Bait use by New Zealand Ling Longline Fisheries

deepwater group

Background

A Recommendation in the PCR for Ling fisheries 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).

This report provides a break-down of bait use by ling longline vessels representing over 98% of the effort, and an evaluation of the status of bait 'bycatch' species in relation to the overall catch composition.

Method

DWG's Environmental Liaison Officer identified 40 longline vessels engaged in ling longline fishing on a full-time or part-time basis. Many 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). To focus on vessels with effort directed primarily at ling, a catch extract was obtained from Fisheries New Zealand (FNZ), which identified 18 longline vessels that had caught a minimum of one tonne of ling during the period 1 October 2017 to 30 September 2018 (i.e. the 2017-18 fishing year).

Some of these vessels are owner-operated, making it difficult to contact them ashore, and in the end a total of 13 vessels were included in a survey on bait use. These vessels accounted for around 98% of the total ling longline fishing effort, based on total numbers of hooks deployed, as reported to FNZ.

Companies and/or owners were contacted by telephone and a set of questions put to them. They were given the option to respond to the questions directly or via email, in which case a template was forwarded to them for completion and return. The questions were:

- 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 (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. In most instances, respondents were unable to confirm the species of jack mackerel used. They were, however, able to provide information on where they sourced their bait from, which provided a reasonably good basis for identifying it as either *T. novaezelandiae* if it was sourced from purse seine operations, or as *T. declivis/T. murphyi* if it was sourced from trawl fishing operations. *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, 2019).

Inquiries confirmed that JMA bait sourced from Independent Fisheries Ltd, Talley's Group Ltd, Westfleet Fishing Ltd and NZ Marine Foods Ltd were caught by trawl and it was therefore reasonable to assume that this comprised either *T. declivis* or *T. murphyi* (or both species). It was similarly confirmed that JMA bait sourced from Sanford Ltd was caught by purse seine, which was therefore ascribed as *T. novaezelandiae*.

Results

Characterisation of bait used

Feedback received from companies and vessel owners covered a total of 13 ling-targeting longline vessels, which accounted for 98% of the effort and 96% of the targeted ling catch in FMAs LIN 3-7. Three bait types are used:

- Jack mackerel (JMA): All JMA categorised as trawl-caught was assumed to be either *T. declivis* or *T. murphyi,* while if purse seine-caught was assumed to be *T. novaezelandiae.* Only the autoline vessels use JMA as bait (whole, small sized fish of around 10-20 cm in length and 150-200 g in weight).
- Barracouta (BAR): Used by one of the smaller autoliners and by all of the hand-baiting vessels (skin-on fillets, purchased frozen in 10-20 kg boxes, trawl-caught).
- Squid (SQU): Used by some of the autoliners (whole or dressed form).

A breakdown of average annual bait use by species and capture method illustrates that jack mackerel species, squid and barracouta comprise around 65%, 22% and 13% respectively, with around 90% being sourced locally (Table 1).

Table 1: Bait species and estimated annual quantities used by ling longline vessels.

Bait Species	Capture Method	Origin	Quantity (t)	Proportion (%)
Jack mackerel	Trawl	New Zealand	626	56.2%
Jack mackerel	Purse seine	New Zealand	35	3.1%
Jack mackerel	?	Chile	60	5.4%
Squid	Trawl	New Zealand	200	18.0%
Squid	?	Korea	50	4.5%
Barracouta	Trawl	New Zealand	144	12.9%
Total - all			**1,113**	**100.00%**
Total - NZ			**1,004**	**90.2%**

Assessment of bait bycatch status

An estimate of the total targeted ling longline catch from LIN 3-7, of 4,790 t for the 2017-18 fishing year, was sourced from FNZ (D. Kerrigan, pers. comm.). The most recent information on bycatch composition for the ling longline fishery, for the year 2016-17, provided catch estimates for the top 50 species (Finucci *et al.*, 2019).

To determine the bycatch status (i.e. main or minor) of the bait species used by the fishery, their estimated quantities were added to the 2016-17 fishery bycatch and their respective percentage contributions to the overall catch determined. Bait sourced from countries other than New Zealand, which amounted to around 10% of the bait used, was excluded.

The ling longline catch composition, modified to include bait as 'bycatch', indicates that JMA trawl, JMA purse seine, BAR and SQU respectively comprise 5.3%, 0.3%, 1.2% and 1.7% of the total commercial catch (Table 2).

Table 2: Ling longline catch composition for the 2016-17 fishing year by target, QMS bycatch, non-QMS bycatch and 'bait bycatch' species (noting that the LIN catch figure is from 2017-18).

Category	Catch (t)	Proportion (%)
Targeted LIN catch	4,790	40.4%
QMS bycatch	4,571	38.5%
Non-QMS bycatch	1,499	12.6%
JMA trawl-caught bait	626	5.3%
JMA purse seine-caught bait	35	0.3%
BAR bait	144	1.2%
SQU bait	200	1.7%
Total	**11,865**	**100.0%**

A detailed breakdown of the ling longline catch composition by species is provided in Table 3.

Table 3: Catch composition for the ling longline fishery for the year 2016-17 (noting that the ling catch is from 2017-18). Ling targeted catch in green, QMS species in blue, non-QMS species in black and the three bait species in red.

Species Code	2016-17 (t)	Catch (%)	Species Code	2016-17 (t)	Catch (%)
LIN	4,790	40.37%	HAP	33	0.28%
SPD	1,992	16.79%	CHG	32	0.27%
RSK	950	8.01%	SND	28	0.24%
JMA trawl	626	5.28%	BAS	24	0.20%
BCD	674	0.29%	BWS	19	0.16%
SPE	383	5.68%	SEV	17	0.14%
SCH	246	3.23%	CSQ	13	0.11%
SQU	200	1.69%	CON	8	0.07%
GSP	197	2.07%	POS	8	0.07%
HCO	187	1.66%	NOT	6	0.05%
SSK	175	1.58%	SKA	6	0.05%
BAR	144	1.47%	NMP	6	0.05%
RAT	134	1.13%	ASR	4	0.03%
RIB	106	0.89%	DWE	3	0.03%
GSH	103	0.87%	PLS	3	0.03%
HAK	103	0.87%	ETL	3	0.03%
RCO	98	0.83%	RBM	3	0.03%
HPB	84	1.21%	HEX	2	0.02%
BNS	65	0.71%	CHI	2	0.02%
BSH	60	0.55%	ETM	1	0.01%
RSO	56	0.51%	ETB	1	0.01%
CAR	45	0.47%	GIZ	1	0.01%
SHA	41	0.38%	CYP	1	0.01%
NSD	38	0.35%	MAK	1	0.01%
HOK	38	0.32%	SCM	1	0.01%
JMA purse seine	35	0.32%	SEE	0.5	0.00%
HAG	34	0.29%	CYO	0.5	0.00%
SCO	34	0.29%			
		Contd.	Total	11,865	100.0%

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 2016-17 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 catches and quantities used as bait by the ling longline fleet.

Species	Capture Method	Fishery Management Area	Catch 2016-17 (t)	Bait Use (t)	Bait Use (%)
JMA	Trawl	JMA 3 & JMA 7	38,467	626	1.6%
JMA	Purse Seine	JMA 1	8,890	35	0.4%
BAR	Trawl	BAR 1, 4, 5 & 7	28,169	144	0.5%
SQU	Trawl	SQU 1T & SQU 6T	18,460	200	1.1%
		Totals	**93,986**	**1,005**	**1.1%**

Conclusion

Based on the defensible assumption that trawl-caught jack mackerel comprises two species, *T. declivis* & *T. murphyi*, and that purse seine-caught jack mackerel comprises *T. novaezelandiae*, none of the bycatch species is likely to exceed 5% of the total ling longline catch and none, therefore, is a 'main' species.

References

Finucci, B., Edwards, C.T.T., Anderson, O. & Ballara, S.L. (2019). Fish and Invertebrate Bycatch in New Zealand Deepwater Fisheries from 1990-91 until 2016-17. New Zealand Aquatic Environment and Biodiversity Report No. 210.

FNZ (2019). Fisheries Assessment Plenary May 2019. Stock Assessments and Stock Status Volume 2: Jack Mackerels (JMA), Pp. 580 – 604.

Rob Tilney
Contract Service Provider
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