Department of Conservation
Te Papa Atawhai

Fisheries New Zealand
Tini a Tangaroa

June 2019

Mitigation Standards to Reduce the Incidental Captures of Seabirds in New Zealand Commercial Fisheries

Bottom longline (autoline)

1. Introduction

To effectively reduce the risk of seabird captures, bottom longline vessels need to use a combination of mitigation practices that best address the risks of their individual operations. As the bottom longline fleet is highly diverse with respect to vessel size, gear set-up and on board equipment, the particulars of the mitigation practices employed may differ between vessels.

To ensure consistency in the mitigation practices employed by the bottom longline fleet, these mitigation standards document what is expected of effective mitigation practices. Mitigation standards are grouped by what the mitigation practices aim to achieve (desired outcomes).

This document also details how the mitigation standards will be implemented and how adherence to the mitigation standards will be monitored and reported.

2. Scope

These mitigation standards are applicable to all bottom longline vessels which use an automatic baiting machine to bait hooks (autoline vessels). See Appendix 1 for a characterisation of the autoline fleet.

3. Desired outcomes

1. The discharge of fish waste[1] from the vessel is managed so as not to attract seabirds to risk areas.
2. Seabirds are not able to access baited hooks during setting.
3. Seabird access to hooks during hauling is minimised.
4. The risk of deck landings or impacts against the vessel is minimised.[2]

[1] Fish waste is defined as all processing offal and all dead or damaged fish that are returned to the sea (or parts thereof).

[2] A deck landing (also known as a deck strike) is a situation when a seabird lands on a vessel and is assisted from the vessel by the crew or an observer. An impact with a vessel is a situation when a seabird collides with the superstructure of the vessel.

4. Mandatory measures

Fisheries (Seabird Mitigation Measures—Bottom Longlines) Circular 2018[3] is the legislative instrument used to mitigate against seabird captures on bottom longline vessels. In summary, the Circular requires all fishers using the method of bottom longlining to;

- Deploy a tori (streamer) line for the duration of all setting events. The tori line must be configured in accordance with the specifications prescribed in the Circular;[4]
- Either set lines at night, or weight lines in accordance with the specifications prescribed in the Circular;
- Restrict the discharge of fish waste during setting; and
- Only discharge fish waste during hauling from the opposite side on the vessel to the side on which the hauling station is located.

5. Mitigation standards

This section details the mitigation standards necessary to achieve each desired outcome and the equipment and/or operational practices currently needed to meet each mitigation standard.

Each mitigation standard will be updated as alternate technologies or operational practices are demonstrated to be effective in achieving the desired outcomes.

These mitigation standards do not replace or override any fisheries regulations, or legislation on workplace health and safety, maritime safety or other relevant subject.

Desired outcome 1: The discharge of fish waste from the vessel is managed so as not to attract seabirds to risk areas

Mitigation standards 1.1 and 1.2 are necessary to achieve desired outcome 1.

Mitigation standard 1.1:	Fish waste is not discharged from the vessel immediately before or during setting.[5]
Mitigation standard 1.2:	Fish waste is held on board for the duration of hauling[6] (when possible) with any discharge occurring in a way which minimises the risk to seabirds.

To meet mitigation standards 1.1 and 1.2, vessel operators should:

- Develop and document a fish waste management system that describes how mandatory requirements and mitigation standards 1.1 and 1.2 will be met. A copy of this document

[3] New Zealand Ministry for Primary Industries. (2018). Fisheries (Seabird Mitigation Measures—Bottom Longlines) Circular 2018. Retrieved from http://www.legislation.govt.nz/regulation/public/2018/0116/latest/whole.html#whole

[4] Only applicable to vessels greater than seven metres in overall length.

[5] 'Setting' is defined as the act of releasing the bottom longline into the water.

[6] 'Hauling' is defined as the period from when line retrieval commences to when all of the hooks are on board.

must be carried on board the vessel at all times and be accessible to, and fully understood by, all crew members.

- Ensure their vessels have the equipment needed to implement their fish waste management system (such as meal plants, holding or batching tanks and discharge chutes). All such equipment should be well maintained with sufficient spare parts kept on board to effect regular maintenance/repairs.
- Develop a fish waste contingency plan that describes what actions will be taken to meet mitigation standards 1.1 and 1.2 in the event of an equipment failure. The contingency plan should ensure that any fish waste discharge from the vessel continues to achieve desired outcome 1. Sufficient, well maintained equipment must be kept on board to allow the vessel to enact the fish waste contingency plan at short notice.
- Maintain automatic baiting machines so that bait scraps are not lost overboard during setting and baiting efficiency[7] is higher than 95%.
- Retain all fish waste on board during setting.
- Retain all used bait on board until hauling has finished.
- Retain any processing offal and dead or damaged fish on board for as long as practicable during hauling. Any discharge that does occur must be done at intervals of no less than 30 minutes and meet mandatory requirements.
- Return live fish to the sea as soon as practicable after they were taken.
- Maintain a secondary system that prevents fish waste lost to the deck or factory floor from being lost overboard. Examples of such secondary systems include equipment to minimise the volume of fish waste lost to the factory floor/deck and the use of gratings or trap systems to reduce the volume of fish waste discharged through scuppers/sump pumps (whilst still allowing the free movement and egress of water).

Desired outcome 2: Seabirds are not able to access baited hooks during setting.

Mitigation standards 2.1, 2.2, 2.3 and 2.4 are necessary to achieve desired outcome 2.

Mitigation standard 2.1:	A tori line effective at deterring birds from accessing baited hooks is deployed throughout setting.
Mitigation standard 2.2:	Hooks set during high-risk periods[8] are protected by the aerial extent of the tori line until the hooks have reached a depth of 10 metres.

[7] Baiting efficiency can be measured by using a tally counter to count 100 hooks as they leave the vessel and recording the number of non-baited hooks.

[8] High-risk periods are defined as during daylight hours (i.e. between nautical dawn and nautical dusk) and during nights three days either side of a full moon (except when there is full cloud cover). High-risk periods are defined as such because seabirds (especially albatross) are generally less active at night. Additional information regarding night setting is available in BirdLife International. (2014, September). *Bycatch mitigation fact-sheet 5: practical information on seabird bycatch mitigation measures.* Retrieved from https://acap.aq/en/resources/bycatch-mitigation/mitigation-fact-sheets/1824-fs-05-demersal-pelagic-longline-night-setting/file

Mitigation standard 2.3:	Hooks set outside of high-risk periods are protected by the aerial extent of the tori line until the hooks have reached a depth of 5 metres.
Mitigation standard 2.4:	Bait state (such as whether it is frozen) does not reduce the sink rate.

To meet mitigation standards 2.1 vessel operators should:

- Deploy a tori line throughout setting. The specifications of the tori line must meet mandatory requirements. The tori line should be fixed to the vessel at the highest practicable point and have streamers[9] spaced along the entire aerial extent of the line. The tori line must be well maintained with sufficient materials carried on board to effect repairs when necessary.
- Carry a second tori line on board and use it immediately following the loss of the primary tori line. The specifications of the second tori line must meet mandatory requirements.
- Ensure the tori line can be adjusted or repositioned so that the streamers can be positioned over the hook bearing to suit varying conditions.

To meet mitigation standard 2.2 vessel operators should:

- Use an integrated weight line (IWL) with a lead core of at least 50 g/m[10]; or
- Externally weight lines so that the slowest sinking hook[11] can be demonstrably shown to reach a depth of 10 metres within the aerial extent of the tori line (refer to Section 8: Sink rates); or
- Conduct setting outside of high-risk periods if mitigation standard 2.2 cannot be met.

To meet mitigation standard 2.3 vessel operators should:

- Use an IWL with a lead core of at least 50 g/m; or
- Externally weight lines so that the slowest sinking hook can be demonstrably shown to reach a depth of 5 metres within the aerial extent of the tori line (refer to Section 8: Sink rates).

To meet mitigation standard 2.4 vessel operators should

- Use bait that is sufficiently thawed (i.e. not fully frozen)

[9] Streamers should be brightly coloured and long enough to deter seabirds.

10 IWLs with a lead core of 50 g/m have proved to effectively reduce seabird bycatch (both in NZ and internationally) due to their linear sink profile and fast sinking rates. Robertson, G., McNeill, M., Smith, N., Wienecke, B., Candy, S., & Olivier, F. (2006). Fast sinking (integrated weight) longlines reduce mortality of White-chinned Petrels (*Procellaria aequinoctialis*) and Sooty Shearwaters (*Puffinus griseus*) in demersal longline fisheries. *Biological Conservation*. 132. 458–471.Dietrich, K. S., Melvin, E. F., & Conquest, L. Integrated weight longlines with paired streamer lines – best practice to prevent seabird bycatch in demersal longline fisheries. *Biological Conservation, 141* (7). 1793–1805.

[11] The location of the slowest sinking hook will vary depending on how gear is configured, but typically the hook closest to a float or furthest from a weight will be the slowest to sink.

Desired outcome 3: Seabirds access to hooks during hauling is minimised.

Mitigation standards 3.1, 3.2 and 3.3 are necessary to achieve desired outcome 3.

Mitigation standard 3.1	Hooks stay at, or near, the sea surface for the least time possible.
Mitigation standard 3.2	Seabirds are actively deterred from approaching hooks during hauling.
Mitigation standard 3.3	Any seabirds caught and released alive are handled in ways that maximise their chance of survival (whilst managing the risk to the crew)

To meet mitigation standards 3.1, 3.2 and 3.3, vessel operators should:

- Haul as quickly as practicable. If breaks are taken during hauling, all hooks must remain below 10 metres
- Utilise measures appropriate to both the vessel and the situation to actively deter seabirds from approaching hauled hooks. Depending on the vessel and the situation, suitable measures include using low pressure water sprayers,[12] sound (such as banging a gaff against the superstructure), hauling mitigation devices (such as brickle curtains) and/or vessel manoeuvres.
- Instruct the deck crew in safe seabird-handling procedures and protocols and ensure these procedures and protocols are adhered to.

Desired Outcome 4: The risk of deck landings or impacts against the vessel is minimised

Mitigation standards 4.1, 4.2 and 4.3 are necessary to achieve desired outcome 4.

Mitigation standard 4.1	Deck lighting does not unnecessarily attract or disorientate seabirds.
Mitigation standard 4.2	Seabirds are not induced to land on the deck due to the presence of fish waste.
Mitigation standard 4.3	Any seabirds that land on deck or impact with the vessel and are released alive, are handled in ways that maximise their chance of survival (whilst managing the risk to the crew).

To meet mitigation standards 4.1, 4.2 and 4.3, vessel operators should:

- Minimise all deck lighting (including outward facing lights) that is not necessary for ship or crew safety, especially when the vessel is sheltering or anchored near seabird breeding colonies.

[12] Deck hoses must be used carefully, as they may harm seabirds.

- Clean the deck and fish waste-handling equipment (such as fish bins) regularly, so that excess fish waste is removed.
- Instruct the deck crew in safe seabird-handling procedures and protocols and ensure these procedures and protocols are adhered to.

6. Implementation

The mitigation standards outlined above are implemented through Fisheries (Seabird Mitigation Measures—Bottom Longlines) Circular 2018 and non-regulatory management measures (as set out in the *Ling Bottom Longline LIN 2-7 Operational Procedures).*[13] Bottom longline operational procedures apply to all vessels that target ling in fish stocks LIN 2 – LIN 7 and are agreed between ling quota holders, vessel operators and Fisheries New Zealand.[14]

Bottom longline operational procedures are implemented and administered by the Deepwater Group Ltd, an organisation which represents the majority of deepwater quota holders. The Deepwater Group contracts an environmental liaison officer (ELO) to oversee bottom longline operational procedures and associated processes. The ELO visits most vessels annually[15] to train crew and review adherence to bottom longline operational procedures. The number of vessels visited by the ELO is reported annually by Fisheries New Zealand[16] and will be included in the seabird annual review report.

7. Verification

Vessel adherence to the mitigation standards is verified through Fisheries New Zealand observer coverage. After each trip, the observer completes a bottom longline operational procedures observer review form (Appendix 2). Fisheries New Zealand discuss the review form with the observer and then sends it to the ELO to follow up on any issues with the vessel operator. The outcome of any follow-up actions are reported to Fisheries New Zealand quarterly and will be reported annually in the seabird annual review report.

During their trips, Fisheries New Zealand observers also inspect and measure both the tori line and the configuration of the fishing gear. Observers record their findings on either the tori line details form (Appendix 3) or the bottom longline gear form (Appendix 4).

The autoline fleet is moderately well observed with approximately 17% of hooks observed between the 2014/15 and 2017/18 fishing years. The level of observer coverage of the autoline fleet will be annually reported in the seabird annual review report.

---

[13] Deepwater Group. (2018). Ling bottom longline LIN 2-7 operational procedures. Version 3.0. Retrieved from https://deepwatergroup.org/newsresources/op-manual/

[14] As all autoline vessels target ling stocks LIN 2 – LIN 7 for some, or part of the year, Bottom Longline Operational Procedures are applicable to all autoline vessels.

[15] The ELO prioritises visiting new vessels and those deemed 'higher risk' due to the number of reported captures or other issues.

[16] https://www.mpi.govt.nz/dmsdocument/33340-annual-review-report-for-deepwater-fisheries-201718

8. Sink rate

A bottle test provides a simple, cheap method for an observer, liaison officer or fisher to establish the sink rate of bottom longline gear.

To conduct a bottle test, attach an empty plastic bottle to a clip using 10 metres of monofilament or rope. During setting, clip the bottle to the mainline next to the slowest sinking hook and throw it overboard. Once the bottle has been pulled under the water, the mainline will be 10 metres deep.

The Commission for the Conservation of Antarctic Marine Living Resources[17] and fishers in New Zealand[18] have developed very similar protocols for conducting bottle tests on bottom longline gear. When the tests are conducted at night, a light stick can be substituted for a bottle.

Bottle tests should be conducted regularly and whenever gear set-up or setting speed is significantly changed (this makes sure that the new set-up meets the mitigation standards). The tests should also be conducted at random intervals along the line (this makes sure that all hooks are sinking at the required rate).

An additional document with more detailed information on how and when to conduct bottle tests will be distributed to skippers and crew by the ELO.

Measuring aerial extent

The aerial extent of a streamer line can be measured by accurately measuring the distance between streamers and counting the streamers until the streamer line touches the water. Alternatively, it can be measured by streaming a separate rope, graduated in metres and with a tension-generating device on the end, until the streamer line touches the water.

[17] CCAMLR Conservation measure 216/XX: Experimental line-weighting trials. Retrieved from https://www.ccamlr.org/sites/default/files/216-XX.pdf

[18] JPEC Ltd. (2014, December). *Bycatch bylines*. Issue 13. Retrieved from https://www.doc.govt.nz/globalassets/documents/conservation/marine-and-coastal/marine-conservation-services/bycatch-bylines/bycatch-bylines-december-2014.pdf

Appendix 1: Characteristics of the autoline fleet

Autoline vessels are typically large between (19 and 46m in length), very active (fishing up to 300 days per year) and deploy a large number of hooks per set (up to 30,000). Collectively, the seven autoline vessels active during the 2017/18 fishing year set approximately 19.5 million hooks.[19]

Autoline vessels mainly operate in offshore waters. Most sets (71 percent) target ling, mainly on the Chatham Rise or in the Sub-Antarctic. Other species targeted include hapuka/ bass, school shark and bluenose.

Three autoline vessels deploy Integrated Weight lines (IWL), a hook bearing line with an integrated lead core of 50g/m. The remaining vessels externally weight lines.

Due to the larger number of hooks deployed per set, the species targeted[20] and the higher level of processing undertaken on board some vessels, autoline vessels generate larger amounts of fish waste compared to manual baiting vessels. The two largest autoline vessels operate fishmeal processing plants and therefore meal the majority of fish waste; the remainder discharge fish waste at sea.

[19] An additional autoline vessel is flagged to New Zealand and regularly operates from New Zealand ports for part of the year. This vessel was not active within the New Zealand Exclusive Economic Zone in 2017/18, although she has previously fished within New Zealand.

[20] Species such as ling and school shark are typically processed at sea.

Appendix 2: Bottom longline operation procedures observer review form

BLL Operation Procedures – Observer Review Form

Trip Number	Vessel Name	Observer name	Trip start date	Trip end date	Sets observed
		.	/ /	/ /	

Record Yes (Y), No (N), Unknown (U) or Not Applicable (N/A) in the box provided, if you answer N or U to any questions (except Items 3, 4 & 12) then please make detailed comments on the reverse.

Item 1. Did the vessel carry a copy of the DWG BLL Operational Procedures (OP) on board that was made available upon request?

Item 2. Were the crew familiar with the contents of the BLL – OP?

Item 3. Were any seabird or marine mammal *'trigger-points'* activated during the trip?
(if Y record details of the triggers and the action taken by the vessel)

Item 4. Did a gear or equipment failure event occur that increased the risk of seabird or marine mammal captures? (*if Y detail the event and the action taken by the vessel)*

Item 5. Were there any changes in crew behaviour, fishing activity, mitigation devices deployed and/or gear used following *'trigger point'* events or during 'high risk' periods (e.g. full moon, multiple capture events).

Mitigation device

Item 6. Was a tori line used for the entirety of all sets?

Item 7. When deployed was the aerial extent of the tori line adequate to reduce bird access to the baited hook line ?

Item 8. Were 'fit and proper'* streamers spaced at a maximum distance of 5 m apart along the entire aerial extent of the tori line?

Item 9. Did the vessel carry a spare tori line or sufficient parts to construct a second tori line if required?

Item 10. Was the tori line attachment point higher than 5 m above the waterline?

Item 11. Could the tori line be adjusted or repositioned so that streamers could be positioned over the backbone to suit varying conditions?

Item 12. Were any other mitigation devices used ('brickle curtain', water cannon etc.)?
(if Y record details in the comments)

Fish Waste & Bait Management

Item 13. Was all fish waste (including bait scraps) retained on board during setting?

Item 14. Was the discharge from the vessel during hauling managed/controlled as per BLL–OP (i.e. no continuous discharge with all offal/used bait held & batch discarded or mealed)?

Item 15. During hauling was all offal/used bait/whole fish either mealed or discarded on the opposite side of the vessel to which the line was hauled?

Item 16. Did baiting machines achieve a high baiting percentage and ensure all unhooked bait was retained on board and not lost overboard during setting (autoline only)?

Item 17. Was the use of totally frozen bait avoided?

General procedures

Item 18. Were all plastics (including fishing plastics such as snoods, carton strapping etc.) retained on board?

Item 19. Was setting conducted at night** or was the line weighted in accordance with legal requirements (i.e. IWL or external weighting)?

Item 20. Were spot lights shining directly astern controlled/dimmed during night setting?

Item 22. Were all seabird or marine mammal captures recorded on the MPI Non-fish Protected Species Catch Return logbook

Item 22. Were seabirds or marine mammals caught and released alive handled with due care?

Item 23. Any other comments?

**fit and proper streamers should be brightly coloured and of a sufficient length to provide a suitable deterrent to seabirds*
***night is defined as between 0.5 hours after nautical dusk until 0.5 hours before nautical dawn*

Appendix 3: Tori line details form

Tori line details form

(v3 August 2018)

Fisheries New Zealand
Tini a Tangaroa

Page___of___

Trip number	Observer code	Vessel name	Date measured (dd/mm/yy)
	.		/ /

If multiple tori lines were used, complete a separate form for each tori line.
Give each tori line a gear code starting with "T1".

Tori line gear code	Reason for measuring*	Type of record*
T		based on T

Tori mainline

Line length	Line diameter	Aerial extent	Recovery rope (Y/N)
m	mm	m	

Attachment point** Tension release (Y/N)

Height above water	Distance (laterally) from centre of the stern	Distance from stern to attachment point	Adjustable (Y/N)
m	. m to port (P) or starboard (S)	. m	

Dual attachment point (if applicable) Tension release (Y/N)

Height above water (m)	Distance (laterally) from centre of the stern
	. m to port (P) or starboard (S)

Distance from join (if present) to		Streamers between second attachment point and join (Y/N)
Stern m	Attachment point m	

Long streamers Y/N Material*

Max dist between long streamers	Paired or single	Number of long streamers/pairs	Max length	Min length	Diameter	Colour code*
m	(P/S)		. m	. m	mm	

Distance to first long streamer that reaches water	Long streamers cover aerial extent (Y/N)	Number of long streamers that touch water
m		

Light streamers Y/N Material*

Distance between light streamers	Paired or single	Number of light streamers/pairs	Max length	Min length	Diameter	Colour code*
m	(P/S)		. m	. m	mm	

Towed object (used to induce drag)

Towed object Y/N	Towed object code*	Size of towed object*
		.

*** Refer to instructions on reverse.**

Comments

Appendix 5: Bottom longline gear form

Bottom longline gear form

(v1 November 2018)

Fisheries New Zealand
Tini a Tangaroa

Page___of___

Trip number	Observer code	Gear code*	Vessel name

Main line

Material*	Diameter (mm)	Integrated weight line (gm)	Main line weights (kg)	Max float diameter (cm)

Drop line length (m)	Number of hooks between surface float and anchor	Distance between subsurface floats (m)

Weighting

Weight under subsurface floats (kg)	Subsurface float weight material*	Average distance between weights (m)	Weight material*	Number of hooks between weights	Dropper length (m)

Branch line

Material*	Snood length (cm)	Snood spacing (m)

Hooks

Hook type*	Hook size	Method of baiting*

Comments

*** Refer to instructions on reverse.**