



A characterisation of the emerging pot fishery for ling

New Zealand Fisheries Assessment Report 2026/15

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ISSN 1179-5352 (online)
ISBN 978-1-997309-36-9 (online)

March 2026



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Please cite this report as:

Middleton, D.A.J.; Steele-Mortimer, B. (2026). A characterisation of the emerging pot fishery for ling. *New Zealand Fisheries Assessment Report 2026/15*. 59 p.

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PLAIN LANGUAGE SUMMARY

Potting has recently become an important method of catching ling in many areas around New Zealand, alongside the traditional trawl and bottom longline fisheries.

Ling potting is now being undertaken by a fleet of dedicated vessels, many of which are using collapsible, cylindrical pots that are deployed on a long backbone.

This report summarises the development of the fishery using standard data sources, and identifies where further data are required. Some of these data needs can be met by modifications to the Electronic Reporting of potting.

Several plots in this report have been removed in accordance with Fisheries New Zealand's Data Confidentiality guidelines.

EXECUTIVE SUMMARY

Middleton, D.A.J.¹; Steele-Mortimer, B.² (2026). A characterisation of the emerging pot fishery for ling.

New Zealand Fisheries Assessment Report 2026/15. 59 p.

There is a long history of ling catches in pot fisheries; while this includes bycatch in the major potting fisheries for rock lobsters and blue cod, most potting catches have occurred when ling was targeted. Ling target potting effort has been carried out since the early 1990s, but was responsible for an insignificant proportion of the overall catch until the late 2010s. Since then, potting has become an important method in all Quota Management Areas, except LIN 5, responsible for 10% to 35% of the annual catch.

In the past, ling target potting was undertaken as a secondary activity by vessels involved in a range of inshore fisheries, but the recent increase in ling potting has seen the development of a fleet of vessels that undertake ling potting as their main fishing activity. Some have transitioned from bottom longlining and have developed a practice of setting lines with much larger number of pots than were used in more traditional potting effort.

Ling potting effort has been reported under a variety of fishing method codes; with the transition to the Electronic Reporting System, ling potting is now either reported as ‘fish trapping’ (FP) or ‘other potting’ (POT), whereas, previously, the ‘cod potting’ (CP) code was used extensively. At present, the FP and POT codes are essentially interchangeable, used by different vessels for similar fishing with the same fishing gear. Some vessels are using rectangular pots with a rigid frame, similar to cod pots but collapsible for storage on deck, but most ling potting vessels, and the majority of target potlifts, use collapsible cylindrical pots with a flexible, spiral structure to support the mesh. There is active development of structures that allow smaller ling and bycatch species, such as hagfish, to escape.

Ling potting was initially most common off the east coast of the South Island but has become more widespread, being undertaken on both the east and west coasts of both the North and South Islands, on the Chatham Rise, and in the sub-Antarctic. There are general similarities between the areas fished by the ling potting fishery and the more traditional trawl and bottom longline fisheries, but—at a fine scale—it appears that different areas are fished by the different methods.

The existing data systems are currently not capturing some key information about the ling potting fishery. The most important missing information relates to the pots used. With ling potting becoming an important part of the fishery, capturing information on the range of pots used, and the particular pots used on each fishing event, should be a priority.

Limited catch sampling data from the pot fishery suggests that potting may catch somewhat smaller ling than the bottom longline fishery, but with both these methods taking larger fish than the trawl fishery. More extensive sampling, with larger sample sizes per event, will be required in order to establish whether the apparent differences in selectivity are real or arise from spatial or temporal differences in the locations sampled.

An important consequence of using pots, rather than longlines, to target ling is the elimination of the risk to seabirds posed by baited hooks. However, seabird capture risks are not completely eliminated by the use of pots. The risk of whale entanglements in the vertical lines connecting the pots to the surface is also a general concern in pot fisheries. Potting is expected to have lower impacts on benthic fauna than trawling, but it is likely that a transition from longlining to potting will result in more gear touching the seabed; the nature of any benthic impacts will depend on the types of seabed fished.

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1. INTRODUCTION

Ling (LIN; *Genypterus blacodes*) was introduced to the Quota Management System (QMS) on 01 October 1986, with eight QMS stocks defined (Figure 1). Two of these stocks are managed as inshore stocks (LIN 1 in Group 2 and LIN 2 in Group 3; Fisheries New Zealand 2022), while LIN 3, LIN 4, LIN 5, LIN 6, and LIN 7 are managed as Tier 1 deepwater stocks (Ministry of Fisheries 2011). LIN 10 is considered an administrative fish stock, with a nominal Total Allowable Commercial Catch (TACC) of 10 t and no recent catches reported.

Ling are considered to be more abundant south of 40°S (Ministry of Fisheries 2011, Fisheries New Zealand 2024), and this is reflected in the catch limits for the different stocks (Table 1), with Total Allowable Commercial Catch (TACC) limits under 1000 t per annum for LIN 1 and LIN 2 but exceeding 2000 t for the more southern stocks.

Catch histories for ling are available from the early 1930s, but the ling fisheries largely developed in the 1970s and 1980s (Figure 2). TACCs for all stocks have generally been stable or increasing through the QMS era, and most stocks—other than LIN 4 and LIN 6—have had catches at or around the catch limit in most years (although catches have reduced in LIN 1, LIN 2, and LIN 3 since the late 2010s, with some indication of cyclical patterns in the catch).

Ling has generally been targeted by trawl and bottom longline fishing, and—together with hake—has also been a significant bycatch in the hoki trawl fishery (sometimes referred to as the hoki, hake, and ling trawl fishery). The trawl and bottom longline fisheries for LIN 3, LIN 4, LIN 5, LIN 6 and LIN 7 have been certified as sustainable fisheries under the Marine Stewardship Council standard since 2014 (Fisheries New Zealand 2019).

In New Zealand, potting has primarily been used to target rock lobsters (red rock lobsters, *Jasus edwardsii*, and packhorse rock lobsters, *Sagmariasus verreauxi*) and blue cod (*Parapercis colias*), although there has also been a small potting fishery for paddle crabs (*Ovalipes catharus*) (Kahawai Collective 2023). Globally, pots are important in crustacean fisheries but also used in a range of finfish fisheries including multi-species tropical reef fisheries, the black sea bass (*Centropristis striata*) fishery off the eastern US, the sablefish (*Anoplopoma fimbria*) fishery off the western coasts of Canada and the US, and the Pacific cod (*Gadus macrocephalus*) fishery off Alaska (Thomsen et al. 2010). In New South Wales, fish pots (referred to as demersal fish traps) are used in a multispecies fishery where snapper (*Pagrus auratus*) is a key target species (Stewart & Ferrell 2003).

In the early 2000s, there was a significant increase in the use of pots in the Bering Sea and Aleutian Islands sablefish fisheries to mitigate the impacts of depredation of longline catches by killer whales (Hanselman et al. 2005). Trials of pot fishing for toothfish (*Dissostichus eleginoides*) were undertaken in the South Georgia fishery with the aim of reducing accidental seabird mortality (Agnew et al. 2001).

A small amount of ling has been caught by potting since at least the early 1990s, but an increase in pot catches was noted in the mid 2010s (Ballara 2019). Some recent developments in potting methods for ling can be attributed to work that originally focussed on developing a scampi potting fishery (Gerrard 2021).

This report characterises the emerging ling pot fisheries with the aim of assessing the current (and likely future) importance of the potting method within the New Zealand fisheries, and assisting in developing a greater understanding of any new data collection that may be required in order that the potting catch can be considered in future assessments.

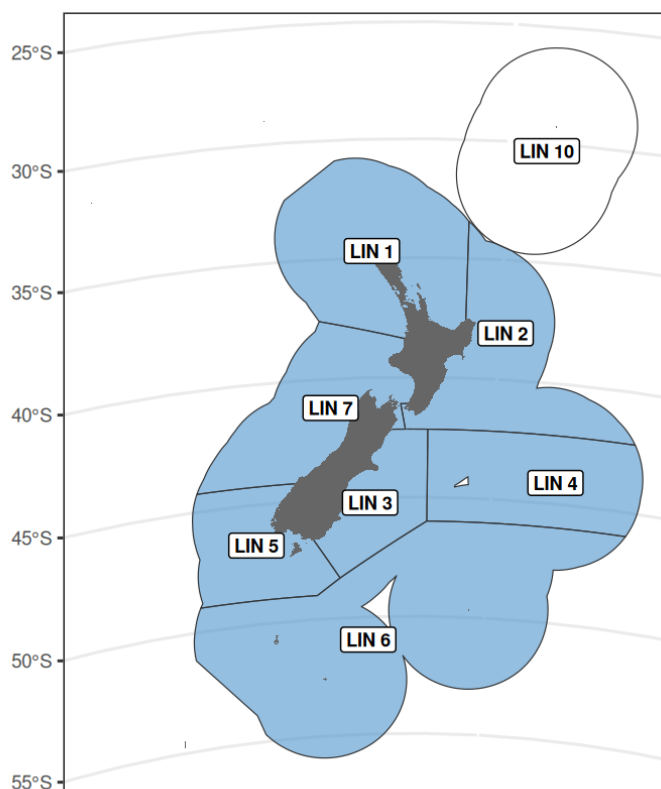


Figure 1: Quota Management Areas for ling with LIN 1, LIN 2, LIN 3, LIN 4, LIN 5, LIN 6 and LIN 7 highlighted.

Table 1: Total Allowable Catch (TAC), Total Allowable Commercial Catch (TACC), and allowances (all tonnes) for LIN 1, LIN 2, LIN 3, LIN 4, LIN 5, LIN 6 and LIN 7, as at 1 October 2025.

Stock	TAC	TACC	Allowances		
			Customary	Recreational	Other mortality
LIN 1	463	400	20	40	3
LIN 2	-	982	-	-	-
LIN 3	2060	2060	0	0	0
LIN 4	4200	4200	0	0	0
LIN 5	5314	5208	1	1	104
LIN 6	8590	8505	0	0	85
LIN 7	3458	3387	2	1	68

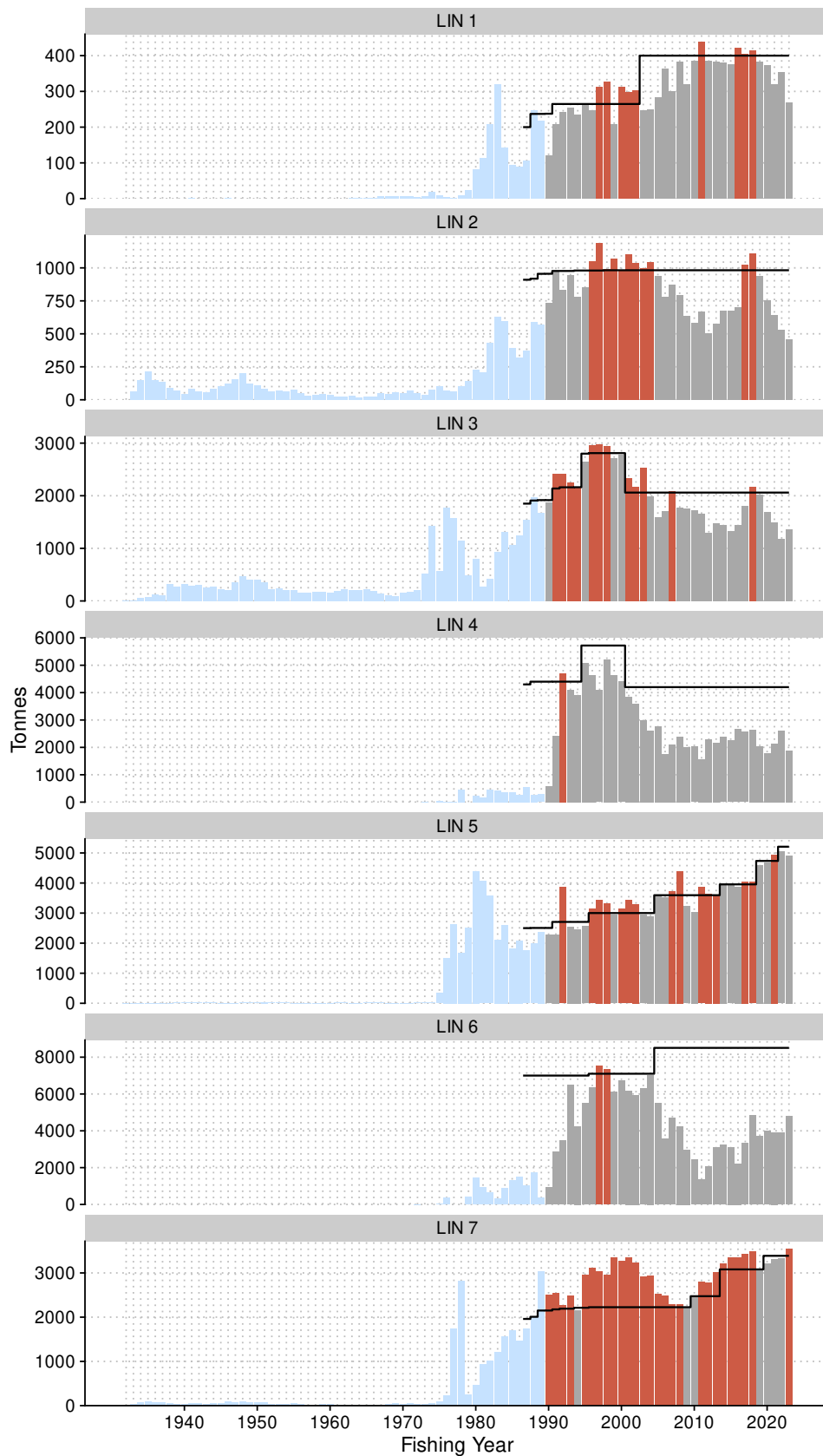


Figure 2: Total Allowable Commercial Catch (TACC; black line) and Monthly Harvest Return/Quota Management Report totals (bars) for LIN 1, LIN 2, LIN 3, LIN 4, LIN 5, LIN 6 and LIN 7 from 1990 to 2023. Years where the TACC was exceeded are highlighted in red. Catches prior to 1990 are shown in blue using the information compiled in the Fisheries Assessment Plenary Report (Fisheries New Zealand 2024). Tabulated data are provided in Table B.1.

2. METHODS

Extracts (report logs 13159, 17268) of statutory commercial catch, effort, and landings data were provided by Fisheries New Zealand and processed using standardised grooming routines (Appendix A).

All years in this report refer to the standard New Zealand fishing year which runs from 1 October to 30 September. Fishing years are labelled using the later calendar year; thus, for example, 1990 refers to the fishing year 1 October 1989 to 30 September 1990.

For a full list of acronyms used in this report, please refer to Appendix D.

2.1 Terminology

In this report we use the term **catches** to refer to the catch of legally retainable fish. Catches include any legally retainable fish that are optionally returned to the sea (for example, schedule 6 returns) but exclude those fish that *must* be returned to the sea, such as fish below the minimum legal size (MLS). Catches include declared accidental losses of fish but do not include fish that escape capture, for example by escaping through the mesh of a trawl.

For species managed under the Quota Management System (QMS) we use the term **removals** to refer to the known mortality of fish; i.e., the legally retainable catches without those fish that are optionally returned to the sea and considered likely to survive. Any mortality suffered by these returned fish is not included in removals. However, in the case of non-QMS species we include returned fish as part of the removals.

2.2 Data sources

There are three types of statutory commercial data relevant to assessing catches and removals:

- Monthly Harvest Returns (MHRs) and their forerunner, Quota Management Reports (QMRs), which we refer to as the **MHR/QMR** data;
- landings and disposals, referred to as **landings** data; and
- the **estimated catches** recorded by fishers for individual fishing events.

MHR/QMR data are the key information used in the balancing of commercial catch against the Total Allowable Commercial Catch (TACC); however, they provide information at a relatively coarse resolution of client, stock, and month. QMRs provided a record of the total monthly catch of each QMS fishstock for each quota holder, by month from December 1986 to September 2001. MHRs replaced QMRs from October 2001 and record data on harvest of both QMS and non-QMS species.

The finest-scale catch information is provided by estimated catches, which are reported per species per fishing event. However, estimated catch data are not necessarily comprehensive or accurate; this is because not all species caught are required to be reported for each event, and the quantities reported are estimated rather than weighed.

Landings and disposals provide data on the catches of all stocks, generally at the fishing trip resolution, with quantities verified (where practicable; e.g., when landed) by weighing. Under the Electronic Reporting regime introduced by the Fisheries (Reporting) Regulations 2017, these data provide a comprehensive record of catches per trip, with the fate of those catches indicated by a destination code (Table 2). However, the set of available destinations has become more comprehensive as reporting regulations have evolved and the possibility that the landings data were less complete in the past must be considered.

In some cases, landings from a trip are first recorded to an interim destination. Because these fish should subsequently be reported to a final destination, the data for the initial, non-final landings are dropped from the landings dataset used in this report, together with any landings data for categories of fish that are not legally retainable.

The **catches** and **removals** used in the remainder of this report comprise the landings for final, legally retainable destinations (Table 2).

2.3 Allocation of catches to fishing events

As noted above, the landings data that define the catches and removals for a stock are generally reported at the resolution of the fishing trip. In some fisheries, trips are lengthy (exceeding a month) and carry out fishing over a wide area; as a result, catches are most usefully *allocated* to individual fishing events. Two allocation approaches are available: *trip-based allocation* and *annual scaling*. In this report, trip-based allocation was used for all stocks and methods.

The trip-based approach allocates the catches of LIN from a trip to the fishing event records from the trip using the hierarchical method of Starr (2007). If ling was included in the estimated catch for at least one of the fishing event records on the trip, then catches were allocated in proportion to the estimated catch for each record (**Est. catch** allocation). If no estimated catch of ling was recorded on the trip, but a single fishing method was used on the trip, then catches were allocated in proportion to the number of fishing events per record (**Effort no.** allocation). If neither of the previous approaches applied for a trip then catches were allocated equally across fishing effort records (**Equal** allocation).

2.4 Conversion factors

Catches and removals in this report are reported as greenweight. However, actual weighing of the catch may take place after processing, in which case the greenweight is derived by applying a conversion factor to the measured processed weight. The conversion factors used in the statutory commercial reporting are specified by Fisheries New Zealand, by species and processed state.

The regulated conversion factors may be updated at times; occasionally this is because the nature of processing a particular species or state has changed, but usually it is because sufficient data have been collected to provide a more reliable estimate of the appropriate conversion factor. In this report, we adjust historical landings data to the current conversion factor for the species and processed state:

$$gwt_{adj} = gwt_{rep} \frac{CF_{cur}}{CF_{rep}} \quad (1)$$

where gwt_{adj} is the adjusted greenweight, gwt_{rep} is the greenweight originally reported, CF_{cur} is the current conversion factor, and CF_{rep} is the conversion factor used when the data were reported.

Table 2: Destination codes used in reporting of landings and disposals, with introduction date for codes that were not defined in the original Fisheries (Reporting) Regulations 1990. The inclusion of the landing/disposal in subsequent MHR returns is indicated in circulars issued under the Fisheries (Reporting) Regulations 2017. Only categories that are legally retainable, and considered final, are included in the catches and removals for a stock. LFR = Licensed Fish Receiver. (Continued on next page.)

Code	Description	Date		Final	Retainable	Included in		
		Introduced	Revoked			MHR	Catches	Removals
A	Accidental losses			Y	Y	Y	Y	Y
B	Retained for use as bait			Y	Y	Y	Y	Y
E	Catch eaten on board			Y	Y	Y	Y	Y
EOY	End of year landings	2017-10-01		Y	Y	Y	Y	Y
H	Losses from holding receptacles		2018-06-30	Y	Y	Y	Y	Y
HL	Losses from holding receptacles on land	2018-07-01		Y	Y	Y	Y	Y
HW	Losses from holding receptacles in the water	2018-07-01		Y	Y	Y	Y	Y
J	Observer or Fishery Officer authorised returns	2013-10-01		Y	Y	Y	Y	Y
L	Landings to an LFR			Y	Y	Y	Y	Y
LFL	Fish landed after being held live on land	2019-01-10		Y	Y	Y	Y	Y
LP	Final landing of fish from holding receptacles at sea	2018-07-01	2019-01-09	Y	Y	Y	Y	Y
LR	Final landing of retained fish	2017-10-01		Y	Y	Y	Y	Y
M	Sixth schedule returns (spiny dogfish)	2004-10-01		Y	Y	Y	Y	Y
O	Catch transported outside the EEZ			Y	Y	Y	Y	Y
PF	Predated fish	2018-07-01		Y	Y	Y	Y	Y
QL	Landings to an LFR after storing in a holding receptacle on land	2018-07-01		Y	Y	Y	Y	Y
QWM	Landings to a disposal facility after storing in a holding receptacle on land	2023-10-11		Y	Y	Y	Y	Y
S	Catch taken by a Fishery Officer or observer			Y	Y	Y	Y	Y
T	Transshipments		2018-06-30	Y	Y	Y	Y	Y
TL	Transshipments, reported as landed by the catching vessel	2018-07-01		Y	Y	Y	Y	Y
U	Used as bait			Y	Y	Y	Y	Y
W	Wharf sales			Y	Y	Y	Y	Y
WM	Landings to a disposal facility	2023-10-11		Y	Y	Y	Y	Y
Z	Returns to the sea (certain sharks, dead or near-dead)	2014-10-01		Y	Y	Y	Y	Y
BS	Biotoxin samples	2019-11-26		Y	Y	N	Y	Y
CS	Customary catch	2017-10-01	2019-11-25	Y	Y	N	Y	Y
D	Non-QMS returns			Y	Y	N	Y	Y
F	Landings as recreational entitlement	2002-07-11		Y	Y	N	Y	Y
I	Returns for safety of protected species	2022-11-01		Y	Y	N	Y	Y
UD	Return of damaged fish	2024-06-01		Y	Y	N	Y	Y
V	Observer samples	2017-10-01		Y	Y	N	Y	Y
X	Permitted returns	2006-10-01		Y	Y	N	Y	N
C	Disposal to the Crown		2001-09-30	Y	Y		Y	Y
G	Returns above legal size	2018-07-01		Y	N	N	N	N
K	Lobster required returns (not sub-MLS)	2018-07-01		Y	N	N	N	N
Y	Sub-MLS returns	2017-10-01		Y	N	N	N	N
LF	Live fish held on land	2019-01-10		N	Y	N	N	N

N	Removals from holding receptacles at sea	2018-07-01		N	Y	N	N	N
P	Placed into a holding receptacle at sea			N	Y	N	N	N
Q	Placed into a holding receptacle on land		2018-06-30	N	Y	N	N	N
R	Landings retained on board			N	Y	N	N	N
TT	Transhipments, reported as landed by the receiving vessel	2017-10-01		N	Y	N	N	N

2.5 Characterisation dataset

A fishery characterisation dataset was prepared by identifying all trips with landings or estimated catches from LIN 1, LIN 2, LIN 3, LIN 4, LIN 5, LIN 6 and LIN 7 and extracting the associated catch and effort data for fishing events within the LIN 1, LIN 2, LIN 3, LIN 4, LIN 5, LIN 6 and LIN 7 Quota Management Areas (Figure 1). Fishing events were selected based on start position (where available) or statistical area. The earlier QMS-era catch and effort data were reported at the resolution of statistical areas, and some statistical areas cannot be uniquely assigned to a single fishstock (Figure 3).

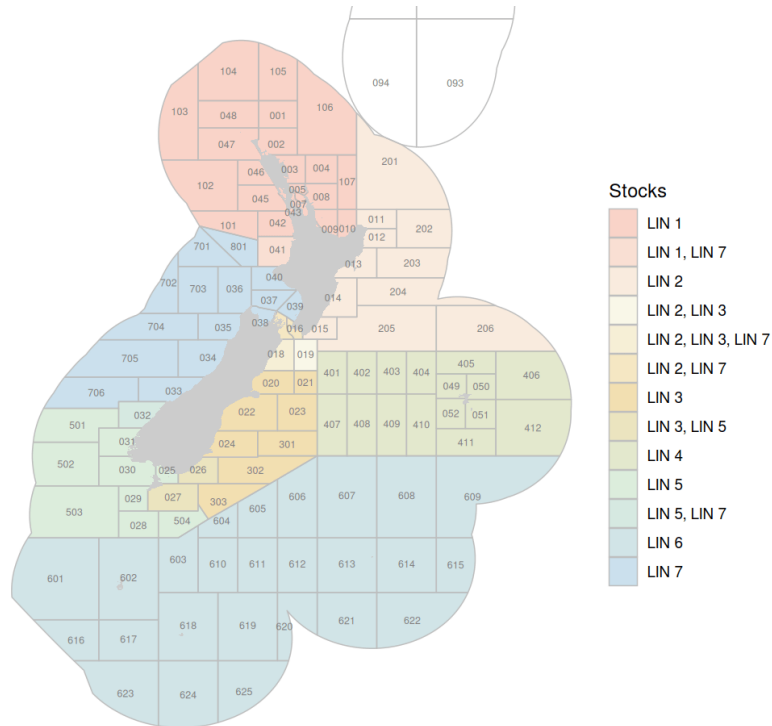


Figure 3: Statistical Areas that intersect the LIN 1, LIN 2, LIN 3, LIN 4, LIN 5, LIN 6 and LIN 7 Quota Management Areas.

3. CHARACTERISATION OF THE LING POT FISHERIES

Ling catches have been reported from a range of potting (or fish trap) methods, and when targeting a range of species (Figure 4). Catches were greatest when ling was targeted, and when the use of cod pots (CP), fish traps (FP), or Other Pots (POT) was reported.

LIN 3 has had the longest history of pot catches of ling, with small annual catches—mainly using cod pots—apparent until 2015 (Figure 5). The LIN 3 potting catch increased from 2016, with a transition in 2019 away from use of cod pots to a mix of Other Pots and fish traps. As discussed further below, it should be noted that the POT code (Other Pots) was only introduced from 1 October 2017.³

Potting catches in LIN 2 were evident in 2016, and increased to 2018, with a similar transition in reporting to the Other Pots method in 2019. However, while potting catches have been maintained in LIN 3, these declined in LIN 2; no potting catches were reported from LIN 2 in 2023.

LIN 4 had potting catches from 2019, other than in 2021, initially reported using a mix of fish traps and Other Pots, but subsequently using the Other Pots code exclusively. A small amount of ling was reported caught using cod pots in LIN 7 in 2016, but otherwise potting has been used in LIN 7 from 2020, with the proportion of potting catch increasing to 22% of the catch 2023, and reported to be from Other Pots.

In LIN 1, use of pots (reported as fish traps) was evident in 2022 and represented a substantial proportion (38%) of the catch in 2023. The first pot catches in LIN 6 were in 2023, but were substantial (exceeding 1000 t).

As of 2023, LIN 5 was the only QMA without evidence of recent potting catches. A small amount of catch was reported using fish traps in LIN 5 in the early 2000s (almost invisible in Figure 5, but apparent in Figure 6). In all areas, the larger catches of ling using the three main potting methods (cod pots, fish traps, and Other Pots) have been target catches (Figure 6).

³via the *Fisheries (E-logbook Users Instructions and Codes) Circular 2017*

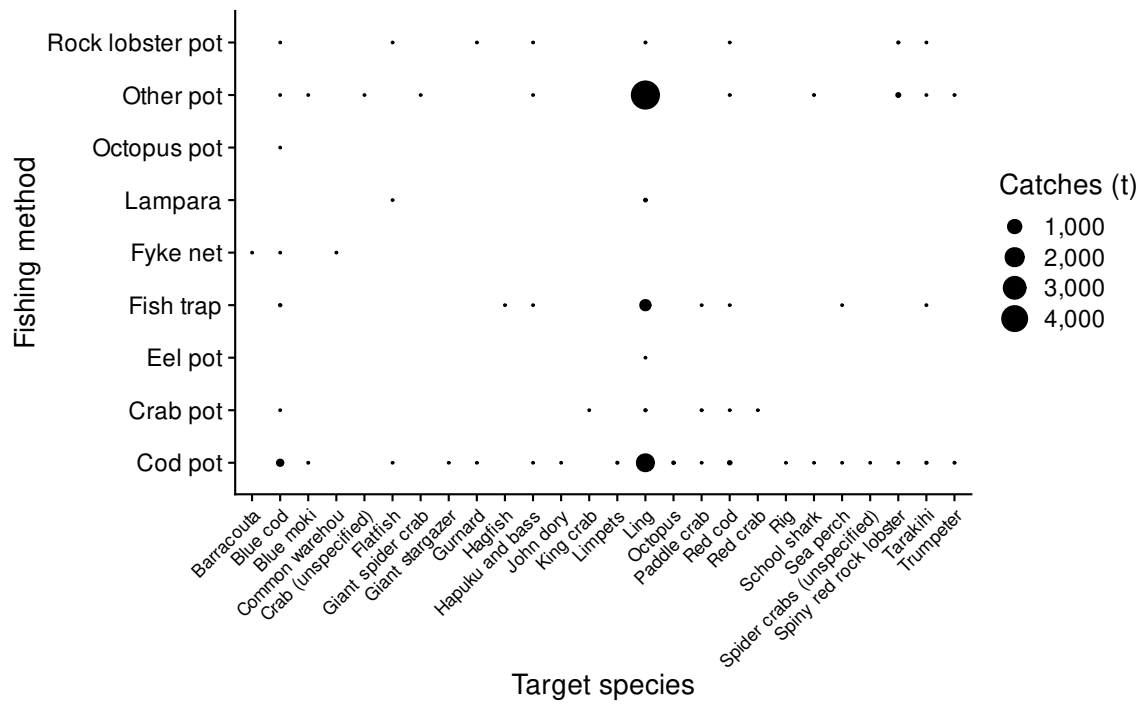


Figure 4: Ling catches by target species and method, for potting and trap methods, from 1990 to 2023.

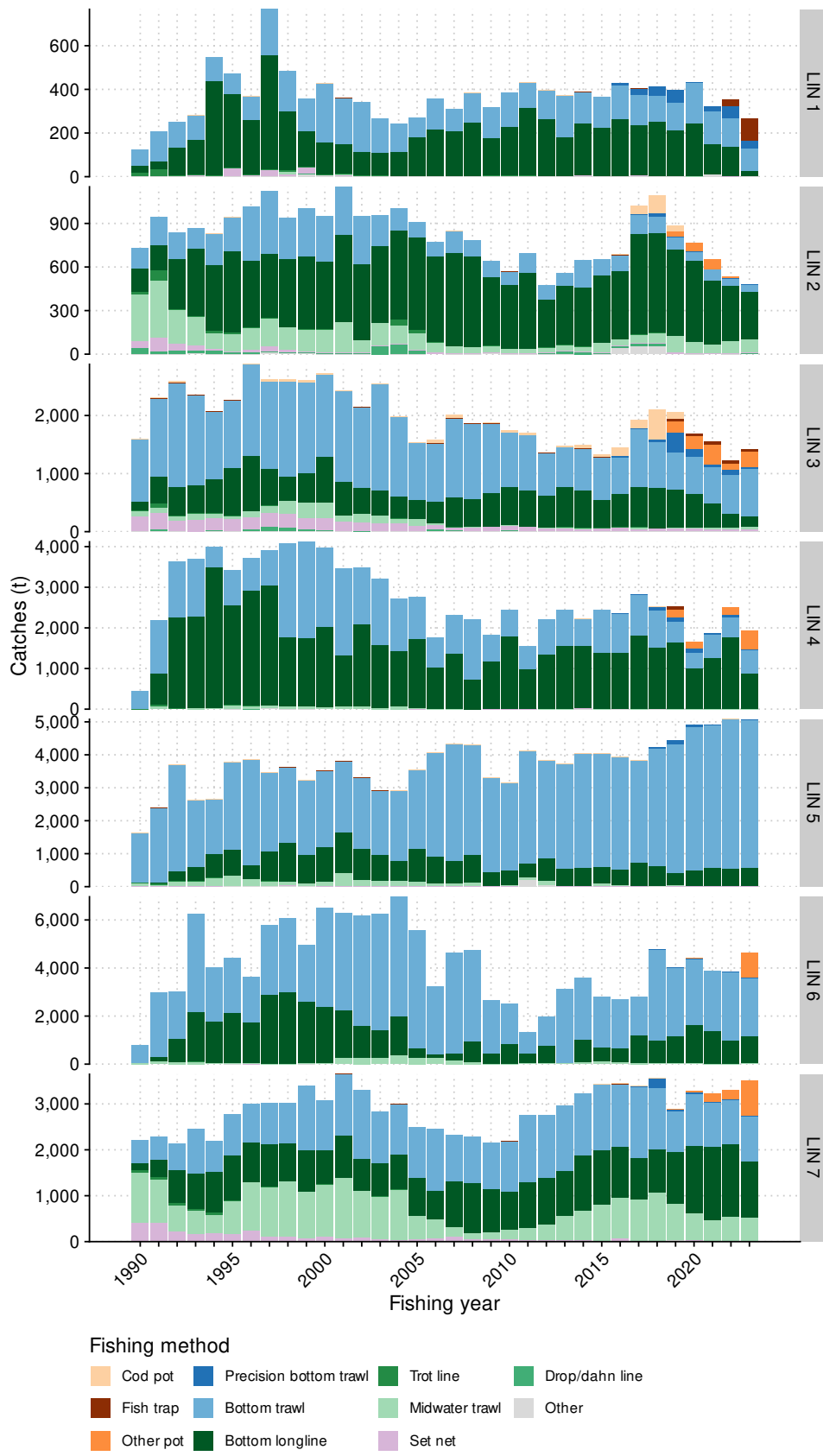


Figure 5: Catches of ling by fishing method, and Quota Management Area. Methods grouped as Other include: BPT, BS, CRP, D, DN, DPN, DPS, DS, DV, EP, FN, H, HL, L, MH, MPT, OCP, PL, PRM, PS, PSH, RLP, RN, SCN, SJ, SLL, T. Tabulated results are provided in Appendix B, and a list of the main fishing method code types is included in the glossary Table D.3.

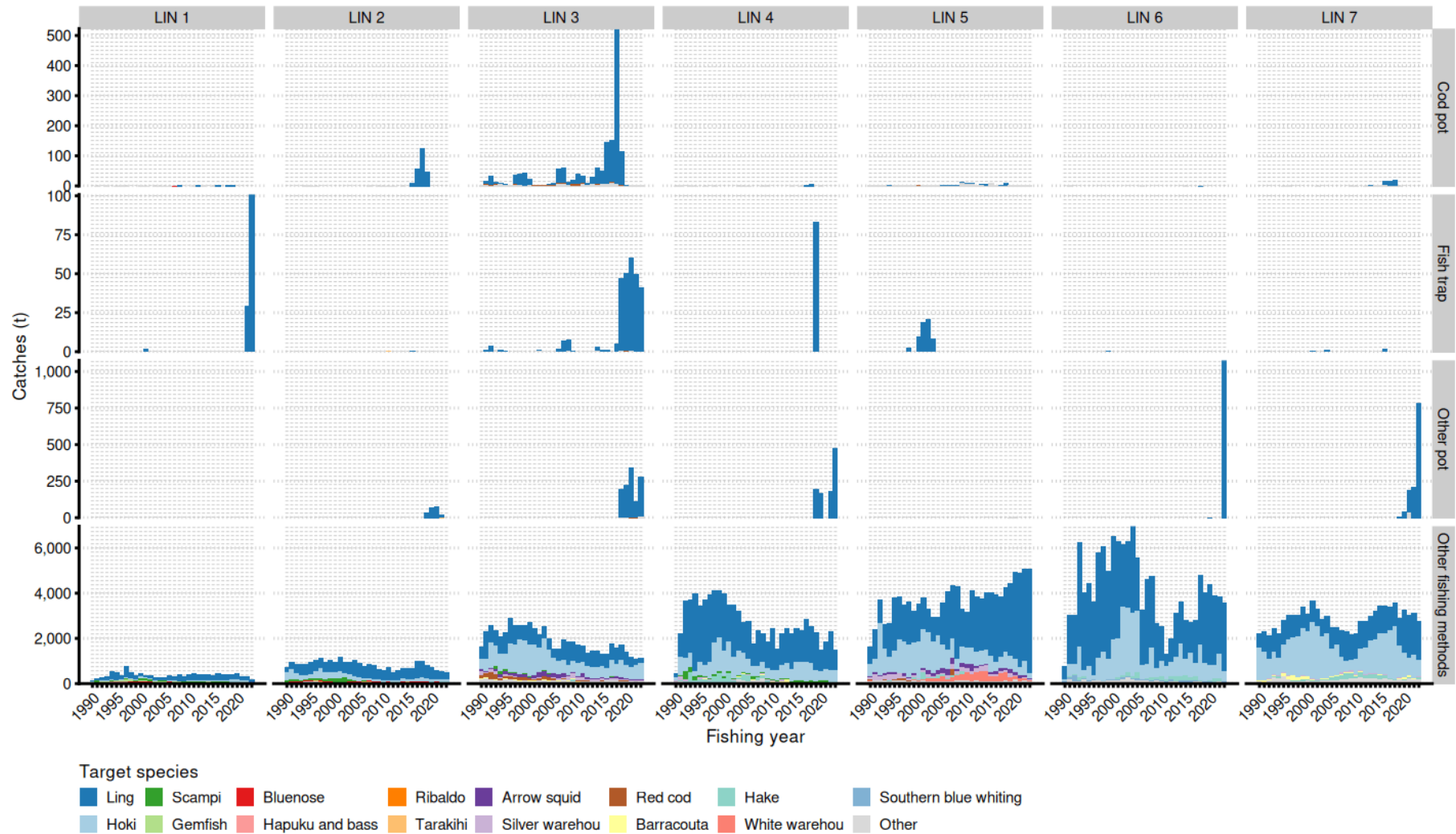


Figure 6: Catches of ling by fishing method, declared target species and Quota Management Area. Fishing Methods grouped as Other include: BLL, BPT, BS, BT-PRB, CRP, D, DL, DN, DPN, DPS, DS, DV, EP, FN, H, HL, L, MH, MPT, MW-PRM, OCP, PL, PS, PSH, RLP, RN, SCN, SJ, SLL, SN, T, TL. Species grouped as Other include target species with less than 5% of the ling catch within a Quota Management Area in a fishing year.

3.1 Potting gear

As noted above, there has been a transition in the gear codes used for reporting potting effort catching ling. The earliest catches were mostly reported from cod potting (CP), with recent effort predominantly using the other pot (POT) code. Some historical and recent catch has been reported from events using the fish traps (FP) code. Some of this change may reflect changes in the gear used, but changes in the reporting regime may also be relevant.

The statutory reporting regime encourages fishers to use the method code that best describes their effort, but has provided little specific guidance on how the different potting codes should be applied. The CP and FP codes were introduced in Part VII of the Second Schedule of the *Fisheries (Reporting) Regulations 1990*. Other than defining CP as ‘Cod potting’ and FP as ‘Fish traps’, no description was given for these methods; while reference was made to the *Fisheries (Commercial Fishing) Regulations 1986* for the meaning of terms used to describe fishing methods generally, no further detail on the potting methods was given in those regulations. The *Fisheries (Commercial Fishing) Regulations 2001* added some detail on the mesh to be used in cod pots but otherwise provided no other information on the gear associated with these method codes.

Schedule 2, Part 7 of the *Fisheries (E-logbook Users Instructions and Codes) Circular 2017* defined the newly introduced POT code to refer to ‘Potting (other)’, but provided no further information on the gear expected to be reported under this code, or the circumstances in which the new code should be used in preference to the existing potting method codes.

The research literature provides more detail on some potting methods. Standardised designs of cod pots for use in blue cod potting surveys were provided by Beentjes (2019). Two different designs were described, one for use in potting surveys in the Marlborough Sounds while the second was for use in other potting surveys around the South Island. The two designs were both for large, rigid pots with dimensions approximately 1.2 m by 0.9 m, and 0.5 m high. The designs differed primarily in the mesh used to cover the pots, and in the dimensions of the entrances to the pot.

Crossland (1976) described experiments with ‘fish traps’ used off north-east New Zealand with the aim of catching snapper for tagging. After initial experiments with rectangular and cylindrical traps, the study focused on the use of ‘Z-traps’ based on a Jamaican design. Like cod pots, these were rigid traps constructed of steel rod and covered with mesh. However, the ‘Z-traps’ had a kinked Z shape (i.e., a zig-zag on the longer side in plan view), rather than straight sides. Larger (2.4 m long by 1.2 m wide) traps were replaced by 1.8 m long by 0.9 m wide traps for easier handling on small vessels. Both designs were 0.6 m high.

Alternative fish pot designs were investigated by Chambers (2012), working with the Waikawa Fishing Company. The study included rigid straight-sided pots (rectangular in plan view), rigid Z-pots, and straight sided pots that could be collapsed. Unlike the Crossland (1976) study, the trials by Chambers (2012) used unbaited pots. The pots were large: 2.4 m long by 1.5 m wide and 0.5 m high. Trials were carried out at two locations (Cape Jackson and Cape Campbell), with tarakihi being the main species caught and the Z-pots achieving higher catch rates.

Scampi potting experiments, also carried out in collaboration with the Waikawa Fishing Company, initially used rigid pots of varying sizes and layout, and with a range of baits (Major et al. 2017). While scampi potting has not yet proved viable in New Zealand, it is this research programme that led to Waikawa Fishing Company’s decision to focus on harvesting ling using potting (Gerrard 2021). Ling catches using two different pot designs were illustrated by Gerrard (2021, figure 122): a large, rigid, rectangular pot, and a cylindrical pot design.

Okains Bay Seafood also focusses on potting for ling. Their website⁴ illustrates the pots used; these are cylindrical, with entrances at each end and resembling traditional eel pots, Hīnaki waharua. The pots are mesh covered, with a spiral, spring-like, frame that allows the pots to be fully collapsible. Nelson-based fishing gear company Beauline, offers pots of this design under the trademarked ‘Spiralpot’ brand,⁵ with the design said to be suitable for catching ‘multiple species of fish, including ling, toothfish and all fish in the codfish family’. A range of other pot and trap designs are also available from Beauline and other gear suppliers. Spiral (or ‘slinky’) pot use has also been adopted in the Alaskan sablefish and Pacific cod fisheries (Hagenbuch 2021, Molyneaux 2024).

3.1.1 Operator feedback on gear in use

In order to clarify the gear being used in the current ling potting fishery, an informal survey of potting operators was undertaken. Not all operators could be contacted, but information was provided by the operators of eleven vessels that were responsible for more than 98% of ling target potting effort (potlifts) in the 2024 fishing year. Two of the vessels contacted considered they were trialling the potting method and were unsure about long term use. The other vessels were more confident about longer-term use, but all indicated that they were still going through a period of trial and error with the design and features of the pots, including entrance sizes, escape holes, and mesh size.

A supplier of some of the collapsible pots was also contacted. The supplier discussed the evolution of the gear over recent years and a shift from generally smaller entrances (220 mm) and larger mesh (estimated at 90 mm), to larger entrances (260 mm to 280 mm) and smaller mesh (40 mm to 50 mm). It was noted that the current design specification appeared to be relatively stable, although each operator appeared to make smaller adjustments to the pots depending on their preference, most notably the inclusion of escape holes.

Two vessels contacted used rectangular, rigid-framed (but collapsible) pots, with estimated dimensions of 2.4 m × 1.5 m × 0.9 m and covered with ‘cray pot’ mesh. Both vessels reported their effort under the POT code.

One vessel used what they called ‘Z pots’ in their earlier operations and had recently used the collapsible coil design pot; both pot types were reported under the FP code. The operator was confident that they would continue to use pots in the future when targeting only ling, but their traditional bottom longline fishing provided bycatch species which were commercially valuable and part of their catch plan.

The other eight vessels contacted were using collapsible coil pots; seven vessels reported these under the POT code, but one vessel reported using the FP code. Most of the collapsible spiral pots were of a similar size: around 0.8 m diameter and 1.8 m long, with an entrance diameter of 260 mm to 280 mm entrance and 40 mm to 50 mm mesh. One vessel was identified to use a slightly larger collapsible spiral pot, with a larger entrance that was also able to be used for targeting toothfish, and other vessels were also trialling larger entrances.

General comments from operators emphasised the importance of having escape holes for reducing catch of smaller ling and considered that this should be monitored. Some operators noted that, when using pots, soak times can be extended relative to bottom longline use. There was interest in the effect this could have on any localised depletion. The possibility of ghost fishing with any lost pots was a concern for some operators; this has encouraged the development of biodegradable mesh panels to mitigate this risk.

All operators reported using baited pots when targeting ling.

⁴<https://www.okainsbayseafood.co.nz/>

⁵<https://www.beauline.nz/online-store/p/spiralpot-160-200>

3.2 The ling potting fleet

In the fishing years from 1990 to 2023, 73 vessels reported targeting ling with a potting method, although only 36 vessels reported a total catch of more than a tonne of ling (Figure 7). The Other Pots method dominates the catch and effort, with the vessel that had the highest total catch exclusively reporting use of this method. However, many of the most active vessels have reported a range of potting methods; seven vessels reported using all three major ling potting method codes.

To better characterise the fleet where ling potting was a key part of the constituent vessels' activities, trips were selected where the modal target species was ling and the modal method was one of the three key ling potting methods (cod pots, fish traps or other potting). Vessels were dropped from the resulting fleet if they had only participated in the ling pot fishery in a single year, unless that year was 2023. The overall catch, and annual effort patterns, of the resulting fleet of 31 vessels is illustrated in Figure 8, with anonymised vessel codes. There has been some turnover in the ling potting fleet; thirteen vessels were active in 2023. Three vessels have been particularly active over the last decade, but some of the highest annual catches were from vessels that only joined the fishery in 2023.

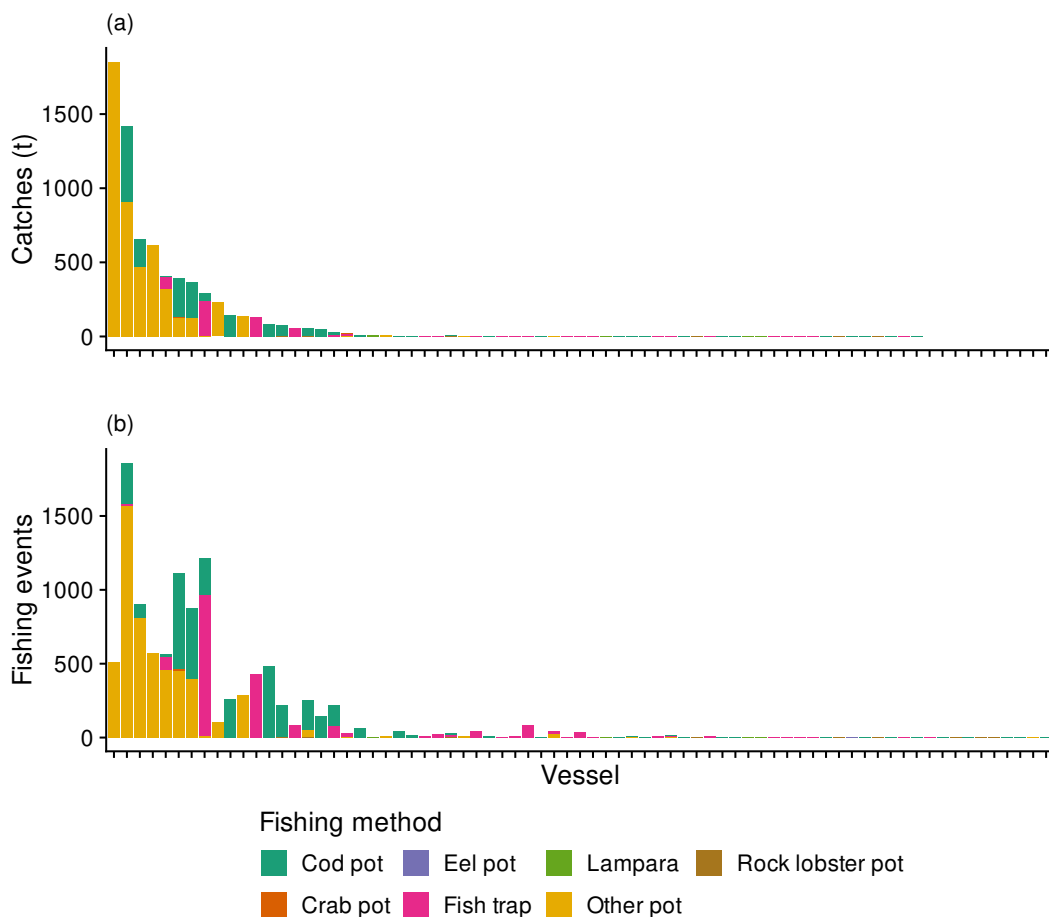


Figure 7: Ling (a) catches and (b) effort (fishing events) by vessel and method, for fishing events using potting and trap methods where ling was the target species. Vessels are arranged by decreasing catch of ling from the set of ling target events.

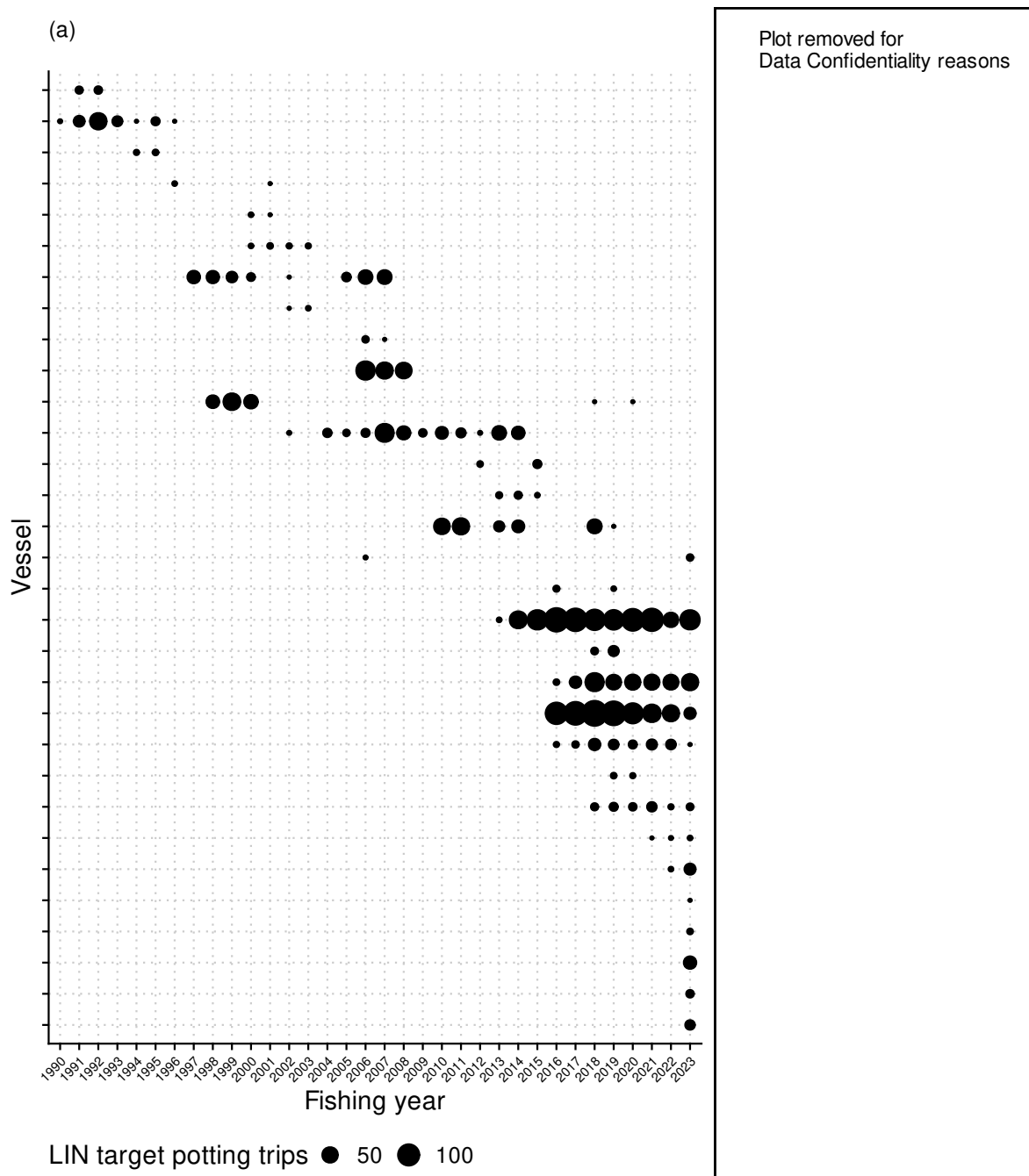


Figure 8: (a) Trips where the modal target species was ling and the modal method was cod potting (CP), other potting (POT), or fish trapping (FP), by vessel and year. Vessels that were only active in one fishing year are excluded, unless that year was 2023. (b) Mean annual ling catch when targeting ling using potting methods, calculated as total target ling catch divided by years active in the fishery. Vessels are arranged by the first year in which a trip was carried out with ling as the main target species and potting as the main method.

To understand the evolution of the ling potting fleet, Figure 9 illustrates the full annual activities and target species of these vessels, based on the modal method and target species at the fishing trip level. Most of the vessels that were classed as part of the ling potting fleet prior to 2013 (i.e., vessel IDs P16–P31) undertook ling potting amongst a range of other fishing activities, including potting for rock lobster and blue cod, and set netting for school shark and rig. Some vessels used both active (trawl) and passive (pot or set net) methods over the course of a year.

The more recent participants in the ling potting fishery (vessels P01–P15) show different patterns. In most (but not all) cases ling potting is undertaken as the key activity annually. Furthermore, these vessels tended to have a history of ling target fishing with several switching from ling target bottom longlining to ling potting.

3.3 Potting fleet effort

As the composition of the ling potting fleet has changed, so have ling potting effort patterns. The vessels in the fleet prior to 2013 tended to undertake short (1–2 day) trips, although a couple of vessels undertook trips of up to 10 days.

The earliest vessels in the more dedicated ling potting fleet that emerged from 2013 (vessels P11–P14) also tended to undertake short trips, but more recent entrants into the fleet, especially the vessels that have changed from trawling or bottom longlining (vessels P01–P10), have tended to undertake longer fishing trips, including trips up to five or six weeks long (Figure 10a).

Most vessels have typically undertaken less than fifty potlifts per day; however three of the most recent entrants to the fleet (vessels P02–P04) have mean daily potlifts of 200–400 lifts (Figure 10b). The Electronic Reporting System (ERS) introduced event-resolution recording of pot fishing that, for ling-target potting, defines a new event as the lifting of a pot (or string of pots) that is more than one nautical mile from the previous pot (or string). From these data, it is apparent that the high numbers of potlifts achieved by vessels P02–P04 are associated with increased numbers of pots lifted per event (i.e., rather than more events per day; Figure 10c).

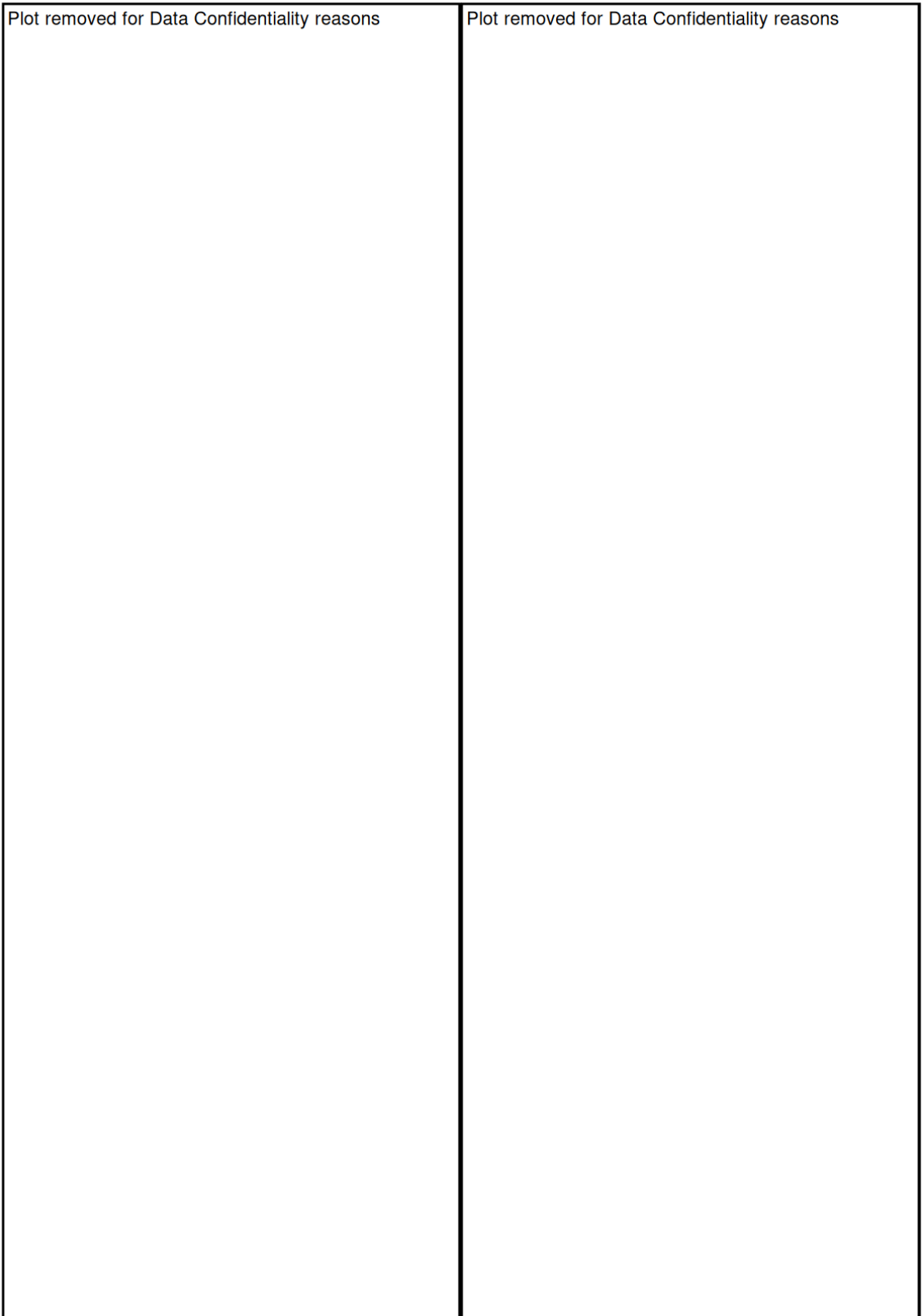


Figure 9: Modal fishing method (a) and target species (b) for trips carried out by vessels that have participated in the ling potting fishery (i.e., had ling and the main target species and potting as the main method for at least one trip in two subsequent years, or in 2023). Vessels are arranged in the same order as Figure 8. In (a) the Ling pot methods category includes the POT, CP and FP method codes.

<p>Plot removed for Data Confidentiality reasons</p>	<p>Plot removed for Data Confidentiality reasons</p>	<p>Plot removed for Data Confidentiality reasons</p>
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Figure 10: Fishing effort metrics for vessels in the ling potting fishery (i.e., had ling and the main target species and potting as the main method for at least one trip in two subsequent years, or in 2023). The effort included is restricted to ling target events by one of the three main potting methods. Vessels are arranged in the same order as Figure 8. (a) ling potting days per trip; (b) total potlifts per day; (c) potlifts per fishing event, for data reported via the Electronic Reporting System.

3.4 Distribution of ling potting

The major ling potting methods have had comprehensive fine-scale (i.e., latitude/longitude per event) effort reporting since 2020, with positions reported only sporadically before this (Figure 11). Longer term spatial trends in ling potting catches are, therefore, best visualised at the resolution of statistical areas.

The largest catches of ling using cod potting have been off the east coast of the South Island (Statistical Areas 019–024; Figure 12), with Area 024, off Dunedin, having the highest and most consistent catch. Larger catches are notably absent after 2019. There have been consistent, small, catches of ling in Foveaux Strait and around Stewart Island (Statistical Areas 025, 027, 029 and 030), in Cook Strait and off the south east of the North Island (Statistical Areas 014–016), and—in the late 2010s— off the North Island west coast.

Ling catches reported from fish traps have been more spatially dispersed and more temporally limited (Figure 13). The highest total catch, and most consistent use of the method, was again from Statistical Area 024, off Dunedin. Catches of ling have been reported in this Area since the early 1990s but were notably higher during 2019–2023. The highest annual catch reported using fish traps was from Statistical Area 407, on the western Chatham Rise, in 2019. However, this was the only year in which fish trap catches were reported from that Area. Otherwise, fish trap catches were reported from off the southwest coast of the South Island (Statistical Areas 030 and 031) in the late 1990s, and off the east and west coasts of the North Island (Statistical Areas 008–010 and 042, 045 and 046) in 2022 and 2023.

Ling catches reported using the Other Pots method have been the most widespread since the code was introduced in 2019 (Figure 14). The method has been used off the southeast of the North Island (Statistical Areas 013–015), in Cook Strait (Statistical Areas 016–017), off the east (Statistical Areas 018–026) and west (Statistical Areas 033–036) coasts of the South Island, on the Chatham Rise (Statistical Areas 401–410), and in the sub-Antarctic (Statistical Areas 603, 610, and 618).

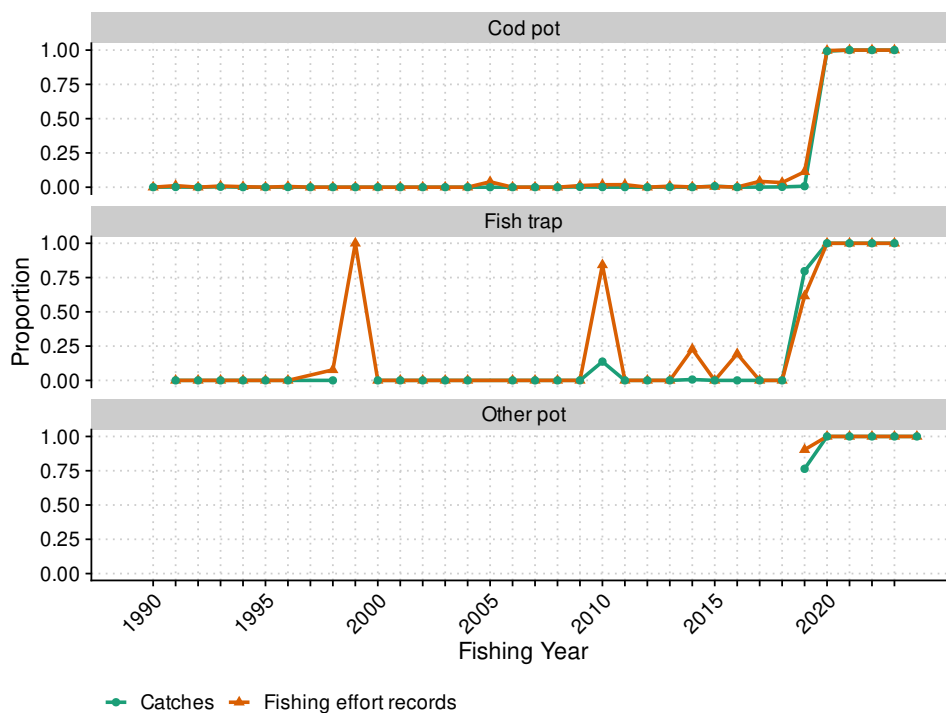


Figure 11: The proportion of records and catches reported with a latitude/longitude for events using the major ling potting methods on trips that landed ling.

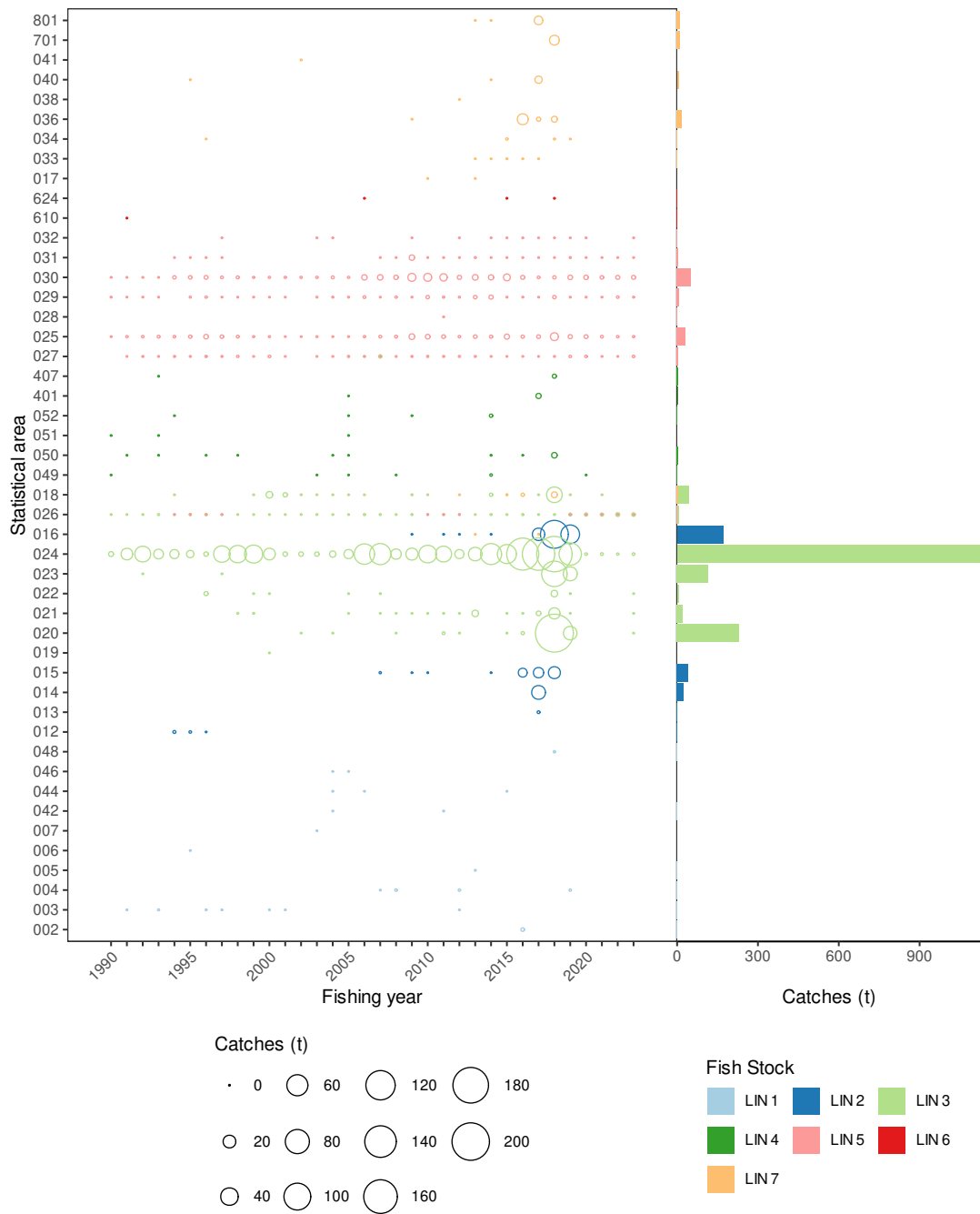


Figure 12: Annual LIN 1, LIN 2, LIN 3, LIN 4, LIN 5, LIN 6 and LIN 7 catches (t) by statistical area for the cod pot fishery. The circle size scales with the catches by statistical area. The bar plot (right) shows the total catches of LIN 1, LIN 2, LIN 3, LIN 4, LIN 5, LIN 6 and LIN 7 for each statistical area.

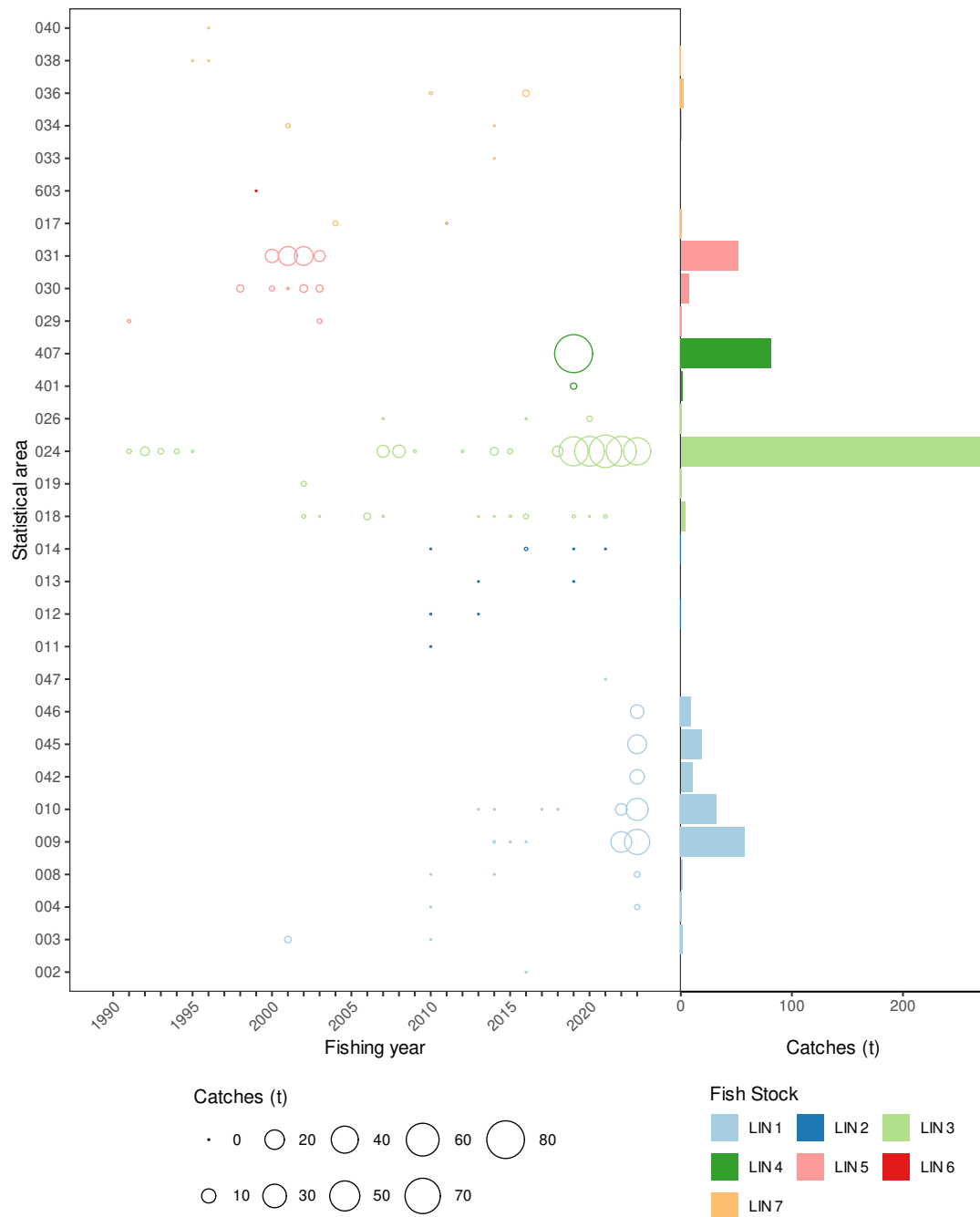


Figure 13: Annual LIN 1, LIN 2, LIN 3, LIN 4, LIN 5, LIN 6 and LIN 7 catches (t) by statistical area for the fish trap fishery. The circle size scales with the catches by statistical area. The bar plot (right) shows the total catches of LIN 1, LIN 2, LIN 3, LIN 4, LIN 5, LIN 6 and LIN 7 for each statistical area.

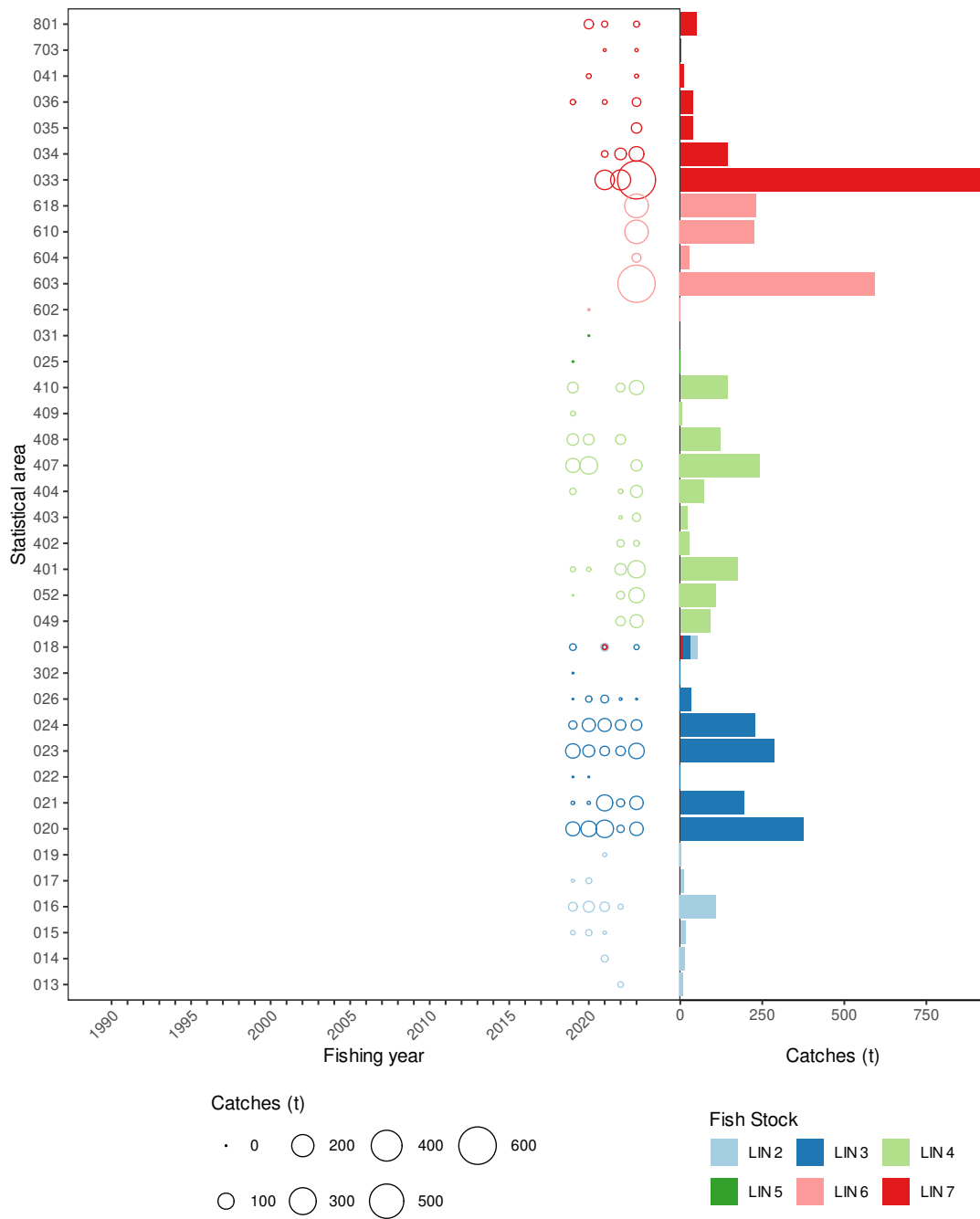


Figure 14: Annual LIN 1, LIN 2, LIN 3, LIN 4, LIN 5, LIN 6 and LIN 7 catches (t) by statistical area for the other pot fishery. The circle size scales with the catches by statistical area. The bar plot (right) shows the total catches of LIN 1, LIN 2, LIN 3, LIN 4, LIN 5, LIN 6 and LIN 7 for each statistical area.

3.5 Overlap of potting, bottom lining, and trawl fisheries

During the 2020 to 2023 fishing years, trawl and longline catches of ling were taken all around the New Zealand coast, and widely across the Chatham Rise. South of the New Zealand mainland, trawling was responsible for the majority of ling catches from the Snares shelf and around the Auckland Islands, while the bottom longline fishery operated more extensively over the Campbell and Bounty Plateaus. The potting fishery was less extensive, but nevertheless operated over much of the same area. This included around much of the New Zealand coast, and across the Chatham Rise (although not to the east of the Chatham Islands). As with the bottom longline fishery, there was limited pot fishing on the Snares shelf edge. Potting did, however, extend to the Campbell Rise and Pukaki Bank, but was generally less widespread than bottom longlining in the sub-Antarctic area.

An initial analysis of the overlap between the three major fisheries for ling is included in Appendix C. This investigated the correlation in ranked catch by the three key fishing methods for 32 km square grid cells with catches aggregated over the 2019 to 2023 fishing years.

At the NZ EEZ scale, there was a positive—but weak—correlation in the grid cell ranks for the three methods (Figure C.1). The relationships between cell rankings by method varied by area. In general, cell rankings were positively related in LIN 1 (Figure C.2), LIN 2 (Figure C.3), LIN 3 (Figure C.4), and LIN 7 (Figure C.5) but unrelated in LIN 4 (Figure C.6), LIN 5 (Figure C.7), and LIN 6 (Figure C.8). For the areas where cell ranks were correlated (LIN 1, LIN 2, LIN 3, and LIN 7) there was a greater correlation between cell ranks for the pot and longline fisheries than for the pot and trawl fisheries.

The fact that the three ling fisheries show some correlation in grid cell catch ranks is unsurprising: ultimately these fisheries are all influenced by the underlying distribution of ling. The variation in correlation between areas indicates that, at the 32 km grid scale, there are regional differences in the spatial partitioning/overlap of the methods. The three methods have greater overlap in the ‘coastal’ fishery around New Zealand than in the more offshore fisheries. The fact that there is greater similarity in catch ranking by grid for the pot and longline fisheries is consistent with the observation that the developing potting fleet includes a number of vessels that previously targeted ling by longlining.

In light of operator comments (see Section 3.1.1) about the possibility of longer soak times when using pots than longlines, we investigated the distribution of soak times for potting and bottom longline fishing events targeting ling. In all Quota Management Areas, other than LIN 5 where there was no target ling potting during 2021–2023, potting soak times were generally longer than for longlines (Figure 15). The greatest difference was in LIN 6 where longline soak times were usually less than a day, but most pot soak times exceeded two days.

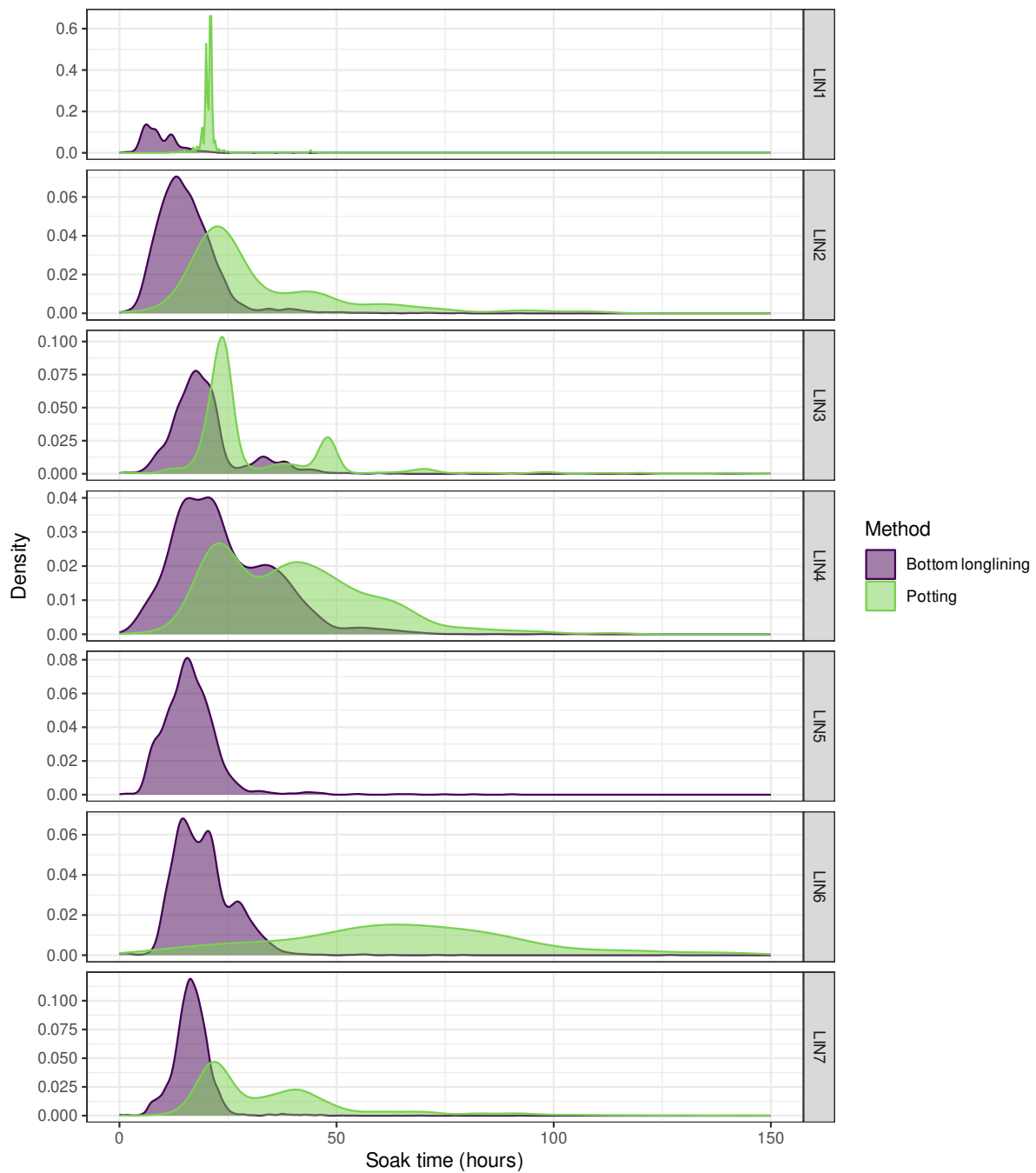


Figure 15: Density distributions of soak times for potting (CP, FP or POT) and bottom longline fishing events targeting ling, by Quota Management Area, with data from the 2021 to 2023 fishing years. Note that soak times for bottom longlining are calculated from set and haul times, whereas the Electronic Reporting System only collects haul times for potting events, but fishers report an average soak time for the pots set.

4. COMPOSITION DATA

Limited data from observation of the ling potting fishery by Fisheries New Zealand observers is currently available in the Centralised Observer Database⁶; information from the ten observed trips where ling was targeted by potting is summarised in Table 3. Here, the observer’s record of the target species was used; this may differ from the target species recorded by the vessel. Seven of the observed trips had ling potting activity recorded on trips that also carried out set netting, and targeted a range of species. These ‘inshore’ trips were likely to have been focussed on protected species capture information; they frequently had no ling catches recorded for the ling potting events (but see below) and had no catch sampling data for ling.

Table 3: Summary of data from all observed trips where ling was targetted using pots. All effort occurring on these trips is categorised by method and target species. Table entries are in the format A|B|C, where A is the number of events in the target/method category, B is the number of events where ling catches were recorded, and C is the number of events where ling length-frequency data are available.

Trip (year) / Method	Target species						
	BCO	HAP	LIN	SCH	SPO	STA	TAR
T01 (2019)							
POT			13 0 0				
SN			1 0 0		29 8 0		
T02 (2019)							
POT			9 0 0				
SN					49 26 0		
T03 (2020)							
POT			15 0 0				
SN					42 10 0		
T04 (2020)							
POT			341 232 0		2 1 0		
SN					105 37 0		
T05 (2020)							
POT			47 47 29				
T06 (2020/2021)							
POT			184 9 0				
SN					52 26 0		
T07 (2021)							
POT	10 1 0		29 16 0				
SN		27 5 0		3 1 0		14 6 0	11 3 0
T08 (2022)							
BLL			85 85 29				
POT			33 0 3				
T09 (2022/2023)							
POT			21 0 0				
SN					60 22 0		
T10 (2024)							
POT			13 0 9				

⁶some data collected from ling potting trips have not been entered due to the use of *ad hoc* data formats

The other three trips exclusively targeted ling; two used pots, while one used both pots and longlining. Catch sampling of ling from potting events was carried out on all three of these trips, despite the fact that—on two of the trips—no catch of ling was recorded⁷ from the potting events. This indicates that catch recording was incomplete, and that the absence of recorded ling catches on other trips with ling target potting may not be correct.

Length-frequency data for ling were available from 41 fishing events on 3 observer trips with samples from two QMAs and three fishing years (Table 4). Only around 10–20 fish were sampled per event. In view of the small sample sizes, and the lack of catch information for many of the sampled events, only high-level comparisons of raw data are feasible. At the Quota Management Area scale, and for both LIN 3 (the SEC observer Fisheries Management Area) and LIN 4 (SOE), there are indications that the potting fishery catches somewhat smaller ling than the bottom longline fishery, but larger fish than the bottom trawl fisheries (Figure 16, Figure 17).

Table 4: Length-frequency samples of ling by area and year, sampled from the ling pot fishery by the Observer Programme in fishing years 1987 to 2024. Observer Fisheries Management Area (FMA) codes and method codes are defined in the glossary.

QMA	Observer FMA	Fishing year	Method	Sampled events	Number of fish
LIN 3	SEC	2020	POT	15	150
LIN 3	SEC	2022	POT	1	20
LIN 3	SEC	2024	POT	9	200
LIN 4	SOE	2020	POT	14	140
LIN 4	SOE	2022	POT	2	30

⁷in the `x_fishing_event_catch` table of the COD database

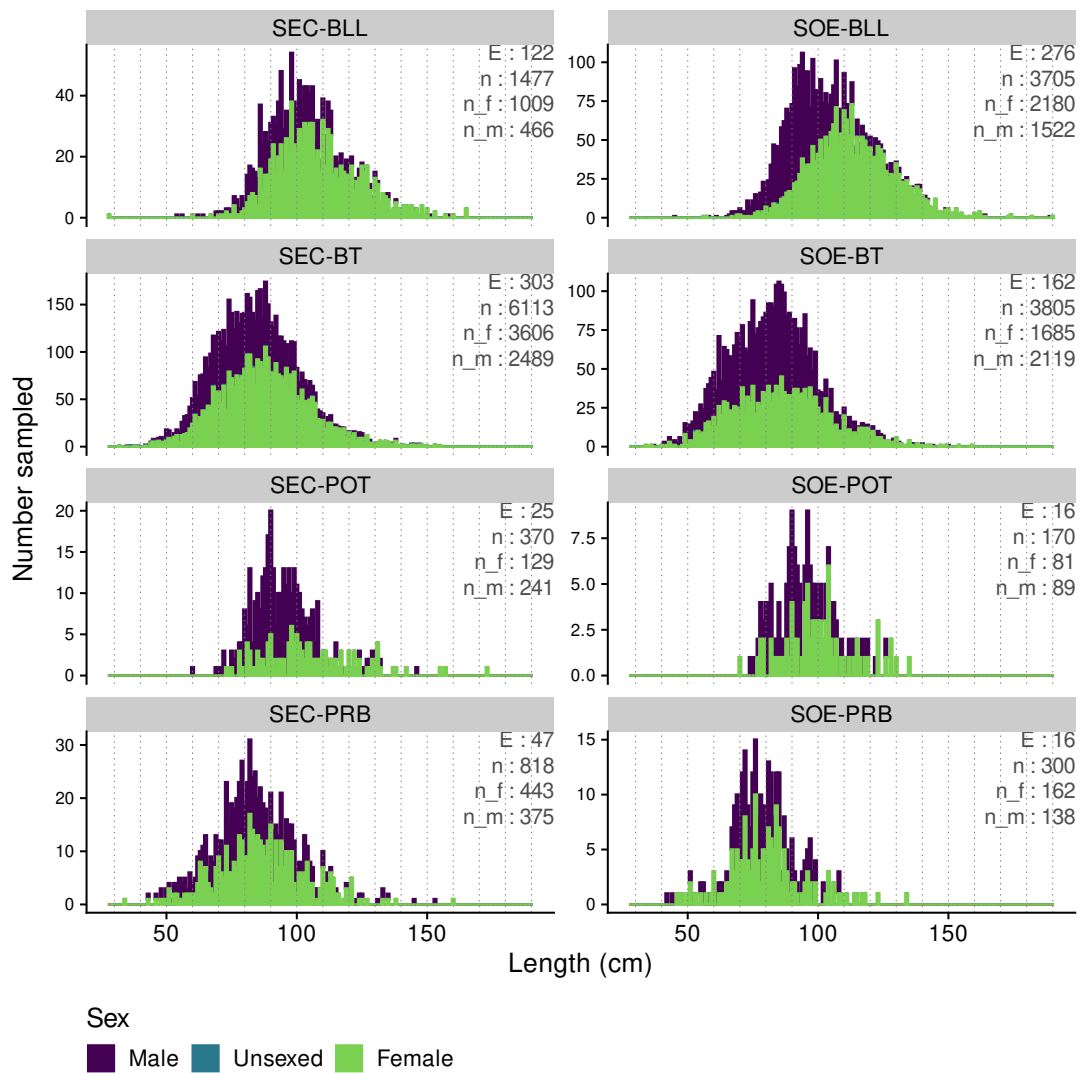


Figure 16: Length-frequency distributions of ling for the SEC, SOE areas by fishing method, for samples collected in the 2020 fishing year or later. Annotations indicate the number of unique sampling events (E) and sampled number of fish (n) for each area-method. Only area-methods with at least 100 fish measurements are included. The observer area codes are defined in the glossary.

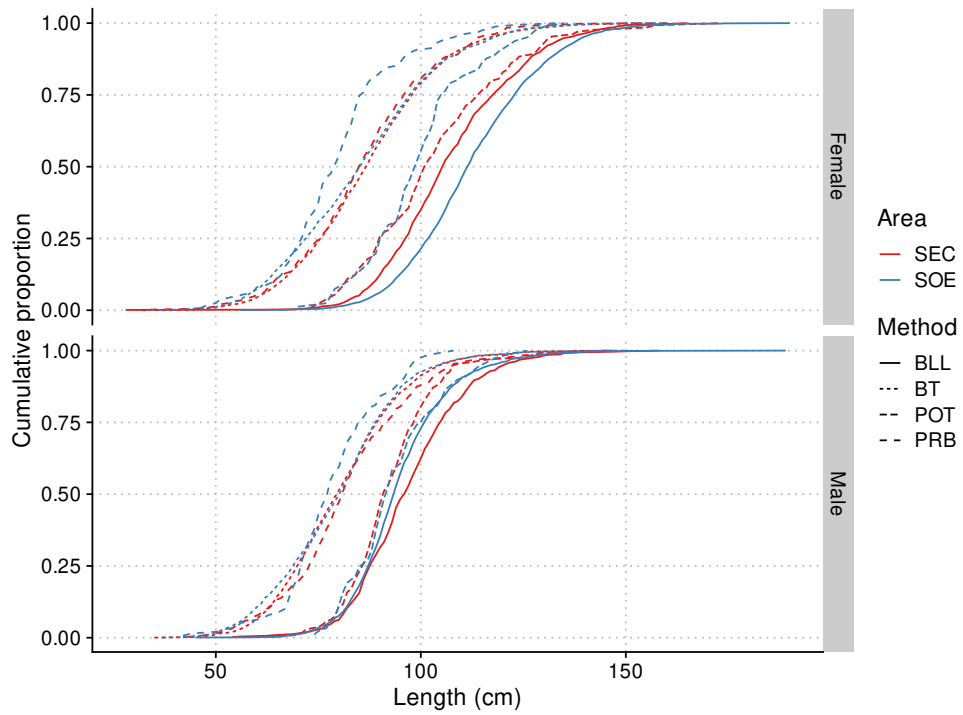


Figure 17: Cumulative length-frequency distributions of ling for the SEC, SOE area by fishing method, using raw, unscaled observer samples collected in the 2020 fishing year or later.

5. ENVIRONMENTAL IMPACTS

Gerrard (2021) suggests that potting may have lower environmental impacts than bottom trawling, specifically lower impact on the seabed and a lower possibility of accidental capturing seabirds or marine mammals. Okains Bay Seafood cite a lack of seabird interactions during setting and hauling as a key advantage of pot fishing for ling over longlining.⁸

No captures of seabirds have been reported using fish traps or Other Pots (Figure 18). Seabird captures when targeting ling using cod pots have been reported, but at a lower rate (per tonne of ling catch) than with bottom longlines or bottom trawls. No mammal or protected fish captures have been reported from any of the three key ling potting methods.

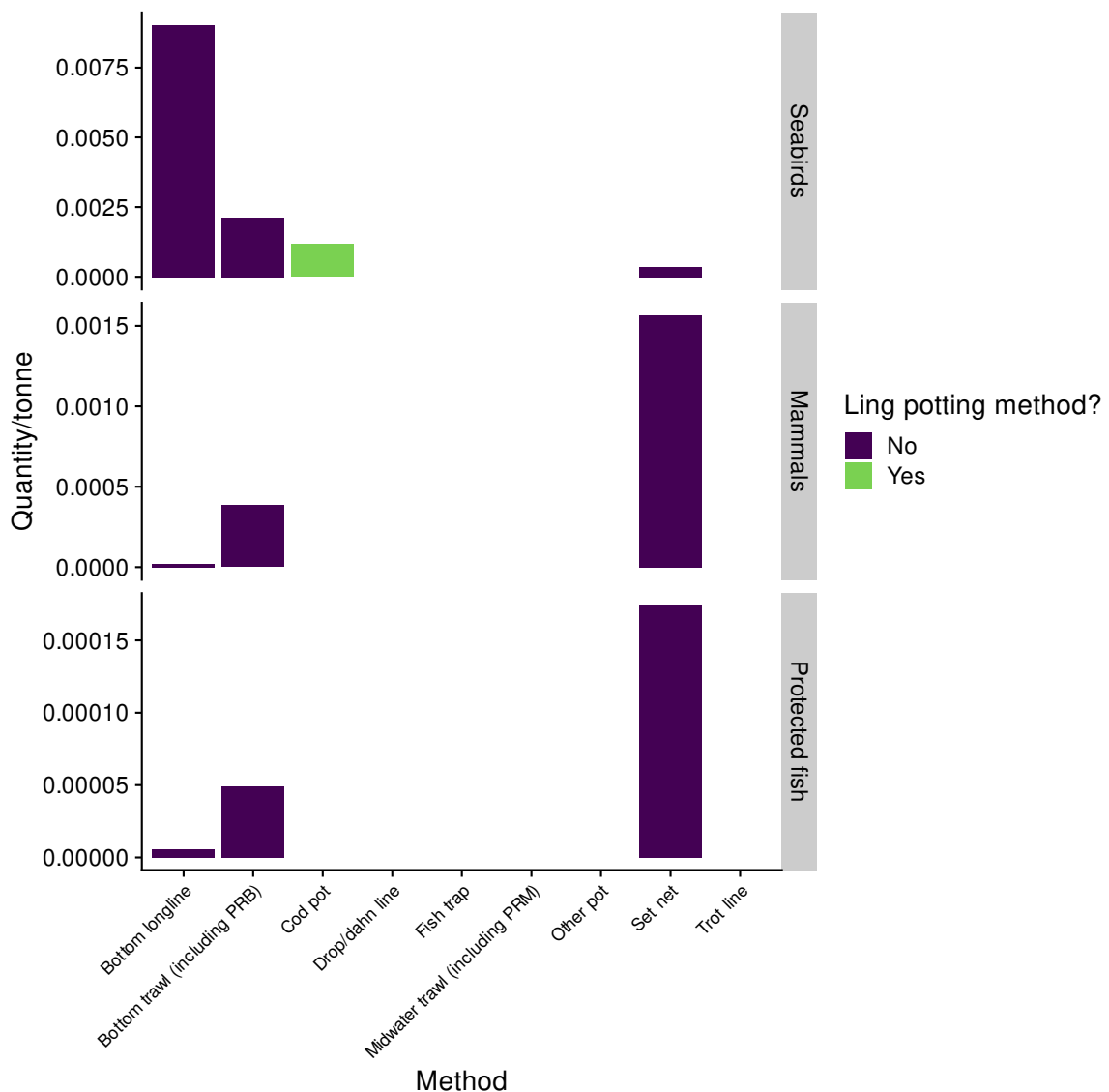


Figure 18: Fisher reported captures of protected species, by method, when targeting ling, per tonne of ling catch. Methods with an aggregate ling catch greater than 500 t during 1990 to 2023 are included. The key ling potting methods are highlighted in green.

⁸<https://www.okainsbayseafood.co.nz/pot-fishing/>

6. DISCUSSION

Catch and effort data from the 1990s to 2023 show that ling have been caught in a range of potting fisheries, but catches are highest when ling are targeted. Ling target potting effort has been evident since the early 1990s, primarily in LIN 3 in association with the blue cod pot fishery. However, potting was responsible for an insignificant proportion of the overall catch of ling until the late 2010s. Since then, potting has become an important method in all Quota Management Areas, other than LIN 5, responsible for 10% to 35% of the annual catch.

In the past, ling target potting was undertaken as a secondary activity by vessels involved in a range of inshore fisheries, including rock lobster and blue cod potting, and set netting for rig and school shark. The recent increase in ling potting has seen the development of a fleet of vessels that undertake ling potting as their main fishing activity. Most recently, this has included a number of vessels that previously targeted ling by bottom longlining and have transitioned to use potting for some or all of their fishing activity.

Several of the new entrants into the potting fleet have succeeded in significantly increasing the number of pots set in ling target fishing events. Traditionally, vessels in the ling potting fleet would lift less than 100 pots per day. However, three of the recent entrants to the fleet typically lift 200 to 500 (and up to 1000) pots per day.

The transition to the Electronic Reporting System, and the introduction of new codes, has impacted on the reporting of ling potting effort. In the late 2020s, catches of ling reported using cod potting increased substantially off the east coast of the South Island. While a small amount of ling catch continues to be reported from cod potting, from 2019 most catch has been reported under either the fish trap or other pot methods, with the latter predominating.

Ling potting has become more widespread, being undertaken off both the east and west coasts of both the North and South Islands, on the Chatham Rise, and in the sub-Antarctic. Although there are general similarities between the areas fished by the ling potting fishery and the more traditional trawl and bottom longline fisheries, an initial analysis suggests that, at a fine scale, different areas are fished by the different methods.

Although the existing data has allowed a reasonable first characterisation of the ling potting fishery, in particular highlighting its emergence as a likely key fishing method for ling in the coming years, it is also apparent that the existing data systems are currently not capturing some key information. The most important missing information relates to the pots used. Prior to 2015, it is likely that ling target potting used rigid pots that were similar to those used for cod and rock lobster potting. During the 2010s, a range of potting experiments were carried out with finfish and scampi as target species. Much of this work also appears to have used rigid pots, although developments included pots/traps that deviated from a rectangular shape. Collapsible, cylindrical pots are now being used by some vessels in the ling potting fleet, and these pots currently contribute a significant proportion of effort and landings. It is likely that the adoption of these pots, which are likely to have lower on-board storage requirements, is responsible for increased daily effort by some vessels in the fleet.

With ling potting becoming an important part of the fishery, capturing information on the range of pots used, and the particular pots used on each fishing event, would now seem to be a priority. Information should be collected on the pot type, mesh sizes, entrances sizes, and escape holes/panels. Without this information, it will not be possible to make useful comparisons between catch rates and relative selectivity of different vessels, over time, and in different areas.

Unusually, the Electronic Reporting System does not require depth information to be reported for potting events. For recent analyses of blue cod potting, Beentjes & Bian (2024) inferred depth based on the fishing event position. Linking positions to bathymetric layers would also allow a comparison of other bottom features (for example, seabed ruggedness) between the areas targeted by pot and line

fisheries. However, a specific analysis on whether inferring depth from position is adequate, or if this field should be added to the reporting of pot events, would be worthwhile.

Catch sampling data from the pot fishery is limited, but suggests that potting may catch somewhat smaller ling than the bottom longline fishery, with both these methods taking larger fish than the trawl fishery. The key limitation in the catch composition data from the potting fishery is simply the quantity available.⁹ Ling catch composition sampling data are only readily available from three trips where ling were targeted by potting, and samples per event have been small. Much more extensive sampling, with larger sample sizes per event, will be required in order to establish whether the apparent differences in selectivity between bottom longlining and potting are real, or simply arise from spatial or temporal differences in the locations sampled. Instructions to observers may need to be developed to ensure representative sampling; a strategy where the complete catch is measured from a randomised set of pots lifted per event is likely to be appropriate. It is also apparent that there needs to be work to address observer data integrity: fishing events with ling catch samples, but without any ling catch recorded, indicated a problem, although it was not clear if this was with the sampling instructions/practice or the subsequent data storage. Observers may also be able to collect more detailed information on pot designs than can be collected via the Electronic Reporting System.

An important consequence of using pots, rather than longlines, to target ling is the removal of the risk to seabirds posed by baited hooks. A small number of seabird captures reported from ling potting using cod pots, however, serves to illustrate that seabird capture risks are not completely eliminated by the use of pots. A particular concern about pot fisheries has been the risk of whale entanglements in the vertical lines connecting the pots to the surface (Pierre et al. 2022). However, no such interactions have been reported to date from ling target potting. Furthermore, deploying ling pots on strings ('longline style'), rather than in small clusters of pots, limits the number of vertical lines involved. Potting is expected to have lower impacts on benthic fauna than trawling, but it is likely that a transition from longlining to potting will result in more gear touching the seabed. The nature of any impacts will depend on the pots used, the types of seabed fished, and the intensity of fishing.

7. ACKNOWLEDGEMENTS

This work was funded by the Deepwater Council of Seafood New Zealand. Background information from discussions with fishery operators, and the fishing equipment company Beauline, was very helpful in understanding the potting gear in use. Fisheries New Zealand provided access to catch, effort, landings, and observer data that were analysed using the Kahawai Collective's reproducible reporting platform. The Deepwater Fisheries Assessment Working Group provided useful comments on the work presented in this report. The report was reviewed by Gretchen Skea and McKenzie Jones, with advice on Data Confidentiality from Merryn Jones. Marianne Vignaux provided editorial review and oversight.

⁹Noting that additional sampling data have been collected but that there have been some difficulties loading these to the COD database.

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APPENDIX A: DATA GROOMING

Grooming of the statutory commercial catch, effort and landings data followed the approach of Starr (2007), with a set of rules defined for each of the different types of data (Bentley 2012).

A.1 Landings

Table A.1: Grooming rules applied to landings data.

Rule	Effect	Description
LADTI	Flag	Invalid landing destination
LASEC	Fix	Landings to Crown or experimental stock codes
LADTH	Drop	Retained (non-final) landings
LADTT	Flag	Vessel received transhipments
LASCF	Fix	Correct some state codes
LASCI	Flag	Landings to invalid state code
LASCD	Drop	Drop landings of secondary product states
LADUP	Drop	Duplicate landings
LACFM	Fix	Replace missing conversion factors with the median over all years
LAGWI	Fix	Estimate missing greenweights
LAGWM	Drop	Missing greenweights that cannot be estimated
LAGWO	Fix	Identify and fix order of magnitude errors in landings

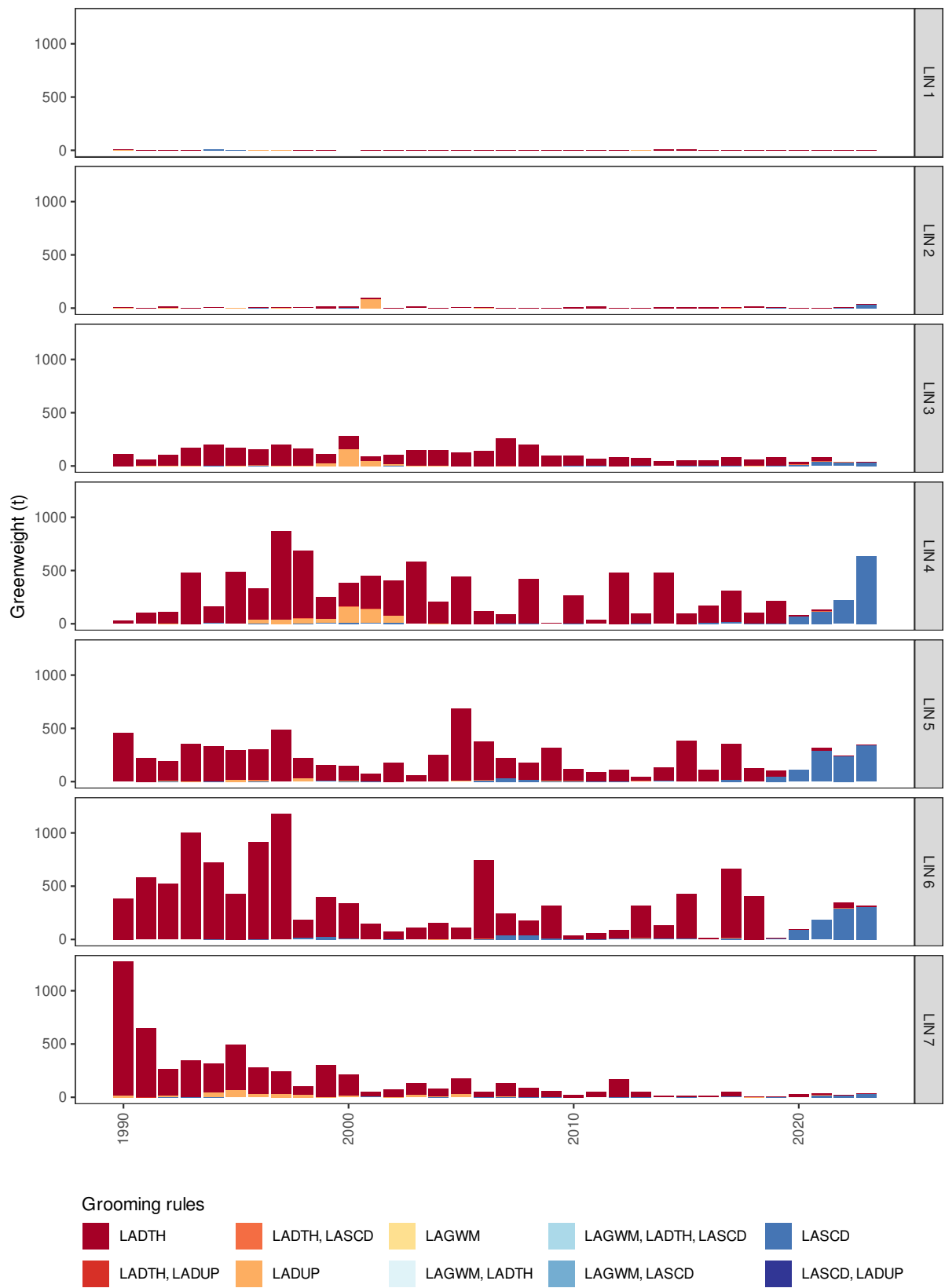


Figure A.1: The quantity of landings dropped, with the relevant grooming rules (Table A.1) indicated, by stock and fishing year.

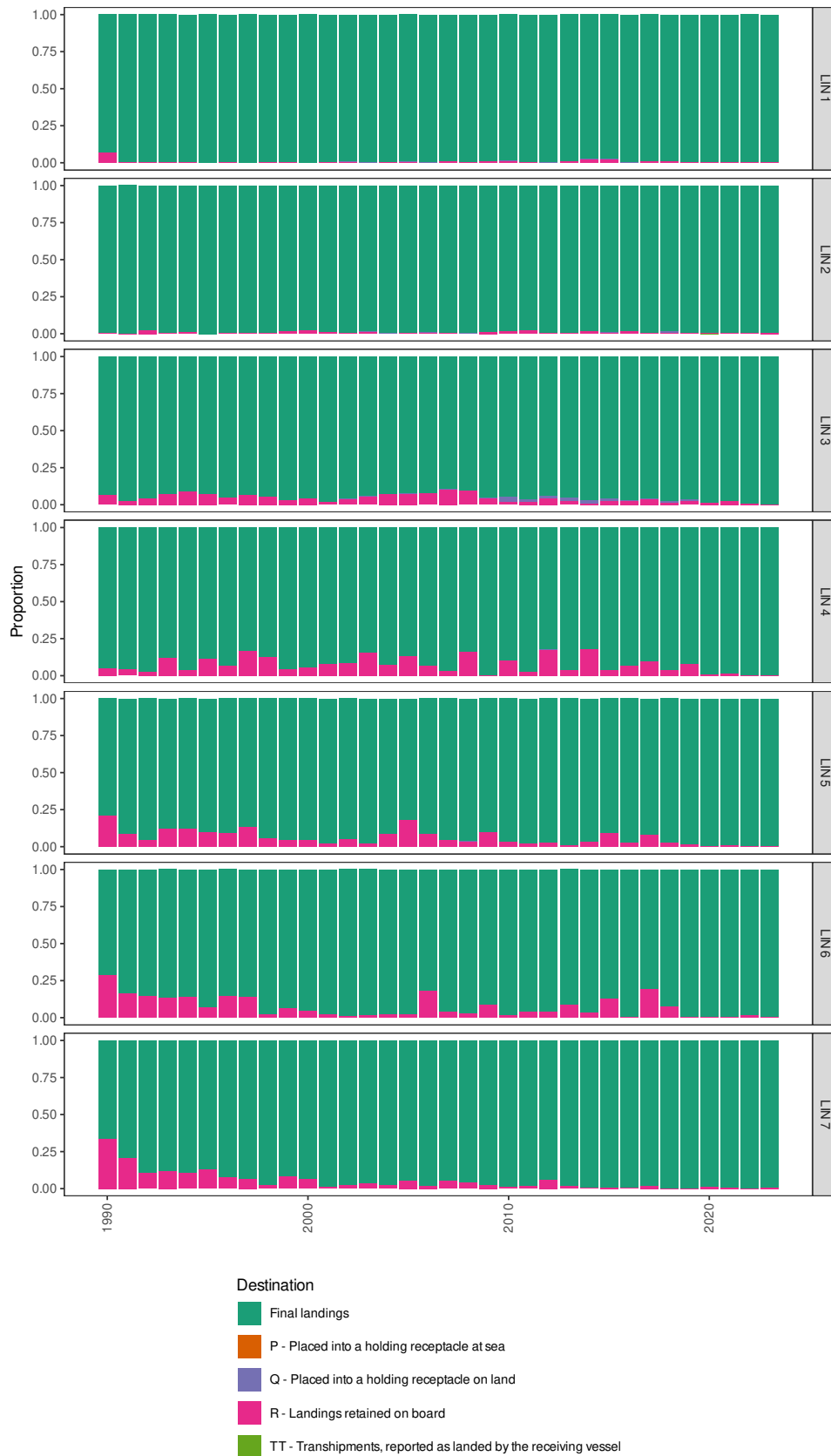


Figure A.2: The proportion of total (final and non-final) landings that are initially to non-final destinations, by stock and fishing year.

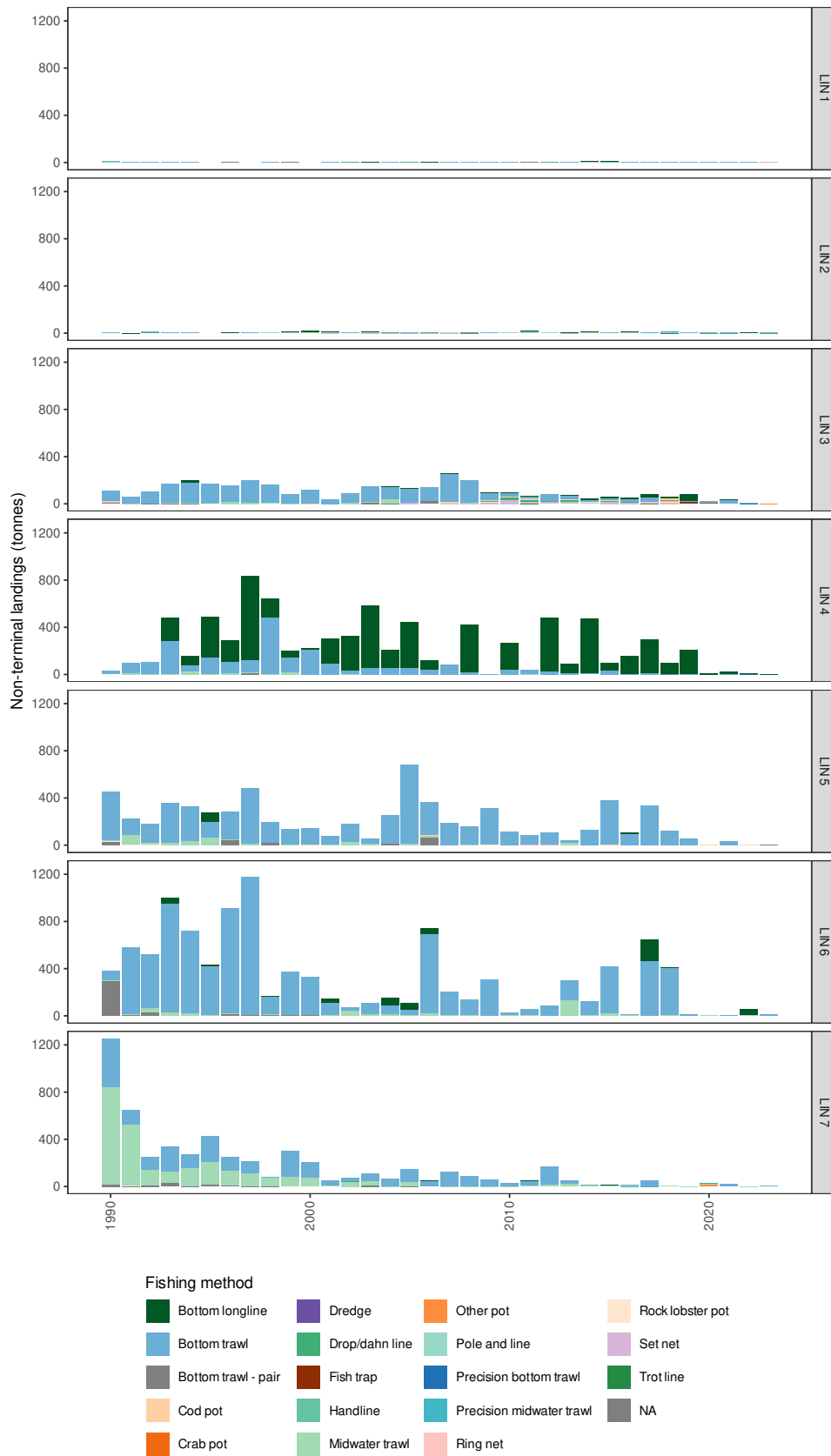


Figure A.3: The quantity of non-final landings, by stock, fishing year, and the modal fishing method used on the trip.

Table A.2: Annual number of trips, and affected greenweight quantity, where the LAGWO rule indicated an order of magnitude error in the landing weight and this was adjusted.

QMA	Fishing year	Trips	Greenweight (kg)	
			Original	Adjusted
LIN 1	1998	1	108.000	1.08000
LIN 1	1999	1	13 854.000	138.54000
LIN 1	2015	1	261.350	2.61350
LIN 1	2016	1	822.500	8.22500
LIN 2	1990	1	52 555.000	508.03167
LIN 2	1991	1	10 367.000	100.21433
LIN 2	1994	1	5 805.000	58.05000
LIN 2	1997	1	77 147.000	771.47000
LIN 2	2001	1	69 951.760	699.51760
LIN 2	2018	1	912.398	9.12398
LIN 2	2019	2	24 672.140	246.72140
LIN 2	2023	1	1 570.790	15.70790
LIN 3	1990	1	10 606.000	102.94059
LIN 3	1992	6	34 257.000	331.41967
LIN 3	1995	4	567 258.000	471.66242
LIN 3	1996	5	454 156.000	1 763.30950
LIN 3	1997	2	167 351.000	962.09600
LIN 3	1998	1	19 865.000	198.65000
LIN 3	1999	3	51 579.300	421.75597
LIN 3	2000	2	11 309.900	113.09900
LIN 3	2001	2	13 714.000	90.28232
LIN 3	2002	1	14 268.000	142.68000
LIN 3	2013	1	53 383.000	5.33830
LIN 3	2014	1	7 963.150	79.63150
LIN 3	2019	2	770.000	7.70000
LIN 3	2021	1	360.000	3.60000
LIN 4	1992	9	1 052 177.000	5 953.54533
LIN 4	1994	1	283 123.000	283.12300
LIN 4	1995	1	49 654.000	53.40147
LIN 4	1996	4	1 096 101.256	1 316.66052
LIN 4	1997	2	172 807.600	979.33049
LIN 4	1998	2	775 160.000	803.77065
LIN 4	1999	3	862 358.300	879.66940
LIN 4	2000	1	202 997.000	202.99700
LIN 4	2001	1	324 674.000	345.62071
LIN 4	2002	1	330 764.000	352.10361
LIN 4	2021	1	156 317.000	15.63170
LIN 5	1990	1	304 635.000	2 956.75147
LIN 5	1992	1	23 069.000	230.69000
LIN 5	1995	1	549 179.000	549.17900
LIN 5	1996	1	75 687.000	756.87000
LIN 5	1997	1	99 187.200	991.87200
LIN 5	2003	1	4 008.000	42.66581
LIN 6	1990	1	278 364.000	2 701.76824
LIN 6	1992	2	263 997.000	2 615.53267
LIN 6	1995	1	468.000	0.46800
LIN 6	1996	2	446 967.600	4 496.14800
LIN 6	1997	1	275 616.000	2 756.16000
LIN 7	1991	3	72 490.000	280.74570
LIN 7	1992	3	231 590.000	2 238.70333
LIN 7	1993	2	10 877.000	105.14433
LIN 7	1994	2	29 576.000	295.76000

Table A.2: Annual number of trips, and affected greenweight quantity, where the LAGWO rule indicated an order of magnitude error in the landing weight and this was adjusted. (continued)

QMA	Fishing year	Trips	Greenweight (kg)	
			Original	Adjusted
LIN 7	1997	2	51 125.000	60.53000
LIN 7	1998	3	418 740.450	1 969.06200
LIN 7	1999	1	10 370.250	103.70250
LIN 7	2000	5	128 989.800	1 016.52300
LIN 7	2003	1	47 041.000	462.57150
LIN 7	2004	4	17 498.600	174.98600
LIN 7	2009	1	6 229.000	62.29000
LIN 7	2011	1	6 892.000	68.92000
LIN 7	2013	1	10 801.050	108.01050
LIN 7	2020	1	8 165.000	81.65000

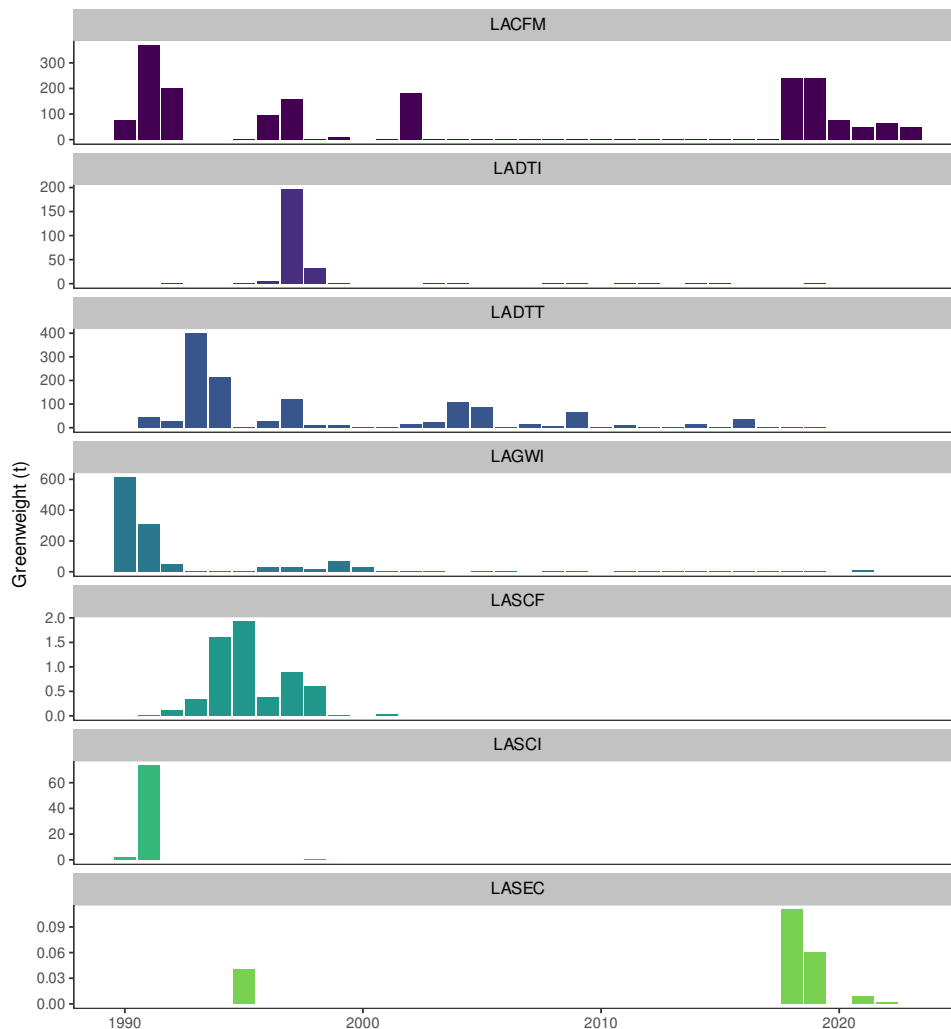


Figure A.4: The quantity of landings flagged by the grooming rules, or where fixes were applied to fields other than the landed greenweight. Note that some landing events may be affected by multiple rules.

A.2 Effort

Table A.3: Grooming rules applied to effort data.

Rule	Effect	Description
FLKIN	Fix	Update target species to SUR when KIN is reported from diving events with no MHR support
FEMDV	Fix	Update historical diving method codes to DV
FEPMN	Fix	Add PSH as a method code for certain vessels if method is null
FEPMI	Fix	Replace missing methods if there is only one method used on the trip (by form type)
FEPMM	Flag	Flag trips if any events have a missing method
FESAI	Fix	Substitute the modal statistical area from a trip for missing areas
FESAM	Flag	Flag events with missing statistical areas
FESAS	Fix	For BCO 4 only correct RL statistical areas to general areas
FESAF	Flag	Flag non RLP events using RL statistical area codes
FETSE	Fix	Set target species to group code for FLA, HPB and OEO species
FETSW	Fix	Flag and set target species to null if target species is not a valid species code
FETSI	Fix	Replace missing target species with the modal value for a trip
FEETN	Fix	Flag and fix some CP effort errors
FEEHN	Fix	Fix transposed effort numbers for lining methods on CELR forms
FEEMU	Fix	Fix SN mesh sizes recorded in inches
FEMEM	Flag	Flag events where the primary effort measure is missing
FEHDE	Flag	Flag records where the maximum daily effort is out of range
FEDBE	Fix	Transpose bottom and effort depths if reported effort depth > bottom depth

Table A.4: Grooming rules applied to estimated catch data.

Rule	Effect	Description
ESTGT	Fix	Create estimated catch records for events with a total catch weight only

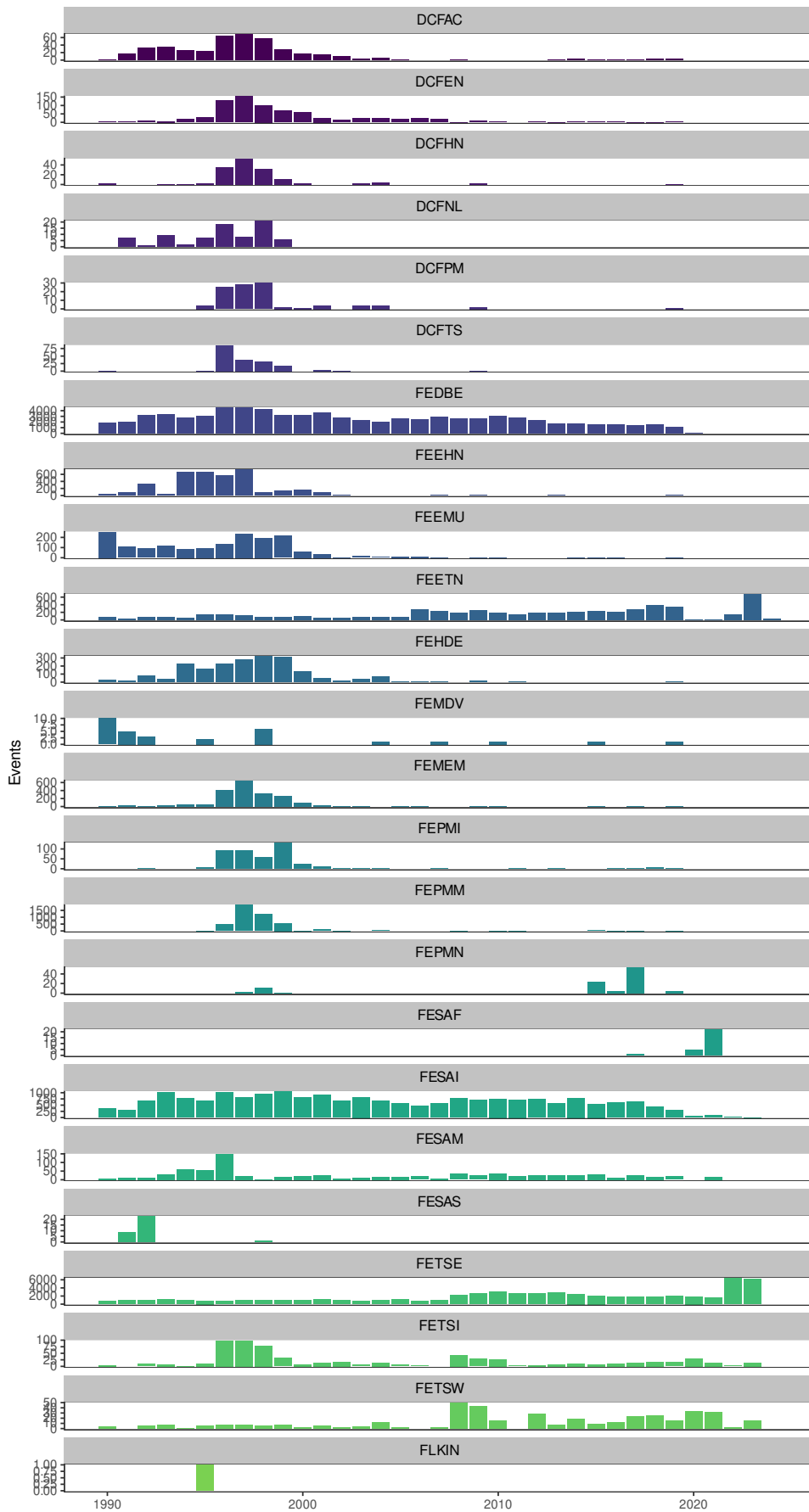


Figure A.5: The number of fishing events flagged or fixed by the grooming rules (Table A.3). Note that some events may be affected by multiple rules.

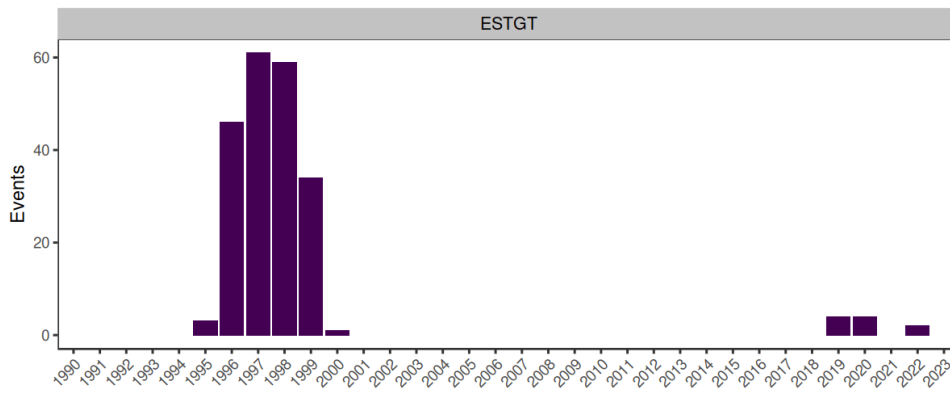


Figure A.6: The number of fishing events where the estimated catch of ling was flagged or fixed by the grooming rules (Table A.4). Note that some events may be affected by multiple rules.

APPENDIX B: TABULATED FISHERIES CHARACTERISATION DATA

Table B.1: Annual Total Allowable Commercial Catch (TACC; t) and Monthly Harvest Return (MHR)/Quota Management Report (QMR) totals (t) for LIN 1, LIN 2, LIN 3, LIN 4, LIN 5, LIN 6 and LIN 7 from 1990 to 2023.

Fishing year	LIN 1		LIN 2		LIN 3		LIN 4		LIN 5		LIN 6		LIN 7	
	TACC	MHR/QMR	TACC	MHR/QMR	TACC	MHR/QMR	TACC	MHR/QMR	TACC	MHR/QMR	TACC	MHR/QMR	TACC	MHR/QMR
1990	237.50	120.51	955.40	735.56	1916.70	1875.75	4400.00	587.02	2505.60	2276.52	7000.00	935.08	2149.80	2495.97
1991	264.70	206.60	976.60	967.46	2137.50	2410.13	4401.00	2420.48	2705.80	2291.38	7000.00	2844.97	2176.00	2534.09
1992	264.70	241.25	976.60	831.44	2160.40	2423.23	4401.00	4710.04	2706.40	3867.04	7000.00	3460.50	2191.80	2262.16
1993	264.70	253.35	976.60	944.45	2160.40	2247.18	4401.00	4099.68	2706.40	2545.58	7000.00	6503.69	2191.80	2475.10
1994	264.70	234.25	980.00	779.33	2161.80	2166.76	4401.00	3916.69	2706.40	2458.84	7000.00	4247.69	2212.60	2155.09
1995	264.70	260.88	980.00	850.08	2800.00	2653.88	5720.00	5072.08	2706.40	2557.69	7000.00	5476.96	2212.60	2945.51
1996	264.70	245.23	980.00	1051.10	2809.90	2961.99	5720.00	4632.29	3001.40	3137.02	7100.00	6341.29	2225.10	3102.52
1997	264.70	312.79	980.00	1187.15	2809.90	2976.38	5720.00	4086.97	3001.40	3437.56	7100.00	7509.96	2225.10	3024.03
1998	264.70	326.34	982.00	991.80	2809.90	2942.96	5720.00	5215.28	3001.40	3320.59	7100.00	7330.96	2225.10	2955.13
1999	264.70	208.44	982.00	1069.95	2809.90	2705.55	5720.00	4642.23	3001.40	2936.89	7100.00	6111.55	2225.10	3344.74
2000	264.70	312.60	982.00	983.06	2809.90	2779.35	5720.00	4402.37	3001.40	3135.58	7100.00	6706.66	2225.10	3274.01
2001	264.70	296.45	982.00	1105.02	2060.00	2329.66	4200.00	3861.17	3001.40	3429.90	7100.00	6176.91	2225.10	3351.98
2002	264.70	303.15	982.00	1034.23	2060.00	2164.44	4200.00	3601.60	3001.40	3294.93	7100.00	5945.45	2225.10	3219.20
2003	400.00	246.20	982.00	995.79	2060.00	2528.53	4200.00	2997.29	3001.40	2939.08	7100.00	6282.96	2225.10	2917.86
2004	400.00	249.04	982.00	1044.28	2060.00	1989.51	4200.00	2617.73	3001.40	2899.48	7100.00	7031.76	2225.10	2925.93
2005	400.00	283.26	982.00	935.98	2060.00	1597.33	4200.00	2757.84	3595.00	3584.41	8505.00	5505.68	2225.10	2521.66
2006	400.00	363.98	982.00	780.03	2060.00	1711.01	4200.00	1768.60	3595.00	3522.15	8505.00	3553.07	2225.10	2478.97
2007	400.00	301.00	982.00	873.64	2060.00	2089.34	4200.00	2112.91	3595.00	3731.39	8505.00	4696.08	2225.10	2294.92
2008	400.00	381.39	982.00	792.10	2060.00	1777.62	4200.00	2382.72	3595.00	4401.44	8505.00	4245.73	2225.10	2281.74
2009	400.00	320.07	982.00	633.70	2060.00	1751.23	4200.00	2000.31	3595.00	3231.70	8505.00	2976.72	2225.10	2223.24
2010	400.00	385.89	982.00	584.18	2060.00	1718.37	4200.00	2025.88	3595.00	3034.13	8505.00	2413.97	2474.00	2446.24
2011	400.00	438.09	982.00	669.56	2060.00	1665.36	4200.00	1571.71	3595.00	3856.40	8505.00	1335.45	2474.00	2800.17
2012	400.00	384.23	982.00	505.92	2060.00	1292.09	4200.00	2305.26	3595.00	3648.81	8505.00	2047.30	2474.00	2770.98
2013	400.00	382.88	982.00	578.69	2060.00	1475.17	4200.00	2180.72	3595.00	3609.87	8505.00	3102.37	2474.00	3009.65
2014	400.00	380.03	982.00	673.52	2060.00	1441.68	4200.00	2372.89	3955.00	3935.22	8505.00	3221.48	3080.00	3199.78
2015	400.00	374.20	982.00	673.09	2060.00	1325.21	4200.00	2246.49	3955.00	3924.31	8505.00	3114.97	3080.00	3343.61
2016	400.00	422.34	982.00	702.42	2060.00	1439.96	4200.00	2658.68	3955.00	3868.39	8505.00	2222.32	3080.00	3351.49
2017	400.00	404.38	982.00	1022.03	2060.00	1807.74	4200.00	2565.31	3955.00	4050.74	8505.00	3322.70	3080.00	3427.83
2018	400.00	414.67	982.00	1105.52	2060.00	2170.83	4200.00	2635.98	3955.00	4034.31	8505.00	4845.90	3080.00	3487.07
2019	400.00	383.48	982.00	938.80	2060.00	2015.73	4200.00	2043.61	4735.00	4596.20	8505.00	3706.10	3080.00	3058.63
2020	400.00	371.46	982.00	755.54	2060.00	1685.00	4200.00	1778.35	4735.00	4678.46	8505.00	3972.09	3387.00	3215.98
2021	400.00	318.88	982.00	644.67	2060.00	1489.08	4200.00	2129.27	4735.00	4949.26	8505.00	3917.00	3387.00	3307.63
2022	400.00	352.94	982.00	531.63	2060.00	1175.41	4200.00	2604.23	5208.00	5049.56	8505.00	3881.20	3387.00	3325.42
2023	400.00	268.06	982.00	458.78	2060.00	1366.28	4200.00	1891.83	5208.00	4906.86	8505.00	4780.76	3387.00	3540.24

Table B.2: Annual LIN 1 catches (t) from the different sources of data used in the fishery characterisation. QMR = Quota Management Reports; MHR = Monthly Harvest Returns. Catches represent groomed (Appendix A) landings/discards data summed by stock (see Table 2 for destination codes included). Allocated catch represents catches allocated to fishing events in the characterisation dataset, with the percentage taken by key fishing methods indicated. Target catch is the allocated catch taken on fishing events where ling was targeted. – : no observations. Catch percentages for years where a method was used by less than three vessels or three permit holders are omitted (indicated by x).

Fishing year	QMR/MHR (t)	Catches (t)	Allocated catches										Target catches	
			Total (t)	BT-PRB (%)	BLL (%)	MW-PRM (%)	SN (%)	POT (%)	CP (%)	DL (%)	TL (%)	FP (%)	tonnes	%
1990	120.51	135.81	123.40	-	24.50	-	1.19	-	-	0.14	12.53	-	25.78	20.89
1991	206.60	200.31	207.26	-	18.31	-	0.32	-	x	0.14	14.58	-	54.49	26.29
1992	241.25	250.00	250.70	-	50.68	-	1.54	-	-	0.07	0.36	-	111.59	44.51
1993	253.35	246.62	281.72	-	57.53	-	2.32	-	x	0.04	0.40	-	143.93	51.09
1994	234.25	258.26	548.72	-	79.35	-	0.65	-	-	0.08	0.11	-	404.05	73.64
1995	260.88	352.08	470.10	-	71.73	-	7.76	-	x	0.15	0.11	-	327.92	69.76
1996	245.23	249.55	368.72	-	68.10	-	1.03	-	x	0.06	0.89	-	209.74	56.88
1997	312.79	304.25	766.74	-	68.26	-	3.47	-	-	0.26	x	-	510.73	66.61
1998	326.34	323.33	482.95	-	55.77	-	1.27	-	-	0.47	0.84	-	255.09	52.82
1999	208.44	224.46	355.94	-	45.82	-	7.99	-	-	0.76	x	-	181.77	51.07
2000	312.60	374.69	429.55	-	34.53	-	0.13	-	x	0.16	x	-	134.16	31.23
2001	296.45	304.41	361.90	-	37.39	-	0.11	-	-	0.36	x	x	113.07	31.24
2002	303.15	325.32	340.44	-	32.68	-	0.26	-	-	0.45	x	-	118.21	34.72
2003	246.20	246.89	265.70	-	40.65	-	0.39	-	x	0.46	x	-	129.85	48.87
2004	249.04	250.47	242.97	-	45.77	-	0.30	-	x	0.14	-	-	100.74	41.46
2005	283.26	269.65	270.44	-	66.39	-	0.08	-	x	0.07	x	-	154.75	57.22
2006	363.98	359.80	356.10	-	59.96	-	x	-	-	0.17	0.04	-	251.34	70.58
2007	301.00	308.45	307.93	-	67.38	-	0.02	-	-	0.23	x	-	200.42	65.09
2008	381.39	395.25	384.38	-	63.66	-	0.19	-	x	0.12	x	-	294.57	76.64
2009	320.07	321.87	319.07	-	55.16	-	0.00	-	-	0.06	x	-	236.01	73.97
2010	385.89	386.52	383.47	-	58.47	-	0.00	-	-	0.09	x	-	274.98	71.71
2011	438.09	460.33	431.92	-	72.74	-	0.00	-	x	0.05	x	-	324.79	75.20
2012	384.23	413.80	395.26	-	66.38	-	0.12	-	x	0.18	x	-	292.20	73.93
2013	382.88	373.04	372.23	-	47.64	-	0.15	-	x	0.03	x	-	243.20	65.34
2014	380.03	388.05	386.17	-	62.18	-	0.24	-	-	0.05	-	x	251.54	65.14
2015	374.20	354.93	366.80	-	61.22	-	0.29	-	-	0.06	x	-	251.96	68.69
2016	422.34	422.55	428.53	-	60.98	-	0.26	-	x	0.01	x	-	314.49	73.39
2017	404.38	400.82	401.93	-	57.70	-	0.54	-	-	0.23	-	x	290.37	72.24
2018	414.67	413.69	412.38	-	60.67	-	0.26	-	x	0.04	-	x	272.61	66.11
2019	383.48	390.83	395.16	-	53.52	-	0.27	-	x	0.01	x	-	235.05	59.48
2020	371.46	432.04	432.09	-	56.67	-	-	-	-	0.03	-	-	267.65	61.94
2021	318.88	314.73	320.47	-	44.62	-	-	-	-	0.04	-	-	206.58	64.46
2022	352.94	348.43	351.49	-	38.97	-	x	-	-	x	-	x	235.48	66.99
2023	268.06	271.44	265.75	-	9.74	-	0.47	-	-	x	-	x	192.19	72.32

Table B.3: Annual LIN 2 catches (t) from the different sources of data used in the fishery characterisation. QMR = Quota Management Reports; MHR = Monthly Harvest Returns. Catches represent groomed (Appendix A) landings/discards data summed by stock (see Table 2 for destination codes included). Allocated catch represents catches allocated to fishing events in the characterisation dataset, with the percentage taken by key fishing methods indicated. Target catch is the allocated catch taken on fishing events where ling was targeted. – : no observations. Catch percentages for years where a method was used by less than three vessels or three permit holders are omitted (indicated by x).

Fishing year	QMR/MHR (t)	Catches (t)	Allocated catches										Target catches	
			Total (t)	BT-PRB (%)	BLL (%)	MW-PRM (%)	SN (%)	POT (%)	CP (%)	DL (%)	TL (%)	FP (%)	tonnes	%
1990	735.56	567.91	729.30	-	22.37	-	6.47	-	-	5.75	2.00	-	258.20	35.40
1991	967.46	940.64	943.20	-	18.05	-	9.67	-	-	2.08	7.22	-	314.79	33.37
1992	831.44	818.33	837.92	-	41.58	-	5.24	-	-	2.98	0.68	-	390.17	46.56
1993	944.45	905.21	863.85	-	53.70	-	3.70	-	-	3.19	0.16	-	504.83	58.44
1994	779.33	867.98	832.05	-	55.07	-	0.94	-	x	3.05	1.58	-	479.50	57.63
1995	850.09	949.47	942.01	-	59.48	-	0.09	-	x	1.74	1.19	-	538.59	57.18
1996	1051.10	1107.58	1014.10	-	44.94	-	1.36	-	-	1.40	0.16	-	469.07	46.26
1997	1187.15	1275.29	1123.12	-	39.53	-	2.71	-	-	1.09	x	-	459.02	40.87
1998	991.80	1030.12	937.38	-	50.33	-	1.51	-	-	1.09	-	-	475.60	50.74
1999	1069.95	1127.24	1005.73	-	50.17	-	0.06	-	-	0.86	x	-	500.23	49.74
2000	983.06	985.85	950.83	-	49.67	-	0.22	-	-	1.07	x	-	474.37	49.89
2001	1105.02	1179.50	1152.14	-	52.19	-	0.17	-	-	0.65	-	-	600.50	52.12
2002	1034.23	1024.79	952.77	-	55.40	-	0.08	-	-	1.06	-	-	528.01	55.42
2003	995.79	999.11	957.57	-	56.06	-	0.07	-	-	5.62	-	-	562.36	58.73
2004	1044.28	1025.60	1005.37	-	61.30	-	0.22	-	-	6.47	3.64	-	680.36	67.67
2005	935.98	938.48	905.79	-	70.36	-	0.19	-	-	2.92	x	-	644.69	71.17
2006	780.03	761.05	773.62	-	77.10	-	1.11	-	-	0.33	x	-	539.91	69.79
2007	873.64	864.11	850.73	-	76.35	-	x	-	x	0.10	-	-	644.58	75.77
2008	792.10	788.55	783.17	-	79.74	-	0.38	-	-	0.26	-	-	609.54	77.83
2009	633.70	638.91	639.36	-	73.77	-	0.95	-	x	0.44	x	-	492.21	76.98
2010	584.18	571.70	568.14	-	77.34	-	0.38	-	-	0.44	-	x	438.56	77.19
2011	669.56	677.67	695.70	-	75.79	-	0.03	-	-	0.48	-	-	569.19	81.82
2012	505.92	469.55	477.98	-	69.24	-	0.17	-	-	1.58	x	-	369.63	77.33
2013	578.69	576.11	556.16	-	72.63	-	0.10	-	-	3.33	x	-	426.16	76.63
2014	673.52	655.91	646.95	-	63.35	-	0.06	-	-	1.97	x	-	454.91	70.32
2015	673.09	678.03	653.48	-	72.06	-	0.18	-	-	0.89	-	-	482.81	73.88
2016	702.42	705.21	689.35	-	68.27	-	0.21	-	x	2.41	-	x	508.33	73.74
2017	1022.03	1032.25	1020.33	-	67.62	-	0.33	-	x	2.44	x	-	812.11	79.59
2018	1105.52	1105.93	1091.49	-	63.03	-	0.46	-	x	1.86	0.07	-	854.76	78.31
2019	938.80	916.89	887.21	-	67.01	-	x	x	x	0.47	-	-	653.72	73.68
2020	755.54	771.21	769.86	-	72.91	-	0.51	x	-	0.46	-	-	604.31	78.50
2021	644.67	644.91	654.40	-	68.00	-	0.62	x	-	0.30	-	-	482.70	73.76
2022	531.63	523.98	536.96	-	71.20	-	0.50	x	-	0.73	-	-	386.93	72.06
2023	458.78	469.21	479.16	-	68.40	-	0.98	-	-	1.21	-	-	325.35	67.90

Table B.4: Annual LIN 3 catches (t) from the different sources of data used in the fishery characterisation. QMR = Quota Management Reports; MHR = Monthly Harvest Returns. Catches represent groomed (Appendix A) landings/discards data summed by stock (see Table 2 for destination codes included). Allocated catch represents catches allocated to fishing events in the characterisation dataset, with the percentage taken by key fishing methods indicated. Target catch is the allocated catch taken on fishing events where ling was targeted. – : no observations. Catch percentages for years where a method was used by less than three vessels or three permit holders are omitted (indicated by x).

Fishing year	QMR/MHR (t)	Catches (t)	Allocated catches										Target catches	
			Total (t)	BT-PRB (%)	BLL (%)	MW-PRM (%)	SN (%)	POT (%)	CP (%)	DL (%)	TL (%)	FP (%)	tonnes	%
1990	1875.75	1667.02	1600.56	-	9.71	-	14.90	-	0.13	1.07	0.54	-	527.69	32.97
1991	2410.13	2307.30	2309.43	-	20.05	-	11.72	-	0.71	1.73	3.21	x	1216.30	52.67
1992	2423.23	2498.50	2589.06	-	19.19	-	7.05	-	1.25	0.18	x	x	796.22	30.75
1993	2247.18	2341.43	2358.19	-	20.74	-	8.25	-	0.47	0.17	x	x	710.47	30.13
1994	2166.76	2118.43	2075.49	-	28.05	-	9.84	-	0.45	1.04	x	x	765.67	36.89
1995	2653.88	2343.66	2262.55	-	36.59	-	9.25	-	0.26	0.36	x	x	949.00	41.94
1996	2961.99	2863.17	2881.94	-	33.22	-	7.12	-	0.11	1.35	-	-	1136.58	39.44
1997	2976.38	2866.62	2615.76	-	24.35	-	8.59	-	1.35	3.26	x	-	915.60	35.00
1998	2942.96	2865.02	2628.58	-	15.52	-	8.71	-	1.51	2.57	-	-	710.68	27.04
1999	2705.55	2706.34	2606.90	-	19.68	-	7.00	-	1.65	1.63	-	-	718.16	27.55
2000	2779.35	2788.23	2722.25	-	29.66	-	7.16	-	0.78	0.96	-	-	1012.92	37.21
2001	2329.66	2438.16	2423.31	-	24.46	-	6.41	-	0.13	0.38	-	-	705.20	29.10
2002	2164.44	2214.36	2150.96	-	20.86	-	6.66	-	0.08	0.34	-	x	575.75	26.77
2003	2528.53	2555.98	2542.28	-	17.12	-	4.90	-	0.06	0.52	-	x	547.37	21.53
2004	1989.51	2031.90	1980.82	-	19.21	-	6.80	-	0.20	-	x	-	482.18	24.34
2005	1597.33	1581.16	1534.89	-	22.79	-	5.49	-	0.62	1.03	-	-	418.15	27.24
2006	1711.01	1679.63	1583.01	-	24.11	-	4.06	-	3.55	2.83	-	x	587.02	37.08
2007	2089.34	2082.35	2017.08	-	25.19	-	2.56	-	3.03	1.22	x	0.35	965.93	47.89
2008	1777.62	1913.11	1873.50	-	26.06	-	3.00	-	0.67	0.93	-	x	1083.59	57.84
2009	1751.23	1941.79	1877.28	-	31.06	-	3.30	-	0.96	0.67	-	x	911.34	48.55
2010	1718.37	1770.70	1745.39	-	37.57	-	3.79	-	2.34	1.52	-	-	867.61	49.71
2011	1665.36	1746.47	1700.82	-	37.21	-	3.67	-	1.95	0.53	x	-	747.71	43.96
2012	1292.09	1352.97	1366.14	-	40.45	-	3.50	-	0.68	0.46	x	x	627.49	45.93
2013	1475.17	1522.63	1480.55	-	47.33	-	2.55	-	1.84	0.77	x	x	779.93	52.68
2014	1441.68	1489.72	1487.45	-	44.47	-	1.99	-	4.07	0.78	x	x	779.26	52.39
2015	1325.21	1365.66	1328.31	-	36.50	-	2.81	-	3.66	0.69	x	0.07	550.38	41.43
2016	1439.96	1544.12	1448.75	-	39.25	-	3.53	-	10.04	0.68	x	0.06	770.98	53.22
2017	1807.74	1883.99	1916.72	-	36.75	-	2.07	-	7.83	0.05	x	-	872.96	45.54
2018	2170.83	2173.30	2102.77	-	32.87	-	1.85	-	24.87	0.16	x	x	1256.05	59.73
2019	2015.73	2061.62	2055.54	-	32.68	-	1.98	9.33	5.62	0.12	-	2.29	1034.11	50.31
2020	1685.00	1715.58	1687.23	-	34.76	-	2.07	13.29	0.05	0.16	-	x	864.46	51.24
2021	1489.08	1549.75	1550.19	-	27.94	-	2.44	22.01	0.06	0.03	-	x	842.10	54.32
2022	1175.41	1216.79	1219.32	-	19.99	-	3.12	8.91	0.10	0.01	-	x	415.76	34.10
2023	1366.28	1406.02	1416.17	-	13.37	-	2.98	19.46	0.08	0.05	-	x	511.39	36.11

Table B.5: Annual LIN 4 catches (t) from the different sources of data used in the fishery characterisation. QMR = Quota Management Reports; MHR = Monthly Harvest Returns. Catches represent groomed (Appendix A) landings/discards data summed by stock (see Table 2 for destination codes included). Allocated catch represents catches allocated to fishing events in the characterisation dataset, with the percentage taken by key fishing methods indicated. Target catch is the allocated catch taken on fishing events where ling was targeted. – : no observations. Catch percentages for years where a method was used by less than three vessels or three permit holders are omitted (indicated by x).

Fishing year	QMR/MHR (t)	Catches (t)	Allocated catches										Target catches	
			Total (t)	BT-PRB (%)	BLL (%)	MW-PRM (%)	SN (%)	POT (%)	CP (%)	DL (%)	TL (%)	FP (%)	tonnes	%
1990	587.01	531.80	449.34	-	x	-	x	-	-	x	x	-	194.28	43.24
1991	2420.48	2298.83	2202.62	-	x	-	-	-	x	-	1.23	-	1022.08	46.40
1992	4710.04	3741.20	3638.36	-	61.60	-	x	-	-	x	x	-	2522.74	69.34
1993	4099.68	3563.30	3699.15	-	61.29	-	-	-	0.00	-	-	-	2348.01	63.47
1994	3916.69	4182.97	3985.79	-	87.00	-	-	-	-	-	-	-	3464.72	86.93
1995	5072.08	3812.50	3430.08	-	72.02	-	-	-	-	x	x	-	2483.84	72.41
1996	4632.29	4115.64	3704.85	-	76.65	-	-	-	x	0.01	x	-	2902.53	78.34
1997	4086.97	4112.90	3914.01	-	75.72	-	x	-	-	-	-	-	2956.69	75.54
1998	5215.28	4393.36	4086.90	-	42.21	-	-	-	x	-	-	-	2302.94	56.35
1999	4642.23	4452.25	4119.02	-	40.96	-	-	-	-	x	-	-	2072.45	50.31
2000	4402.37	4046.77	3964.00	-	49.97	-	-	-	-	-	-	-	2515.48	63.46
2001	3861.17	3585.38	3469.71	-	36.65	-	-	-	-	-	-	-	1620.81	46.71
2002	3601.60	3558.69	3490.78	-	58.29	-	-	-	-	-	x	-	2340.98	67.06
2003	2997.29	3263.36	3217.69	-	48.60	-	x	-	-	-	-	-	1801.59	55.99
2004	2617.73	2728.79	2726.40	-	50.64	-	-	-	-	-	-	-	1360.86	49.91
2005	2757.84	2970.90	2760.76	-	61.82	-	x	-	-	-	-	-	1669.98	60.49
2006	1768.60	1772.50	1753.40	-	58.31	-	-	-	-	-	-	-	1007.17	57.44
2007	2112.91	2310.27	2320.15	-	59.43	-	-	-	-	-	-	-	1561.08	67.28
2008	2382.72	2214.33	2195.31	-	33.00	-	x	-	x	-	-	-	1268.31	57.77
2009	2000.31	1868.87	1831.37	-	63.91	-	x	-	x	-	-	-	1181.18	64.50
2010	2025.88	2426.48	2432.60	-	73.47	-	x	-	-	-	-	-	1870.98	76.91
2011	1571.71	1540.62	1545.14	-	63.66	-	x	-	-	-	-	-	964.50	62.42
2012	2305.26	2218.34	2198.80	-	60.97	-	-	-	-	x	-	-	1374.87	62.53
2013	2180.72	2458.94	2431.19	-	63.81	-	-	-	-	x	-	-	1529.04	62.89
2014	2372.89	2231.64	2222.96	-	69.77	-	x	-	x	x	-	-	1583.05	71.21
2015	2246.49	2469.74	2437.63	-	56.71	-	-	-	-	-	-	-	1512.46	62.05
2016	2658.68	2391.58	2364.18	-	58.85	-	x	-	-	-	-	-	1449.42	61.31
2017	2565.31	2701.88	2820.54	-	64.26	-	-	-	x	-	-	-	1872.95	66.40
2018	2635.98	2519.12	2518.13	-	60.35	-	-	-	x	-	-	-	1644.84	65.32
2019	2043.61	2528.33	2526.70	-	65.34	-	-	x	-	-	-	x	1959.93	77.57
2020	1778.35	1646.80	1658.92	-	60.30	-	-	-	x	-	-	-	1151.40	69.41
2021	2129.27	1878.71	1863.84	-	67.26	-	-	-	-	-	-	-	1242.80	66.68
2022	2604.23	2455.88	2497.57	-	70.71	-	-	x	-	-	-	-	1941.02	77.72
2023	1891.83	1944.02	1941.87	-	45.50	-	-	x	-	-	-	-	1356.41	69.85

Table B.6: Annual LIN 5 catches (t) from the different sources of data used in the fishery characterisation. QMR = Quota Management Reports; MHR = Monthly Harvest Returns. Catches represent groomed (Appendix A) landings/discards data summed by stock (see Table 2 for destination codes included). Allocated catch represents catches allocated to fishing events in the characterisation dataset, with the percentage taken by key fishing methods indicated. Target catch is the allocated catch taken on fishing events where ling was targeted. – : no observations. Catch percentages for years where a method was used by less than three vessels or three permit holders are omitted (indicated by x).

Fishing year	QMR/MHR (t)	Catches (t)	Allocated catches										Target catches		
			Total (t)	BT-PRB (%)	BLL (%)	MW-PRM (%)	SN (%)	POT (%)	CP (%)	DL (%)	TL (%)	FP (%)	tonnes	%	
1990	2276.52	1758.50	1621.11	-	0.68	-	0.02	-	0.01	-	-	x	-	770.38	47.52
1991	2291.38	2450.50	2387.26	-	1.61	-	0.05	-	0.01	0.01	x	x	1312.86	54.99	
1992	3867.04	3841.41	3706.11	-	8.32	-	0.67	-	0.01	0.00	x	-	1066.35	28.77	
1993	2545.58	2599.76	2623.81	-	17.07	-	0.03	-	0.02	-	x	-	1080.05	41.16	
1994	2458.84	2355.85	2663.17	-	27.91	-	0.01	-	0.04	0.04	x	-	1499.72	56.31	
1995	2557.69	2583.01	3773.74	-	21.33	-	0.04	-	0.05	0.02	x	-	2355.52	62.42	
1996	3137.02	2871.40	3861.66	-	11.08	-	0.02	-	0.08	0.02	x	-	1920.09	49.72	
1997	3437.56	3274.24	3461.06	-	26.38	-	0.16	-	0.04	0.09	x	-	1629.38	47.08	
1998	3320.59	3182.09	3628.34	-	32.69	-	0.81	-	0.03	0.06	-	x	1902.98	52.45	
1999	2936.89	3070.87	3224.84	-	27.52	-	0.64	-	0.01	0.05	-	-	1425.43	44.20	
2000	3135.58	3125.92	3526.40	-	29.33	-	0.02	-	0.02	0.03	-	x	1663.13	47.16	
2001	3429.90	3643.46	3805.21	-	32.44	-	0.02	-	0.01	0.02	-	x	1429.93	37.58	
2002	3294.93	3333.32	3311.75	-	29.20	-	0.02	-	0.01	0.02	-	x	1062.53	32.08	
2003	2939.08	2953.17	2919.43	-	27.59	-	0.60	-	0.01	0.06	-	0.29	1090.91	37.37	
2004	2899.48	2719.04	2912.15	-	20.69	-	0.04	-	0.02	0.08	-	-	779.13	26.75	
2005	3584.41	3130.15	3554.06	-	28.07	-	0.04	-	0.01	0.03	-	-	1847.81	51.99	
2006	3522.15	3820.17	4066.53	-	20.14	-	0.02	-	0.08	0.02	-	-	2591.74	63.73	
2007	3731.39	3925.11	4328.66	-	16.23	-	0.05	-	0.07	0.01	-	-	2362.31	54.57	
2008	4401.44	4067.85	4305.35	-	19.56	-	0.06	-	0.05	0.00	-	-	3237.67	75.20	
2009	3231.70	3050.01	3313.65	-	12.71	-	0.18	-	0.38	0.00	-	-	1686.65	50.90	
2010	3034.13	3075.04	3156.82	-	14.25	-	0.13	-	0.30	0.00	-	-	1586.10	50.24	
2011	3856.40	4051.78	4134.08	-	10.57	-	0.11	-	0.17	0.00	-	-	2569.17	62.15	
2012	3648.81	3739.18	3823.70	-	18.60	-	0.09	-	0.05	0.01	-	-	2441.43	63.85	
2013	3609.87	3699.84	3732.25	-	14.68	-	0.06	-	0.13	x	-	-	2303.27	61.71	
2014	3935.22	4029.44	4034.25	-	13.95	-	0.07	-	0.11	0.00	-	-	2532.63	62.78	
2015	3924.31	3932.06	4042.21	-	12.80	-	0.05	-	0.18	-	-	-	2809.77	69.51	
2016	3868.39	3835.96	3949.60	-	12.54	-	0.06	-	0.05	x	-	-	3005.20	76.09	
2017	4050.74	4022.99	3824.33	-	18.36	-	0.06	-	0.04	x	-	-	2679.75	70.07	
2018	4034.31	4218.17	4231.22	-	13.92	-	0.02	-	0.19	x	-	-	2821.43	66.68	
2019	4596.20	4402.17	4425.45	-	8.56	-	0.05	x	0.08	x	-	-	3207.56	72.48	
2020	4678.46	4901.37	4916.57	-	9.90	-	0.09	-	0.06	0.00	-	-	3832.38	77.95	
2021	4949.26	4921.82	4896.30	-	11.92	-	0.04	-	0.03	x	-	-	4181.33	85.40	
2022	5049.56	5096.27	5078.08	-	10.60	-	0.01	-	0.03	x	-	-	4113.90	81.01	
2023	4906.86	4997.88	5052.21	-	11.33	-	0.02	-	0.04	-	-	-	4612.38	91.29	

Table B.7: Annual LIN 6 catches (t) from the different sources of data used in the fishery characterisation. QMR = Quota Management Reports; MHR = Monthly Harvest Returns. Catches represent groomed (Appendix A) landings/discards data summed by stock (see Table 2 for destination codes included). Allocated catch represents catches allocated to fishing events in the characterisation dataset, with the percentage taken by key fishing methods indicated. Target catch is the allocated catch taken on fishing events where ling was targeted. – : no observations. Catch percentages for years where a method was used by less than three vessels or three permit holders are omitted (indicated by x).

Fishing year	QMR/MHR (t)	Catches (t)	Allocated catches										Target catches		
			Total (t)	BT-PRB (%)	BLL (%)	MW-PRM (%)	SN (%)	POT (%)	CP (%)	DL (%)	TL (%)	FP (%)	tonnes	%	
1990	935.09	967.70	768.74	-	-	-	-	-	-	-	-	-	-	589.70	76.71
1991	2844.97	2988.85	2998.95	-	x	-	-	-	-	x	-	-	-	2154.47	71.84
1992	3460.50	3067.77	3007.62	-	x	-	-	-	-	-	-	-	-	2148.27	71.43
1993	6503.69	6423.32	6245.97	-	33.36	-	-	-	-	-	x	x	-	4606.89	73.76
1994	4247.69	4405.56	4011.02	-	43.45	-	-	-	-	-	-	-	-	3453.95	86.11
1995	5476.96	5835.03	4433.67	-	47.70	-	-	-	-	-	-	-	-	3688.71	83.20
1996	6341.29	5324.78	3625.99	-	46.86	-	x	-	-	-	-	-	-	3298.60	90.97
1997	7509.96	7343.10	5773.78	-	50.06	-	x	-	-	-	-	-	-	4666.30	80.82
1998	7330.97	7450.63	6058.68	-	49.15	-	-	-	-	-	-	-	-	4673.05	77.13
1999	6111.55	5870.82	4975.20	-	52.16	-	x	-	-	-	-	-	-	3902.31	78.44
2000	6706.65	6877.52	6516.06	-	36.27	-	-	-	-	-	-	-	-	4571.61	70.16
2001	6176.91	6452.27	6305.01	-	31.90	-	-	-	-	-	-	-	-	4310.46	68.37
2002	5945.45	6137.24	6165.62	-	21.78	-	x	-	-	-	-	-	-	2800.96	45.43
2003	6282.96	6312.28	6275.59	-	19.03	-	-	-	-	-	-	-	-	2946.78	46.96
2004	7031.76	7190.19	6964.97	-	23.74	-	-	-	-	-	-	-	-	3860.78	55.43
2005	5505.68	5690.48	5575.91	-	x	-	-	-	-	-	-	-	-	2362.58	42.37
2006	3553.07	3392.20	3229.00	-	x	-	-	-	-	x	-	-	-	2448.91	75.84
2007	4696.08	5026.78	4619.56	-	x	-	-	x	-	-	-	-	-	3767.90	81.56
2008	4245.73	5031.86	4723.17	-	x	-	-	x	-	-	-	-	-	3132.42	66.32
2009	2976.72	3259.23	2679.32	-	x	-	-	x	-	-	-	-	-	2013.81	75.16
2010	2413.97	2602.32	2510.46	-	x	-	-	x	-	-	-	-	-	1525.83	60.78
2011	1335.45	1364.49	1315.02	-	x	-	-	-	-	-	-	-	-	566.87	43.11
2012	2047.30	2062.27	1974.60	-	x	-	-	x	-	-	-	-	-	1033.53	52.34
2013	3102.37	3159.63	3129.74	-	-	-	-	x	-	-	-	-	-	1915.90	61.22
2014	3221.47	3549.30	3601.03	-	x	-	-	x	-	-	-	-	-	1836.01	50.99
2015	3114.97	2897.74	2784.09	-	x	-	-	x	-	-	-	-	-	1713.69	61.55
2016	2222.32	2723.50	2698.43	-	22.95	-	-	x	-	-	-	-	-	1339.61	49.64
2017	3322.70	2763.78	2786.05	-	41.18	-	-	-	-	-	-	-	-	1883.20	67.59
2018	4845.90	5051.43	4774.00	-	20.30	-	-	-	-	-	-	-	-	3070.84	64.32
2019	3706.10	4017.62	4006.26	-	29.05	-	-	-	-	-	-	-	-	3136.74	78.30
2020	3972.09	4397.16	4396.24	-	37.03	-	-	-	x	-	-	-	-	3595.65	81.79
2021	3917.00	3856.88	3878.85	-	34.97	-	-	-	-	-	-	-	-	3087.70	79.60
2022	3881.20	3850.35	3838.26	-	x	-	-	-	-	-	-	-	-	2521.20	65.69
2023	4780.76	4707.11	4654.04	-	x	-	-	-	x	-	-	-	-	4119.96	88.52

Table B.8: Annual LIN 7 catches (t) from the different sources of data used in the fishery characterisation. QMR = Quota Management Reports; MHR = Monthly Harvest Returns. Catches represent groomed (Appendix A) landings/discards data summed by stock (see Table 2 for destination codes included). Allocated catch represents catches allocated to fishing events in the characterisation dataset, with the percentage taken by key fishing methods indicated. Target catch is the allocated catch taken on fishing events where ling was targeted. – : no observations. Catch percentages for years where a method was used by less than three vessels or three permit holders are omitted (indicated by x).

Fishing year	QMR/MHR (t)	Catches (t)	Allocated catches										Target catches	
			Total (t)	BT-PRB (%)	BLL (%)	MW-PRM (%)	SN (%)	POT (%)	CP (%)	DL (%)	TL (%)	FP (%)	tonnes	%
1990	2495.97	2458.34	2201.27	-	6.89	-	18.59	-	-	0.01	2.35	-	649.23	29.49
1991	2534.09	2488.62	2293.08	-	16.21	-	17.66	-	-	0.01	2.36	-	883.93	38.55
1992	2262.16	2105.73	2130.39	-	33.41	-	10.34	-	-	0.01	2.22	-	1074.81	50.45
1993	2475.10	2544.57	2449.59	-	31.13	-	6.64	-	-	0.00	1.31	-	1038.75	42.40
1994	2155.09	2247.15	2191.60	-	40.76	-	8.19	-	-	0.11	2.17	-	1076.51	49.12
1995	2945.51	2875.20	2776.80	-	35.07	-	5.54	-	-	0.06	x	x	1070.84	38.56
1996	3102.52	3049.44	3000.65	-	29.02	-	8.02	-	x	0.02	-	x	1082.96	36.09
1997	3024.03	3047.92	3016.74	-	30.44	-	3.32	-	-	0.02	x	-	998.23	33.09
1998	2955.13	3065.11	3032.14	-	28.16	-	3.45	-	-	0.06	-	-	954.58	31.48
1999	3344.74	3403.90	3390.11	-	27.12	-	2.10	-	-	0.07	-	-	968.46	28.57
2000	3274.01	3087.23	3078.41	-	24.11	-	3.57	-	-	0.02	x	-	778.48	25.29
2001	3351.97	3708.29	3646.19	-	25.24	-	1.61	-	-	0.01	-	x	938.66	25.74
2002	3219.20	3270.44	3301.61	-	21.49	-	2.47	-	x	0.03	-	-	799.85	24.23
2003	2917.86	2833.17	2825.94	-	25.77	-	1.89	-	-	0.06	x	-	765.19	27.08
2004	2925.93	2984.81	2997.72	-	25.43	-	1.15	-	-	0.06	x	x	813.93	27.15
2005	2521.66	2541.44	2489.91	-	33.68	-	2.01	-	-	0.05	-	-	966.21	38.81
2006	2478.97	2489.14	2459.75	-	25.65	-	2.69	-	-	0.05	-	-	770.87	31.34
2007	2294.91	2320.61	2336.15	-	42.91	-	4.38	-	-	0.04	-	-	1171.46	50.14
2008	2281.74	2289.43	2275.70	-	48.63	-	2.25	-	-	0.02	-	-	1308.97	57.52
2009	2223.24	2216.47	2149.62	-	44.22	-	1.98	-	-	0.17	-	-	1142.81	53.16
2010	4892.47	2462.12	2188.54	-	38.51	-	2.10	-	-	0.06	-	x	1100.40	50.28
2011	2800.17	2845.30	2760.44	-	36.85	-	1.20	-	-	0.01	-	x	1236.41	44.79
2012	2770.98	2802.79	2756.08	-	36.96	-	1.06	-	x	0.04	-	-	1182.25	42.90
2013	3009.65	3012.01	2966.25	-	33.22	-	1.14	-	0.00	0.04	-	-	1083.53	36.53
2014	3199.78	3307.88	3218.86	-	37.53	-	0.68	-	x	0.00	-	x	1269.21	39.43
2015	3343.61	3426.36	3434.63	-	34.90	-	0.00	-	0.01	x	-	-	1248.10	36.34
2016	3351.49	3440.09	3449.05	-	32.34	-	1.42	-	x	0.00	-	x	1233.87	35.77
2017	3427.83	3468.32	3404.98	-	26.56	-	0.00	-	0.45	0.00	-	-	1062.90	31.22
2018	3487.07	3597.22	3569.23	-	26.90	-	0.20	-	0.50	0.13	-	-	1056.03	29.59
2019	3058.63	2995.18	2878.27	-	39.44	-	0.00	x	-	0.06	-	-	1235.53	42.93
2020	3215.98	3296.28	3282.96	-	44.77	-	0.79	x	-	0.02	-	-	1915.62	58.35
2021	3307.63	3276.90	3225.35	-	50.20	-	0.12	x	-	0.00	-	-	2054.07	63.69
2022	3325.42	3338.64	3302.51	-	48.19	-	0.02	x	-	0.01	-	-	2056.00	62.26
2023	3540.24	3540.28	3512.56	-	34.63	-	0.14	22.24	-	0.00	-	-	2479.69	70.59

APPENDIX C: SPATIAL OVERLAP OF LING FISHERIES

To assess the overlap between the ling potting fishery, and the bottom trawl and longline fisheries for ling, catches from all three methods were aggregated on a 32 km grid for the five year period 2019–2023. Grids were ranked in descending order of ling catch from each method, both over all areas and separately within each ling quota management area. The ranks were compared for the three methods in a pairwise manner, using scatterplots and Pearson’s correlation coefficient, for cells with catches by multiple methods.

For all areas (Figure C.1) there was a positive correlation in the grid cell ranks for the three methods; although the relationships were not especially strong there was some indication that the cell ranking for potting is more similar to that of the longline fishery than the trawl fishery.

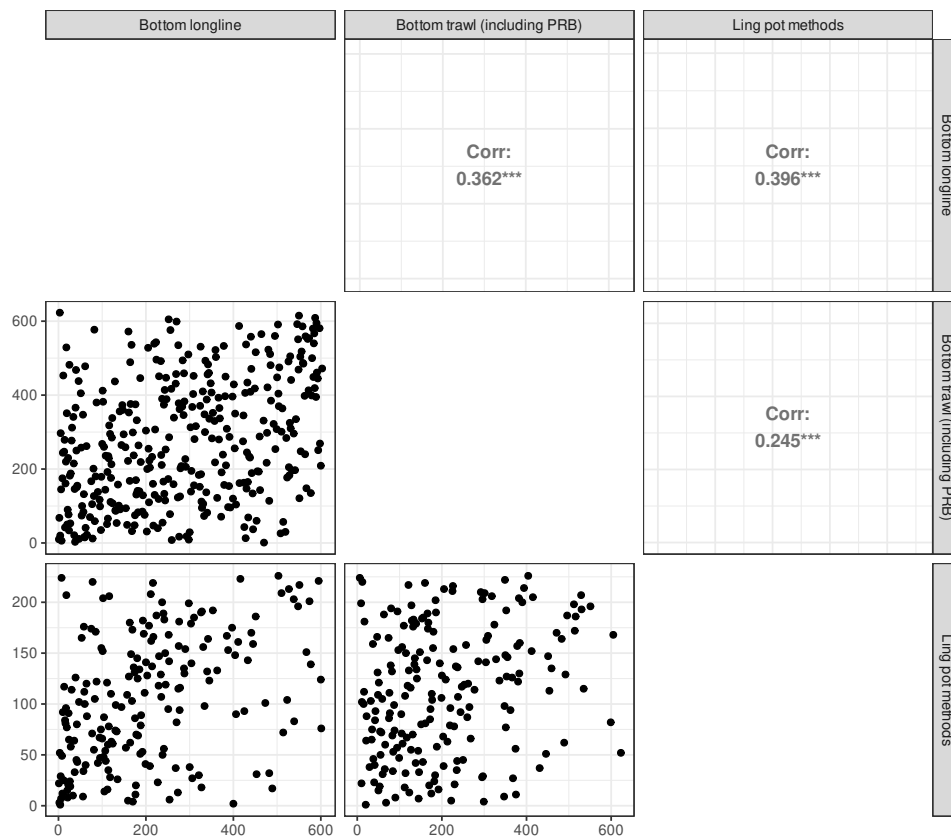


Figure C.1: Comparison of grid ranks for ling catches in 2019 to 2023 (where a rank of 1 is given to the grid cell with the highest catch by a method) for bottom trawling, bottom longlining, and ling potting.

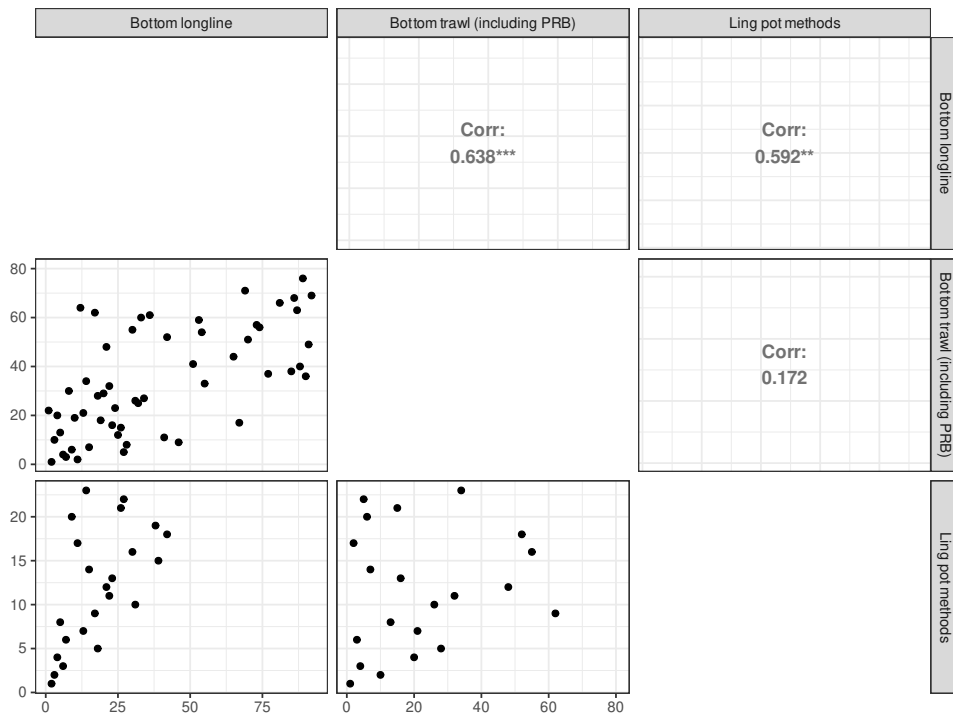


Figure C.2: Comparison of grid ranks for LIN 1 ling catches in 2019 to 2023 (where a rank of 1 is given to the grid cell with the highest catch by a method) for bottom trawling, bottom longlining, and ling potting.

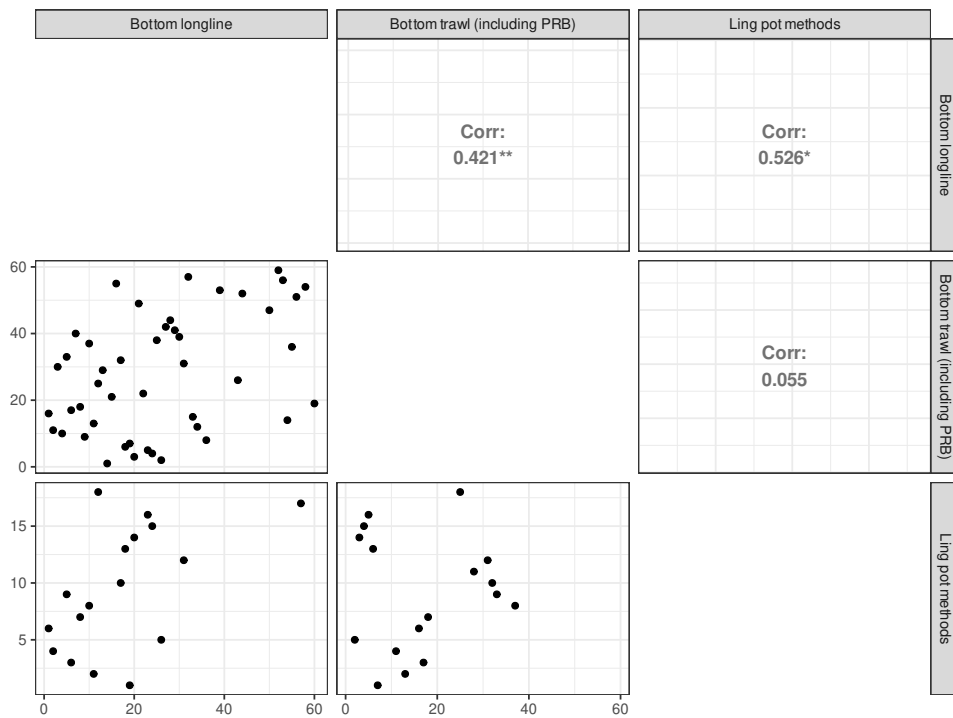


Figure C.3: Comparison of grid ranks for LIN 2 ling catches in 2019 to 2023 (where a rank of 1 is given to the grid cell with the highest catch by a method) for bottom trawling, bottom longlining, and ling potting.

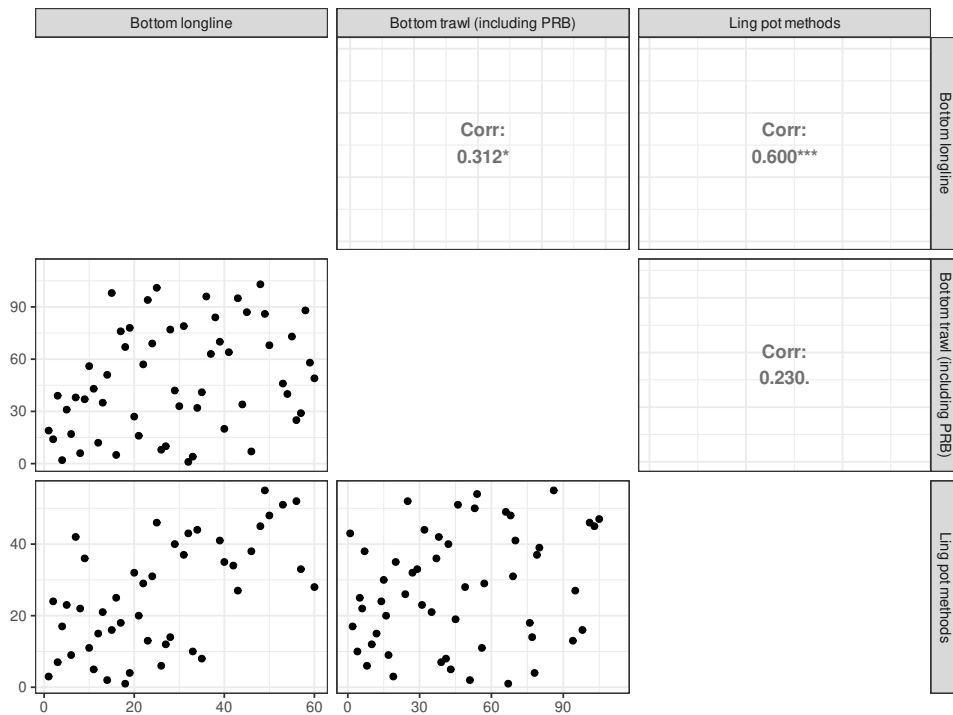


Figure C.4: Comparison of grid ranks for LIN 3 ling catches in 2019 to 2023 (where a rank of 1 is given to the grid cell with the highest catch by a method) for bottom trawling, bottom longlining, and ling potting.

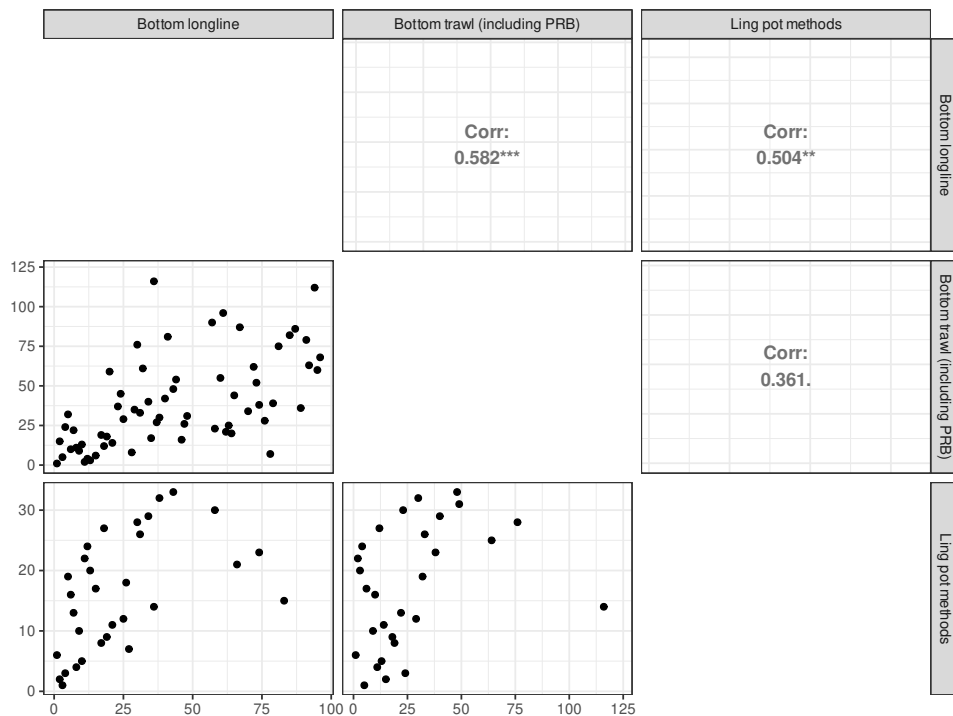


Figure C.5: Comparison of grid ranks for LIN 7 ling catches in 2019 to 2023 (where a rank of 1 is given to the grid cell with the highest catch by a method) for bottom trawling, bottom longlining, and ling potting.

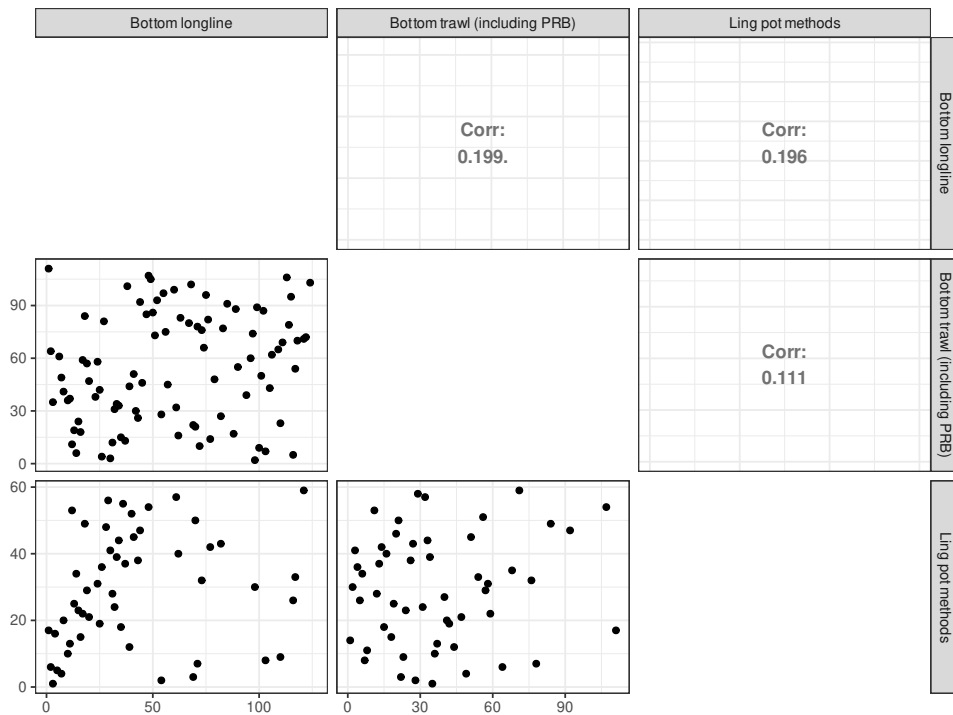


Figure C.6: Comparison of grid ranks for LIN 4 ling catches in 2019 to 2023 (where a rank of 1 is given to the grid cell with the highest catch by a method) for bottom trawling, bottom longlining, and ling potting.

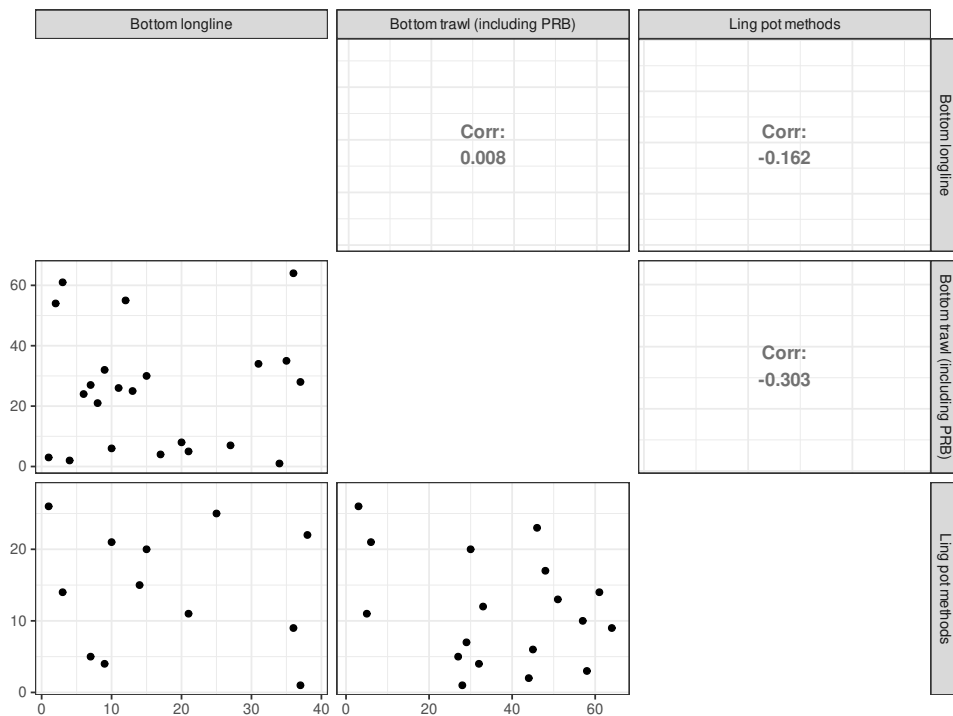


Figure C.7: Comparison of grid ranks for LIN 5 ling catches in 2019 to 2023 (where a rank of 1 is given to the grid cell with the highest catch by a method) for bottom trawling, bottom longlining, and ling potting.

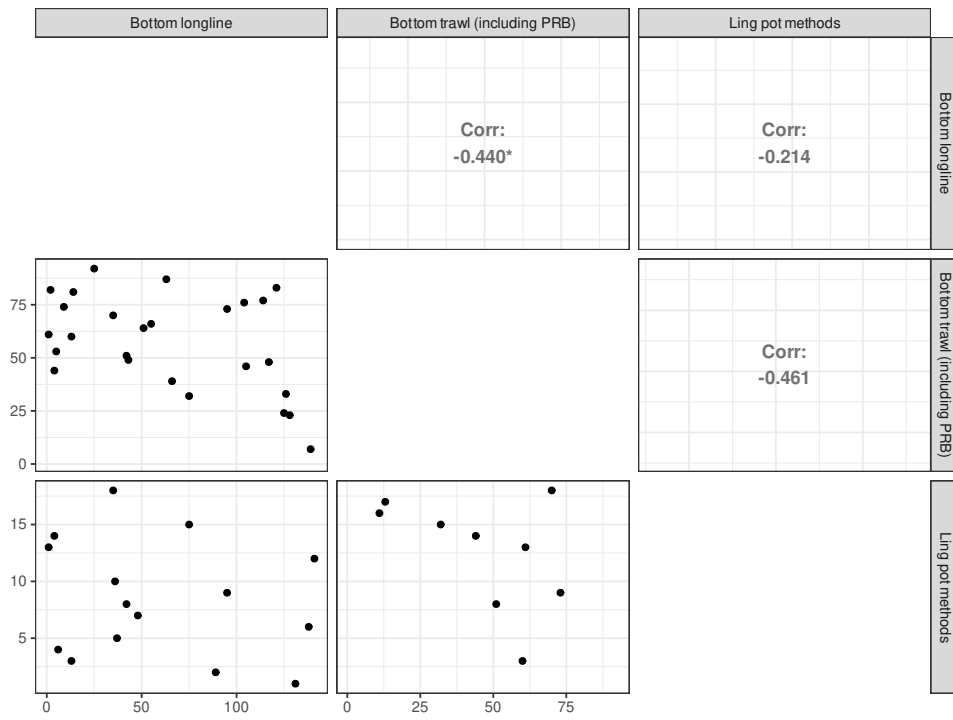


Figure C.8: Comparison of grid ranks for LIN 6 ling catches in 2019 to 2023 (where a rank of 1 is given to the grid cell with the highest catch by a method) for bottom trawling, bottom longlining, and ling potting.

APPENDIX D: GLOSSARY

Table D.1: Product state codes used in this report.

Code	Description
DRE	Dressed
FIL	Fillets: skin-on
GGU	Gilled and gutted
GRE	Green (or whole)
GUT	Gutted
HDS	Heads
HGT	Headed, gutted, and tailed
HGU	Headed and gutted
MEA	Fish meal
MKF	Minced, skin-off fillets
ROE	Roe
SKF	Fillets: skin-off
TRF	Fillets: skin-on trimmed
TSK	Fillets: skin-off trimmed
USK	Fillets: skin-off untrimmed
UTF	Fillets: skin-on untrimmed

Table D.2: Form type codes used in this report.

Code	Description
CEL	Catch, Effort and Landing Return (CELR)
ERS - Lining	Electronic Reporting System - Lining
ERS - Netting	Electronic Reporting System - Netting
ERS - Potting	Electronic Reporting System - Potting
ERS - Seining	Electronic Reporting System - Seining
ERS - Trawl	Electronic Reporting System - Trawl
HCE	High Seas Catch, Effort and Landing Return (HS CELR)
HLC	High Seas Lining Catch Effort Return (HS LCER)
HTC	High Seas Trawl Catch Effort Return (HS TCER)
HTU	High Seas Tuna Longlinging Catch Effort Return (HS TLCER)
LCE	Lining Catch Effort Return (LCER)
LTC	Lining Trip Catch Effort Return (LTCER)
NCE	Netting Catch, Effort and Landing Return (NCELR)
SJC	Squid Jigging Catch and Effort Return (SJCER)
TCE	Trawl Catch Effort Return (TCER)
TCP	Trawl Catch, Effort and Processing Return (TCEPR)
TUN	Tuna Longlinging Catch Effort Return (TLCER)

Table D.3: Fishing method codes used in this report.

Code	Description
BLL	Bottom longline
BPT	Bottom trawl - pair
BT	Bottom trawl
CP	Cod pot
DL	Drop/dahn line
FP	Fish trap
MW	Midwater trawl
POT	Other pot
PRB	Precision bottom trawl
PRM	Precision midwater trawl
SN	Set net
TL	Trot line
TWL	Trawling (includes BT & MW)

Table D.4: Species codes used in this report.

Code	Common name	Scientific name
BAR	Barracouta	<i>Thyrsites atun</i>
BNS	Bluenose	<i>Hyperoglyphe antarctica</i>
HAK	Hake	<i>Merluccius australis</i>
HOK	Hoki	<i>Macruronus novaezelandiae</i>
HPB	Hapuku and bass	<i>Polyprion oxygeneios, Polyprion americanus</i>
LIN	Ling	<i>Genypterus blacodes</i>
RCO	Red cod	<i>Pseudophycis bachus</i>
RIB	Ribaldo	<i>Mora moro</i>
SBW	Southern blue whiting	<i>Micromesistius australis</i>
SCI	Scampi	<i>Metanephrops challengerii</i>
SKI	Gemfish	<i>Rexea</i> spp.
SQU	Arrow squid	<i>Nototodarus sloanii, Nototodarus gouldi</i>
SWA	Silver warehou	<i>Seriotelella punctata</i>
TAR	Tarakihi	<i>Nemadactylus macropterus, Nemadactylus</i> sp. (King tarakihi)
WWA	White warehou	<i>Seriotelella caerulea</i>

Table D.5: Area codes for Observer data used in this report.

Code	Description
AKE	Auckland (East) (FMA 1)
AKW	Auckland (West) (FMA 9)
CEE	Central (East) (FMA 2)
CEW	Central (Egmont) (FMA 8)
CHA	Challenger/Central (Plateau) (FMA 7)
SEC	South-East (Coast) (FMA 3)
SOE	South-East (Chatham Rise) (FMA 4)
SOI	Southern Ocean Islands (Auckland Islands and Campbell Island)
SOU	Southland (FMA 5)
SUB	Sub-Antarctic (FMA 6)