addition of all scampi trawl vessels via this new priority group.
~~9~~ **10**	Purse seine national fleet (approx. 5 vessels)	EDS supports.
~~10~~ **11**	Danish seine national fleet (approx. 14 vessels)	EDS supports.
12	Mid to deepwater trawl fleet (approx. 30 vessels).	EDS requests the addition of all offshore mid to deepwater trawl vessels via this new priority group.

[78] FNZ (2021), above n 1, at page 36.
[79] FNZ (2021), above n 1, at page 36.