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Provisional Bottom Fishing Impact Assessment for Japanese midwater trawl fisheries in SIOFA convention area

Relates to agenda item: 6.2 Working paper ☒ Info paper ☐

Delegation of Japan

Abstract

This document reports the provisional Bottom Fishing Impact Assessment for Japanese midwater trawl fisheries in the SIOFA convention area (CA) in accordance with CMM 2017/01 para. 14 and SIOFA BFIAS (Annex I, SC2 Report). In SIOFA CA, there were 11 years of operations in 2001–2002, and 2009–2017 by the three vessels. Although all vessels conduct midwater trawl operation with basically no contacts between seabed and fishing gears, actual trawling forms differ depending on the vessels equipment, especially power of main trawl winch. Based on best available information, Japan conducted the impact assessment on Japanese midwater trawl fishing operations by two trawling types separately.

Recommendations *(working papers only)*

There is no specific recommendation.

Provisional Bottom Fishing Impact Assessment for Japanese midwater trawl fisheries in SIOFA convention area

Delegation of Japan (edited by Takehiro Okuda and Tsutomu Nishida)

This document reports the provisional Bottom Fishing Impact Assessment for Japanese midwater trawl fisheries in the SIOFA convention area (CA) in accordance with CMM 2017/01 para. 14 and SIOFA BFIAS (Annex I, SC2 Report). In SIOFA CA, there were 11 years of operations in 2001–2002, and 2009–2017 by the three vessels. Although all vessels conduct midwater trawl operation with basically no contacts between seabed and fishing gears, actual trawling forms differ depending on the vessels equipment, especially power of main trawl winch. Based on best available information, Japan conducted the impact assessment on Japanese midwater trawl fishing operations by two trawling types separately.

1) Description of the Proposed Fishing Activities

1-1) Details of the vessels to be used

1-1a) Vessel with type T trawling

- Vessel name: Tomi-maru No.58
- Flag state: Japan
- Vessel owner: Kato Gyo-gyo Co., Ltd.
- Port of registration: Shiogama, Japan
- IMO number: 8613621
- Radio call sign: 7LGH
- Vessel type: Commercial trawl fishing vessel
- Fishing gear type: Stern midwater otter trawls (OTM-2 in ISSCFG, FAO)
- Vessel length overall: 59.88 m
- Beam length: 11.00 m
- Vessel gross registered tonnage: 1204 tonnes
- Power of main engine: 2132 KW
- Storage capacity: Frozen hold capacity 650 m^3
- Equipment used for determining position: Furuno GP-500

Until 2013, the midwater trawler Tomi-maru No.58 was operated by former owner (Kanai Gyo-gyo Co., Ltd.) at SIOFA CA. Furthermore, the former owner also operated the other midwater trawler Tomi-maru No.87 within SIOFA CA in 2001. Because the former owner of both Tomi-maru No.58 and No. 87 was out of business and sold Tomi-maru No. 58 to current her owner after some renovations, it was not possible to have details about the previous information about vessels and fishing gears used in SIOFA CA. Both Tomi-maru No.58 and No.87 have been carrying midwater trawling operations which kept a sufficient distance from the seabed, called type-T trawling in this document.

1-1b) Vessel with type-K trawling

- Vessel name: Kaiyo-maru No.51
- Flag state: Japan
- Vessel owner: Kaiyo Fishery Co., Ltd.
- Port of registration: Hachinohe, Japan
- IMO number: 9668427
- Radio call sign: 7JNX
- Vessel type: Commercial trawl fishing vessel
- Fishing gear type: Stern midwater otter trawls (OTM-2 in ISSCFG, FAO)
- Vessel length overall: 56.97 m
- Beam length: 12.50 m
- Vessel gross registered tonnage: 1598 tonnes
- Power of main engine: 2999 KW
- Storage capacity: Frozen hold capacity 780 m^3
- Equipment used for determining position: Furuno GP-150

Because power of main trawl winch is relatively low, Kaiyo-maru has been carrying midwater trawling operations which aim at fish schools that are formed relatively close to the seabed, called type-K trawling in this document. Compare to type-T, type-K trawling has a relatively high possibility of occasional contact between the seabed and fishing gears.

1-2) Detailed description of fishing methods

1-2a) Vessel 1: Tomi-maru No.58

- Trawl gear type: Midwater trawl
- Head rope length: 70 m
- Ground rope length: 70 m
- Bobbin Diameter: 300 mm
- Otterboard to wing length: 170 m
- Horizontal net opening: 35 m
- Vertical net opening: 60 m
- Wing mesh size: 26 m
- Codend mesh size: 120 mm
- Codend circumference: 7.0 m
- Mesh type: Diamond

- Trawl net design: Single
- Trawl net material: Nylon multifilament
- Otterboard type: Vertical V type
- Otterboard weight: 6000 kg
- Range in fishing height off bottom: 50–1000 m

1-2b) Vessel 2: Kaiyo-maru No.51

1-2b-1) Fishing gear type 1 (in 2013)

- Trawl gear type: Midwater trawl
- Head rope length: 98.8 m
- Ground rope length: 98.8 m
- Bobbin Diameter: 70 mm
- Otterboard to wing length: 150 m
- Horizontal net opening: 60 m
- Vertical net opening: 56 m
- Wing mesh size: 56 m
- Codend mesh size: 120 mm
- Codend circumference: 21.6 m
- Mesh type: Diamond
- Trawl net design: Single
- Trawl net material: Polyethylene
- Otterboard type: 14VF12m^2
- Otterboard weight: 4000 kg
- Range in fishing height off bottom: 10–410 m

1-2b-2) Fishing gear type 2 (in 2014–2015)

- Trawl gear type: Midwater trawl
- Head rope length: 98.8 m
- Ground rope length: 98.8 m
- Bobbin Diameter: 70 mm
- Otterboard to wing length: 150 m
- Horizontal net opening: 60 m
- Vertical net opening: 50 m

- Wing mesh size: 16 m
- Codend mesh size: 120 mm
- Codend circumference: 21.6 m
- Mesh type: Diamond
- Trawl net design: Single
- Trawl net material: Polyethylene
- Otterboard type: 14VF12m^2
- Otterboard weight: 4000 kg
- Range in fishing height off bottom: 10–410 m

1-2b-3) Fishing gear set 3 (in 2016–2017)

- Trawl gear type: Midwater trawl
- Head rope length: 98.8 m
- Ground rope length: 98.8 m
- Bobbin Diameter: 70 mm
- Otterboard to wing length: 150 m
- Horizontal net opening: 60 m
- Vertical net opening: 40 m
- Wing mesh size: 16 m
- Codend mesh size: 120 mm
- Codend circumference: 21.6 m
- Mesh type: Diamond
- Trawl net design: Single
- Trawl net material: Polyethylene
- Otterboard type: 14VF12m^2
- Otterboard weight: 4000 kg
- Range in fishing height off bottom: 10–410 m

1-3) Seabed depth range to be fished

The seabed depth ranged from 100 to 1350 m, and from 250 to 1110 m, in type-T and type-K, respectively. It is noted that these seabed depths represent just below the vessel at mid-day.

1-4) Target species, and likely or potential by-catch species

1-4-1) Target species

Target species for both types of midwater trawl fishery are as follows.

- BYX: Splendid alfonsino (*Beryx splendens*)
- EDR: Pelagic armourhead (*Pentaceros richardsoni*)

1-4-2) Likely or potential by-catch species

Major by-catch species were as follows.

- ORY: Orange roughy (*Hoplostethus mediterraneus*)
- SEY: Violet warehou (*Schedophilus velaini*)
- BWA: Bluenose warehou (*Hyperoglyphe antarctica*)
- WRF: Wreckfish (*Polyprion americanus*)
- WHA: Hapuku (*Polyprion oxygeneio*s)
- PRP: Roudi escolar (*Promethichthys prometheus*)
- BXD: Alfonsino (*Beryx decadactylus*)
- SFS: Silver scabbardfish (*Lepidopus caudatus*)
- EPI: Black cardinal fish (*Epigonus telescopus*)

1-5) Intended period and duration of fishing

In SIOFA CA, vessels with type-T trawling were operated as following periods.

2001: 2 Apr. –23 May, 4 Jun. –28Jul., 9 Aug. –28 Sep., 8 Oct. –2 Dec., 15 –31Dec., 18 Mar. –30 Apr., 13 May –22 Jun., and 4–28 Jul.

2002: 1–11 Jan., 24 Jan. –4 Mar., and 11 Mar. –14Apr.

2009: 19 Aug –23 Sep., 4 Oct. –3 Nov., and 12 Nov. –12 Dec.

2010: 2 May –1 Jun., 11 Jun. –12 Jul., and 23 Jul. –21 Aug., 30 Aug. –7 Nov., and 18 Nov. –16 Dec.

2011: 21 Oct. –18 Nov., and 1–31 Dec.

2012: 1–15 Jan., 27–29 Jan., 5–17 Feb., 29 Feb. –27 Mar.

2013: 19 Jul. –17 Aug., 29 Aug. –25 Sep., 5–30 Oct., and 10 Nov. –6 Dec.

2015: 28 Feb. –20 Mar., 4 Apr. –20 May, 31 May –18 Jul., 16 Aug. –27 Sep., and 8 Oct. –10 Dec.

2016: 12 Apr. –21 May, 14 Jun. –7 Aug., 18 Aug. –30 Sep., 28 Oct. –5 Dec., and 16–31 Dec.

2017: 11 Jan. –19 Feb., 11 Apr. –1 May, 10 May –18 Jun., 2 Jul –11 Aug., 5 Sep. –22 Oct., and 3 Nov. –15 Dec.

In SIOFA CA, Kaiyo-maru No.51 with type-K trawling was operated as following periods.

2013: 14–31 Dec.

2014: 1–23 Jan., 4 Feb. –20 Mar., 25 Sep. –7 Nov., 19 Nov. –8 Dec., and 20–30 Dec.

2015: 2 Jan. –4 Feb., 17 Feb. –3 Apr., 16 Apr. –1 May, 29 Sep. –12 Nov., and 25 Nov. –31 Dec.

2016: 1–6 Jan., 21 Jan. –10 Mar., 23 Mar. –9 May, 24 May –11 Jun., 7 Nov. –7 Dec., and 19–31 Dec.

2017: 1 Jan. –3 Feb., 16 Feb. –3 Apr., 30 Apr. –14 Jun., 6 Jul. –19 Aug., and 1 Sep. –16 Oct.

1-6) Effort indices

Effort indices of Japanese midwater trawl fisheries are summarized in Table 1.

Table 1 Effort indices in Japanese midwater trawl fisheries.

Year	Vessels	Tows	Cumulative tow durations (minutes)
Type-T			
2001	2	468	88,650
2002	1	69	12,560
2009	1	178	26,865
2010	1	293	70,925
2011	1	122	33,000
2012	1	101	24,130
2013	1	208	55,190
2015	1	361	80,060
2016	1	327	91,350
2017	1	396	111,305
Type-K			
2013	1	20	4,890
2014	1	213	42,410
2015	1	328	55,560
2016	1	321	59,770
2017	1	340	59,255

1-7) Estimated total catch and discard quantities by target and bycatch species

In Japanese midwater trawl fishing at SIOFA CA, although splendid alfonsino (BYX) and pelagic armorhead (EDR) are main target species, other bycatch species are also retained. Retained catch amount of target and major by-catch species are summarized in Table 2.

Discard amount of by-catch fishes is nor reported in fishing logbook before 2016. Since 2017, Japanese scientific observer program for trawl fishery has the form for recording discard amount of all fishes. Because discard amounts caught by midwater trawling in 2017 are relatively low, discard amounts are included into catch amount in Table 2.

Table 2 Combined catch and discard amount (t) of major retained fishes in Japanese midwater trawl fishing at SIOFA CA. BYX: Splendid alfonsino (*Beryx splendens*), EDR: Pelagic armourhead (*Pentaceros richardsoni*), ORY: Orange roughy (*Hoplostethus mediterraneus*), SEY: Violet warehou (*Schedophilus velaini*), BWA: Bluenose warehou (*Hyperoglyphe antarctica*), EPI: Black cardinal fish (*Epigonus telescopus*). "-" means no information (i.e., not recorded on fishing logbook) for this table.

Year	BYX	EDR	ORY	SEY	BWA	EPI
2001	2,987	17	600	-	-	-
2002	286	6	1	-	-	-
2009				40	21	36
2010	475	4	0	27	7	3
2011	612	0	0	0	0	0
2012	287	9	0	2	0	3
2013	1,265	14	0	0	1	0
2014	452	9	0	16	21	4
2015	2,396	33	1	401	22	35
2016	1,977	48	0	560	22	41
2017	1,967	79	0	298	53	0

2) Mapping and Description of Proposed Fishing Areas

2-1) Maps of the intended fishing areas

Footprint of Japanese midwater trawl fisheries are indicated in the Figure 1 and 2. The footprints in 2001–2002, part of 2010, and 2011–2016 are represented as grid blocks of 30 minutes resolution according to spatial resolution of fishing log book as data sources (Fig. 1: red squares, Fig. 2: green squares). The foot prints in 2009, part of 2010, and 2017 are indicated as grid blocks of 20 minutes resolution as defined by CMM2017/01 (Fig. 1: yellow squares, Fig. 2: blue squares).

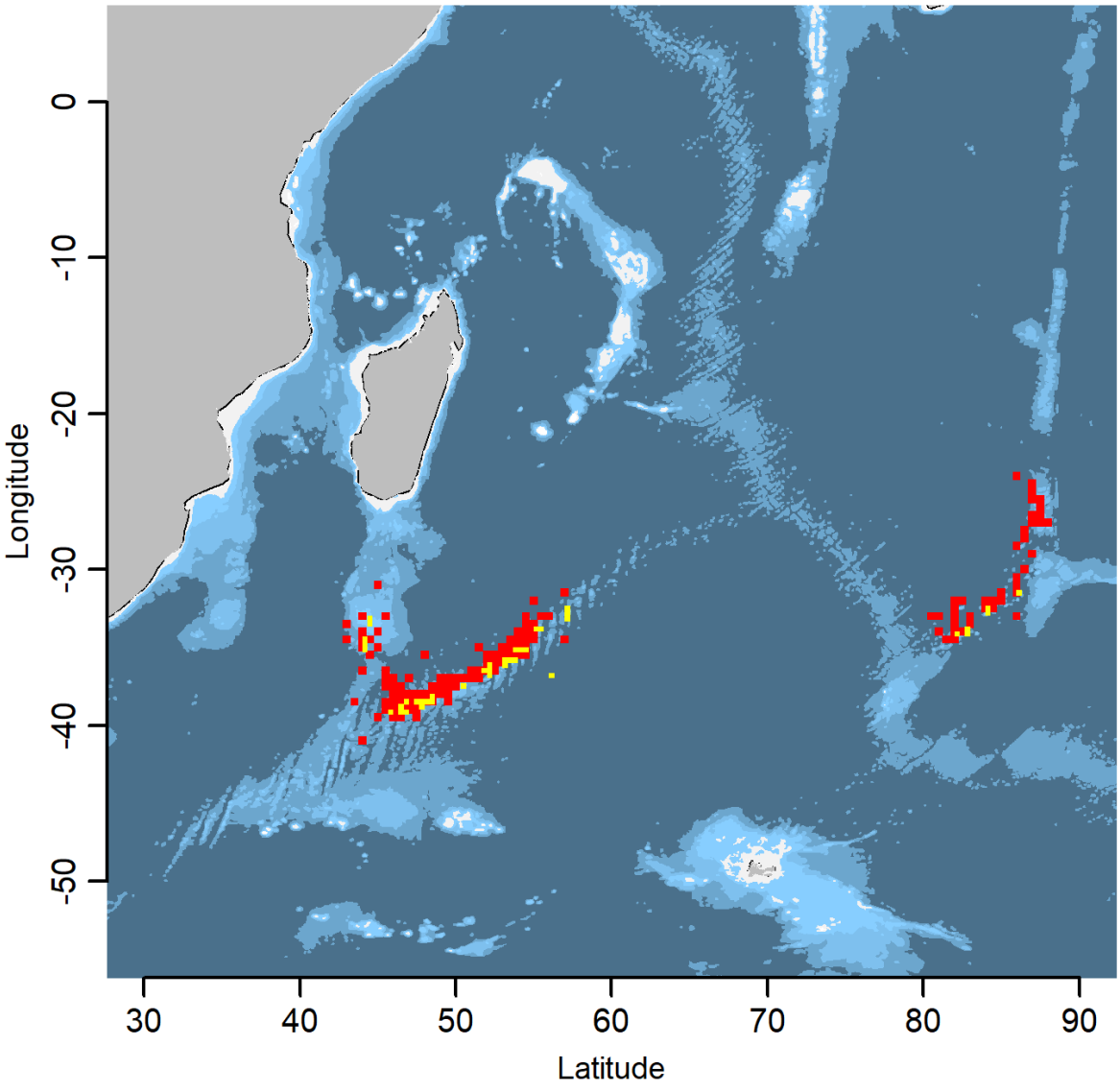

Fig. 1 The footprints of Japanese midwater fisheries with type-T trawling in 2001–2002, 2009–2013, and 2015–2017. Red squares indicate the foot prints in 2001–2002, part of 2010, 2011–2013, and 2015–2016 which are described as grid blocks of 30 minutes resolution according to spatial resolution of fishing log book as data sources. Yellow squares represent the foot prints in 2009, part of 2010, and 2017 which are described as grid blocks of 20 minutes resolution.

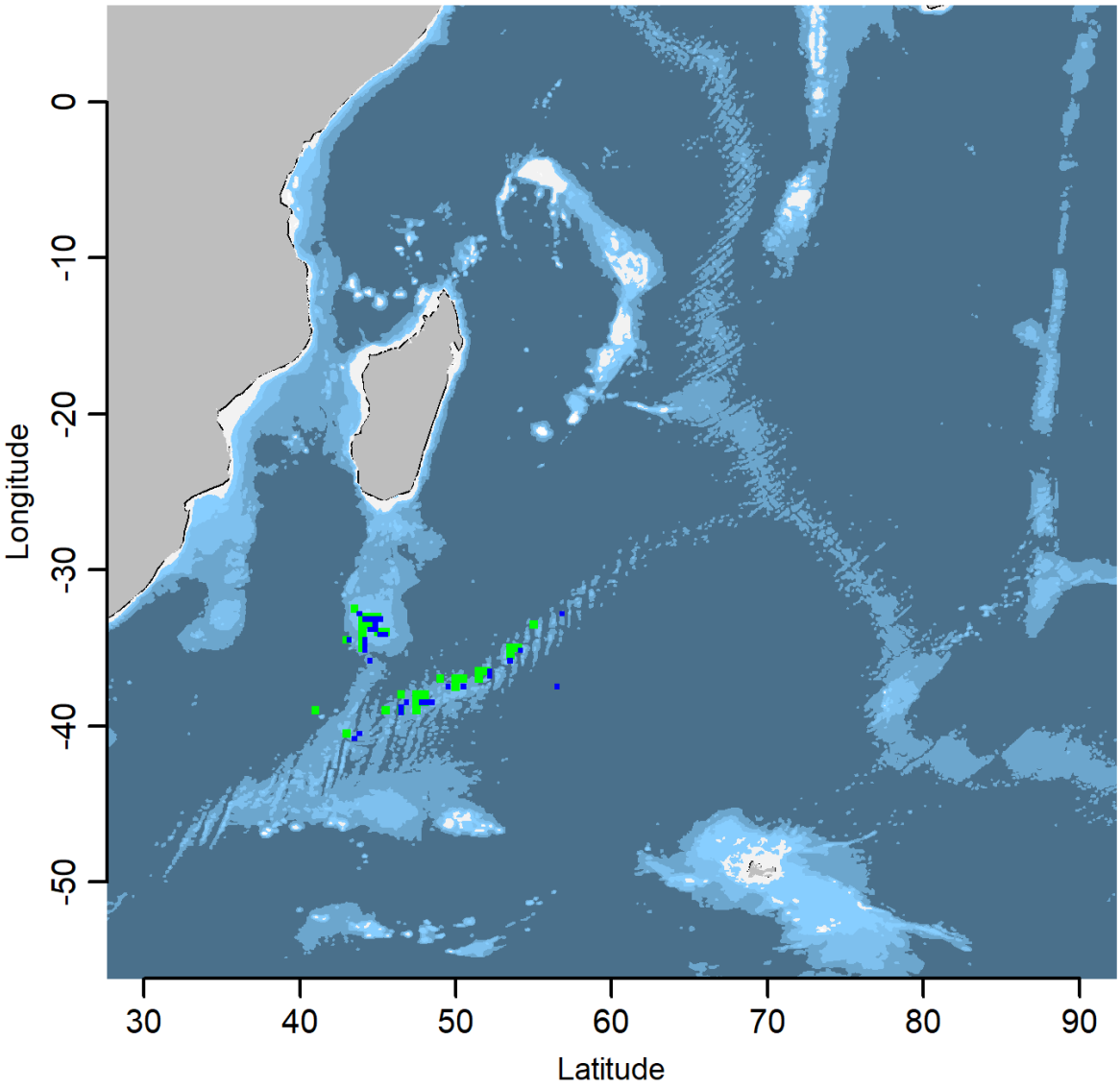

Fig. 2 The footprints of Japanese midwater fisheries with type-T trawling in 2013–2017. Green squares indicate the foot prints in 2013–2016 which are described as grid blocks of 30 minutes resolution according to spatial resolution of fishing log book as data sources. Blue squares represent the foot prints in 2017 which are described as grid blocks of 20 minutes resolution.

2-2) Area, or topographic features likely to support VMEs

The Japanese midwater trawl fisheries did not collect any detailed information which support any VMEs management; e.g., detailed topography of the ocean floor to conducted habitat model analysis.

2-3) Mapping of all known VMEs, or evidence of VMEs, in the proposed fishing areas

The scientific observer program started in January 2017 to collect scientific information including VME by-catch. In 2017, scientific observers investigated incidental by-catch for all midwater trawling hauls, but there were noby-catch of benthic invertebrates including VME indicators for both trawling types, i.e., type-T and type-K.

2-4) Mapping of the results of predictive habitat modelling for VMEs in the SIOFA area

There are no available data about benthic invertebrates caught by the Japanese midwater trawl fisheries to conduct habitat modelling for VMEs in the SIOFA area.

2-5) Baseline data and description of the proposed fishing areas

Current footprint of Japanese midwater trawl fishery is the maximum proposed fishing area, except when a new exploratory fishing will be implemented according to CMMs regarding "new fishery" in SIOFA CA. There is not enough information and data to describe other base line data within the midwater trawl fishing grounds at SIOFA CA.

3) Impact assessment

3-1) Risk assessment

3-1-1) The level of risk posed by each activity

3-1-1-1) Intensity

Impacts on VME by the intensity of Japanese midwater trawl fishing in SIOFA CA are nil because of basically no contact between seabed and fishing gears.

3-1-1-2) Duration

Impacts on VME by the duration of Japanese midwater trawl fishing in SIOFA CA are likely nil because of basically no contact between seabed and fishing gears

3-1-1-3) Spatial extent

Impacts on VME by the spatial extent of Japanese midwater trawl exploratory fishing in SIOFA CA are likely nil because of basically no contact between seabed and fishing gears.

3-1-1-4) Cumulative impact

Although Japanese midwater trawl fishing was conducted 11 years in 2001–2002, and 2009–2017, cumulative impacts is considered as nil because of basically no contact between seabed and fishing gears.

3-1-2) Overall risk (Low/Medium/High)

Low: Because Japanese midwater trawl fishing was conducted with a sufficient distance from the seabed.

3-2) Interactions with VMEs

3-2-1) What impacts are likely to results from the fishing gears to be used?

There is no information collected by Japanese midwater trawl fishery to evaluate any actual impacts on seabed ecosystems including VMEs. However, both types of midwater trawling method kept a sufficient distance from the seabed during their operations, thus impacts on VME are likely nil.

3-2-2) What will the probability, likely extent (% of habitat targeted) and intensity of the interaction between the proposed fishing gear/targeting practices on the VMEs

There is a nil probability of interactions between Japanese midwater trawl fisheries and VME due to sufficient distance between the seabed and fishing gears.

3-2-3) What are the characteristics of the habitat and benthic communities which may be impacted?

There is no information collected by Japanese midwater trawl fisheries to evaluate what characteristics of habitat and benthic communities were impacted. However, both types of midwater trawling method kept a sufficient distance from the seabed during their operations, thus impacts on seabed ecosystems including VMEs are likely nil. The 100 % covered on-board scientific observers will keep monitoring any VME bycatch to avoid impacts on VMEs

3-2-4) How diverse is the ecosystem in the proposed fishing areas, and will the fishing activity reduce this biodiversity?

There is no information collected by Japanese midwater trawl fisheries to evaluate diverse of the ecosystem and if reduction of protected biodiversity by fishing activity. However, both types of midwater trawling method kept a sufficient distance from the seabed during their operations, thus impacts on biodiversity are likely nil. The 100 % covered on-board scientific observers will keep monitoring to avoid any impacts on biodiversity.

3-2-5) What is the likely spatial scale and duration of the impacts?

Spatial scale and duration of the impacts are likely nil because both types of midwater trawling method kept a sufficient distance from the seabed during their operations.

3-2-6) Any other threats or issues: gear loss, ghost fishing, incidental bycatch discards, protected or endangered species mortalities, effects on ecosystem functioning.

Loss of midwater trawl fishing gear causing ghost fishing has been very rear because gears are expensive and the operation managers (e.g., fishing master) avoids the risk of lost fishing gear as much as possible. Thus, threats by gear loss and ghost fishing are likely nil.

There is no information collected by midwater trawl fisheries to evaluate any actual threats raised by incidental bycatch discards, protected or endangered species mortalities, effects on ecosystem functioning.

4) Information on status of the deep-sea stocks to be fished

4-1) A list of the intended target and likely by-catch species

See 1-4-1) and 1-4-2).

4-2) Tables of historic catches and catch trends of these species in the intended fishing area

See table 2 in 1-7).

4-3) Tables, figures of analyses of historic nominal and/or standardized CPUE trends in these species

Nominal CPUE (catch/trawling duration) of splendid alfonsino was shown in Figure 2. For other retained species like as pelagic armorhead and orange roughy, figures indicating CPUE trend are omitted in this document, because there are only few years in which a sufficient amount of catch is obtained by Japanese midwater trawl fisheries (Table 2).

It is noted that fishing season/grounds and fish school forming patterns vary among cruises, and fishing gear and trawling type were different among vessels, thus CPUE of trawl fisheries does not necessarily reflect actual stock status of target fishes. For Japanese midwater trawl fisheries, there is not enough information and data to conduct standardizing CPUEs.

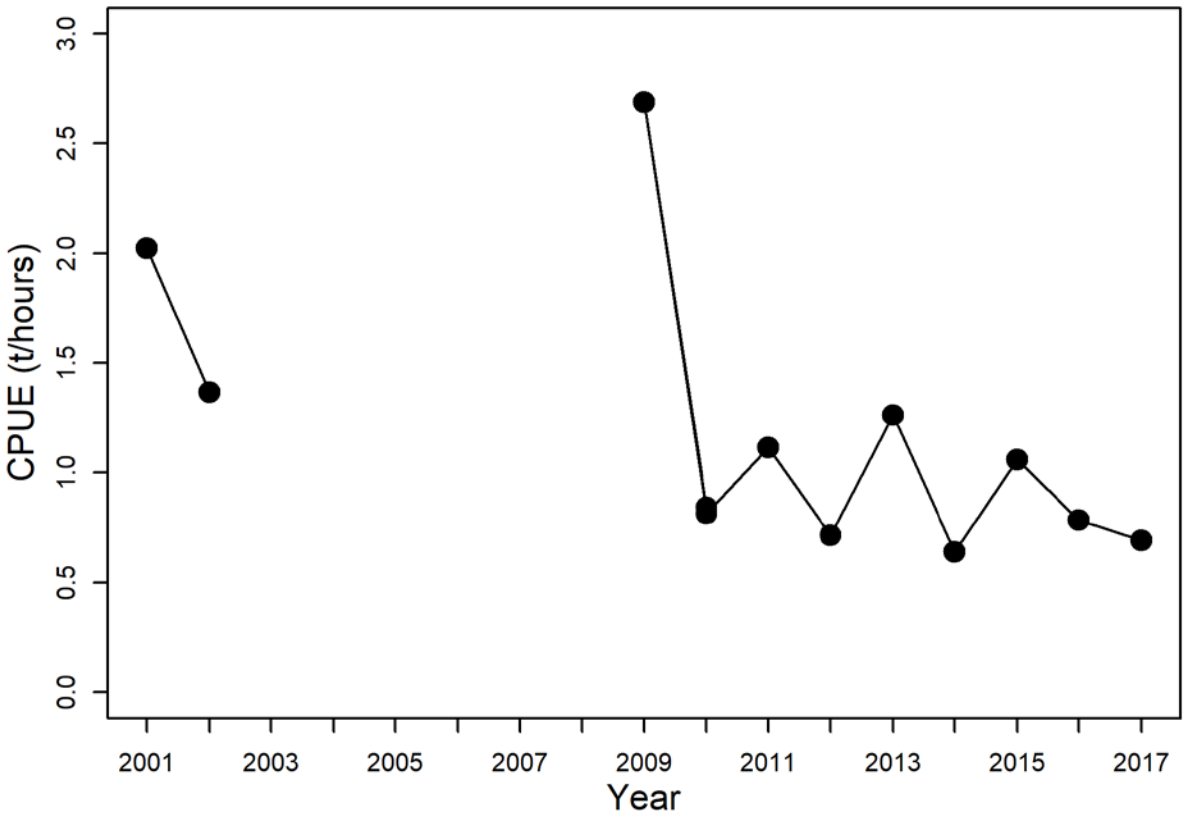

Fig. 2 Nominal CPUE of Japanese midwater trawl fishery in the SIOFA CA . Black circles are catch/trawling duration (t/hours).

4-4) Results of any surveys conducted on the stocks to be fished

There are no resource surveys by Japanese midwater trawl fisheries.

4-5) Results of the most recent stock assessments that have been conducted for the stocks to be fished

To now, there are no stock assessments for splendid alfonsino. SIOFA 2nd SAWG (Stock Assessments Working Group) in 2019 plans to conduct stock assessments for splendid alfonsino.

4-6) Any other information

There is no other information on status of the deep-sea stocks.

5) Monitoring, Management and Mitigation Measures

5-1) VMS positional information

Fisheries Agency of Japan verifies locations of vessels through the Vessel Monitoring System (VMS).

5-2) Details of catch and effort data collection systems

All fishing vessels for both commercial and exploratory fisheries have been collecting fisheries data for each operation including dates, locations, depth, catch/effort data and other relevant information. This information is recorded in logbooks and submitted to Fisheries Agency of Japan.

The Japanese midwater trawl fishing vessel also collects scientific data such as detail information of operations (haul-by-haul fishing effort, catch/ bycatch by species) and biological information including size data according to SIOFA scientific observer program.

5-3) Details of any scientific observer coverage

According to CMM 2016/02, Japanese midwater trawl vessels have been carrying out 100 % on-board scientific observer coverage.

5-4) Description of the data that will be provided to the SIOFA secretariat for the fishing activity

Japan will provide logbook information and scientific observer data according to the conservation measure.