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**AVAILABLE DATA
ON CETACEAN INTERACTIONS
IN THE WCPFC LONGLINE AND PURSE SEINE FISHERIES**

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1. Introduction

In response to a proposal for amendments to the Conservation and Management Measure for Protection of Cetaceans from Purse Seine Fishing Operations ([CMM 2011-03](#)) by Korea (ROK, 2019), WCPFC16 tasked the SPC to compile available data on Cetacean interactions in the WCPFC longline and purse seine fisheries through the following recommendation:

521. The Commission tasked the Scientific Services Provider to review available data to provide estimates of fishery interaction types and levels with cetaceans, without respect to particular flags, to the lowest possible taxonomic level, in the WCPF Convention Area, and to provide a report to the Scientific Committee for its review.

In responding to the recommendation for review of the inclusion of the longline fishery into this CMM, this paper provides summaries of available longline observer data that are relevant to the potential estimation of the level and types of interactions with cetaceans. This paper also provides a summary of information on the level and types of interactions with cetaceans in the purse seine fishery since this information is relevant to the current CMM.

2. Presentation of available data on Cetacean interactions

Observers are required to collect a range of information from the WCPFC Longline and Purse seine fisheries on Cetacean interactions through the Regional Observer Programme. This paper deals with direct interactions with the respective gears, noting that an ‘interaction’ does not equate to mortality of the animal.

The latest list of Regional Observer Programme (ROP) minimum data fields which refer to cetacean interactions are available [here](#). Tables 1–3 provide lists of the codes used by observers to record interactions to the longline gear, purse seine gear and non-gear interactions in the WCPFC area. It should be noted that more detailed observer reporting of interaction types have only been required in recent years. The tuna catch of longline vessels are also prone to predation by cetaceans and observers record instances when individual fish have been predated by cetaceans (with the Fate Code of “Whale Damage”).

2.1. Longline fishery

Tables 4–7 and Figures 1–8 provide an indication of observer data coverage and a breakdown of observer-reported cetacean interactions in the WCPFC longline fishery for the period 2015–2019.

WCPFC members (CCMs) and Cooperating non-members (CNMs) are required to have 5% observer coverage of their longline fleets (no later than 30 June 2012), as outlined in the Conservation and Management Measure for the Regional Observer Programme ([CMM 2018-05](#)). Figures 1–2 provide an indication of the spatial coverage of longline observer data in the WCPFC Area for the past five years (2015–2019).

Figure 3 provides an indication of cetacean interactions in the WCPFC longline fishery by species/species group, showing the top five interactions (based on frequency of interactions per 100 sets) to be False Killer Whale (*Pseudorca crassidens*), Toothed whales (*nei*), and several species of oceanic dolphins (bottlenose, rough-toothed and Risso’s). There are several rare instances of baleen whale (*Mysticeti*) interaction with the longline gear, which would not be expected, so further review of these events in the observer data are warranted.

Table 4 provides a breakdown of cetacean interactions by species/species group and broad FATE category (released/discarded or escaped). A column indicating whether the reported interaction had additional ‘comments’ by the observer is included in this table to provide potential users with indication of the extent of further information on each interaction.

Table 5 provides a breakdown of cetacean interactions by species/species group and LIFE STATUS category (Alive/Dead/Unknown) and indicate that 85% of the interactions resulted in the animal released/escaped alive.

Table 6 provides a breakdown of cetacean interaction by species/species group and TYPE OF GEAR INTERACTION. Most of the interactions with the longline (where the detail was recorded) were “Hooked unknown”, “Hooked internally (Mouth)” and “Entangled in the gear”.

Table 7 provides a breakdown of cetacean interaction by species/species group and TYPE OF OTHER (non-GEAR) INTERACTION. Most of these interactions (96%) were sightings beside the vessel without interacting with the longline gear.

Figures 4–8 provide an indication of the frequency of the main Cetacean species/species groups over time (quarter) and area for the past five years. These maps could provide some initial insights into observer reporting practices, but in general, longline observer coverage does not appear to be sufficient enough to provide a useful understanding on the spatial/temporal patterns of cetacean interactions in the longline fishery at this stage. It should also be noted that identified areas generally reflect those with relatively high observer coverage and to some extent, the observer programme’s attention to more detailed levels of cetacean interaction and species identification.

Figure 9 provides an indication of the spatial and temporal (quarter) extent of cetacean predation in the longline tuna catch over the most recent 5-year period, through the frequency of sets with evidence of cetacean predation, as reported by the observer. Based on the observer data currently available, cetacean predation of tuna is more than an order of magnitude more frequent, and clearly more widespread, than cetacean interaction with the gear.

2.2. Purse seine fishery

Tables 8–11 and Figures 10–18 provide an indication of observer data coverage and a breakdown of observer-reported cetacean interactions in the WCPFC purse seine fishery for the period 2015-2019.

WCPFC members (CCMs) and Cooperating non-members (CNMs) are required to have 100% observer coverage on their purse seine fleets operating in the area¹ bounded by 20°N and 20°S in the WCPFC Convention Area, as outlined in para 34. of the Conservation and Management Measure for bigeye, yellowfin and skipjack tuna in the Western and Central Pacific Ocean ([CMM 2018-01](#)). Figures 10 provides an indication of the distribution of purse seine effort in the WCPFC Area for the past five years (2015–2019), noting that observer coverage in the tropical area for this period is close to or at 100% coverage for most fleets (see Williams et al, 2020). The presence of both toothed whales (*Odontoceti*) and baleen whales (*Mysticeti*) in the vicinity of the purse seine operation is likely related to their respective preys, which are the tuna species, and the same prey species of the tuna.

Figures 11–12 provides an indication of Cetacean interactions in the WCPFC purse seine fishery by set type (unassociated and associated set types) and species/species group. The top five interactions (based on frequency of interactions per 100 sets) for the **Unassociated sets** are

- False Killer whale (*Pseudorca crassidens*)
- Short-finned pilot whale (*Globicephala macrorhynchus*)
- Risso’s Dolphin (*Grampus griseus*)
- Bryde’s whale (*Balaenoptera Edeni*)
- Bottlenose dolphin (*Tursiops spp.*)

The top five interactions (based on frequency of interactions per 100 sets) for the **Associated sets** are

- False Killer whale (*Pseudorca crassidens*)

¹ “... exclusively on the high seas, on the high seas and in waters under the jurisdiction of one or more coastal States, or vessels fishing in waters under the jurisdiction of two or more coastal States ...”

- Bryde’s whale (*Balaenoptera Edeni*)
- Rough-toothed dolphin (*Steno bredanensis*)
- Short-finned pilot whale (*Globicephala macrorhynchus*)
- Bottlenose dolphin (*Tursiops spp.*)

Cetacean interactions of these top species in Associated sets are encountered around 3–5 times more frequently than in unassociated sets.

Table 8 provides a breakdown of cetacean interactions by species/species group and broad FATE category (released/discarded or escaped), contrasting interactions by periods 1995–2009 (observer coverage was 5-10%), 2010-2014 (observer coverage was required to be 100%) and 2015–2019 (observer coverage was required to be 100%). A column indicating whether the reported interaction had additional ‘comments’ by the observer is included in this table to provide potential users with indication of the extent of further information on each interaction. There were more than double the number of cetacean interactions during the period 2010–2014 when compared to 2015–2019 as an indication of greater awareness of vessels avoiding sets in the vicinity of cetaceans.

Table 9 provides a breakdown of cetacean interactions by species/species group and LIFE STATUS category (Alive/Dead/Unknown) and indicate that 85–90% of the interactions resulted in the animal released/escaped alive since 2010.

Table 10 provides a breakdown of cetacean interactions by species/species group and TYPE OF GEAR INTERACTION. Most of the interactions with purse seine (where the detail was recorded) were “Crew released through the net (56%)”, “Broke through the net (21%)” and “Entangled in the gear (15%)”.

Table 11 provides a breakdown of cetacean interactions by species/species group and TYPE OF OTHER (non-GEAR) INTERACTION. Most of these interactions (49%) were sightings beside the vessel without interacting with the purse seine gear, followed by “Interaction, outside net (24%)” and “Interaction, crew feeding (13%)”.

Figures 13–18 provide an indication of the frequency of the main Cetacean species/species groups over time (quarter) and area for the past five years in the tropical purse seine fishery. These maps provide some insights into inter-annual patterns in cetacean species spatial distribution. For example, False killer whale (*Pseudorca crassidens*) interactions in the tropical purse seine fishery appear more prevalent in the 1st and 4th quarters (Figure 13).

References

- Republic of Korea. 2019. PROPOSED AMENDMENTS TO CONSERVATION AND MANAGEMENT MEASURE FOR PROTECTION OF CETACEANS FROM PURSE SEINE FISHING OPERATIONS (CMM 2011-03) WCPFC16-2019-DP15. Sixteenth Regular Session of the Western and Central Pacific Fisheries Commission (WCPFC16). Port Moresby, Papua New Guinea. 5–11 December 2019
- Williams, P.G., A. Panizza, C. Falasi, E. Loganimoce. 2020. Status of ROP data management. Information Paper ST IP-02. Sixteenth Regular Session of the Scientific Committee of the WCPFC (SC16). Online Meeting. 11–20 August 2020.

3. TABLES

Table 1. Longline GEAR interaction codes

IEN	Entangled in gear
IHD	Hooked deeply - throat or stomach
IHE	Hooked externally
IHI	Hooked internally (mouth)
IHJ	Hooked in jaw (circle hook)
IHU	Hooked unknown
INT/OTH	Other, please specify (Interaction not specified)

Table 2. Purse seine GEAR interaction codes

IBR	Broke through net
ICR	Crew released through net
IEN	Entangled in gear
IJO	Jumped out (over net)
IRN	Roped, pulled from net
INT/OTH	Other, please specify (Interaction not specified)

Table 3. OTHER (non-gear) interaction codes

FRB	Feeding on bait during set
IBV	Interaction, beside vessel
ICF	Interaction, crew feeding
ICP	Collision with propeller
ICV	Collision with vessel
IDW	Interaction - dead in water
IFO	Feeding on discarded offal
ION	Interaction, outside net
IRE	Resting on vessel, floats or FADs (birds)
IWF	Interaction - with FADs, but not set on
INT/OTH	Interactions - other, please specify (Interaction not specified)

Table 4. Cetacean interactions (number of individuals) with the longline gear, as reported by observers in the WCPF Convention Area longline fishery, 2015–2019

Species name	FAO Code	Taxonomic level	Scientific name	No. of comments	FATE	
					Released	Escaped
BALEEN WHALES NEI	MYS	ORD	<i>Mysticeti</i>	0	1	0
BEAKED WHALES NEI	MEP	GEN	<i>Mesoplodon spp</i>	1	3	0
BLUE WHALE	BLW	SPS	<i>Balaenoptera musculus</i>	1	1	0
BOTTLENOSE DOLPHIN	DBO	SPS	<i>Tursiops truncatus</i>	16	22	0
COMMON DOLPHIN	DCO	SPS	<i>Delphinus delphis</i>	3	4	0
DOLPHINS NEI	DLP	FAM	<i>Delphinidae</i>	4	8	0
DWARF SPERM WHALE	DWW	SPS	<i>Kogia simus</i>	1	1	0
FALSE KILLER WHALE	FAW	SPS	<i>Pseudorca crassidens</i>	49	67	1
FIN WHALE	FIW	SPS	<i>Balaenoptera physalus</i>	1	1	0
FRASER'S DOLPHIN	FRD	SPS	<i>Lagenodelphis hosei</i>	1	1	0
GINKGO-TOOTHED BEAKED WHALE	TGW	SPS	<i>Mesoplodon ginkgodens</i>	1	1	0
HUMPBACK WHALE	HUW	SPS	<i>Megaptera novaeangliae</i>	1	1	0
INDO-PACIF. BOTTLENOSE DOLPHIN	DBZ	SPS	<i>Tursiops aduncus</i>	10	10	0
KILLER WHALE	KIW	SPS	<i>Orcinus orca</i>	0	4	0
LONG-BEAKED COMMON DOLPHIN	DCZ	SPS	<i>Delphinus capensis</i>	1	1	0
MELON-HEADED WHALE	MEW	SPS	<i>Peponocephala electra</i>	10	8	2
PACIFIC WHITE-SIDED DOLPHIN	DWP	SPS	<i>Lagenorhynchus obliquidens</i>	0	2	0
PANTROPICAL SPOTTED DOLPHIN	DPN	SPS	<i>Stenella attenuata</i>	3	6	0
PYGMY KILLER WHALE	KPW	SPS	<i>Feresa attenuata</i>	2	2	0
PYGMY SPERM WHALE	PYW	SPS	<i>Kogia breviceps</i>	1	1	0
RISSE'S DOLPHIN	DRR	SPS	<i>Grampus griseus</i>	9	14	0
ROUGH-TOOTHED DOLPHIN	RTD	SPS	<i>Steno bredanensis</i>	14	14	1
SEI WHALE	SIW	SPS	<i>Balaenoptera borealis</i>	1	1	0
SHORT-FINNED PILOT WHALE	SHW	SPS	<i>Globicephala macrorhynchus</i>	19	22	0
SPERM WHALE	SPW	SPS	<i>Physeter macrocephalus</i>	1	2	0
SPINNER DOLPHIN	DSI	SPS	<i>Stenella longirostris</i>	9	9	0
STRIPED DOLPHIN	DST	SPS	<i>Stenella coeruleoalba</i>	3	5	0
TOOTHED WHALES NEI	ODN	SPS	<i>Odontoceti</i>	27	48	0
WHALE (UNIDENTIFIED)	WLE	INF-ORD	<i>Cetacea</i>	5	11	0

Table 5. Life status of cetaceans (number of individuals) that interacted with the longline gear, as reported by observers in the WCPF Convention Area longline fishery, 2015–2019

Species name	FAO Code	Taxonomic level	Scientific name	LIFE STATUS		
				Alive	Dead	Unk.
BALEEN WHALES NEI	MYS	ORD	<i>Mysticeti</i>	0	0	1
BEAKED WHALES NEI	MEP	GEN	<i>Mesoplodon spp</i>	2	0	1
BLUE WHALE	BLW	SPS	<i>Balaenoptera musculus</i>	1	0	0
BOTTLENOSE DOLPHIN	DBO	SPS	<i>Tursiops truncatus</i>	21	1	0
COMMON DOLPHIN	DCO	SPS	<i>Delphinus delphis</i>	3	0	1
DOLPHINS NEI	DLP	FAM	<i>Delphinidae</i>	7	0	1
DWARF SPERM WHALE	DWW	SPS	<i>Kogia simus</i>	1	0	0
FALSE KILLER WHALE	FAW	SPS	<i>Pseudorca crassidens</i>	59	8	1
FIN WHALE	FIW	SPS	<i>Balaenoptera physalus</i>	1	0	0
FRASER'S DOLPHIN	FRD	SPS	<i>Lagenodelphis hosei</i>	0	1	0
GINKGO-TOOTHED BEAKED WHALE	TGW	SPS	<i>Mesoplodon ginkgodens</i>	1	0	0
HUMPBACK WHALE	HUW	SPS	<i>Megaptera novaeangliae</i>	1	0	0
INDO-PACIF. BOTTLENOSE DOLPHIN	DBZ	SPS	<i>Tursiops aduncus</i>	6	4	0
KILLER WHALE	KIW	SPS	<i>Orcinus orca</i>	4	0	0
LONG-BEAKED COMMON DOLPHIN	DCZ	SPS	<i>Delphinus capensis</i>	1	0	0
MELON-HEADED WHALE	MEW	SPS	<i>Peponocephala electra</i>	8	2	0
PACIFIC WHITE-SIDED DOLPHIN	DWP	SPS	<i>Lagenorhynchus obliquidens</i>	2	0	0
PANTROPICAL SPOTTED DOLPHIN	DPN	SPS	<i>Stenella attenuata</i>	6	0	0
PYGMY KILLER WHALE	KPW	SPS	<i>Feresa attenuata</i>	2	0	0
PYGMY SPERM WHALE	PYW	SPS	<i>Kogia breviceps</i>	1	0	0
RISSEO'S DOLPHIN	DRR	SPS	<i>Grampus griseus</i>	10	4	0
ROUGH-TOOTHED DOLPHIN	RTD	SPS	<i>Steno bredanensis</i>	10	5	0
SEI WHALE	SIW	SPS	<i>Balaenoptera borealis</i>	1	0	0
SHORT-FINNED PILOT WHALE	SHW	SPS	<i>Globicephala macrorhynchus</i>	22	0	0
SPERM WHALE	SPW	SPS	<i>Physeter macrocephalus</i>	2	0	0
SPINNER DOLPHIN	DSI	SPS	<i>Stenella longirostris</i>	8	1	0
STRIPED DOLPHIN	DST	SPS	<i>Stenella coeruleoalba</i>	4	1	0
TOOTHED WHALES NEI	ODN	SPS	<i>Odontoceti</i>	31	13	4
WHALE (UNIDENTIFIED)	WLE	INF-ORD	<i>Cetacea</i>	9	1	1

Table 6. Cetacean interactions (number of individuals) with the longline gear, by type of interaction, as reported by observers in the WCPF Convention Area longline fishery, 2015–2019

Species name	FAO Code	Taxonomic level	Scientific name	Entangled in gear	Hooked deeply - throat or stomach	Hooked externally	Hooked internally (mouth)	Hooked in jaw (circle hook)	Hooked unknown	Interaction details not provided
BALEEN WHALES NEI	MYS	ORD	<i>Mysticeti</i>	0	0	0	0	0	0	1
BEAKED WHALES NEI	MEP	GEN	<i>Mesoplodon spp</i>	1	0	1	0	0	1	0
BLUE WHALE	BLW	SPS	<i>Balaenoptera musculus</i>	0	0	0	0	0	0	1
BOTTLENOSE DOLPHIN	DBO	SPS	<i>Tursiops truncatus</i>	0	2	0	2	0	0	18
COMMON DOLPHIN	DCO	SPS	<i>Delphinus delphis</i>	0	0	0	0	0	0	4
DOLPHINS NEI	DLP	FAM	<i>Delphinidae</i>	0	0	0	0	0	0	8
DWARF SPERM WHALE	DWW	SPS	<i>Kogia simus</i>	0	0	0	0	0	0	1
FALSE KILLER WHALE	FAW	SPS	<i>Pseudorca crassidens</i>	5	0	1	17	1	5	39
FIN WHALE	FIW	SPS	<i>Balaenoptera physalus</i>	1	0	0	0	0	0	0
FRASER'S DOLPHIN	FRD	SPS	<i>Lagenodelphis hosei</i>	0	0	0	0	0	0	1
GINKGO-TOOTHED BEAKED WHALE	TGW	SPS	<i>Mesoplodon Ginkgodens</i>	0	0	0	0	0	0	1
HUMPBACK WHALE	HUW	SPS	<i>Megaptera novaeangliae</i>	1	0	0	0	0	0	0
INDO-PACIF. BOTTLENOSE DOLPHIN	DBZ	SPS	<i>Tursiops aduncus</i>	0	0	0	0	0	0	10
KILLER WHALE	KIW	SPS	<i>Orcinus orca</i>	0	0	0	0	0	4	0
LONG-BEAKED COMMON DOLPHIN	DCZ	SPS	<i>Delphinus capensis</i>	0	0	0	0	0	0	1
MELON-HEADED WHALE	MEW	SPS	<i>Peponocephala electra</i>	1	0	0	0	0	0	9
PACIFIC WHITE-SIDED DOLPHIN	DWP	SPS	<i>Lagenorhynchus obliquidens</i>	0	0	0	0	0	0	2
PANTROPICAL SPOTTED DOLPHIN	DPN	SPS	<i>Stenella attenuata</i>	0	0	0	0	1	0	5
PYGMY KILLER WHALE	KPW	SPS	<i>Feresa attenuata</i>	0	0	0	0	0	0	2
PYGMY SPERM WHALE	PYW	SPS	<i>Kogia breviceps</i>	0	0	0	0	0	0	1
RISSO'S DOLPHIN	DRR	SPS	<i>Grampus griseus</i>	0	0	2	2	0	5	5
ROUGH-TOOTHED DOLPHIN	RTD	SPS	<i>Steno bredanensis</i>	2	0	0	5	1	3	4
SEI WHALE	SIW	SPS	<i>Balaenoptera borealis</i>	0	0	0	0	0	0	1
SHORT-FINNED PILOT WHALE	SHW	SPS	<i>Globicephala macrorhynchus</i>	0	0	2	0	0	0	20
SPERM WHALE	SPW	SPS	<i>Physeter macrocephalus</i>	0	0	0	0	0	0	2
SPINNER DOLPHIN	DSI	SPS	<i>Stenella longirostris</i>	0	0	1	0	0	0	8
STRIPED DOLPHIN	DST	SPS	<i>Stenella coeruleoalba</i>	0	0	1	0	1	0	3
TOOTHED WHALES NEI	ODN	SPS	<i>Odontoceti</i>	2	1	1	1	0	13	30
WHALE (UNIDENTIFIED)	WLE	INF-ORD	<i>Cetacea</i>	1	0	1	1	0	2	6

Table 8. Cetacean interactions (number of individuals) with the purse seine gear, as reported by observers in the tropical WCPF Convention Area purse seine fishery

Species name	FAO Code	Taxonomic level	Scientific name	No. of comments	1995-2009		2010-2014		2015-2019	
					Released	Escaped	Released	Escaped	Released	Escaped
AQUATIC MAMMALS NEI	MAM	ORD	<i>Cetartiodactyla</i>	71	768	29	42	0	31	0
BALEEN WHALES NEI	MYS	ORD	<i>Mysticeti</i>	12	5	0	127	0	23	3
BEAKED WHALES NEI	MEP	GEN	<i>Mesoplodon spp</i>	10	10	0	83	0	9	7
BLAINVILLE'S BEAKED WHALE	BBW	SPS	<i>Mesoplodon densirostris</i>	1	2	0	20	0	5	0
BLUE WHALE	BLW	SPS	<i>Balaenoptera musculus</i>	8	0	0	5	0	13	3
BOTTLENOSE DOLPHIN	DBO	SPS	<i>Tursiops truncatus</i>	121	303	0	1264	0	634	4
BRYDE'S WHALE	BRW	SPS	<i>Balaenoptera Edeni</i>	151	6	0	213	5	296	47
COMMON DOLPHIN	DCO	SPS	<i>Delphinus delphis</i>	37	453	0	441	0	115	1
CUVIER'S BEAKED WHALE	BCW	SPS	<i>Ziphius cavirostris</i>	13	0	0	6	0	30	16
DOLPHINS NEI	DLP	FAM	<i>Delphinidae</i>	15	37	0	45	0	48	0
DUSKY DOLPHIN	DDU	SPS	<i>Logenorrhynchus obscurus</i>	0	0	0	0	0	1	0
DWARF SPERM WHALE	DWW	SPS	<i>Kogia simus</i>	2	0	0	14	0	7	0
FALSE KILLER WHALE	FAW	SPS	<i>Pseudorca crassidens</i>	551	566	0	8222	9	4001	157
FIN WHALE	FIW	SPS	<i>Balaenoptera physalus</i>	15	0	0	0	0	14	9
FRASER'S DOLPHIN	FRD	SPS	<i>Lagenodelphis hosei</i>	2	0	0	92	0	5	0
GINKGO-TOOTHED BEAKED WHALE	TGW	SPS	<i>Mesoplodon ginkgodens</i>	8	0	0	45	0	10	5
HUMPBACK WHALE	HUW	SPS	<i>Megaptera novaeangliae</i>	9	3	19	24	0	21	5
INDO-PACIF. BOTTLENOSE DOLPHIN	DBZ	SPS	<i>Tursiops aduncus</i>	63	188	0	735	0	223	4
KILLER WHALE	KIW	SPS	<i>Orcinus orca</i>	1	17	0	1	0	15	1
LONG-BEAKED COMMON DOLPHIN	DCZ	SPS	<i>Delphinus capensis</i>	7	40	0	92	0	24	8
LONG-FINNED PILOT WHALE	PIW	SPS	<i>Globicephala melas</i>	0	0	0	0	0	3	0
MELON-HEADED WHALE	MEW	SPS	<i>Peponocephala electra</i>	19	8	2	295	0	163	2
MINKE WHALE	MIW	SPS	<i>Balaenoptera acutorostrata</i>	12	0	0	25	0	49	9
NORTHERN RIGHT WHALE DOLPHIN	RNW	SPS	<i>Lissodelphis borealis</i>	0	0	0	5	0	0	0
PACIFIC WHITE-SIDED DOLPHIN	DWP	SPS	<i>Lagenorrhynchus obliquidens</i>	0	6	0	35	0	15	0
PANTROPICAL SPOTTED DOLPHIN	DPN	SPS	<i>Stenella attenuata</i>	14	8	0	57	0	72	1
PILOT WHALES NEI	GLO	GEN	<i>Globicephala spp</i>	0	0	0	0	0	5	0
PYGMY KILLER WHALE	KPW	SPS	<i>Feresa attenuata</i>	9	2	0	138	0	94	1
PYGMY SPERM WHALE	PYW	SPS	<i>Kogia breviceps</i>	14	3	0	121	0	30	6
RISSE'S DOLPHIN	DRR	SPS	<i>Grampus griseus</i>	37	109	0	1324	0	179	0
ROUGH-TOOTHED DOLPHIN	RTD	SPS	<i>Steno bredanensis</i>	212	106	0	1092	0	873	4
SEI WHALE	SIW	SPS	<i>Balaenoptera borealis</i>	102	2	1	146	2	196	63
SHORT-FINNED PILOT WHALE	SHW	SPS	<i>Globicephala macrorhynchus</i>	70	31	4	1592	12	688	17
SPERM WHALE	SPW	SPS	<i>Physeter macrocephalus</i>	8	0	0	25	0	18	2
SPINNER DOLPHIN	DSI	SPS	<i>Stenella longirostris</i>	85	92	0	810	0	442	4
SPOTTED DOLPHINS NEI	DSP	GEN	<i>Stenella spp.</i>	8	17	0	36	0	0	0
STRIPED DOLPHIN	DST	SPS	<i>Stenella coeruleoalba</i>	16	8	0	116	0	99	0
TOOTHED WHALES NEI	ODN	ORD	<i>Odontoceti</i>	14	41	1	7	0	9	3
WHALE (UNIDENTIFIED)	WLE	ORD	<i>Cetacea</i>	3	9	1	21	0	4	0

Table 9. Life status of cetaceans (number of individuals) that interacted with the purse seine gear, as reported by observers in the tropical WCPF Convention Area purse seine fishery

Species name	FAO Code	Taxonomic level	Scientific name	1995-2009			2010-2014			2015-2019		
				Alive	Dead	Unk.	Alive	Dead	Unk.	Alive	Dead	Unk.
AQUATIC MAMMALS NEI	MAM	ORD	<i>Cetartiodactyla</i>	222	513	62	40	0	2	29	2	0
BALEEN WHALES NEI	MYS	ORD	<i>Mysticeti</i>	4	1	0	124	3	0	24	1	1
BEAKED WHALES NEI	MEP	GEN	<i>Mesoplodon spp</i>	10	0	0	70	13	0	15	0	1
BLAINVILLE'S BEAKED WHALE	BBW	SPS	<i>Mesoplodon densirostris</i>	2	0	0	16	2	2	5	0	0
BLUE WHALE	BLW	SPS	<i>Balaenoptera musculus</i>	0	0	0	2	0	3	13	2	1
BOTTLENOSE DOLPHIN	DBO	SPS	<i>Tursiops truncatus</i>	119	109	75	823	387	54	416	154	68
BRYDE'S WHALE	BRW	SPS	<i>Balaenoptera edeni</i>	3	2	1	199	11	8	307	10	26
COMMON DOLPHIN	DCO	SPS	<i>Delphinus delphis</i>	131	293	29	395	29	17	68	47	1
CUVIER'S BEAKED WHALE	BCW	SPS	<i>Ziphius cavirostris</i>	0	0	0	6	0	0	46	0	0
DOLPHINS NEI	DLP	FAM	<i>Delphinidae</i>	16	5	16	36	4	5	37	11	0
DUSKY DOLPHIN	DDU	SPS	<i>Lagenorhynchus obscurus</i>	0	0	0	0	0	0	0	0	1
DWARF SPERM WHALE	DWW	SPS	<i>Kogia simus</i>	0	0	0	14	0	0	7	0	0
FALSE KILLER WHALE	FAW	SPS	<i>Pseudorca crassidens</i>	383	147	36	7790	288	153	3665	259	234
FIN WHALE	FIW	SPS	<i>Balaenoptera physalus</i>	0	0	0	0	0	0	23	0	0
FRASER'S DOLPHIN	FRD	SPS	<i>Lagenodelphis hosei</i>	0	0	0	68	23	1	3	2	0
GINKGO-TOOTHED BEAKED WHALE	TGW	SPS	<i>Mesoplodon ginkgodens</i>	0	0	0	38	7	0	15	0	0
HUMPBACK WHALE	HUW	SPS	<i>Megaptera novaeangliae</i>	22	0	0	16	5	3	24	2	0
INDO-PACIF. BOTTLENOSE DOLPHIN	DBZ	SPS	<i>Tursiops aduncus</i>	34	121	33	561	169	5	151	75	1
KILLER WHALE	KIW	SPS	<i>Orcinus orca</i>	3	0	14	1	0	0	6	0	10
LONG-BEAKED COMMON DOLPHIN	DCZ	SPS	<i>Delphinus capensis</i>	5	3	32	64	27	1	18	2	12
LONG-FINNED PILOT WHALE	PIW	SPS	<i>Globicephala melas</i>	0	0	0	0	0	0	3	0	0
MELON-HEADED WHALE	MEW	SPS	<i>Peponocephala electra</i>	3	6	1	280	5	10	158	5	2
MINKE WHALE	MIW	SPS	<i>Balaenoptera acutorostrata</i>	0	0	0	25	0	0	58	0	0
NORTHERN RIGHT WHALE DOLPHIN	RNW	SPS	<i>Lissodelphis borealis</i>	0	0	0	3	0	2	0	0	0
PACIFIC WHITE-SIDED DOLPHIN	DWP	SPS	<i>Lagenorhynchus obliquidens</i>	6	0	0	35	0	0	15	0	0
PANTROPICAL SPOTTED DOLPHIN	DPN	SPS	<i>Stenella attenuata</i>	1	7	0	50	7	0	17	56	0
PILOT WHALES NEI	GLO	GEN	<i>Globicephala spp</i>	0	0	0	0	0	0	0	0	5
PYGMY KILLER WHALE	KPW	SPS	<i>Feresa attenuata</i>	0	2	0	125	9	4	95	0	0
PYGMY SPERM WHALE	PYW	SPS	<i>Kogia breviceps</i>	0	0	3	118	1	2	35	0	1
RISSO'S DOLPHIN	DRR	SPS	<i>Grampus griseus</i>	43	64	2	1236	58	30	157	22	0
ROUGH-TOOTHED DOLPHIN	RTD	SPS	<i>Steno bredanensis</i>	22	73	11	701	362	29	445	422	10
SEI WHALE	SIW	SPS	<i>Balaenoptera borealis</i>	3	0	0	142	4	2	250	7	2
SHORT-FINNED PILOT WHALE	SHW	SPS	<i>Globicephala macrorhynchus</i>	21	14	0	1569	7	28	625	30	50
SPERM WHALE	SPW	SPS	<i>Physeter macrocephalus</i>	0	0	0	19	1	5	19	1	0
SPINNER DOLPHIN	DSI	SPS	<i>Stenella longirostris</i>	12	76	4	505	299	6	336	91	19
SPOTTED DOLPHINS NEI	DSP	GEN	<i>Stenella spp.</i>	4	13	0	25	6	5	0	0	0
STRIPED DOLPHIN	DST	SPS	<i>Stenella coeruleoalba</i>	0	8	0	46	47	23	16	83	0
TOOTHED WHALES NEI	ODN	ORD	<i>Odontoceti</i>	21	21	0	7	0	0	11	1	0
WHALE (UNIDENTIFIED)	WLE	ORD	<i>Cetacea</i>	1	1	8	19	2	0	4	0	0

Table 10. Cetacean interactions (number of individuals) with the purse seine gear, by type of interaction, as reported by observers in the tropical WCPF Convention Area purse seine fishery

Species name	FAO Code	Taxonomic level	Scientific name	Broke through net	Crew released through net	Entangled in gear	Jumped out (over net)	Roped, pulled from net	Interaction details not provided
AQUATIC MAMMALS NEI	MAM	ORD	<i>Cetartiodactyla</i>	2	0	0	1	0	867
BALEEN WHALES NEI	MYS	ORD	<i>Mysticeti</i>	4	0	0	1	1	152
BEAKED WHALES NEI	MEP	GEN	<i>Mesoplodon spp</i>	2	0	0	0	0	107
BLAINVILLE'S BEAKED WHALE	BBW	SPS	<i>Mesoplodon densirostris</i>	0	0	0	0	0	27
BLUE WHALE	BLW	SPS	<i>Balaenoptera musculus</i>	5	0	0	0	0	16
BOTTLENOSE DOLPHIN	DBO	SPS	<i>Tursiops truncatus</i>	0	102	21	22	0	2,060
BRYDE'S WHALE	BRW	SPS	<i>Balaenoptera Edeni</i>	53	23	6	7	1	478
COMMON DOLPHIN	DCO	SPS	<i>Delphinus delphis</i>	1	18	1	1	0	996
CUVIER'S BEAKED WHALE	BCW	SPS	<i>Ziphius cavirostris</i>	1	0	0	0	0	51
DOLPHINS NEI	DLP	FAM	<i>Delphinidae</i>	0	4	0	0	0	126
DUSKY DOLPHIN	DDU	SPS	<i>Lagenorhynchus obscurus</i>	0	0	0	0	0	1
DWARF SPERM WHALE	DWW	SPS	<i>Kogia simus</i>	0	0	0	0	0	21
FALSE KILLER WHALE	FAW	SPS	<i>Pseudorca crassidens</i>	97	182	62	21	26	12,573
FIN WHALE	FIW	SPS	<i>Balaenoptera physalus</i>	9	1	7	0	1	5
FRASER'S DOLPHIN	FRD	SPS	<i>Lagenodelphis hosei</i>	0	0	0	0	0	97
GINKGO-TOOTHED BEAKED WHALE	TGW	SPS	<i>Mesoplodon ginkgodens</i>	4	0	0	0	0	56
HUMPBACK WHALE	HUW	SPS	<i>Megaptera novaeangliae</i>	1	1	0	0	0	70
INDO-PACIF. BOTTLENOSE DOLPHIN	DBZ	SPS	<i>Tursiops aduncus</i>	0	56	4	0	0	1,090
KILLER WHALE	KIW	SPS	<i>Orcinus orca</i>	0	0	0	0	0	34
LONG-BEAKED COMMON DOLPHIN	DCZ	SPS	<i>Delphinus capensis</i>	0	0	9	0	0	155
LONG-FINNED PILOT WHALE	PIW	SPS	<i>Globicephala melas</i>	0	0	0	0	0	3
MELON-HEADED WHALE	MEW	SPS	<i>Peponocephala electra</i>	0	11	0	2	0	457
MINKE WHALE	MIW	SPS	<i>Balaenoptera acutorostrata</i>	4	1	0	2	2	74
NORTHERN RIGHT WHALE DOLPHIN	RNW	SPS	<i>Lissodelphis borealis</i>	0	0	0	0	0	5
PACIFIC WHITE-SIDED DOLPHIN	DWP	SPS	<i>Lagenorhynchus obliquidens</i>	0	0	0	0	0	56
PANTROPICAL SPOTTED DOLPHIN	DPN	SPS	<i>Stenella attenuata</i>	0	15	18	0	5	100
PILOT WHALES NEI	GLO	GEN	<i>Globicephala spp</i>	0	0	0	0	0	5
PYGMY KILLER WHALE	KPW	SPS	<i>Feresa attenuata</i>	4	1	0	1	0	229
PYGMY SPERM WHALE	PYW	SPS	<i>Kogia breviceps</i>	8	1	0	0	0	151
RISSO'S DOLPHIN	DRR	SPS	<i>Grampus griseus</i>	0	8	1	0	8	1,595
ROUGH-TOOTHED DOLPHIN	RTD	SPS	<i>Steno bredanensis</i>	0	163	15	0	1	1,894
SEI WHALE	SIW	SPS	<i>Balaenoptera borealis</i>	44	12	3	7	0	345
SHORT-FINNED PILOT WHALE	SHW	SPS	<i>Globicephala macrorhynchus</i>	13	20	7	1	0	2,303
SPERM WHALE	SPW	SPS	<i>Physeter macrocephalus</i>	1	0	0	0	0	44
SPINNER DOLPHIN	DSI	SPS	<i>Stenella longirostris</i>	0	51	10	0	0	1,297
SPOTTED DOLPHINS NEI	DSP	GEN	<i>Stenella spp.</i>	0	0	0	0	0	53
STRIPED DOLPHIN	DST	SPS	<i>Stenella coeruleoalba</i>	5	33	30	0	0	155
TOOTHED WHALES NEI	ODN	ORD	<i>Odontoceti</i>	3	3	0	0	0	55
WHALE (UNIDENTIFIED)	WLE	ORD	<i>Cetacea</i>	0	1	0	0	0	34

4. FIGURES

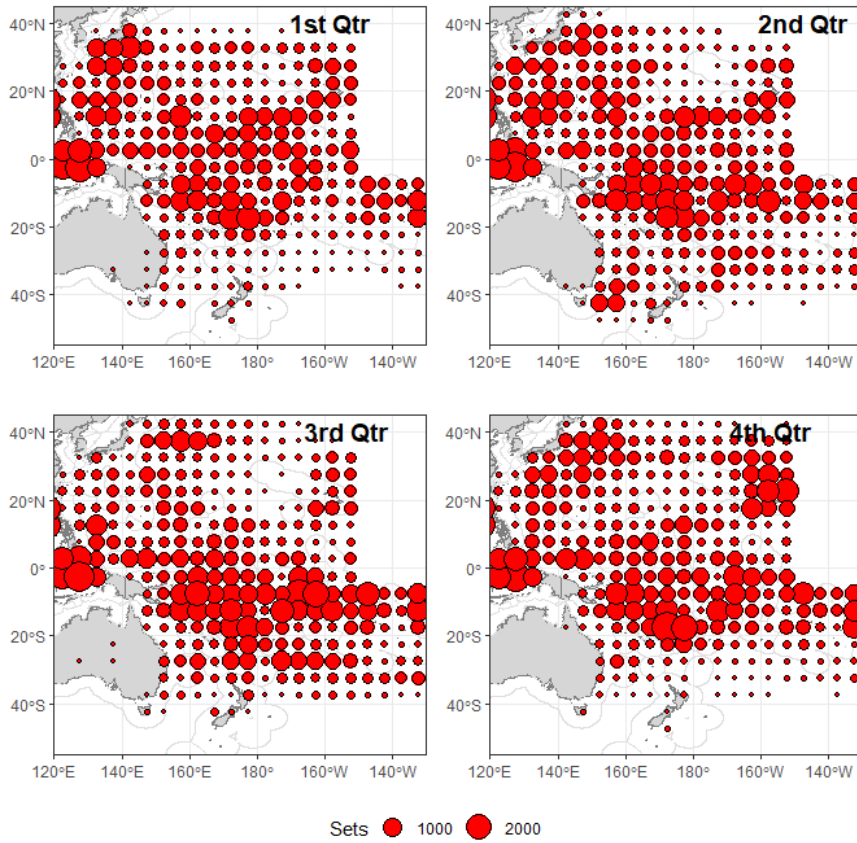


Figure 1. Distribution of longline effort (annual average SETS) in the WCPF Convention Area longline fishery, by quarter, 2015–2019

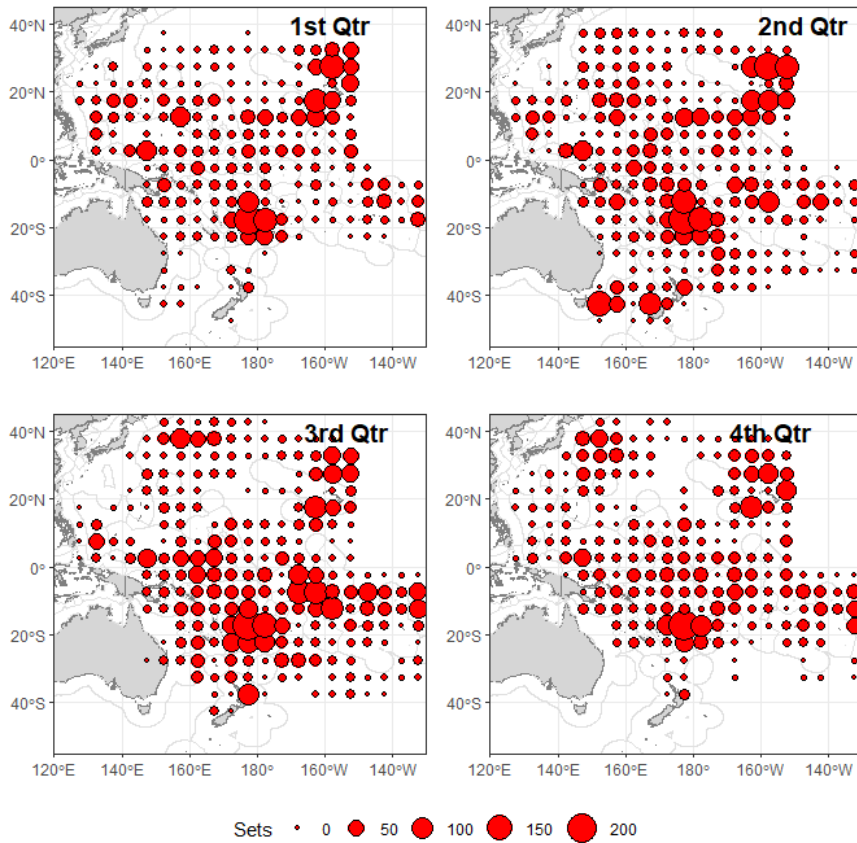


Figure 2. Distribution of OBSERVER longline effort (annual average SETS) in the WCPF Convention Area longline fishery, by quarter, 2015–2019

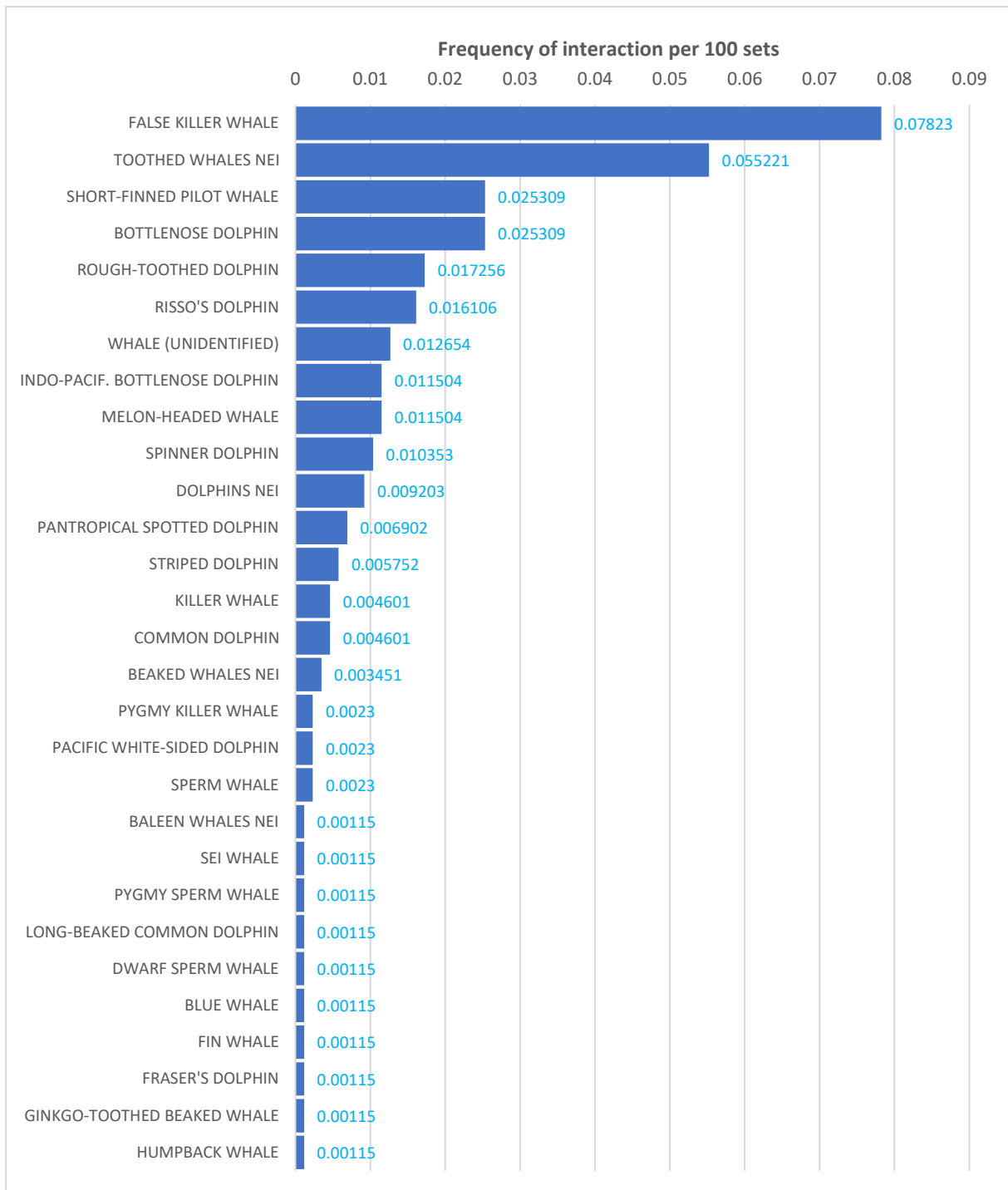


Figure 3. Frequency of Cetacean interactions with the longline gear, as reported by observers in the WCPF Convention Area longline fishery, 2015–2019

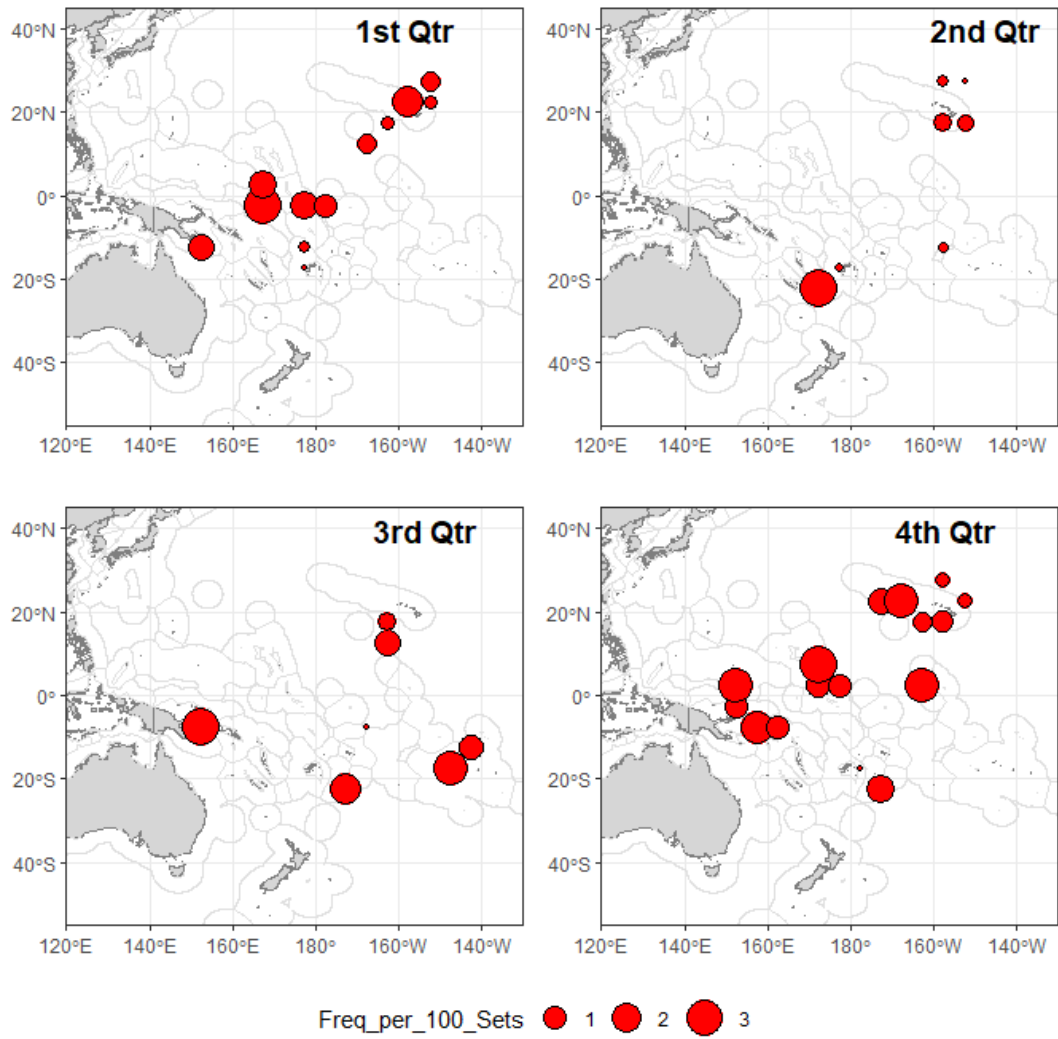


Figure 4. False Killer Whale (*Pseudorca crassidens*) interactions (frequency per 100 sets) in the WCPF Convention Area longline fishery, by Quarter, 2015–2019

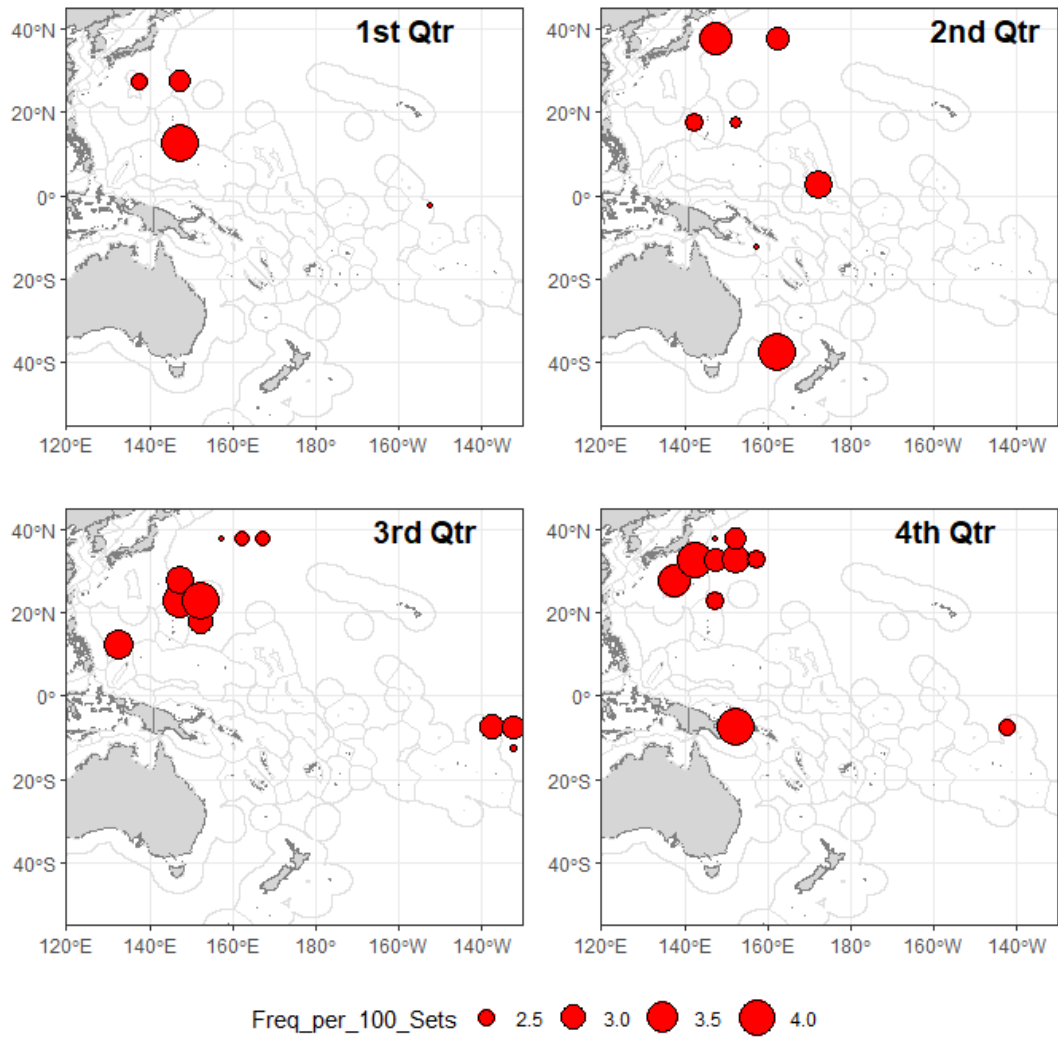


Figure 5. TOOTHED WHALES (*Odontoceti*) interactions (frequency per 100 sets) in the WCPF Convention Area longline fishery, by Quarter, 2015–2019

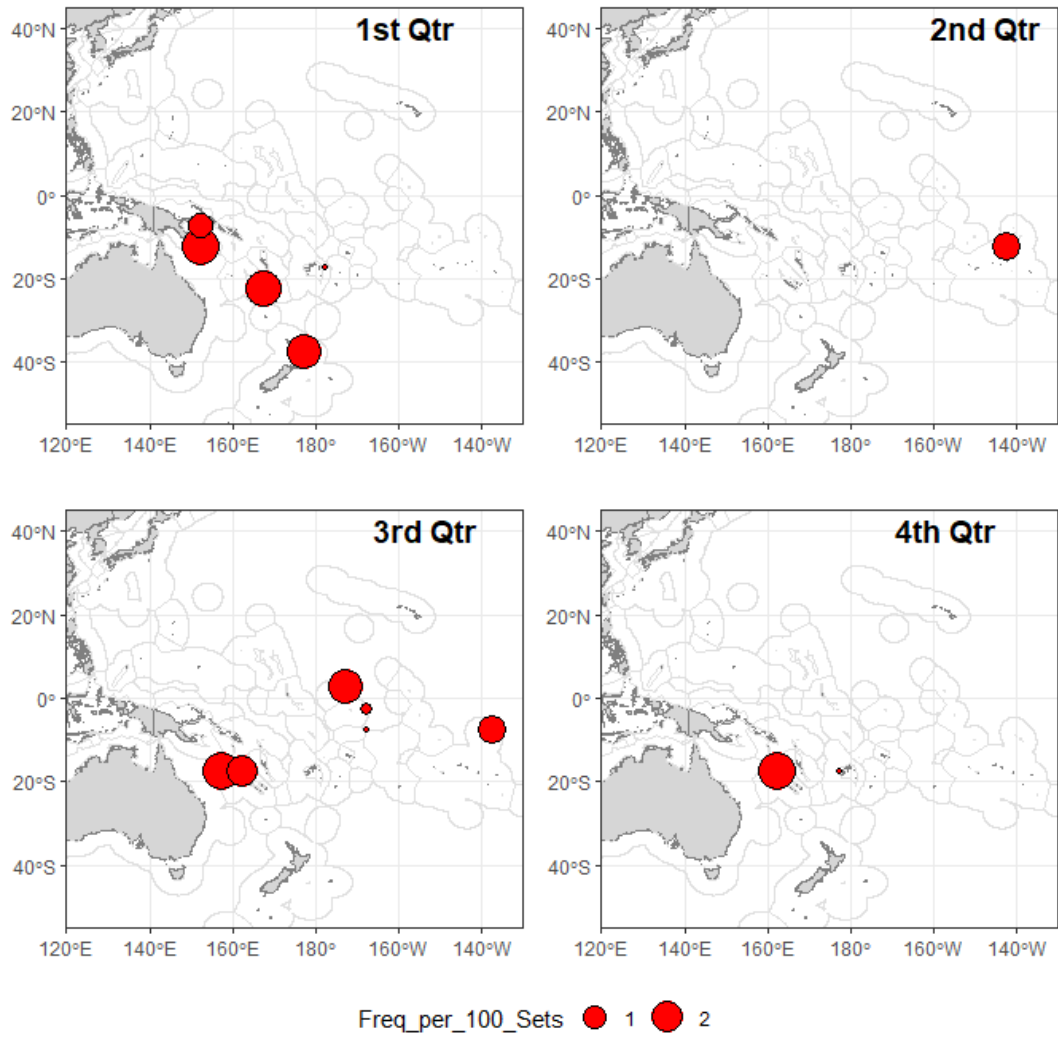


Figure 6. SHORT-FINNED PILOT WHALE (*Globicephala macrorhynchus*) interactions (frequency per 100 sets) in the WCPF Convention Area longline fishery, by Quarter, 2015–2019

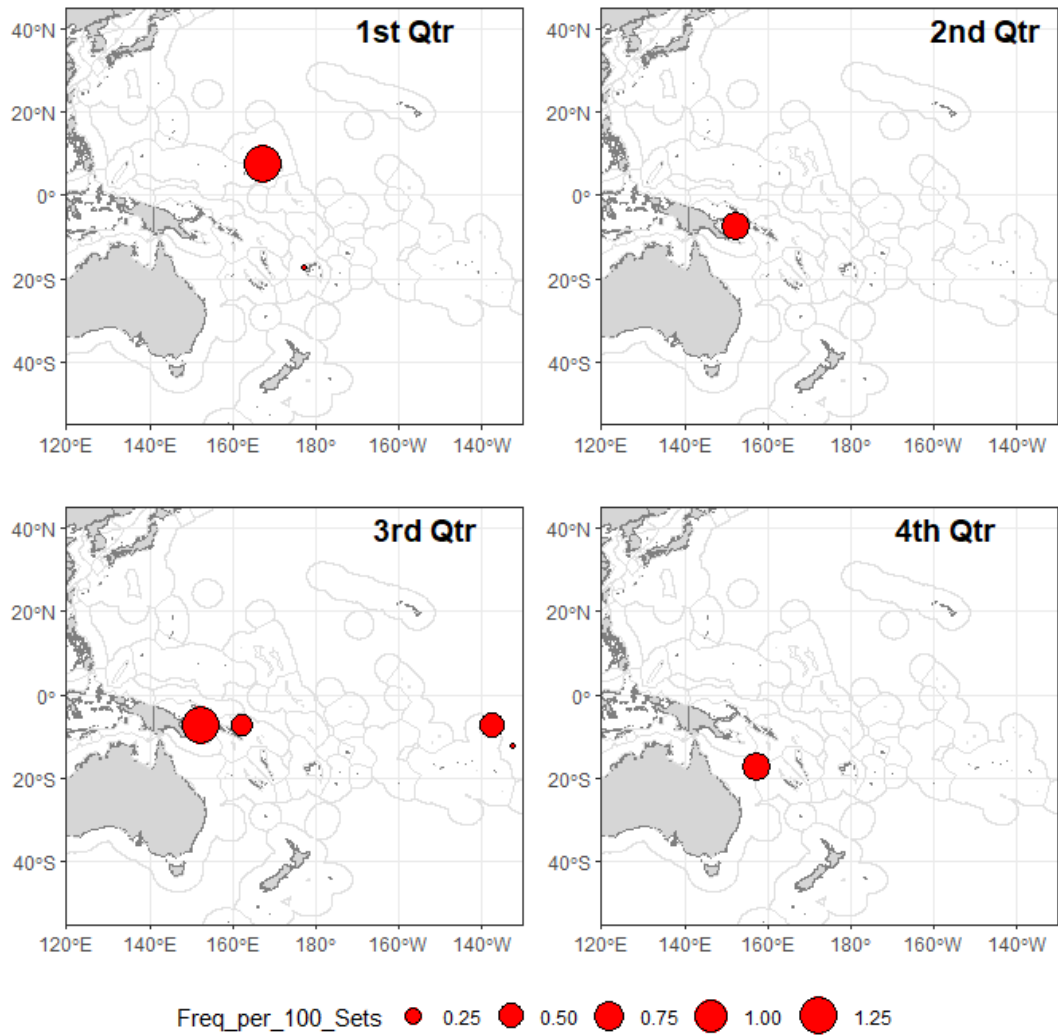


Figure 7. MELON-HEADED WHALE (*Peponocephala electra*) interactions (frequency per 100 sets) in the WCPF Convention Area longline fishery, by Quarter, 2015–2019

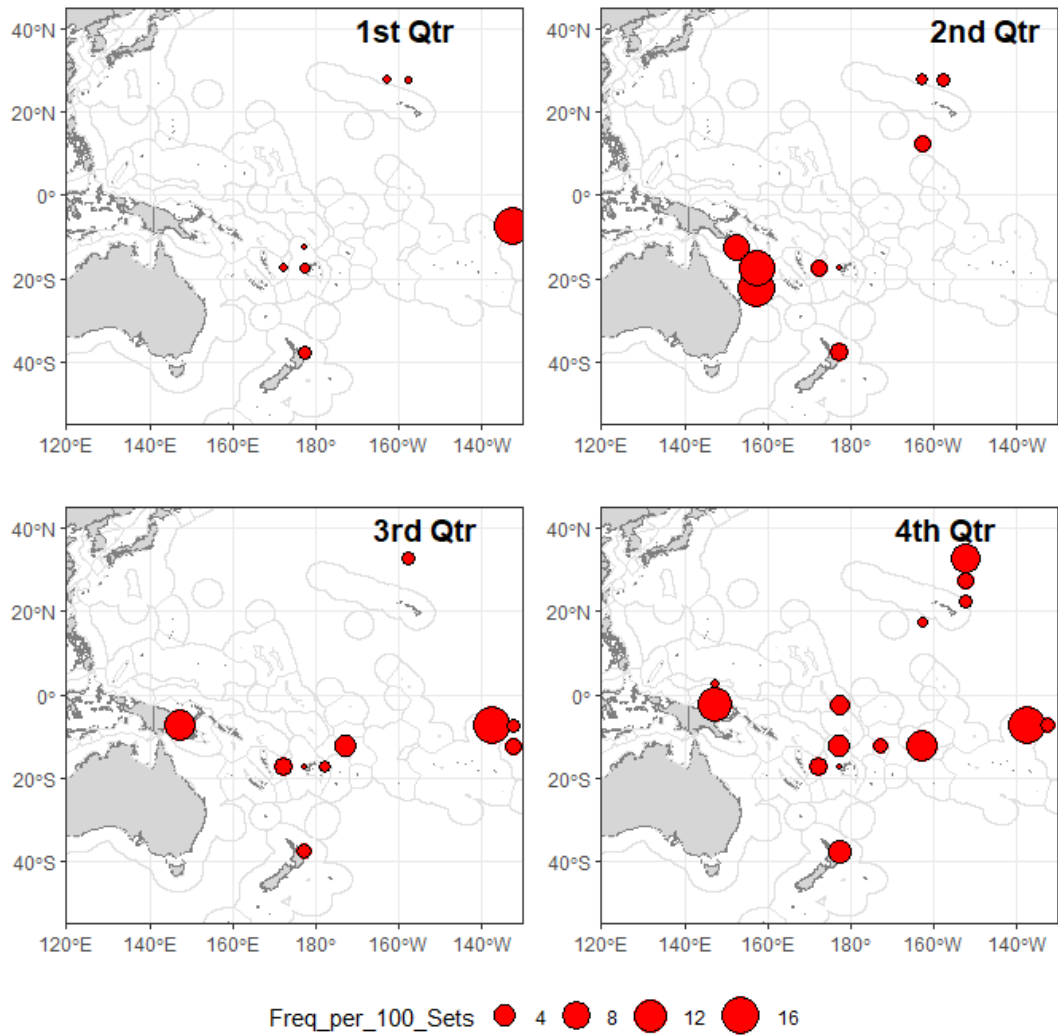


Figure 8. Oceanic DOLPHIN (*Delphinidae*) interactions (frequency per 100 sets) in the WCPF Convention Area longline fishery, by Quarter, 2015–2019

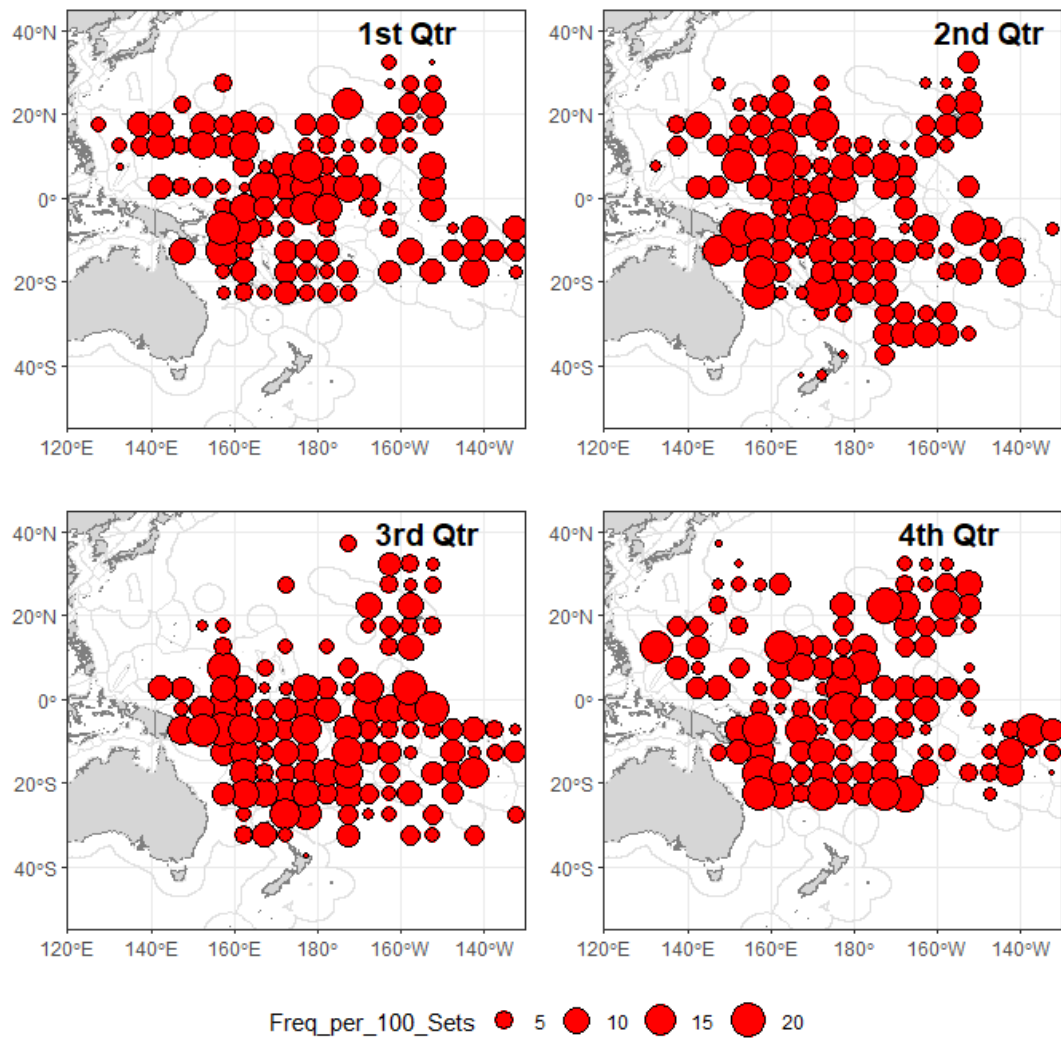


Figure 9. Cetacean predation of tuna (frequency per 100 sets) in the WCPF Convention Area longline fishery, by Quarter, 2015–2019

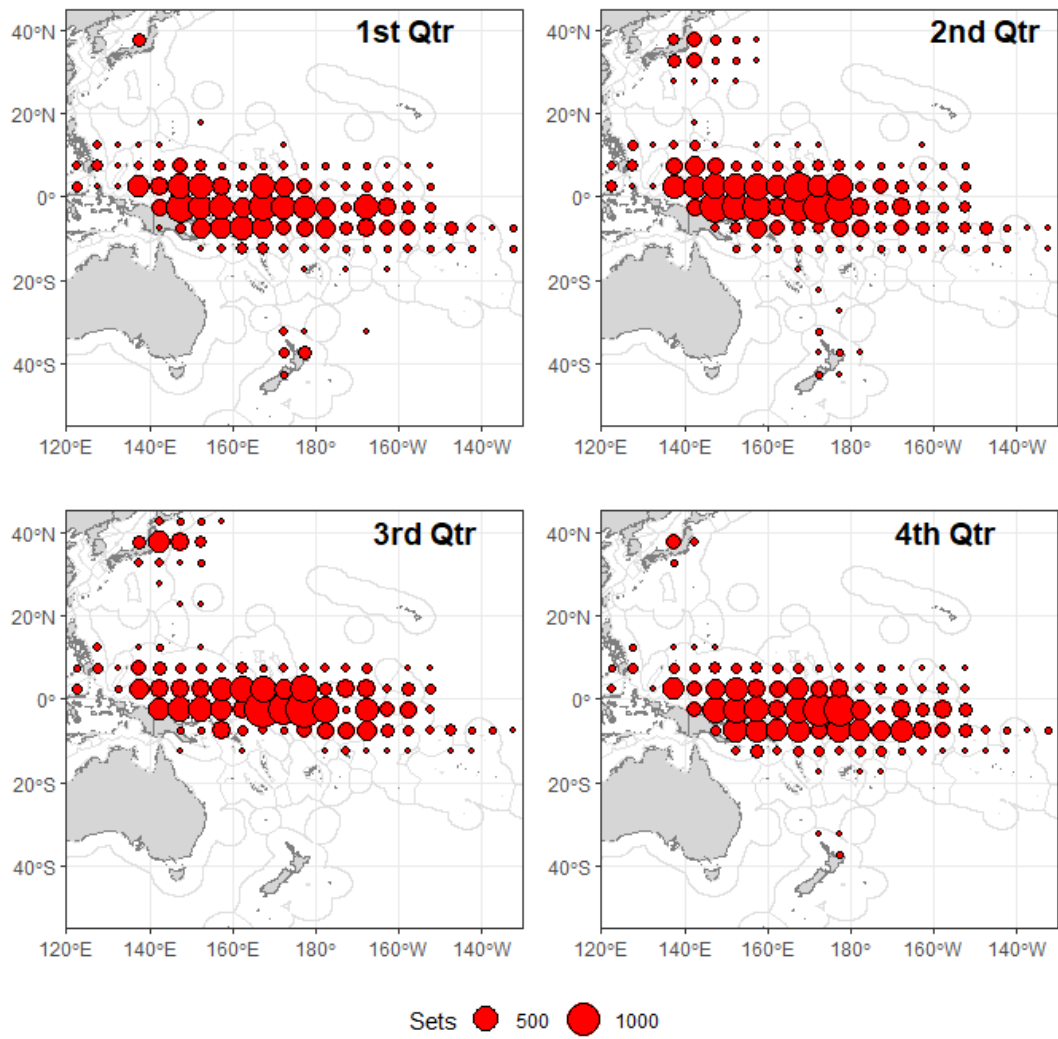


Figure 10. Distribution of purse seine effort (annual average SETS) in the WCPF Convention Area purse seine fishery, by quarter, 2015–2019

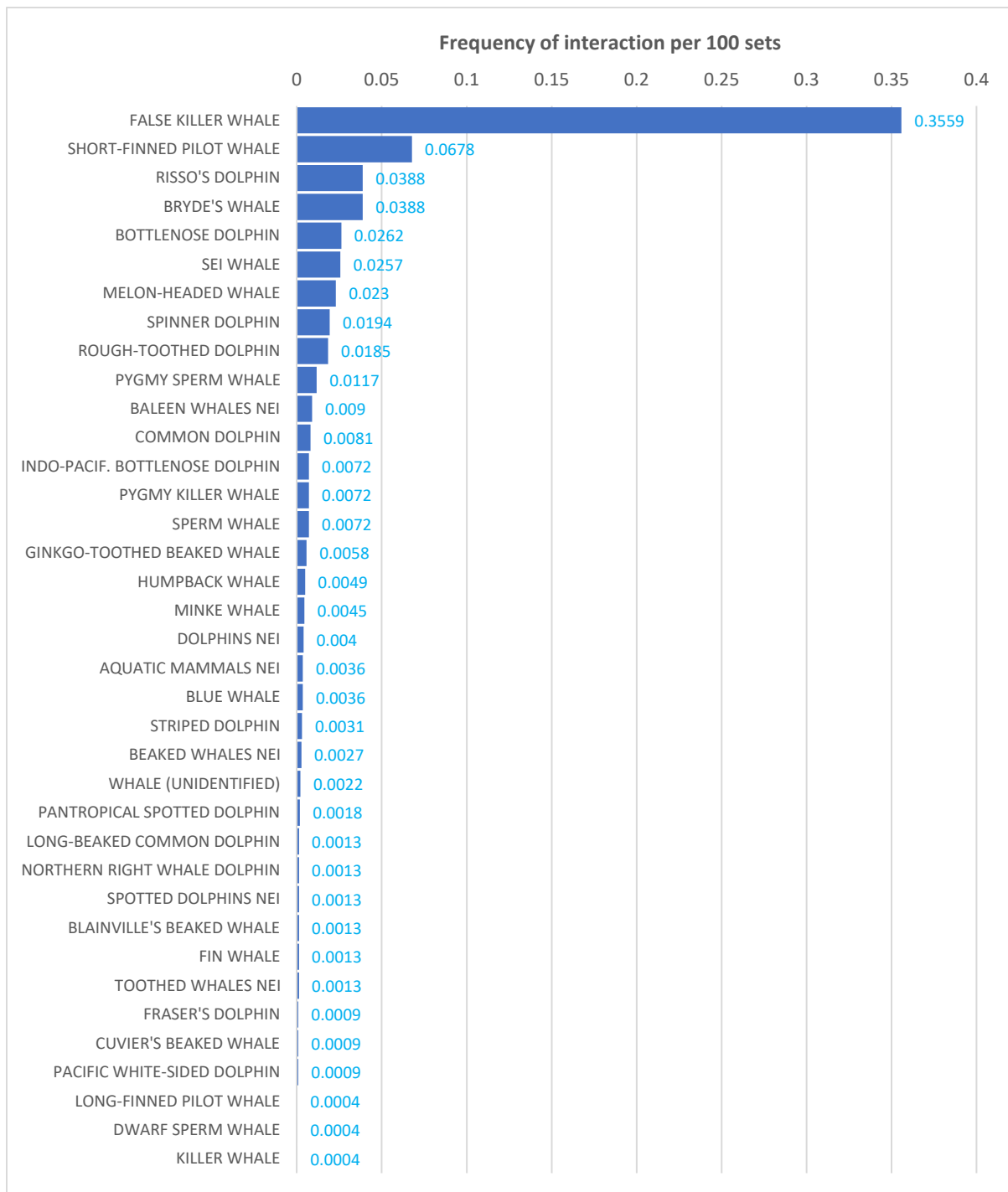


Figure 11. Frequency of Cetacean interactions with the purse seine gear, for UNASSOCIATED SETS, as reported by observers in the WCPF Convention Area purse seine fishery, 2010–2019

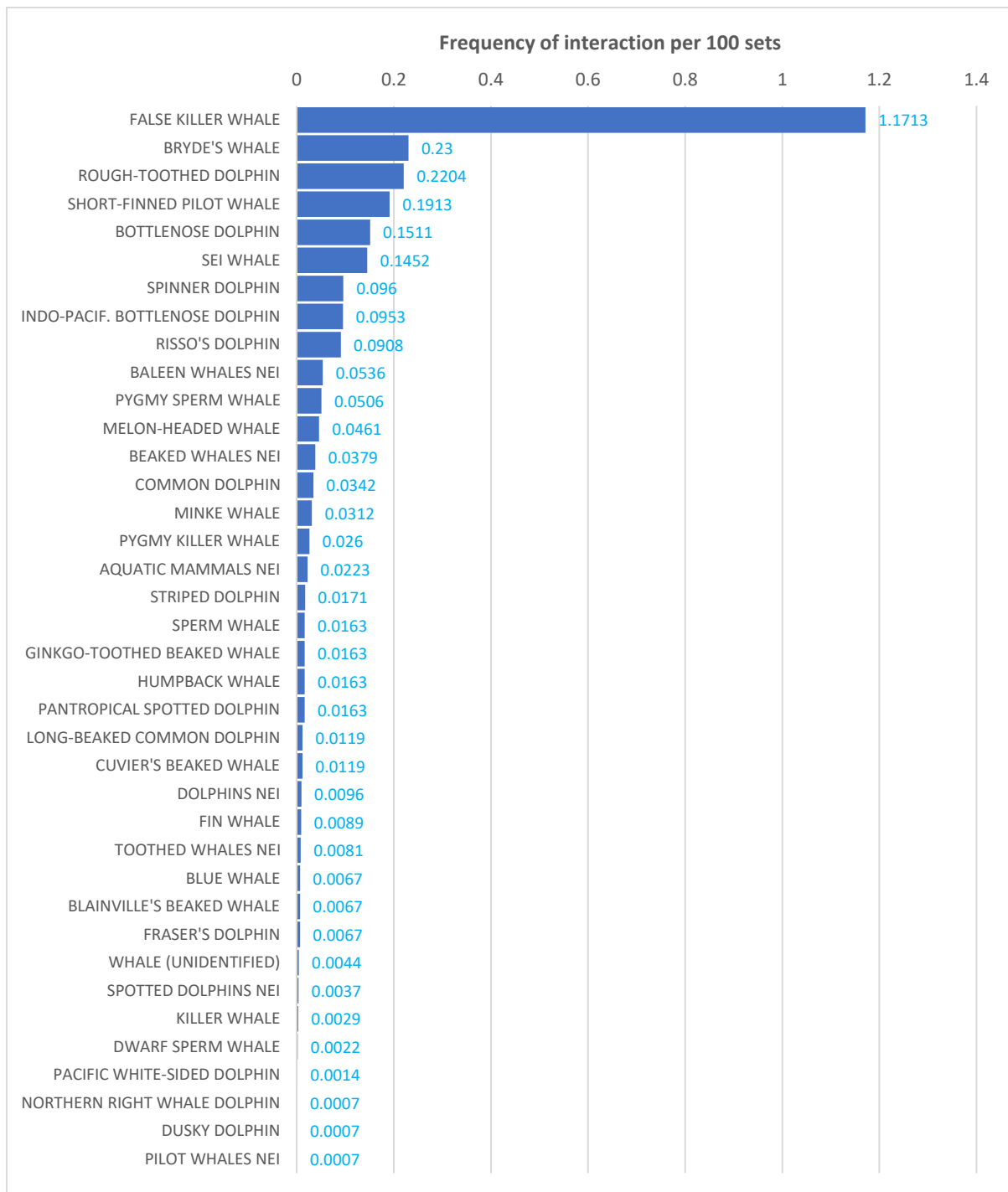


Figure 12. Frequency of Cetacean interactions with the purse seine gear, for ASSOCIATED SETS, as reported by observers in the WCPF Convention Area purse seine fishery, 2010–2019

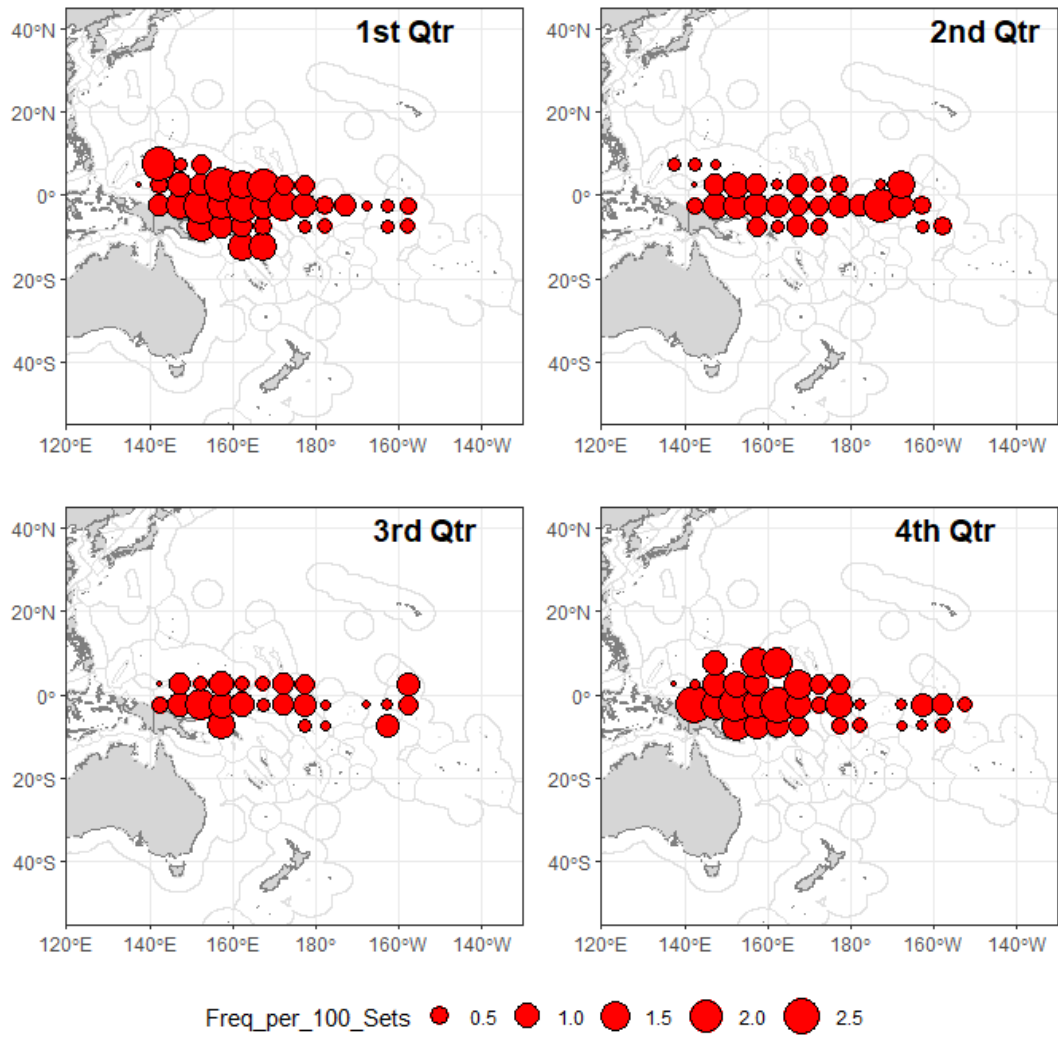


Figure 13. False Killer Whale (*Pseudorca crassidens*) interactions (frequency per 100 sets) in the WCPF Convention Area purse seine fishery, by Quarter, 2015–2019

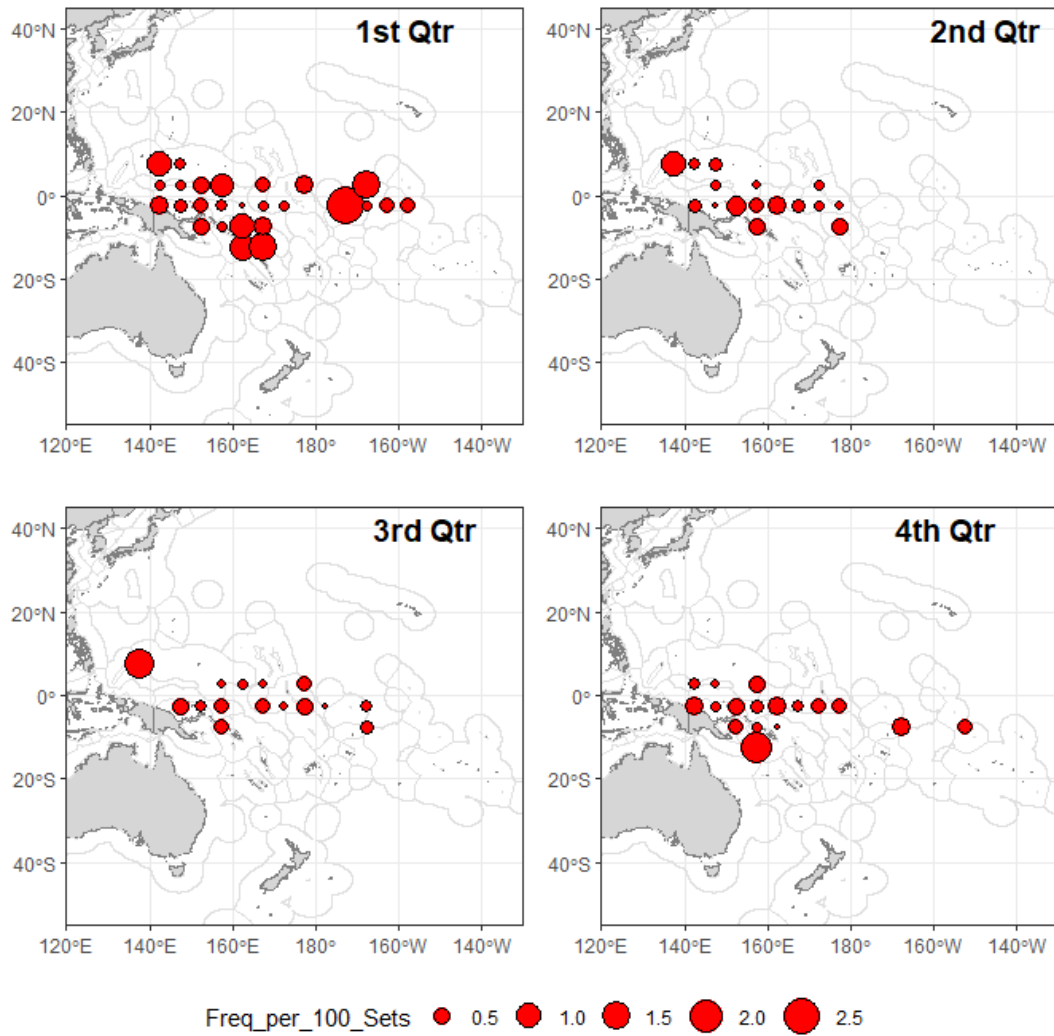


Figure 14. BRYDE'S WHALE (*Balaenoptera Edeni*) interactions (frequency per 100 sets) in the WCPF Convention Area purse seine fishery, by Quarter, 2015–2019

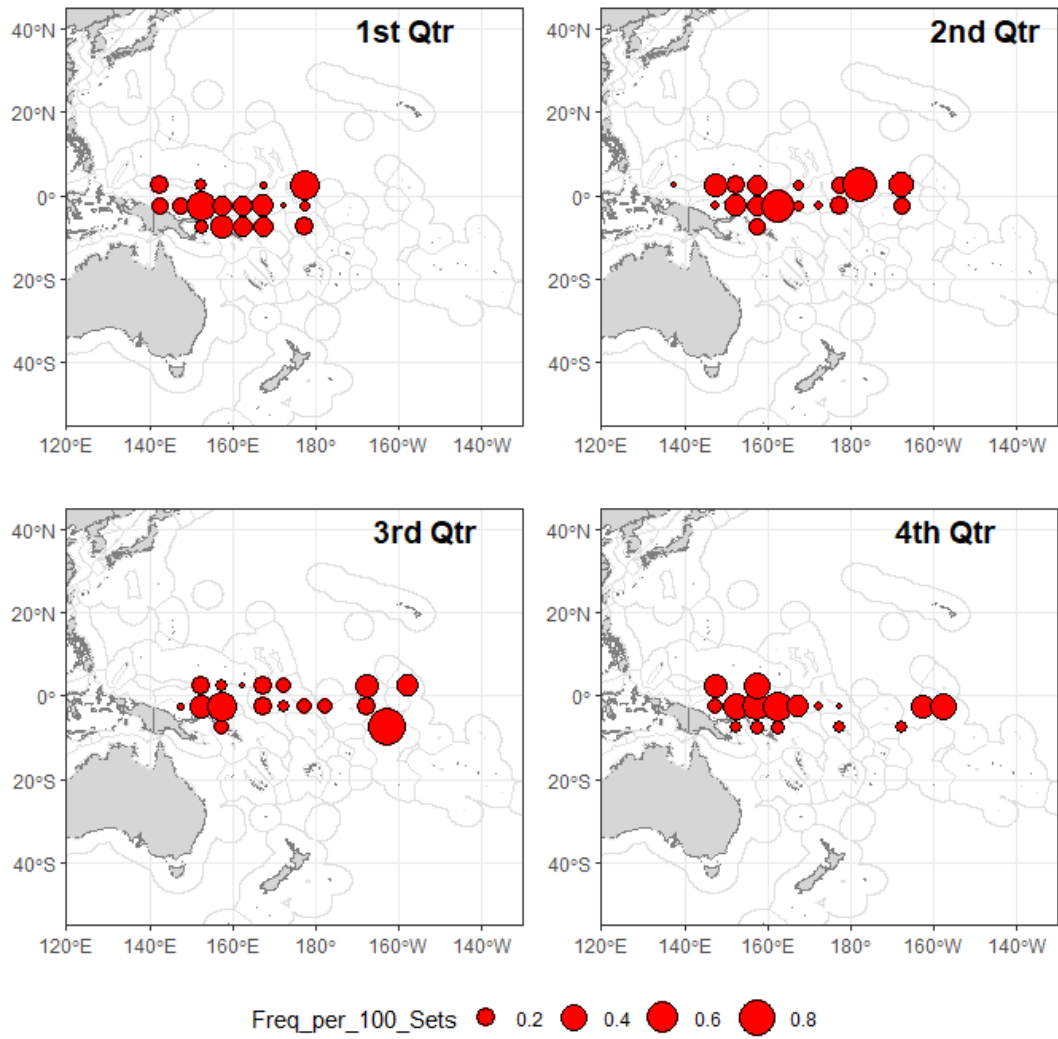


Figure 15. SHORT-FINNED PILOT WHALE (*Globicephala macrorhynchus*) interactions (frequency per 100 sets) in the WCPF Convention Area purse seine fishery, by Quarter, 2015–2019

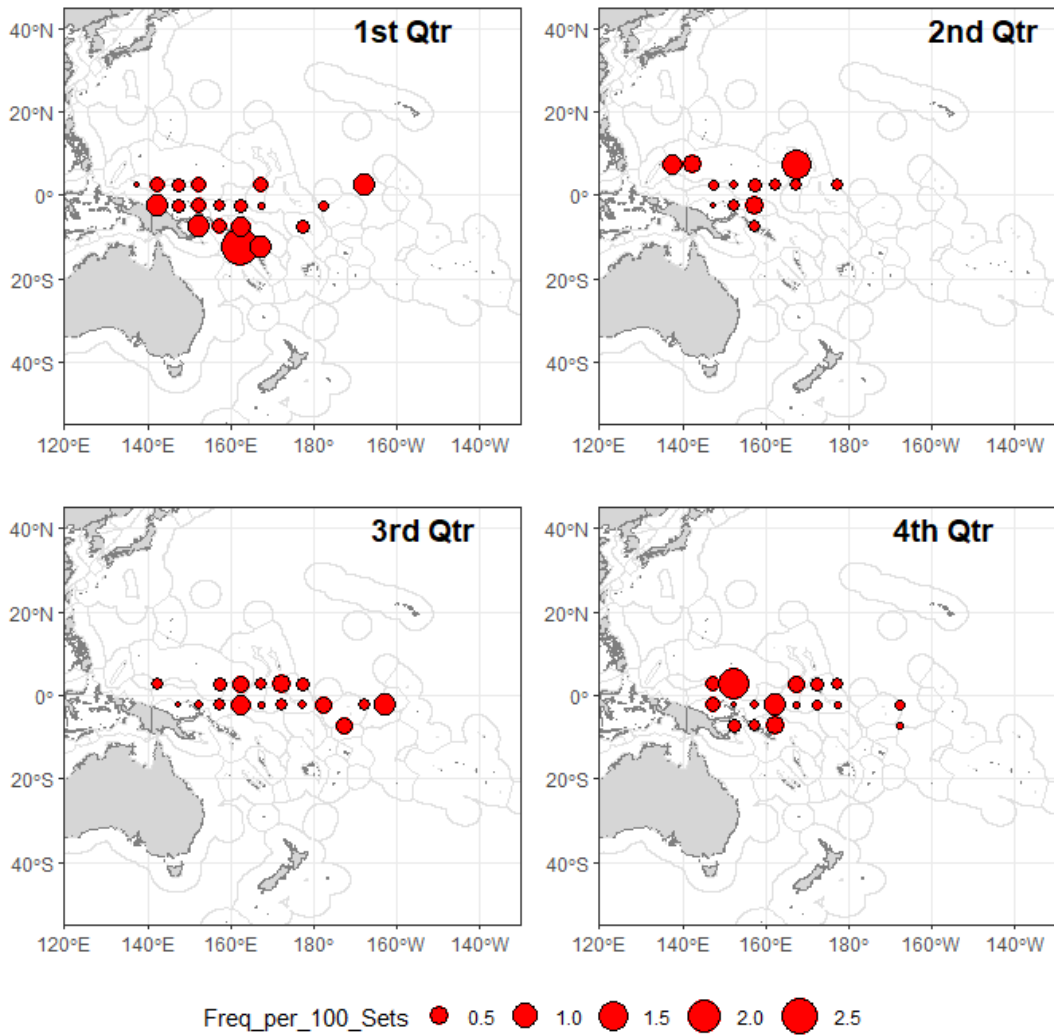


Figure 16. SEI WHALE (*Balaenoptera borealis*) interactions (frequency per 100 sets) in the WCPF Convention Area purse seine fishery, by Quarter, 2015–2019

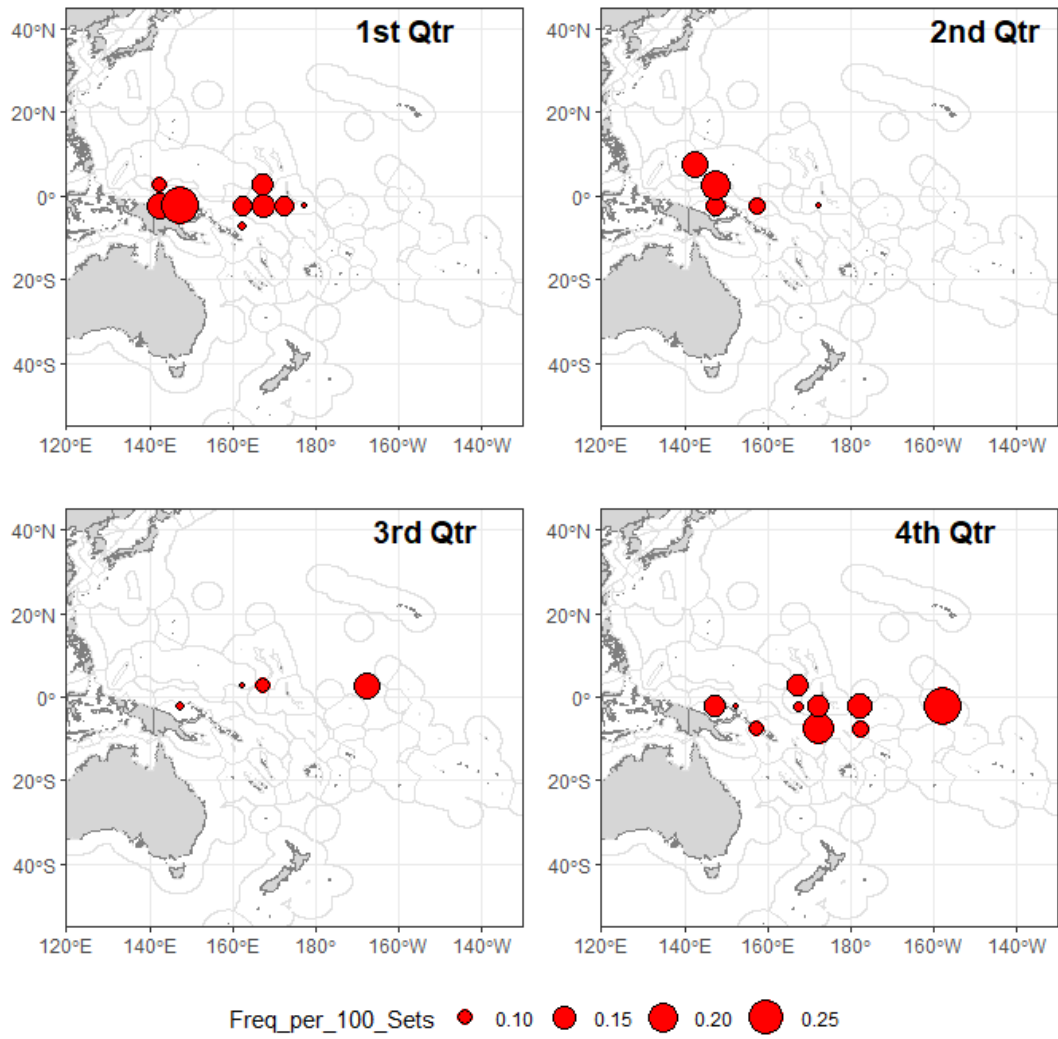


Figure 17. MELON-HEADED WHALE (*Peponocephala electra*) interactions (frequency per 100 sets) in the WCPF Convention Area purse seine fishery, by Quarter, 2015–2019

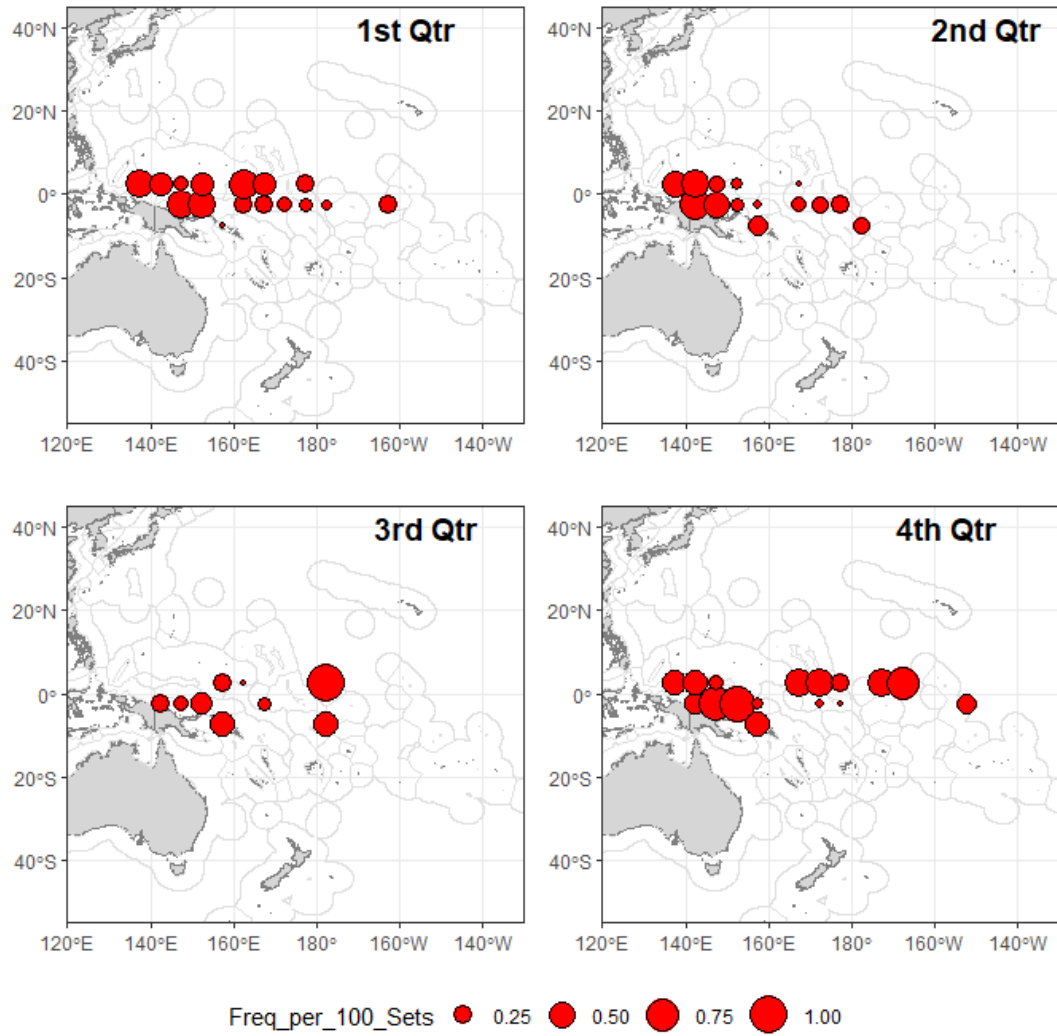


Figure 18. BOTTLENOSE DOLPHINS (*Tursiops spp.*) interactions (frequency per 100 sets) in the WCPF Convention Area purse seine fishery, by Quarter, 2015–2019