

An underwater scene with warm, golden light rays filtering down from the surface. Several lingcod fish are visible, swimming in the water. The fish have a mottled pattern of light and dark brown spots on their bodies.

# Bait use by New Zealand Ling Longline Fisheries

17 June 2022

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## Background

A Recommendation in the ling longline PCR requires information to be provided annually on the species, quantities and origin of bait used by the MSC-certified ling longline fisheries (LIN 3-7), as follows:

*“PI 2.1.3, Sla. A recommendation is set that information is collected annually to determine the quantities and sources of bait species used in the fishery. This information should be retained and reported routinely at annual surveillance audits of the fishery.”*

This report provides a breakdown of bait use by ling longline vessels representing approximately 95% of the effort during the 2020-21 fishing year and an evaluation of the status of bait ‘bycatch’ species in relation to the overall catch composition.

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## Method

DWG’s Environmental Liaison Officer identified 26 longline vessels engaged in ling longline fishing. Many of these vessels are involved in bottom longline fisheries other than ling (e.g. bluenose, hapuku, snapper, ribaldo, school shark and also surface longlining for tuna species). This analysis of bait use focuses on vessels with effort directed primarily at ling, of which 21 vessels were identified, and which represented approximately 95% of the fishing effort by ling longliners in FMAs LIN 3-7, based on the number of hooks deployed during the 2020-21 fishing year. Four of these were autoliners and 17 were hand-baiters.

Bait usage templates were forwarded to companies and/or vessel owners for completion via email. Bait usage data were received for 10 vessels via email return. For the remaining 11 vessels, bait usage data were sourced via telephone call. The information requested included:

- Average duration and number of ling-targeted trips undertaken per year?
- Average quantity of bait used, by species, during ling-targeted fishing trips?
- Origin of the bait used (NZ trawl-caught, NZ purse seine-caught, imported)?
- State of bait used (e.g. whole or fillets)?

Jack mackerel is one of the main baits used and the three species caught in New Zealand are all required to be reported against the generic code, JMA. The information on where the JMA bait was sourced from provided a reasonably good basis for identifying it as either *T. novaezelandiae* if it was sourced from purse seine operators, or as *T. declivis*/*T. murphyi* if it was sourced from trawl fishing operators. *Trachurus declivis* and *T. murphyi* are taken mainly by trawl gear in waters deeper than 150 m in the JMA 3 and JMA 7 management areas, while *T. novaezelandiae* is the dominant jack mackerel species taken by a purse seine fishery off the east coast of North Island in management area JMA 1 in waters shallower than 150 m (FNZ, 2022).

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## Results

### Characterisation of bait used

Feedback received from companies and vessel owners covered a total of 21 ling-targeting longliners, two of which had not fished during 2020-21. Four bait types are used:

- Jack mackerel (JMA): Used by autoline vessels. Most sourced from New Zealand and a small quantity from Chile. All New Zealand JMA categorised as trawl-caught was assumed to be either *T. declivis* or *T. murphyi*. No JMA bait used was caught by purse seine.
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- Barracouta (BAR): Used by all of the hand-baiting vessels (skin-on fillets, purchased frozen in 10-20 kg boxes, trawl-caught).
- Atlantic/English mackerel (EMA): Imported, used by two autoliners as part of their bait complement.
- Squid (SQU): Used by two autoliners (whole or dressed form). Most sourced from New Zealand trawl fishery (50 t) and a smaller quantity (30 t) from Chile.

A breakdown of average annual bait use by species and capture method illustrates that jack mackerel species, squid, barracouta and Atlantic mackerel comprise around 71%, 3%, 20% and 2% respectively. Around 94% of the bait used is sourced locally (Table 1).

**Table 1: Local and imported bait species and the estimated annual quantity used by ling longline vessels during the 2020-21 fishing year.**

Bait Species	Capture Method	Origin	Quantity (t)	Proportion (%)
Jack mackerel	Trawl	New Zealand	1,045	70.8%
Jack mackerel	Purse seine	New Zealand	0	0.0%
Jack mackerel	Trawl?	Imported	20	1.4%
Atlantic mackerel	Trawl?	Imported	35	2.4%
Squid	Trawl	New Zealand	50	3.4%
Squid	Jig?	Imported	30	2.0%
Barracouta	Trawl	New Zealand	295	20.0%
<b>Total - all</b>			<b>1,475</b>	<b>100.0%</b>
<b>Total - NZ</b>			<b>1,390</b>	<b>94.2%</b>

### Assessment of bait bycatch status

An estimate of the total targeted ling longline catch from LIN 3-7, of 5,549 t for the 2020-21 fishing year, was sourced from FNZ (G. Lydon, pers. comm.). The most recent information on bycatch composition for the ling longline fishery (Finucci *et al.*, 2020) provides estimates of the top 100 fish species based on observer data for the period 2002-03 to 2017-18 (i.e. 16 years). The process applied for the present analysis was as follows:

- The observed catch estimates for the top 40 species, for the period 2002-03 to 2017-18, were divided by 16 to provide an average annual catch estimate by species
- The average annual catch estimates were raised by a factor of 7.75 so that the LIN catch approximated that taken in 2020-21 (i.e. 5,549 t). This produced an estimate of catch composition for the top 40 species
- The bait usage estimates for the 2020-21 fishing year were then added to the catch composition and their contributions calculated as a percentage of the overall estimated ling longline catch (i.e. the bait species were treated as 'bycatch' in the LIN longline fishery). Bait sourced from countries other than New Zealand, which amounted to around 6.0% of the bait used, was excluded.

The ling longline catch composition, modified to include bait as 'bycatch', indicates that JMA trawl (two species), BAR and SQU respectively comprise 10.4%, 2.9% and 0.8% of the total estimated commercial catch (Table 2).

**Table 2: Estimated ling longline catch composition for the 2020-21 fishing year by target, QMS bycatch, non-QMS bycatch and New Zealand-caught 'bait bycatch' species.**

Category	Catch (t)	Proportion (%)
Targeted LIN catch	5,547	55.3%
QMS bycatch	2,470	24.6%
Non-QMS bycatch	617	6.2%
JMA trawl-caught bait	1,045	10.4%
JMA purse seine-caught bait	0	0.0%
BAR bait	295	2.9%
SQU bait	80	0.5%
<b>Total</b>	<b>10,024</b>	<b>100.0%</b>

A detailed breakdown of the estimated ling longline catch composition by species for 2020-21 is provided in Table 3.

**Table 3: Estimated catch composition for the ling longline fishery for the 2020-21 fishing year. Ling targeted catch in orange, QMS species in blue, non-QMS species in black and the three bait species in red.**

Species Code	Estimated Catch (t) 2020-21	Estimated Catch (%)	Species Code	Estimated Catch (t) 2020-21	Estimated Catch (%)
LIN	5,547	56.91%	HPB	23	0.23%
SPD	1,267	13.00%	RAT	22	0.22%
JMA trawl	1,045	10.72%	SCO	18	0.19%
BAR	295	3.03%	HAG	17	0.17%
RIB	281	2.88%	BNS	15	0.15%
RSK	230	2.36%	HAK	15	0.15%
BCD	143	1.47%	CAR	13	0.13%
SSK	126	1.29%	PLS	13	0.13%
SPE	124	1.27%	HAP	12	0.12%
GSP	107	1.10%	NSD	11	0.11%
RCO	102	1.04%	SKA	9	0.09%
SND	92	0.94%	ETB	8	0.08%
SCH	65	0.67%	CHI	6	0.06%
GSH	55	0.57%	ETL	5	0.05%
HCO	51	0.52%	ETM	4	0.04%

SQU	50	0.51%	SEE	3	0.03%
BSH	45	0.46%	HOK	3	0.03%
OSD	37	0.38%	DSK	3	0.03%
CSQ	37	0.38%	POS	2	0.02%
DWD	26	0.27%	BWS	1	0.01%
CON	23	0.24%	RSO	1	0.01%
		<b>Contd.</b>	<b>Totals</b>	<b>9,747</b>	<b>100.00%</b>

An evaluation of the quantities of JMA, BAR and SQU used as bait by the ling longline fisheries, as against annual commercial catches of these species in the 2020-21 fishing year, shows that only a very minor component of each of these fisheries is used as bait (Table 4).

**Table 4: JMA, BAR and SQU quantities used as bait by the ling longline fleet in relation to New Zealand commercial catches during 2020-21.**

Species	Capture Method	Fishery Management Area	Catch 2020-21 (t)	Bait Use (t)	Bait Use (%)
JMA	Trawl	JMA 3 & JMA 7	37,411	1,045	2.8%
JMA	Purse seine	JMA 1	6,777	0	0.0%
BAR	Trawl	BAR 1, BAR 4, BAR 5 & BAR 7	21,397	295	1.4%
SQU	Trawl	SQU 1T & SQU 6T	30,081	50	0.2%
		<b>Totals</b>	<b>95,666</b>	<b>1,390</b>	<b>1.5%</b>

## Conclusion

The quantity of two jack mackerel species used as bait in the ling longline fisheries in FMAs LIN 3-7 amounts to 10.7% of the overall estimated catch. The two species, *T. declivis* & *T. murphyi*, may therefore meet the criterion for 'main' species under FCR v1.3.

## References

- Finucci, B., Anderson, O.F. and Edwards, C.T.T. (2020). Non-target fish and invertebrate catch and discards in New Zealand ling longline fisheries from 2002-03 to 2017-18. New Zealand Aquatic Environment and Biodiversity Report No. 241. 83 p. <https://www.mpi.govt.nz/dmsdocument/40757-AEBR-241-Non-target-fish-and-invertebrate-catch-and-discards-in-New-Zealand-ling-longline-fisheries-from-200203-to-201718>
- FNZ (2022). Fisheries Assessment Plenary May 2022: Stock Assessments and Stock Status, Vol. 2 Horse mussel to Red crab (Jack mackerels pp.639-664). <https://www.mpi.govt.nz/dmsdocument/51736-Fisheries-Assessment-Plenary-May-2022-Stock-Assessments-and-Stock-Status-Volume-2-Horse-Mussel-to-Red-Crab>

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