Fisheries New Zealand
Tini a Tangaroa

Identification of benthic invertebrate samples from research trawls and observer trips, 2020–21

New Zealand Aquatic Environment and Biodiversity Report No. 269

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EXECUTIVE SUMMARY

Schnabel, K.E.[1]; Mills, V.S.; Tracey, D.M.; Macpherson, D.; Kelly, M.; Peart, R.A.; Maggs, J.Q.; Yeoman, J.; Wood, C.R. (2021). Identification of benthic invertebrate samples from research trawls and observer trips, 2020–21.

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Accurate taxonomic identification of invertebrate bycatch samples collected by both observers on commercial fishing vessels and fisheries research staff during research trawl surveys is useful for the determination of species distributions and benthic communities affected by fishing activities. Improved identification of benthic invertebrates facilitates these analyses but is also useful information to improve predictive habitat suitability modelling and spatial planning studies, as well as in the development of accurate ecological risk assessments of fishing impacts on benthic habitats.

This report is the final in the three-year annual series for Fisheries New Zealand Project DAE2018-04. The research has had a similar focus to an earlier five-year time series of Deepwater Projects, all of which provide the identification and enumeration of benthic invertebrate bycatch to Fisheries New Zealand and contribute to the Aquatic Environment and Biodiversity Research science programme. There are several research project aims within this programme; the scientific information presented here will help to inform fisheries interactions with fish bycatch, primarily the catch of non-target benthic invertebrates, as well as expand knowledge of the region's biodiversity.

A total of 496 benthic invertebrate samples, collected since 1992, were authoritatively identified for this reporting period (1 July 2020 – 30 June 2021). These comprised 371 samples retained from 64 research trawls surveys, and 125 samples from 95 observer trips. Accumulated historical samples, collected prior to 2011, from observers (52 samples) and research trawl surveys (257 samples), made up a significant portion of the identifications. The relevant databases, National Institute of Water and Atmospheric Research (NIWA) Invertebrate Collection (NIC) database *Specify* (*niwainvert*) and Fisheries New Zealand *trawl* and *COD* databases, were updated as required with the revised expert identifications.

Returned invertebrate bycatch represents a portion of the invertebrates taken as bycatch at sea. The sub-set of samples identified (those collected between 1992 and 2021) were taken as bycatch from 23 commercial target fisheries and from nine Fisheries Management Areas (FMAs) with 10 samples processed from five high seas regions. Most of the invertebrate specimens processed over the last year were returned from bottom trawl fisheries targeting orange roughy (*Hoplostethus atlanticus*), arrow squid (*Nototodarus* spp.), and hoki (*Macruronus novaezelandiae*). The highest number of observer-collected samples (>10) were taken from the South-East Chatham Rise (FMA 4) and from the various southern FMAs: Southland (FMA 5); South-East Coast (FMA 3); Southern Offshore Islands (FMA 6A), and Auckland West (FMA 9). Sample counts from northern FMAs and the high seas regions were low.

Identifications of bycatch fauna for 2201 specimens (183 unique taxa) in seven phyla are presented. These are: Arthropoda (crustaceans), Chordata (tunicates), Cnidaria (anemones, hydroids, sea pens, and zoanthids, but excluding the protected coral groups that are identified under a Department of Conservation project), Echinodermata (seastars, brittlestars, urchins, and sea cucumbers), Mollusca (mainly squid and octopus), Nematoda (roundworms), and Porifera (sponges). The level of identification within these phyla ranges from species to order, based on the expertise available or state of the collected sample. The Fisheries New Zealand target annual sample size of 315 has been well exceeded this reporting period due to efforts from NIWA taxonomists as well as New Zealand and international experts. The fauna identified include 17 species new to science with specimens providing type material

[1] All authors: National Institute of Water and Atmospheric Research (NIWA), New Zealand.

for ongoing species descriptions. An undescribed species of amphipod belonging to a new genus, and potentially a new family, was collected by an observer from the east coast South Island region.

The achievements across three years of the project are summarised: identifications for over 1600 samples and around 7200 specimens from 86 research trawl surveys and 202 commercial fisheries trips in the New Zealand region were made. Over 660 distinct taxa were identified in ten phyla and over 135 undescribed taxa (128 species, 6 genera, and 1 family) were reported during the course of this project.

The species identifications described here provide an insight into the overall composition of fisheries bycatch. The continued discovery of undescribed taxa in observer and research trawl material being returned underscores both the ability of the shipboard staff to identify unusual organisms, and the value of this material for ongoing biodiversity research of the New Zealand deepsea fauna.

1. INTRODUCTION

1.1 Background

Within the New Zealand region the recording of benthic invertebrate bycatch data during research trawls and by observers on fishing vessels targeting deepwater stocks provides an understanding of where benthic fauna are most at risk from interactions with fishing activities in the deepsea and improves our knowledge of the region's species diversity. A standard approach is followed at-sea to identify and apply a Fisheries New Zealand, 3-letter species code to marine organisms taken from research trawl and commercial fishing activities. Invertebrate bycatch which cannot be identified at sea is retained and returned for identification by expert taxonomists ashore. These data can help inform several Government-funded projects monitoring these interactions.

The key reasons for retaining benthic bycatch specimens at sea are:

- the identification is uncertain,
- the specimen has been caught outside the depth range or distribution given in identification guides,
- samples are specifically requested by Fisheries New Zealand,
- the specimen is rare or unusual.

The three stated Environment Outcomes of the eleven Management Objectives provided in the National Fisheries Plan for Deepwater and Middle-depth Fisheries 2019 (Fisheries New Zealand 2019) are relevant to the management of benthic systems and their fauna (including protected corals):

- **Environment Outcome 5** Ensure that maintenance of biological diversity of the aquatic environment and protection of habitats of particular significance for fisheries management are explicitly considered in management.
- **Environment Outcome 7** Manage deepwater and middle-depth fisheries to avoid, remedy or mitigate the adverse effects of these fisheries on the benthic habitat.
- **Environment Outcome 8** Manage deepwater and middle-depth fisheries to avoid, remedy or mitigate the adverse effects of these fisheries on the long-term viability of endangered, threatened and protected species populations.

This project provides the identification and enumeration of benthic invertebrates, other than protected coral species, taken as incidental bycatch during research trawls and collected by observers on deepwater fishing vessels. The processing and identification of benthic samples from inshore research trawl surveys is covered by the survey objectives of their respective projects.

Identification and storage of protected coral bycatch samples are progressed under a Department of Conservation (DOC) Conservation Services Programme (CSP) project. Currently the three-year DOC20303-INT2019-04 project is in the middle of a three-year reporting period, see Tracey et al. (2019); Macpherson et al. (2020, 2021).

The samples to be identified in this project include those collected from both inside the New Zealand Exclusive Economic Zone (EEZ), as well as from the high seas region where samples are collected as part of the South Pacific Regional Fisheries Management Organisation (SPRFMO) arrangement. Samples collected from deepsea fishing vessels in the Ross Sea as part of Convention on the Conservation of Antarctic Marine Living Resources (CCAMLR) requirements are, however, not included as part of this research.

1.2 Overall Objective

To identify benthic invertebrates in samples taken during research trawls and by observers on fishing vessels.

1.3 Specific Objectives 1 and 2

1. To identify deepwater benthic invertebrates in samples taken during research trawls and by observers on fishing vessels targeting deepwater stocks.
2. To update relevant databases recording the catch of invertebrates in research trawls and commercial fishing.

Milestone 9	Provide collection methods for trawl surveys and Observer trips voyage, identify observer samples and sort, curate and identify research survey samples (annual), update *Specify* database *niwainvert* (and produce summary extract from *niwainvert*)
Milestone 10	Data loaded by NIWA Data Manager into *COD* and *trawl*
Milestone 11	Present the results to Aquatic Environment Working Group
Milestone 12	Submit draft AEBR to MPI
Milestone 13	Submit year 3 data to MPI Research Data Manager

Monthly work in progress reports have been submitted up to June 2021.This report presents results for year three of the DAE2018-04 project.

2. METHODS

2.1 Methods for Specific Objective 1

A key objective for contracts tendered by NIWA for fisheries research trawl surveys is to preserve specimens of unidentified organisms taken during the survey and identify these ashore, as described by Bagley et al. (2013), O'Driscoll et al. (2010), MacGibbon et al. (2019), Stevens et al. (2009, 2018, 2021). At each research trawl station, all items in the catch are sorted and weighed on motion-compensating electronic scales and, where possible, identified with the use of at-sea guides (Tracey et al. 2011, 2014; Williams et al. 2014), to the lowest taxonomic level possible using Fisheries New Zealand three-letter species codes. Unusual or unidentified organisms are inventoried, counted, and then frozen or preserved for later identification ashore.

Fisheries New Zealand observers collect information including specimen identification (also using Fisheries New Zealand three-letter species codes) and catch weight on board commercial fishing vessels. Data are recorded on "Observer Benthic Materials Forms", and although observers have been able to identify an increasing proportion of such material at sea using field guides, material continues to be returned for identification at NIWA. Currently, the unidentified organisms including fish, squid, and invertebrates returned by observers are processed at NIWA under the Fisheries New Zealand *Data Custodianship Services* DAT2016-01P (physical specimen sorting and storage) and DAT2016-01E (electronic data services) projects. These projects include the requirements to assure storage and safekeeping of specimens by maintaining an accurate catalogue of the data for which custodianship

services are being provided and by delivering an Information Request and Specimen Provision service. The invertebrate specimens are subsequently identified by experts through the project described by this report (DAE2018-04).

Sampling Instructions

Under Milestone 1, NIWA provides instructions for identifying invertebrates on research surveys and on observed commercial trips. Revised and updated instructions for refining sample collection at sea from research surveys and observer trips were provided to Fisheries New Zealand in June 2019 and were included as Appendices in previous reports (Schnabel et al. 2019, Mills et al. 2020). The instructions complement those instructions in the deepsea invertebrate guide (Tracey et al. 2011) and the revised coral guide that includes unprotected coral fauna (Tracey et al. 2014) and comprise part of the specific voyage objectives for research trawl surveys. Every attempt has been made to continue to improve the at-sea data collection to enable efficient and accurate database updates.

Prior to sailing, all research trawl survey voyage leaders are provided with the instruction document referred to above, "Instructions to researchers when carrying out at-sea invertebrate data collection", a spreadsheet for use at sea when recording retained benthic (and fish) sample data named "Specimen sheet for research trawl voyages", and specimen sample labels. Voyages routinely follow the protocols for labelling, storage, and tallies of material.

The Fisheries New Zealand Observer Programme are provided with a variation of these instructions to collect specimens (see Schnabel et al. 2019: appendix 2), 'Instructions to observers when carrying out at-sea invertebrate data collection'.

'Sample' is defined as unidentified benthic and non-benthic (e.g., squid) invertebrate organisms. Most samples collected at sea were returned frozen for identification. Preservation is primarily by freezing although some groups of invertebrates need to be fixed at sea in formalin or ethanol to retain key taxonomic features needed for later identification. For example, for research voyages a protocol is now in place stating that for expert identification purposes all anemones collected on research trips should be fixed in formalin at sea where practical. All safety-at-sea requirements are followed, e.g., if formalin is needed, Material Safety Data Sheets (MSDS), personal protective equipment, and instructions for safe handling are provided. Specimens of unusual species collected are photographed at sea as time permits and photographs are required to be available for updates to identification guides.

As part of the Instructions to observers the production of waterproof labels was discussed in 2020. An action from the recommendation to Fisheries New Zealand has been the production of labels with the Observer Services Group and Research Data Manager (Figures 1 & 2). At time of writing the revised labels were to be printed for use by the observers (K. Tunley, Fisheries New Zealand, pers. comm.).

MPI observer:	Photo number(s):
Trip:	Tow/Set:
Observer Benthic Materials Form MPI sample ID:	(write in pencil) MPI Species Code:
Comments:	
(NIWA use only) NIWA ID:	
OSD:	Specify:

Figure 1: Example of a proposed specimen label. MPI (Ministry for Primary Industries) may be changed to Fisheries New Zealand.

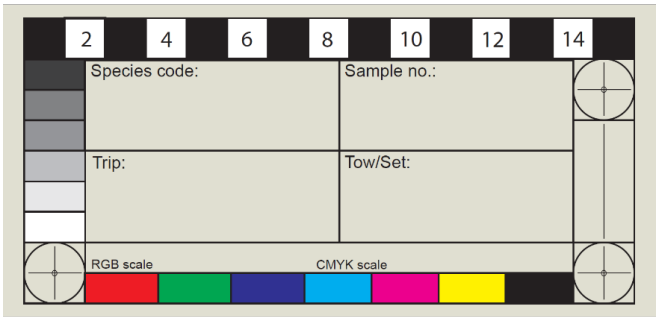

Figure 2: Example of the Fisheries New Zealand prototype photo label.

Processing ashore

The benthic invertebrates returned by observers from commercial fishing voyages were thawed, sorted into main groups, and identified to coarse taxonomic level (generally class/order level). These data were entered into the web-interfaced NIWA Observer Samples database (OSD), then returned to frozen storage, fixed in ethanol or formalin, or dried or discarded where appropriate (according to DAT2016-01P Fisheries New Zealand project tasks). The OSD data were then imported into the NIWA Invertebrate Collection (NIC) *Specify niwainvert* database (see below).

Research trawl samples were processed and registered directly into *niwainvert* in readiness for taxonomic identification under this DAE2018-04 project.

The annual target was to identify up to 315 samples returned by observers and research trawl trips between July 2020 and June 2021. Identifications were processed in the following order of priorities, with the most recently collected samples having the highest priority and progressively older 'historical' samples processed to clear a backlog when time permitted:

1. Samples collected from July 2020 to June 2021
2. Accumulated unidentified samples from previous years of the DAE2018-04 project between 2011 and 2020
3. Accumulated unidentified historical samples (pre-2011)
4. Up to 50 samples collected from outside the New Zealand EEZ (SPRFMO).

Identification procedures

Curation and taxonomic identification of Observer and research survey material

The methods followed the procedures for identifying fauna and biological specimens housed in the NIC at NIWA. NIWA currently manages Fisheries New Zealand specimens according to the: "Guidelines for the care of natural history collections" (Society for the Preservation of Natural History Collections 1994). NIWA also has its own collection policy document: "NIWA Marine Invertebrate Collection Policy and Procedures", which guided the process.

The NIC staff actioned the identification process of all samples and liaised with the relevant taxonomists at NIWA and at other institutions (Table 1). If required, samples were transferred to other sites within New Zealand, e.g., Holothuroidea and ascidian samples were sent to Niki Davey and Mike Page, both at NIWA Nelson, and sponges were sent to Michelle Kelly, NIWA, Auckland.

Due to their condition, some samples could only be identified to a higher level, e.g., order or phylum. After expert identifications were completed, the invertebrate specimens were curated and catalogued in the NIC *Specify* database *niwainvert*, and specimens were stored permanently within the NIC in conditions/media appropriate for the specific taxon group. Bulk samples, samples in poor condition, and samples of more common invertebrates where there are already sufficient museum vouchers are permitted to be discarded. Specimens retained are held in stewardship for Fisheries New Zealand.

Table 1: List of experts available to identify benthic invertebrate fauna 2020/21. Experts are all affiliated with NIWA unless otherwise indicated.

Taxonomic group	Expert
Ascidians (sea squirts)	Mike Page
Annelida	Geoff Read (NIWA, Emeritus)
Brachiopoda	Jeffrey Robinson (University of Otago)
Bryozoa (lace corals)	Dennis Gordon (NIWA, Emeritus)
Non-protected Cnidaria: Hydrozoa (hydroids)	Diana Macpherson (NIWA) & Amanda Ferreira e Cunha (University of Sao Paulo, Brazil)
Un-protected Cnidaria: sea pens	Kate Neill
Un-protected Cnidaria: zoanthids	Frederic Sinniger (University of Ryukyus, Japan)
Decapod Crustacea	Kareen Schnabel, Jeff Forman
Amphipoda & Isopoda	Rachael Peart
Sea spiders	Kate Neill
Echinodermata: asteroids (starfish)	Kate Neill
Echinodermata: holothuroids (sea cucumbers)	Niki Davey
Echinodermata: ophiuroids (brittle stars)	Sadie Mills
Mollusca: squid, octopus	Kat Bolstad, Jesse Kelly, Heather Braid, Jaever Santos (AUT), Mandy Reid (Australian Museum). Darren Stevens, Mark Fenwick (both NIWA)
Mollusca: gastropods and bivalves	Bruce Marshall (Te Papa)
Porifera (sponges)	Michelle Kelly

Visiting experts to aid identification

NIWA has previously taken advantage of visiting taxonomists to identify material collected where local expertise does not exist, however, travel restrictions due to COVID-19 have precluded visits by international experts to New Zealand collections and have significantly restricted shipping of specimens to overseas institutions for identification. A small number of samples were, nevertheless, identified by international experts from specimen photographs or through loans and are included here (contributing to ongoing work by overseas researchers Mandy Reid, Australia, Frederic Sinniger, Japan, and Jean Vacelet, France).

As in most years of the programme, NIWA took opportunistic advantage of several other New Zealand experts visiting the NIC to identify or confirm the identification of project material. This year the NIC hosted the AUT Lab for Cephalopod Ecology & Systematics (ALCES) team led by Dr. Kathrin Bolstad, and Jerusha Bennet from the University of Otago who identified a parasitic nematode worm.

2.2 Methods for Specific Objective 2

The *Specify* database *niwainvert* was updated with the identifications using the scientific name and taxonomic hierarchy. Scientific names, not Fisheries New Zealand species codes, are entered into *niwainvert*. A summary output dataset (Appendix 1) was then provided to the Fisheries New Zealand contracted Research Data Manager at NIWA to enable database updates to be made by appropriate database experts – observer samples onto the Fisheries New Zealand Centralised Observer Database (*COD*) and identifications for research trawl survey samples onto the Fisheries New Zealand Research Trawl Database (*trawl*). Both databases are maintained by NIWA for Fisheries New Zealand.

Column headings for the data exported from *niwainvert* included the fields listed below, and this information was provided to the *COD* and *trawl* database managers:

- Trip_code
- Station_no
- NIC catalogue number (Prefix-NIWA)
- OSD Number or Lot number if available
- Observer Initial ID label if available
- Best-match expert ID Fisheries New Zealand species code
- Phylum
- Order
- Family
- Genus
- Species
- Determiner - Expert identifiers name (most recent expert ID)
- Determined date
- Weight of sample if available
- Weight of catch if available
- Count
- Name of the observer when available

The data, including species codes, weights, and sample numbers were loaded into tables in *COD* and *trawl* using the common link of trip number (or trip code) and station number. The data loading process is described in previous reports (e.g., Tracey & Mills 2016). Updates followed protocols in place to ensure any changes to the species identification include the apportioned catch weights being adjusted to reflect the weight of a given species taken on a research trawl. Trip and station are the common links to load data into both *niwainvert* and *COD*. This enables subsequent *COD* updates to be made from *niwainvert* if a species revision occurs in later years. A comment is appended to each record with cross-reference to the *niwainvert* specimen catalogue number to aid future queries.

A summary of samples including sample count by FMA and target commercial species is provided for the observer and research survey collected data by the *COD* and *trawl* database managers.

3. RESULTS

3.1 *Niwainvert* summary

A summary of sample data such as trip, species, and numbers of samples is provided for the observer and research survey collected data (Appendix 1 A and B). Column headings for the data provided are as outlined in the methods for Specific Objective 2.

The target was to identify up to 315 samples returned by observers and research trawl trips. The number of samples that have been processed for this reporting period (2020–21), the period covered by the current contract DAE2018-04 (2018–2021), previous Fisheries New Zealand contracts (2011–2018), and historical samples (pre-June 2011) are summarised in Table 2.

A total of 496 samples (2201 specimens) have been authoritatively identified from around the New Zealand region between July 2020 and June 2021: 371 research trawl survey samples (Figure 3) and 125 observer samples (Figure 4). This is 181 samples more than initially required for the current year of the project, primarily ex gratia identifications of Cephalopoda by visiting ALCES scientists and historical samples of decapod crustaceans. Note that Figures 3 and 4 show the location of samples with a colour ramp showing the year the specimen was collected rather than by project year.

Table 2: Number of samples processed for this reporting period (2020–21). *includes 10 observer collected samples from high seas regions (see Table 4 in section 3.4).

Sample date	Research (no. of samples)	Observer (no. of samples)	Total Count
July 2020 – June 2021	0	17	17
July 2018– June 2020	94	24	118
July 2011 – June 2018	20	32	52
pre-June 2011	257	52	309
Total	371	125*	496

Ten of the samples identified were collected in international waters (extra-territorial, ET) including the Tasmanian Ridge, the Lord Howe Rise, Wanganella Bank, and western Challenger Plateau (see Table 4 in section 3.4).

The identified samples represent 170 unique taxa from seven phyla including: 151 Arthropoda (crustaceans: amphipods, isopods, decapods, euphausids, mysids, and two sea spiders); 26 ascidians (sea squirts); 44 Cnidaria (jelly fish, soft corals, hydroids, seapens, and zoanthids, but not including protected corals groups); 51 Echinodermata (sea stars, brittle stars, urchins, and sea cucumbers); 159 Mollusca (gastropods, bivalves, octopus, and squid); one sample of a parasitic nematode; and 54 Porifera (sponges) (Table 3). There were also four samples that were not invertebrates but possibly fish eggs (NIWA 69515), sediment globules (NIWA 146430), and a piece of wood with associated fauna that will be further processed by Te Papa malacologist Bruce Marshall (NIWA 141783).

The level of identification varies from species to family, based on the expertise available or condition of the sample. A total of 106 described species were identified, including at least 17 new or undescribed species and one undescribed genus (possibly even a new family) of amphipod among the samples (see section 3.2 below). Several taxa provide new distribution points that extend a taxon range that will help contribute to descriptions of the taxonomy, distribution, and biology of the region's benthic fauna.

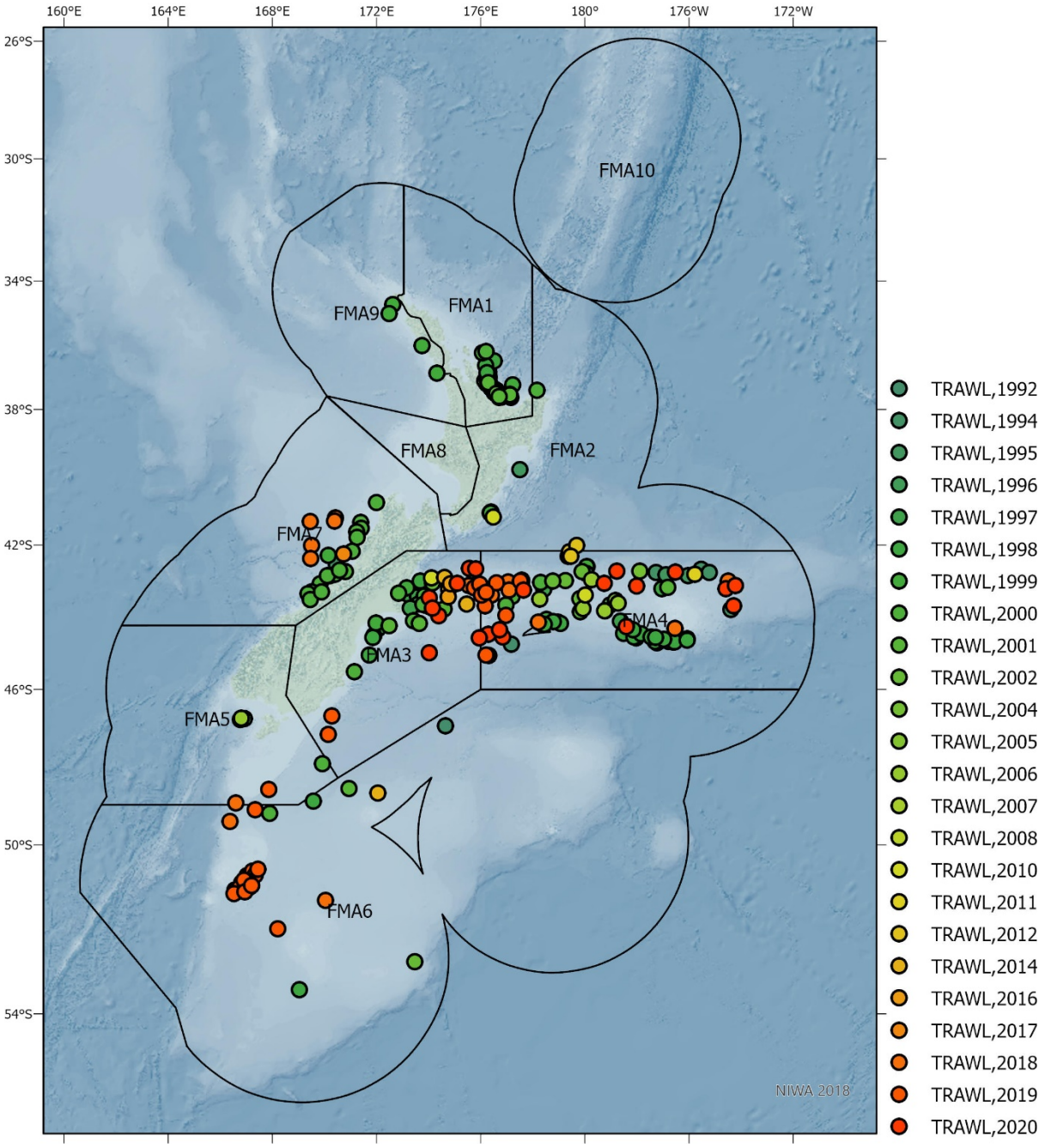

Figure 3: **A plot of the location of invertebrate samples processed for DAE2018-04 in the New Zealand region (Year 3) from research trawl surveys. Coloured dots are colour ramped according to collection year with the oldest samples in dark green, and the most recent in dark red. Fisheries Management Areas are shown.**

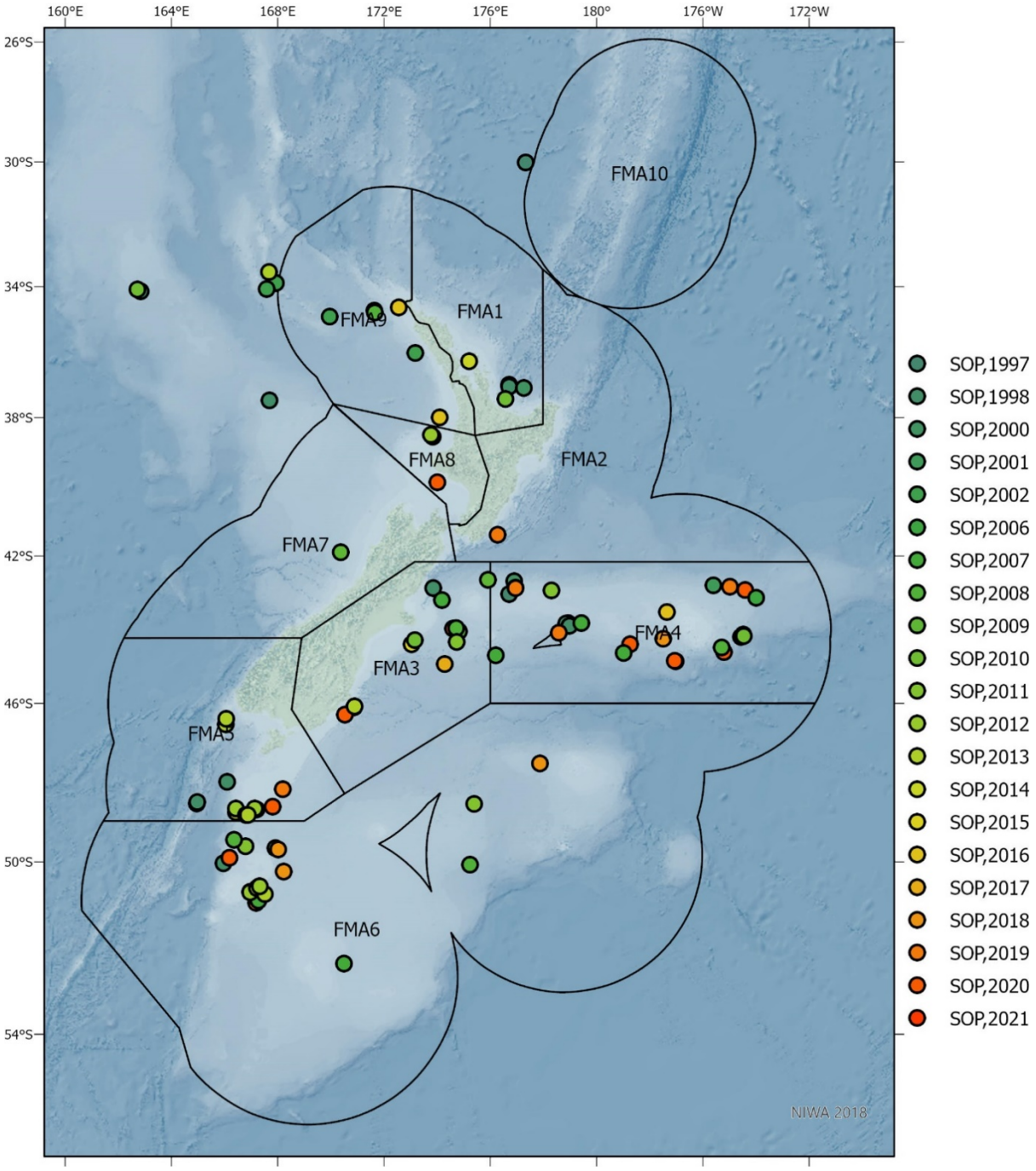

Figure 4: A plot of the location of invertebrate samples processed for DAE2018-04 in the New Zealand region (Year 3) for samples returned from observers on commercial vessels. Coloured dots are colour ramped according to collection year with the oldest samples in dark green, and the most recent in dark red. Fisheries Management Areas are shown.

Table 3: Summary of the number of specimens and number of samples identified from the combined research trawl and observer collected material. This list summarises the taxa to family level, see Appendix 1 for the full sample list. (Continued over next two pages)

Phylum	Class	Order	Family	No. of samples	No. of specimens
Arthropoda	**Malacostraca**	Amphipoda		1	1
			Calliopiidae	1	1
			Lysianassidae	2	2
			Pardaliscidae	1	1
			Acanthaspidiidae	1	1
		Decapoda	Acanthephyridae	3	11
			Aristeidae	5	25
			Axiidae	1	1
			Benthesicymidae	2	4
			Chirostylidae	1	15
			Crangonidae	1	4
			Diogenidae	4	10
			Geryonidae	1	1
			Lithodidae	1	2
			Majidae	2	2
			Munididae	1	2
			Munidopsidae	2	23
			Nematocarcinidae	1	6
			Oplophoridae	1	1
			Ovalipidae	11	25
			Paguridae	69	298
			Palinuridae	3	3
			Parapaguridae	1	41
			Pasiphaeidae	3	3
			Raninidae	1	1
			Sergestidae	1	25
			Solenoceridae	17	275
			Spongicolidae	1	2
			Trichopeltariidae	5	5
		Euphausiacea	Euphausiidae	1	2
		Isopoda	Munnidae	1	1
		Lophogastrida (Mysidacea)	Lophogastridae	3	3
	Pycnogonida	Pantopoda	Colossendeidae	2	2
Arthropoda Total				**151**	**799**
Chordata				1	1
	Ascidiacea			3	3
		Aplousobranchia		2	3
			Polyclinidae	13	22
			Pseudodistomidae	1	1
		Stolidobranchia	Pyuridae	4	4
			Styelidae	4	4
	Thaliacea	Pyrosomida		1	1
Chordata Total				**29**	**39**
Cnidaria	**Anthozoa**	Alcyonacea	Alcyoniidae	3	4
			Clavulariidae	3	111
		Pennatulacea		1	1
			Halipteridae	4	5
			Pennatulidae	1	1

Phylum	Class	Order	Family	No. of samples	No. of specimens
			Protoptilidae	1	1
			Umbellulidae	6	6
		Telestacea	Telestidae	1	40
		Zoantharia	Parazoanthidae	1	5
	Hydrozoa			2	2
		Anthoathecata	Solanderiidae	1	1
		Leptothecata	Aglaopheniidae	3	3
			Lafoeidae	3	12
			Plumulariidae	2	2
		Siphonophora	Rhodaliidae	7	8
	Scyphozoa			4	4
		Coronatae	Atollidae	3	5
		Semaeostomeae	Ulmaridae	1	1
Cnidaria Total				**47**	**212**
Echinodermata	**Asteroidea**	Forcipulatida	Stichasteridae	5	5
		Notomyotida	Benthopectinidae	7	8
		Paxillosida	Pseudarchasteridae	1	2
		Spinulosida	Echinasteridae	1	1
		Valvatida	Goniasteridae	16	29
	Crinoidea	Comatulida	Charitometridae	1	1
			Phrynocrinidae	2	4
	Echinoidea	Camarodonta	Echinidae	2	3
		Cidaroida		1	1
			Cidaridae	2	2
		Clypeasteroida	Laganidae	1	1
	Holothuroidea	Dendrochirotida	Psolidae	1	2
		Elasipodida	Pelagothuriidae	2	2
			Psychropotidae	1	1
	Ophiuroidea	Amphilepidida	Ophiactidae	2	111
		Euryalida	Euryalidae	1	5
			Gorgonocephalidae	2	3
		Ophiacanthida	Ophiacanthidae	3	47
Echinodermata Total				**51**	**228**
Mollusca				1	50
	Bivalvia	Mytilida	Mytilidae	2	4
		Pectinida	Anomiidae	2	20
		Pholadomyida	Euciroidae	4	15
	Cephalopoda	Octopoda	Amphitretidae	2	2
			Argonautidae	3	7
			Enteroctopodidae	5	5
			Megaleledonidae	9	11
			Octopodidae	5	8
			Opisthoteuthidae	2	3
		Oegopsida	Cranchiidae	1	1
			Gonatidae	1	1
			Onychoteuthidae	1	1
			Pholidoteuthidae	1	1
		Sepiida	Sepiadariidae	61	418
			Sepiolidae	2	4
	Gastropoda			1	30
			Pectinodontidae	1	4
		Littorinimorpha	Cassidae	4	5

Phylum	Class	Order	Family	No. of samples	No. of specimens
			Hipponicidae	5	51
			Ranellidae	12	29
		Neogastropoda	Buccinulidae	13	29
			Muricidae	1	1
			Pseudomelatomidae	1	1
			Turbinellidae	2	2
			Volutidae	16	47
		Umbraculida	Umbraculidae	2	2
Mollusca Total				**160**	**752**
Nematoda	**Enoplea**	Marimermithida		1	6
Nematoda Total				**1**	**6**
Porifera	**Demospongiae**	Dictyoceratida	Irciniidae	1	1
		Haplosclerida	Callyspongiidae	2	2
		Poecilosclerida	Cladorhizidae	1	1
			Phellodermidae	1	1
		Suberitida	Halichondriidae	1	1
			Suberitidae	1	5
		Tetractinellida	Ancorinidae	1	1
			Pleromidae	2	2
			Scleritodermidae	1	1
			Tetillidae	31	124
			Theneidae	1	1
	Hexactinellida	Lyssacinosida	Rossellidae	7	9
		Sceptrulophora	Farreidae	4	4
Porifera Total				**54**	**153**
Animalia, Sediment, Wood				**12**	**3**
Grand Total				**496**	**2 201**

Figure 5 shows the proportions of identified samples by catch year (separating research trawl and observer samples), indicating a peak of identified samples collected since 2018 and the effort to include historical fisheries bycatch samples from the late 1990s and early 2000s. The limited numbers of sample identification provided here for the intermittent period (2003–2017) might be an indication of the success of the ongoing 'identification of benthic invertebrate bycatch' programme that has been operating near-continuously since 2011.

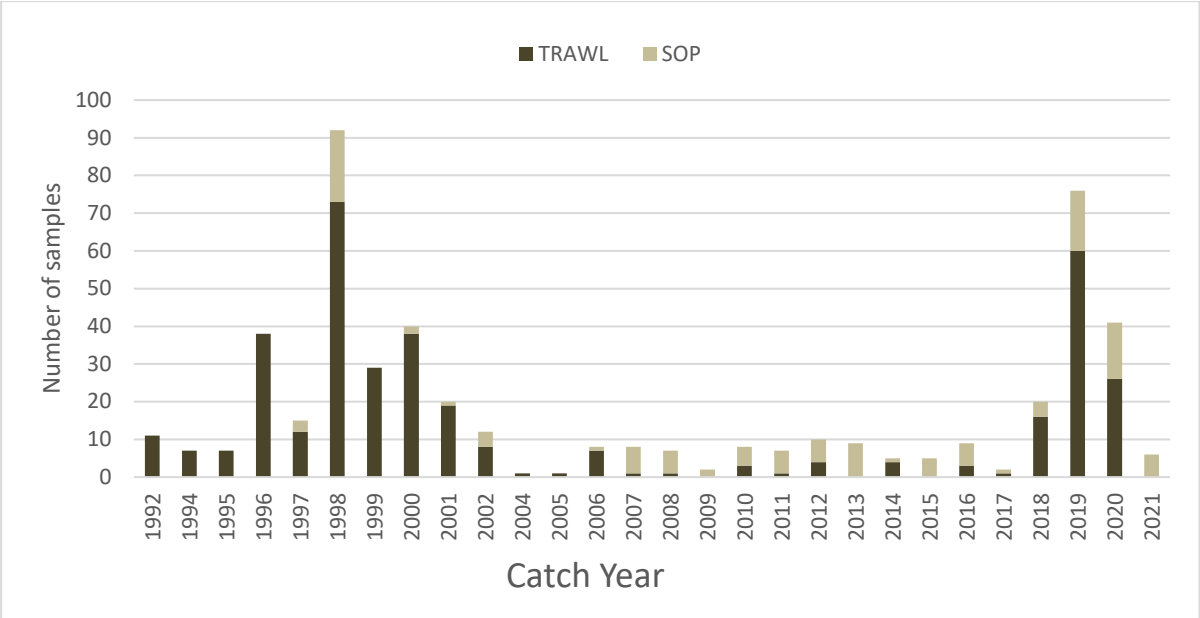

Figure 5: Total number of samples identified from fisheries research trawl surveys (dark bars) and observers (light bars) in the 2020–21 project plotted by the year they were caught.

Niwainvert summary for three-year duration of DAE2018-04 project

During the three-year period of the DAE2018-04 project (July 2018–June 2021), expert identifications were provided for a total of 1644 samples including a combined 7187 specimens (Figure 6). Identified samples were derived from 86 research trawl and 202 observed commercial fisheries trips in the New Zealand region.

Over 660 distinct taxa were identified in ten phyla and at least 128 undescribed species, six genera, and one family were identified as new to science, see details given by Schnabel et al. (2019) and Mills et al. (2020) and section 3.2 for details on taxonomic highlights. A total of 17 scientific publications and client reports are listed that refer to or include data from specimens identified in this 3-year project series, and this number will increase as research continues to include these samples.

The number of samples processed each year has remained relatively steady with the target number of 315 samples exceeded by between 181 (Year 3 – 2020/21) and 267 (Year 1 – 2018/19) samples (Figure 6). An upward trend in recent *trawl* samples in Year 2 and Year 3 is contrasted by a general downward trend of observer and historical samples identified. The increased return of research trawl specimens is at least in part due to the identification and retention of cephalopod specimens on board by researchers from the AUT ALCES group. The slight downward trend of samples processed overall since 2020 might in part be due to COVID-19 restrictions, temporarily limiting fishing activities as well as sample processing and identification (e.g., no anemones returned from the January 2021 hoki research survey on the Chatham Rise have been identified). Fewer observer specimens received is considered an indication of increased confidence of observers to make accurate identifications of bycatch fauna.

The distribution of sample identifications across the three years of this project by collection year is shown in Figure 7. The earliest fisheries bycatch samples processed were collected by research trawl surveys in the early 1990s and it is evident that the DAE2018-04 project has included a wide range of the historical samples collected since then. The first year of this project (reported on in 2019) focused on samples collected in the mid to late 2010s and the last year (reported on herein) focused on the earlier historical collections. As indicated above, this pattern might be indicative of the successful processing

of the historical backlog of unidentified material that remains in the NIC but see concluding comments under section 4.

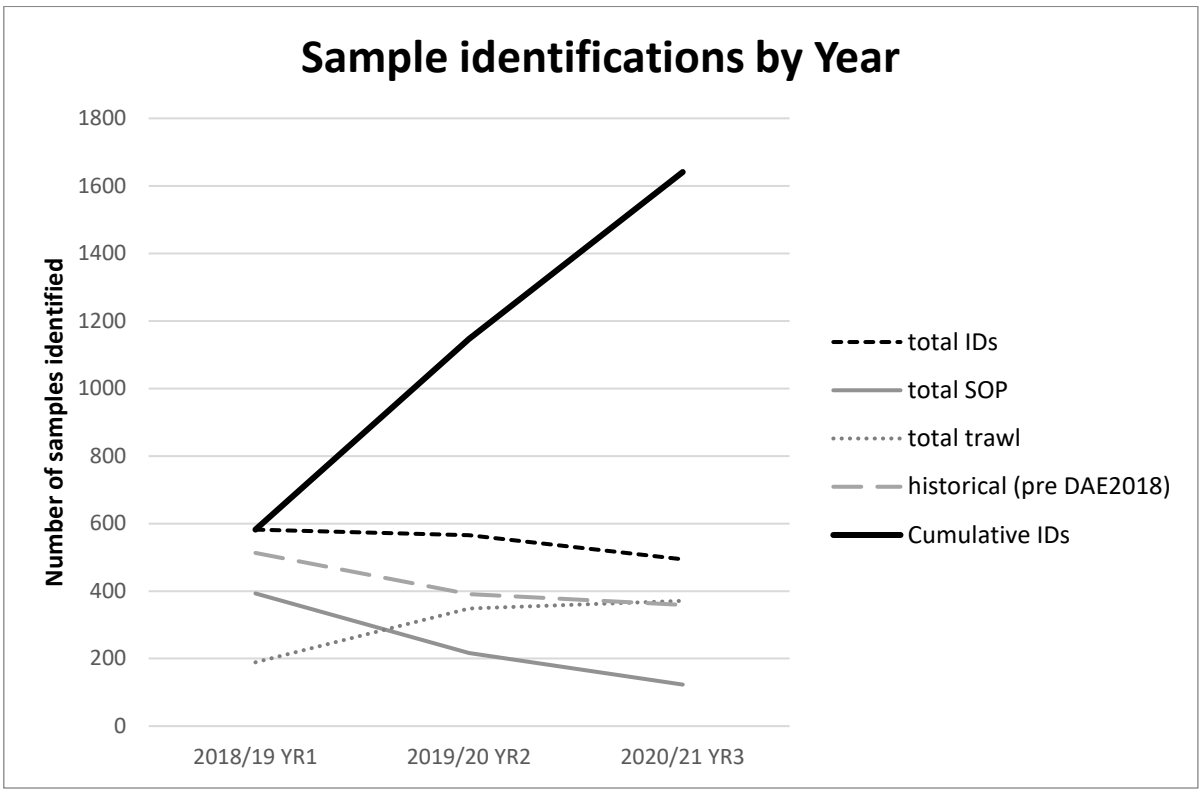

Figure 6: Summary of the number of sample identifications provided over the three years of the DAE2018-04 project showing the cumulative number of samples (solid black line), annual total number of samples (black broken line), annual number of *trawl* samples (stippled grey), observer samples (solid grey), and historical samples (broken grey line).

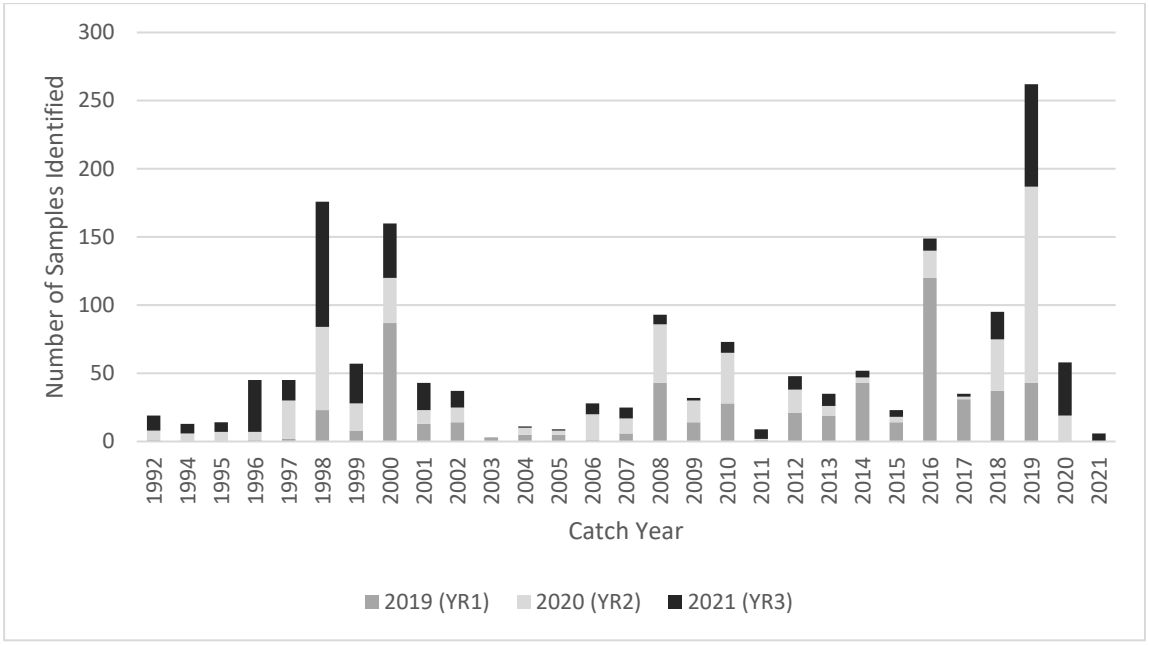

Figure 7: Number of identifications made in 2019 (Year 1, dark grey bar), 2020 (Year 2, light grey bar) and 2021 (Year 3, solid black bar) of the DAE2018-04 project plotted by catch year.

3.2 Taxonomic highlights

The project provided additional records of several interesting species, which confirmed and strengthened understanding of their spatial distribution and geographic boundaries. Details are provided in Appendix 1. Below are the taxonomic highlights listed by taxa and described by the respective identification experts. All summaries are provided by the experts below who acknowledged the provision of samples from the Fisheries New Zealand Observer Programme.

Arthropoda – Amphipoda (Rachael Peart, NIWA)

The amphipods examined were reasonably typical of deep, coldwater amphipods, but one sample was of particular interest: (NIWA 87606, TRIP3415/10) was a large mixed sample apparently "pulled out of a *Hyalascus* glass sponge (NIWA 75808, OSD 2062)" collected from the south-western Chatham Rise. This sample was composed of three taxa: a lysianassoid amphipod, three pardaliscid amphipods, and six Janiroidea isopods. This expert was unable to identify the lysianassoid to family or genus and suspected that this specimen is at least a new genus.

Arthropoda – Decapoda (Kareen Schnabel, NIWA)

Two specimens of a sample collected on the Wanganella Bank (NIWA 88622, TRIP3933/23) belong to a new species of spongicolid shrimp and are included in a manuscript submitted for publication (Schnabel et al. 2021). Spongicolid shrimp are known as venus or sponge shrimp because they are obligatory symbionts of large deepsea glass sponges; Figure 8 shows an example of this new species from specimens extracted from their host sponge, collected during the 2003 TAN0308 NORFANZ expedition.

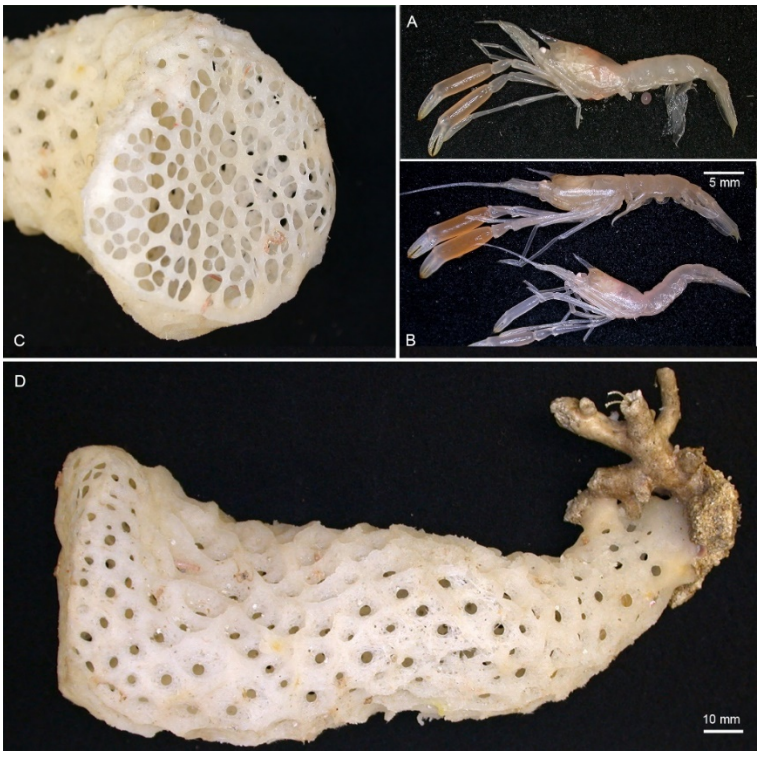

Figure 8: Live colouration of *Spongiocaris* sp. nov. and euplectellid sponge host *Regadrella okinoseana* Ijima, 1896. A. NMNZ CR.019259, B–D. NMNZ CR.019494, scale applies to both A and B (figure reproduced from Schnabel et al. 2021).

This expert would also like to acknowledge the opportunity to examine, identify, and curate select historical collections through this project. About 100 bycatch samples of decapods, primarily hermit

crabs were identified within a short period of time, a third of which required cataloguing in the *niwainvert* database. These records improved the available information about species distributions around New Zealand.

Cnidaria – Zoanthidea (Frederic Sinniger, University of Ryukyus, Japan)

Schnabel et al. (2019) reported for the first time the zoanthid genus *Bullagummizoanthus* in the New Zealand region with two samples identified from the EEZ by expert Frederic Sinniger. One further sample (NIWA 65950) from the Lord Howe Rise (ET) was newly identified by Dr. Sinniger based on a photograph and is included in this report. Figure 9 shows the pale pink/yellow zoanthids growing on the bright pink host bubblegum coral *Paragorgia coralloides* that so far appears to be the exclusive host of this associated zoanthid (Sinniger et al. 2013). Only one species is currently contained within the genus *Bullagummizoanthus* and taxonomic work (using morphology and DNA) by Sinniger and colleagues is underway to determine whether the New Zealand specimens belong to an undescribed species.

Figure 9: ***Bullagummizoanthus*** **(NIWA 65950, Trip 3177/37) zoanthid, attached to the bubblegum coral host (NIWA 65949).**

Mollusca – Cephalopoda (Kat Bolstad and members of the AUT Lab for Cephalopod Ecology and Systematics, ALCES, and Darren Stevens and Mark Fenwick, NIWA)

Cephalopods again comprise a large portion of the identified material thanks to ongoing work by NIWA and AUT experts, and despite travel restrictions experienced due to COVID-19. A total of 93 samples were identified, comprising 20 species. This included four undescribed species, three of these add further material to the ongoing taxonomic work on bobtail squid by MSc student Jaever Santos; Figure 10 shows a live colouration image of one of these undescribed species as captured during a 2012 *Tangaroa* biodiversity survey. The formal publication and species description is pending (Santos 2020).

One further sample of an undescribed species of *Iridoteuthis* is only the second NIC specimen discovered (NIWA 84790, KAH9801/38), the first specimen being reported in last year's report (Mills et al. 2020) and currently on loan to Dr. Mandy Reid (Australian Museum, Sydney) for taxonomic description.

Figure 10: Live specimen photo of a currently undescribed species of *Sepioloidea* bobtail squid (collected during 2012 *Tangaroa* voyage TAN1206, image credit: Rob Stewart, NIWA).

Mollusca – discovering a new baleen limpet (Kerry Walton, University of Otago)

Marshall & Walton (2021) recently published a new genus and species of limpet, *Baleenopelta rotunda*, that is only known to live on decaying baleen plates from slope depths around New Zealand. Limpets of often quite distantly related species have evolved to occupy a range of 'exotic' habitats in the deepsea, such as skate egg cases, squid beaks, hydrothermal vents, methane seeps, sunken wood, bone, worm tubes, and now baleen. Kerry Walton believes this is the first gastropod species to be recorded as unique to this habitat, and its shape (conical transitioning sharply to cylindrical) is quite unusual among limpets. It is possible that the periostracum (outer shell layer) is calcified, rather than chitinous, the latter being the norm. Figure 11 reproduces a figure of the new species from the recent taxonomic paper.

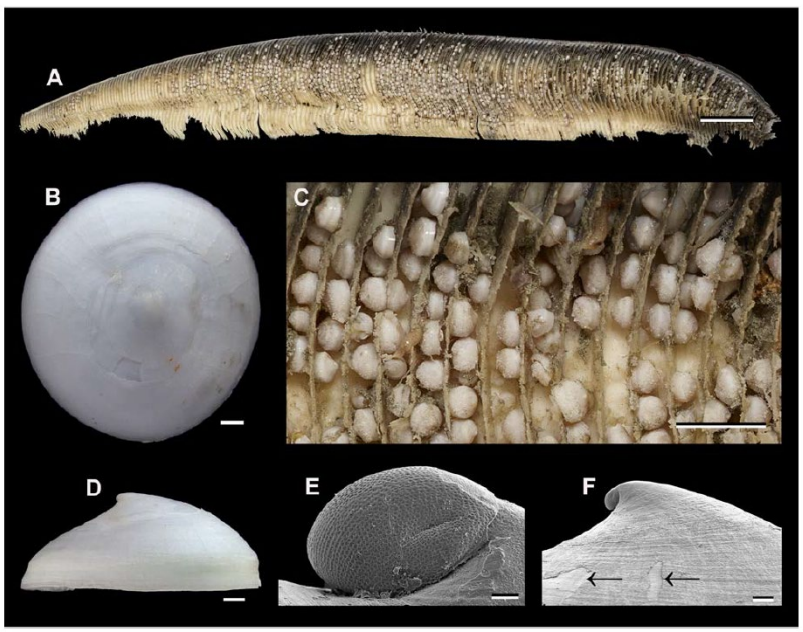

Figure 11: Reproduction of figure 1 of the Marshall & Walton (2021) species description of *Baleenopelta rotunda*, a limpet only found on baleen plates (A).

Nematoda (Jerusha Bennet, Otago University)

An unusual parasite was removed from a poorly preserved *Diplopteraster* starfish and was identified by Otago University parasitology Ph.D. student Jerusha Bennett as a marimermithid nematode (NIWA 99810, AEX9901/07). This specimen will contribute to this expert's ongoing research on New Zealand parasite species diversity and evolution.

Porifera (Michelle Kelly, NIWA)

The 2021 collection of observer sponges comprised 64 sponge specimens (and one non-sponge) examined from a variety of locations around the New Zealand EEZ, the majority of which were species of Tetillidae: 31 tetillid sponges including 26 specimens of *Antarctotetilla leptoderma* (Sollas, 1886), the occasionally free-living, common, egg-shaped tetillid sponge from the southern regions of the New Zealand EEZ; four specimens of the spherical *Cinachyra* n. sp. 4 (tough cratered sphere), with unusual flush porocalyces on the surface; and a single specimen of the rare species, *Craniella* n. sp. 1 (promonaenes, no sigmas) – the third collected from New Zealand waters. One of the benefits of seeing all these tetillid sponges in one collection is that their morphological characters can be directly compared and defined per species. *Lissodendoryx* (*Ectyodoryx*) *bifacialis* Lévi & Lévi, 1983 was also reasonably common in the collection (5 specimens).

The six high priority species included a large specimen of the undescribed poecilosclerid sponge, *Echinostylinos* n. sp. 1 (fluffy cloud bush) (NIWA 131925, TRIP5854/24) and two large specimens of the coral-like glass sponge *Farrea similaris* Reiswig & Kelly, 2011 (NIWA 61927,61930 from TRIP3065/58; NIWA 146467, TRIP6135/174; NIWA 146478, TRIP6135/40) collected by observers. *Halichondria* (*Halichondria*) sp. 8 (NIWA 131921, TRIP5854/24, very delicate, huge spicules) is very difficult to differentiate from three other deepwater species and requires further comparisons. It is unique, however, in having unusually large oxea spicules. *Callyspongia* (*Callyspongia*) n. sp. 12 (palmate, cf. Pegasus Canyon specimens) (NIWA147898, TAN2001/8) is unique in skeletal form and shape, being easily recognisable as a hollow, delicately fibrous palm-like sponge.

Four extremely large sponges were identified by vouchers and images only and included two trumpet sponges, colloquially termed *Hyalascus* "cf. *maui*" sp. nov. This distinctive detached, 'roller' species is endemic and common on Chatham Rise (Figure 12). A specimen of the much more robust *Hyalascus* n. sp. 1 (HMR May 05 flared thick vase) (but in very poor condition) was also identified.

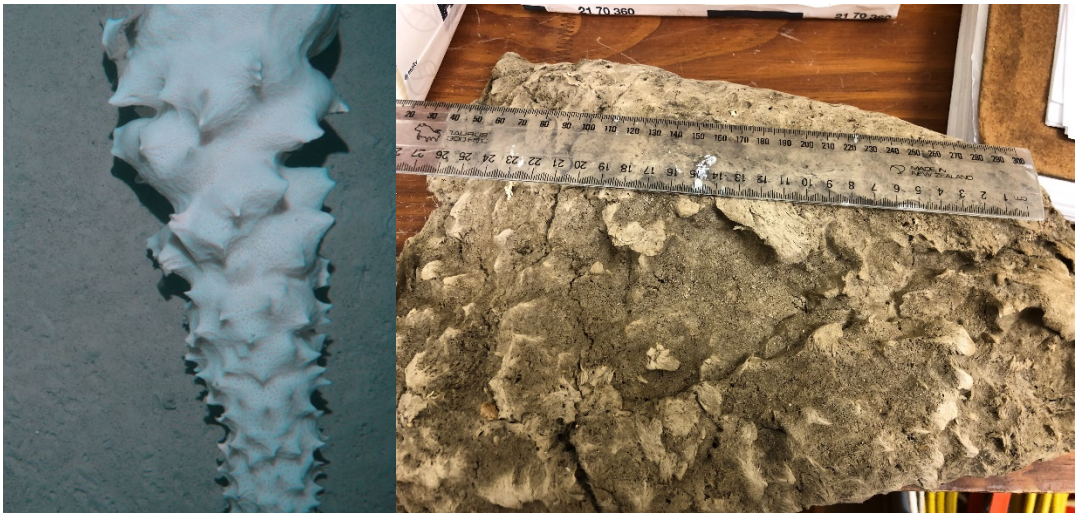

Figure 12: Left image: A large dried *Hyalascus* "maui" sp. nov. glass sponge, commonly found on the Chatham Rise, NIWA 75881, TRIP3494/22; Right image: *Hyalascus* "cf. maui" sp. nov. living on the Chatham Rise (credit: Oceans Survey 20/20 Chatham Rise - TAN0705).

Finally, a large stalked glass sponge, *Caulophacus (Caulophacus) discohexaster* Tabachnick & Lévi, 2004 collected as an unidentified coral (NIWA 131915, TRIP5854/24) was identified – the long and very dense stalk can sometimes be confused with a coral branch, but the stalk and mushroom-like heads on closer examination will appear fibrous, and glassy spicules may be apparent (Figure 13).

Additional species worthy of note:

- two coral-like glass sponge *Farrea similaris* Reiswig & Kelly, 2011,
- two dried glass sponges of *Symplectella rowi* at its southern limit around Macquarie Ridge,
- three lithistid "rock sponges": the relatively common *Aciculites pulchra* Dendy, 1924, *Pleroma turbinatum* Sollas, 1888, and "living fossil" *Pleroma aotea* Kelly, 2003,
- two specimens of the northern species, *Xestospongia coralloides* (Dendy, 1924) were identified, differing slightly from each other, but very similar in terms of morphology which is a thin plate with the aquiferous system differentiated on either side of the plate, and
- a large, but badly macerated specimen of the unusual endemic species, *Tedania* (*Tedaniopsis*) *turbinata* (Dendy, 1924), was identified.

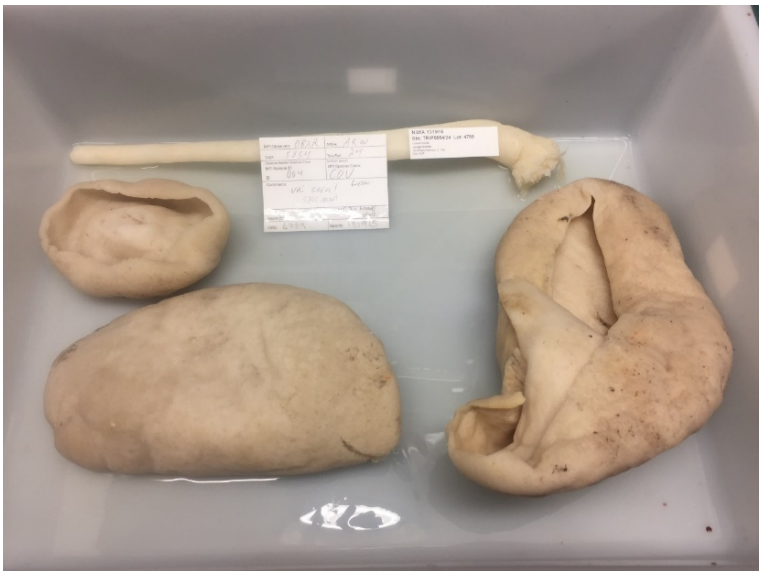

Figure 13: Three mushroom-like heads and one dense stem of the stalked glass sponge *Caulophacus (Caulophacus) discohexaster* collected by an observer (NIWA 131915, TRIP5854/24) from 1050 m in the Reinga Basin.

3.3 Trawl database updates

The following actions were carried out to add or check the newly acquired expert identifications or the confirmed identifications into the *trawl* database:

- Each new identification was checked against the curr_spp (current species) table to determine if a species code existed and where possible obtain the current valid species code, otherwise a match was made to progressively higher-order codes.
- The trawl database catch and subcatch tables were checked to determine if the code was or was not entered in these tables. For some, default codes have been used for samples retained because identification was needed ashore (i.e., SQX for an unidentified squid).
- SQLs were written to either update the catch and subcatch tables where a code existed or insert a catch record into these two tables where a code was not recorded.
- A comment including the identification and determined date was added to the t_catch and t_subcatch tables per individual catch/subcatch row.

In total, 371 samples retained from research trawls and later identified ashore by taxonomic experts are reported here for DAE2018-04:

- 19 existing catch and subcatch records had species codes updated (comments were also inserted per catch/subcatch entry, with identification details and date).
- 325 records were inserted into the catch and subcatch tables.
- 20 existing catch and subcatch records did not require species codes to be updated, because the code used at sea was correct (though comments were added per catch/subcatch entry, with identification details and date). This often reflects a higher order, i.e., GAS (for any gastropod) where a specific code does not exist for a species.
- 7 records were not inserted because the trip_code/station_no does not exist in *trawl*.

3.4 COD database updates

The *COD* database manager received a total of 125 samples from 107 fishing events from *niwainvert* to update *COD* for DAE2018-04. Updating catch records took place following methods described by Tracey & Sanders (2010). Sample data are loaded into a *COD* database 'load' table, z_invertebrate_samples. The data are then used to update catch records in the stage and report tables, y_benthic and x_fishing_event_catch. There are always some complexities when loading these data.

- 18 samples were updated where the target record matched the initial observer identification.
- 27 could be matched based on trip-tow and MPI sample number (but lacked an initial observer identification). The MPI sample number was not previously recorded in *niwainvert* and the utility of this field and its benefit to adding a confidence level to matching records between databases is highlighted. The affected records were all historical samples. There is now an automatic link between "Initial observer ID" in OSD and the "initial ID code" field in *niwainvert* to assist with record matching in *COD*. In June this year, an automatic link was implemented between "MPI sample number" fields in both *COD* and *niwainvert* to assist with record matching in future years.
- 70 records were added as new records into the *COD* database.
- 10 samples where trip data were unavailable, one station could not be matched and nine had not been loaded into *COD* due to a delay in development work required for processing new Fisheries New Zealand bottom longline (BLL) paper forms.

An extract of the 115 samples used to update *COD* is appended and includes the target species field (Appendix 2). Samples were collected from 23 commercial target fisheries and in nine Fisheries Management Areas (FMAs) with 10 samples processed from five high seas regions outside the New Zealand EEZ (ET) (Tables 4 & 5). The highest number of observer-collected samples (at least 10) were taken from the South-East Chatham Rise (FMA 4, n=34) and from the southern FMAs: Southland (FMA 5, n=17); South-East Coast (FMA 3, n=15); Southern Offshore Islands (FMA 6A, n=14), and Auckland West (FMA 9, n=10). Sample counts from northern FMAs and the high seas regions were low (under 10). In the two previous years, most samples were from Southland (FMA 5) and South-East Coast (FMA 3), followed by the Chatham Rise (FMA 4) (Schnabel et al. 2019, Mills et al. 2020).

In this reporting period, most of the observer samples that were identified were collected in fishing events targeting orange roughy, arrow squid, and hoki (Table 5, Appendix 2). These results are very similar to Year 1 (Schnabel et al. 2019) but differ slightly from Year 2 (Mills et al. 2020) when samples were reported from 64 fishing events that targeted arrow squid and 25 for barracouta (*Thyrsites atun*) (less than 3 in both other years). Not all invertebrate bycatch is retained for taxonomic identification by specialists ashore and so the observed fishing event data are not indicative of trends. The samples reported on were collected over multiple years and represent only a portion of the total invertebrate bycatch taken at sea.

Table 4: Count of observer collected samples by Fisheries Management Area (FMA) and high seas (ET) region. The samples identified for this period were collected over multiple years (between 1992 and 2021) and the identified samples represent a portion of all benthic invertebrates captured at sea.

Area	Description	Count of samples
AKE	Auckland East (FMA 1)	5
AKW	Auckland West (FMA 9)	10
CEE	Central East (FMA 2)	1
CET	Challenger Plateau (ET)	2
CEW	Central West (FMA 8)	4
CHA	Challenger/Central Plateau (FMA 7)	1
HOWE	Lord Howe Rise (ET)	2
SEC	South-East Coast (FMA 3)	15
SOE	South-East Chatham Rise (FMA 4)	34
SOI	Southern Offshore Islands (FMA 6A)	14
SOU	Southland (FMA 5)	17
SUB	Sub-Antarctic (FMA 6)	6
TMAR	Tasmanian Ridge (ET)	2
WANB	Wanganella Bank (ET)	2

Table 5: Count of observer samples identified during the June 2020-June 2021 reporting period by target fishery, number of fishing events, and fishing method. Note that samples identified over this period were collected in multiple years between 1992 and 2021 and that the identified samples are a portion of all benthic invertebrates captured by fishing gear. Fishing method codes: TWL = trawling (includes bottom trawl [BT] and midwater trawl), BLL = bottom longline.

Target fishery (common name)	Target code	Fishing method	Count of fishing events	Count of samples
Alfonsino	BYS	TWL	3	4
Alfonsino & long-finned beryx	BYX	TWL	1	1
Arrow squid	SQU	TWL	14	17
Barracouta	BAR	TWL	1	1
Black oreo	BOE	TWL	4	4
Bluenose	BNS	BLL	1	1
Cardinalfish	CDL	TWL	1	1
Gurnard	GUR	TWL	1	1
Hake	HAK	TWL	1	1
Hoki	HOK	TWL	12	12
Jack mackerel	JMA	TWL	4	6
Ling	LIN	TWL	1	1
Mixed fish	MIX	TWL	1	3
NZ southern arrow squid	NOS	TWL	1	1
Orange roughy	ORH	TWL	24	33
Oreos	OEO	TWL	5	5
Scampi	SCI	TWL	7	9
Silver warehou	SWA	TWL	3	4
Smooth oreo	SSO	TWL	5	6
Snapper	SNA	TWL	1	1
Southern blue whiting	SBW	TWL	1	1
Trevally	TRE	BT	1	1
White warehou	WWA	TWL	1	1

4. DISCUSSION

The overarching aim of this research is to provide Fisheries New Zealand with scientific information on the aquatic environment of New Zealand's marine region. The three years of funding for the curation and identification of fisheries bycatch invertebrates project (DAE2018-04) has continued to contribute significant information on biodiversity, distribution, and target fisheries bycatch for the Aquatic Environment and Biodiversity Research science programme. The data presented here will support various Fisheries New Zealand projects that monitor fishing effects and interactions and investigate impacts on the benthic community structure and function. The project data have focused on the deepwater fisheries; however, the observer-collected samples are not focused on a particular target fishery or FMA. The key reason for retaining benthic bycatch specimens at sea is where identification is uncertain. Other factors include if the specimen has been caught outside the depth range or distribution given in identification guides, or if the specimen is rare or unusual.

The invertebrate bycatch reported on through this project does not include the identification of protected corals in fisheries bycatch, a task funded through DOC CSP (Project DOC20303 – INT2019-04). The report for DOC by Macpherson et al. (2021) also describes which target fishery and FMA returned the highest number of protected coral samples over time, and similar patterns were reported to those presented here. The trends in both studies represent only a sub-set of the overall invertebrate bycatch taken at sea, but the accurate description to species level of the composition of bycatch helps inform analyses made at a higher taxon level (e.g., Anderson et al. 2014). However, there are limitations in how the overall trends by fishery and FMA are presented in both the DOC research and in this study. For example, observer coverage by region can vary over time or some observers may return fewer samples because they are more experienced in the identification of the fauna. Ashore there can be selective identification of samples of a particular taxon which may or may not skew the trends.

Over the years the focus has been on identifying most recently collected samples, but this has not been exclusive. The smaller number of samples received from observers in recent times has been considered as an indication of the use of the invertebrate guide and increased confidence to make accurate identifications of bycatch fauna at sea. The cumulative number of samples has increased over time. Many historical samples held in the NIC have also been identified since the programme began in 2011. This year, 309 historical samples were processed and identified. The general trend of a decreasing number of research trawl and observer samples being returned each year for identification continues, which allows for a focus on addressing the backlog of unidentified samples. These backlog samples are typically prioritised to take advantage of visiting taxonomic experts, e.g., in reporting year 2019–2020 a significant effort was placed on processing accumulated anemone specimens (Mills et al. 2020).

The expert identification of a broad range of invertebrate bycatch samples collected by both fisheries observers and science staff on research trawl surveys has continued to produce new specimen data records and significant finds. These specimens are important vouchers on which new species descriptions have been based and from which several taxonomic descriptions have been published. These publications in turn highlight improved knowledge of the region's species diversity as well as the undescribed biodiversity of benthic invertebrate fauna in the New Zealand region.

The accumulation of these data records from this and the earlier bycatch identification projects contribute to filling knowledge gaps around spatial distribution of species, help describe the overall composition of observed bycatch, and provide opportunity to continue to improve both predictive habitat suitability models and risk assessments (e.g., Anderson et al. 2016, 2020, Georgian et al. 2019, Rowden et al. 2019). It is envisaged that this programme will continue to support the ongoing fisheries bycatch collections.

5. MANAGEMENT IMPLICATIONS

The 2019 National Fisheries Plan for Deepwater and Middle-depth Fisheries (Fisheries New Zealand 2019) describes several of the environmental outcomes relevant to the management of benthic systems and their fauna. These include ensuring that the maintenance of biological diversity of the aquatic environment and protection of habitats of particular significance for fisheries management are explicitly considered in management, to avoid, remedy, or mitigate the adverse effects of deepwater and middle-depth fisheries on the benthic habitat. The recording of benthic invertebrate bycatch data during research trawls and by observers on fishing vessels targeting deepwater stocks continues to improve knowledge of the region's species diversity and distribution and contributes to enhancing the understanding how fisheries activities interact with benthic fauna in the deepsea.

Recommendations for further research for management consideration are listed below.

Improvements to the accuracy of data collection

Training: Annual training sessions of observers would develop a much-needed two-way dialogue between observers and researchers, to improve their skills at identifying and collecting samples and bycatch data and to encourage them by keeping them informed about how their data are used. Researchers would also obtain feedback and information from observers that could benefit data analyses and interpretation.

- At a previous Aquatic Environment Working Group meeting it was suggested by NIWA that taxonomists participate in observer briefings in the same manner as that done with CCAMLR observer briefings. These briefings could take the form of a one-day workshop, cover several faunal groups, and provide special instructions for handling subsampling requests and tips for separating easily confused taxa.
- It was pointed out that there are many more deepwater in-zone observers compared with CCAMLR observers and that this is unlikely to be logistically feasible because they are rarely all on land at the same time and it would be difficult to coordinate one session. Two briefings per year could allow more observers to attend.
- It was suggested that briefings be pre-recorded and videos be distributed amongst observers along the lines of a CSP DOC initiative currently underway.

Fisheries New Zealand science group, Research Data Manager (RDM), and Observer Services could further discuss instructions that NIWA taxonomists could provide to brief observers. This work would be separate to this project.

Adding species codes to enhance accuracy: A number of invertebrates do not have an assigned three-letter Fisheries New Zealand species code. New codes could be created for these taxa, to improve the accuracy of at-sea identifications and to help match data records. This task to obtain new codes is managed by NIWA database manager (Jade Maggs) and Fisheries New Zealand RDM.

Developing invertebrate identification guides: Expansion and refinement of the existing deepwater invertebrate guide and the development of an inshore invertebrate guide have previously been discussed with Fisheries New Zealand and would support observers and fisheries researchers at sea. There is currently no comprehensive inshore fisheries invertebrate bycatch guide and there are a range of taxa that are not covered by existing guides (Tracey et al. 2011, 2014).

Improving at-sea procedures:

Labelling: The quality of observer invertebrate data collected at sea is very good; however, the use of pre-printed labels for specimens and specimen images to prompt observers to enter data consistently could improve the reliability of observer bycatch data.

The standardised use of pre-printed labels and photocards has recently progressed (see section 2.1, Figures 1 and 2). Clear instructions on taking photos of organisms at sea have been added to the instructions for both researchers and observers and will certainly aid the identification of material on land.

Specimen photography: Ideally, and as per the Instructions, an image is taken with a label that includes trip and station data, and the specimen, or a sub-sample of the specimen, is returned to help experts verify the identification. Over time, standardised easy-to-use labels for observers to include in photographs should improve the process and hence the accuracy of accompanying metadata. Examples of different labelling methods used by observers are shown by Macpherson et al. (2021).

Database refinements

Improving database record matching: To aid the import and update of *Specify niwainvert* records to *COD* and *trawl*, a data field has been added that will map the MPI sample number from the specimen datasheet and OSD to the *niwainvert* data record. An initiative such as this helps improve matching records once identifications have been updated. A meeting of Fisheries New Zealand and NIWA database experts could be held to ensure database loading continues to be refined.

Ongoing identification of historical samples

Backlog of unidentified samples: A portion of accumulated historical research trawl and observer samples held at NIWA remain unidentified. As at June 2021, 420 registered fisheries bycatch samples in *niwainvert* await further identification (to a taxonomic level higher than family), with 180 of these collected since 2011. As stated previously, the authors see the benefit of furthering the identification of the unregistered and registered historical samples in future years.

Focus on specific taxonomic groups

Examples of a targeted taxonomic focus with benefits to specified Fisheries New Zealand Environment Outcomes could include:

- Increasing the capacity to identify abundant and diverse anemone fauna. This would fill one of the largest taxonomic gaps currently in New Zealand, that was somewhat addressed at the deepsea anemone workshop conducted in 2020.
- NIWA could focus on more impacted taxon groups to address recent research questions (e.g., *Hyalascus* (HYA) – a floppy tubular sponge which is increasingly being caught as bycatch).
- Alternatively, samples from specific areas could be prioritised (e.g., to support habitat suitability modelling, seafloor classification, and spatial management studies).

Further discussion is required with Fisheries New Zealand about these options and the future prioritisation of sample identification effort.

6. ACKNOWLEDGMENTS

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7. PUBLICATIONS

Many publications relevant to the samples reported on here are either published or currently in preparation and list specimens identified from research trawl and observer trips, e.g.;

- Geange, S.W., Rowden, A.A., Nicol, S., Bock, T., Cryer, M. (2020). A Data-Informed Approach for Identifying Move-on Encounter Thresholds for Vulnerable Marine Ecosystem Indicator Taxa. *Frontiers in Marine Science*. https://doi.org/10.3389/fmars.2020.00155
  - Uses *niwainvert* data that includes fisheries bycatch samples.
- Gordon D.P. (2021). Apprehending novel biodiversity redux –thirteen new genera and three new families of Zealandian Bryozoa, with the first living species of the Eocene–Miocene genus *Vincularia* (Vinculariidae). *Journal of the Marine Biological Association of the United Kingdom 101(2)*: 1–28. https://doi.org/10.1017/S0025315421000266
  - The holotype of a new genus and new species of Bryozoa is collected from observer TRIP1621/8 (Z11008) *Elementella secunda* Gordon, 2021 n. gen., n. sp.
- Schnabel, K.E. (2020). The Marine Fauna of New Zealand. Squat lobsters (Crustacea, Decapoda, Chirostyloidea). *NIWA Biodiversity Memoir 132*. 351 p.
  - 61 specimen lots were examined material in this memoir. Three holotypes (*Uroptychus torrancei, U. ahyongi*, *and U. belli*) and nine paratypes (*U. ahyongi, U. torrancei, U. belli, U. ihu*) were collected on NIWA fisheries research trawl surveys and by observers.
- Marshall B.A. & Walton K. (2021). *Baleenopelta rotunda*, a newly discovered limpet from decaying baleen from New Zealand. *Molluscan Research*, DOI: https://doi.org/10.1080/13235818.2021.1883500
  - Specimens deposited at Te Papa now, but originated from observer collected baleen samples
- Pardo-Gandarillas, M.C., Díaz-Santana-Iturrios, M., Fenwick, M., Villanueva, R., Ibáñez, C.M. (2021). Redescription of the Flapjack Octopod, *Opisthoteuthis bruuni* (Cephalopoda: Opisthoteuthidae), from the Southeastern Pacific Ocean and Evolutionary Relationships of Cirrate Octopods. *Malacologia 63(2)*: 155–169. https://doi.org/10.4002/040.063.0201
  - Trawl survey collected octopus specimens sequenced in this study
- Petersen G., Stephenson F., Brough T., Rowden A. (2020). Seafloor Community Classification: Group descriptions. NIWA Client Report 2020230HN for Department of Conservation, NIWA Hamilton. 237 p.
  - Used full *niwainvert* data extract to compile seafloor community data, which includes numerous DAE records
- Santos, J. (2020). Two New 'Bottletail Squids' (Cephalopoda: Sepiadariidae) from New Zealand, with New Observations on *Sepioloidea pacifica* (Kirk, 1882). MSc thesis, Auckland University of Technology. 82 p.
  - SOP and research trawl samples provide type and non-type material for species descriptions.
- Schnabel, K.E., Kou, Q., Corbari, L., Xu, P. (2021) Integrative taxonomy of New Zealand Stenopodidea (Crustacea: Decapoda:) with new species and records for the region. *Diversity 13*: 343.
  - Specimens contribute to material examined and include a new species.
- Stephenson, F., Rowden, A., Brough, T., Leathwick, J., Bulmer, R., Clark, D., Lundquist, C., Greenfield, B., Bowden, D., Tuck, I., Neill, K., Mackay, K., Pinkerton, M., Anderson, O., Gorman, R., Mills, S., Watson, S., Nelson, W., Hewitt J. (2020). Development of a New Zealand Seafloor Community Classification (SCC). NIWA Client Report prepared for DOC. 84 pp.
  - used *niwainvert* full dataset containing many DAE project records.
- Tracey, D.M., Hjorvarsdottir, F. (eds, comps) (2019). The State of Knowledge of Deep-Sea Corals in the New Zealand Region. *NIWA Science and Technology Series Number 84*. 140 p.
  - included maps compiled to show species distributions (soft corals sea pens of relevance to DAE work).

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APPENDIX 1: NIWA *SPECIFY* DATABASE SUMMARY OF SAMPLE DATA PROVIDED FOR THE OBSERVER (A) AND RESEARCH SURVEY COLLECTED DATA (B).

(A) Observer collected samples

TRIP	TOW	Catalog Number	OSD Number	Initial ID Code	Expert ID code	Phylum	Class	Order	Family	Preferred Taxon [Formatted]	Determined Date	Count	Date	Latitude1	Longitude1	Depth 1	Depth 2
1024	39-40	154292			NEI	Arthropoda	Malacostraca	Lophogastrida (Mysidacea)	Lophogastridae	Neognathophausia ingens	22/07/2020	1	30/07/1997	-30.0	177.3	910	1048
1054	4	105967			SSQ	Mollusca	Cephalopoda	Sepiida	Sepiadariidae	Sepioloidea n.sp. I	27/10/2020	1	16/11/1997	-43.1	176.7	375	
1054	4	142286			SSQ	Mollusca	Cephalopoda	Sepiida	Sepiadariidae	Sepioloidea n.sp. I	27/10/2020	1	16/11/1997	-43.1	176.7	375	
1124	58	154427			DSO	Porifera	Demospongiae	Tetractinellida	Tetillidae	Cinachyra n. sp. 4	29/04/2021	1	06/08/1998	-37.1	176.7	1011	
1124	50	92839			UMB	Cnidaria	Anthozoa	Pennatulacea	Umbellulidae	Umbellula	27/05/2020	1	23/07/1998	-37.0	176.7	974	1118
1137	6	127503			DSO	Porifera	Demospongiae	Poecilosclerida	Cladorhizidae	Abyssocladia n. sp. I	02/2021	1	08/08/1998	-47.5	148.9	1024	
1152	7	101764	MNP0781, ID#: 782		DSO	Porifera	Demospongiae	Tetractinellida	Pleromidae	Pleroma aotea	29/04/2021	1	10/09/1998	-37.5	167.7	904	
1152	35	101766	MNP0746, ID#: 747		DSO	Porifera	Demospongiae	Tetractinellida	Pleromidae	Pleroma turbinatum	06/05/2021	1	18/09/1998	-34.2	162.9	791	
1152	7	101765	MNP0782, ID#: 783		SLT	Porifera	Demospongiae	Tetractinellida	Ancorinidae	Stelletta n. sp. 2	06/05/2021	1	10/09/1998	-37.5	167.7	904	
1153	52	155654			ASR	Echinodermata	Asteroidea	Forcipulatida	Stichasteridae	Smilasterias actinata	21/01/2021	1	10/09/1998	-47.7	147.5	965	
1158	18	154437			DSO	Porifera	Demospongiae	Tetractinellida	Tetillidae	Craniella n.sp. 1	29/04/2021	1	17/09/1998	-49.7	167.9	590	
1160	60	154433			DSO	Porifera	Demospongiae	Tetractinellida	Tetillidae	Antarctotetilla leptoderma	29/04/2021	1	15/10/1998	-43.9	178.9	500	
1160	55	154449			DSO	Porifera	Demospongiae	Tetractinellida	Tetillidae	Antarctotetilla leptoderma	29/04/2021	1	13/10/1998	-43.9	179	550	
1160	57	2557			ASC	Chordata	Ascidiacea	Aplousobranchia	Polyclinidae	Synoicum otagoensis	16/03/2021	1	14/10/1998	-43.9	178.9	485	
1171	38	155834			HDR	Cnidaria	Hydrozoa	Leptothecata	Aglaopheniidae	Lytocarpia alata	04/03/2021	1	29/11/1998	-48.6	165	1061	
1171	115	156128			OPH	Echinodermata	Ophiuroidea	Ophiacanthida	Ophiacanthidae	Ophiacantha densispina	24/03/2021	7	11/12/1998	-48.5	165	937	
1171	114	156127			OPV	Echinodermata	Ophiuroidea	Ophiacanthida	Ophiacanthidae	Ophiacantha vivipara	24/03/2021	39	11/12/1998	-48.5	165	937	
1171	113	156126			OAB	Echinodermata	Ophiuroidea	Amphilepidida	Ophiactidae	Ophiactis abyssicola	24/03/2021	106	11/12/1998	-48.5	165	937	
1171	76	155620			ASR	Echinodermata	Asteroidea	Forcipulatida	Stichasteridae	Smilasterias	20/01/2021	1	04/12/1998	-50.0	166	850	
1171	24	155652			ASR	Echinodermata	Asteroidea	Forcipulatida	Stichasteridae	Smilasterias actinata	21/01/2021	1	27/11/1998	-48.0	166.1	940	1180
1172	40	24341			BPI	Echinodermata	Asteroidea	Notomyotida	Benthopectinidae	Benthopecten pikei	30/03/2021	1	09/12/1998	-42.9	173.9	1010	
1337	31	154565		CRB	CHO	Arthropoda	Malacostraca	Decapoda	Geryonidae	Chaceon	22/10/2020	1	31/03/2000	-37.1	177.3	750	869
1417	32	154704			GCL	Mollusca	Cephalopoda	Octopoda	Megaleledonidae	Graneledone challengeri	03/11/2020	2	01/12/2000				
1585	13	148586			BIV	Mollusca	Bivalvia	Mytilida	Mytilidae	Idas	2021	1	22/01/2001	-42.8	-175.6	1100	

TRIP	TOW	Catalog Number	OSD Number	Initial ID Code	Expert ID code	Phylum	Class	Order	Family	Preferred Taxon [Formatted]	Determined Date	Count	Date	Latitude1	Longitude1	Depth 1	Depth 2
1597	42	103643			PPA	Arthropoda	Malacostraca	Decapoda	Palinuridae	Projasus parkeri	06/05/2021	1	27/01/2002	-34.9	170	500	
1683	19	154460			DSO	Porifera	Demospongiae	Tetractinellida	Tetillidae	Cinachyra n. sp. 4	29/04/2021	1	20/08/2002	-36.1	173.2	929	845
1718	10	103642			PPA	Arthropoda	Malacostraca	Decapoda	Palinuridae	Projasus parkeri	06/05/2021	1	2004	-34.1	167.6	737	859
2251	113	83657			PYC	Arthropoda	Pycnogonida	Pantopoda	Colossendeidae	Colossendeis	27/05/2020	1	07/06/2006	-43.2	-174	1033	1169
2413	89	71147			CID	Echinodermata	Echinoidea	Cidaroida		Cidaroida	19/10/2020	1	13/05/2007	-43.9	179.4	495	574
2496	30	131510	4121	JFI	SCY	Cnidaria	Scyphozoa	Semaeostomeae	Ulmaridae	Stygiomedusa	05/05/2021	1	27/09/2007	-52.4	170.5	434	449
2496	42	43991			ASC	Chordata	Ascidiacea	Aplousobranchia	Polyclinidae	Synoicum otagoensis	22/04/2021	1	07/10/2007	-43.2	174.2	520	593
2520	33	49089	4	JFI	EEX	Echinodermata	Holothuroidea	Elasipodida	Pelagothuriidae	Enypniastes eximia	12/03/2021	1	12/11/2007	-44.7	-179	1283	
2520	144	49097	20		SCY	Cnidaria	Scyphozoa			Scyphozoa indet.	04/03/2021	1	26/11/2007	-44.2	-174.5	1179	1380
2521	19	49090	2	JFI	EEX	Echinodermata	Holothuroidea	Elasipodida	Pelagothuriidae	Enypniastes eximia	12/03/2021	1	09/11/2007	-44.7	176.2	1152	1115
2533	20	62968			SSQ	Mollusca	Cephalopoda	Sepiida	Sepiadariidae	Sepioloidea n.sp. I	27/10/2020	1	14/11/2007	-50.9	167.3		
2617	137	42475			ASC	Chordata	Ascidiacea	Aplousobranchia	Polyclinidae	Synoicum otagoensis	22/04/2021	1	19/05/2008	-44.1	174.8	506	555
2653	162	49489			APH	Arthropoda	Malacostraca	Amphipoda		Amphipoda indet.	03/05/2021	1	03/08/2008	-50.1	175.2	1014	1111
2692	62	47946	111		GYS	Cnidaria	Anthozoa	Pennatulacea	Pennatulidae	Gyrophyllum sibogae	29/03/2021	1	09/09/2008	-49.5	166.4	654	
2692	128	67927			ASC	Chordata	Ascidiacea	Aplousobranchia	Polyclinidae	Synoicum otagoensis	22/04/2021	1	29/09/2008	-44.0	174.7	504	540
2704	8	67187			ASC	Chordata	Ascidiacea	Stolidobranchia	Pyuridae	Culeolus hospitalis	22/04/2021	1	02/10/2008	-34.8	171.7	988	987
2714	85	67832	MFIsh sample 31		ASR	Echinodermata	Asteroidea	Forcipulatida	Stichasteridae	Smilasterias actinata	12/01/2021	1	13/11/2008	-44.5	-175.3	709	1000
2911	68	65877	138			Chordata	Thaliacea	Pyrosomida		Pyrosomida	04/03/2021	1	02/08/2009	-42.7	175.9	1067	1146
2943	5	65598	417		HWL	Cnidaria	Anthozoa	Pennatulacea	Halipteridae	Halipteris willemoesi	27/05/2020	1	09/09/2009	-41.9	170.4	610	523
3065	58	61927	580		FAR	Porifera	Hexactinellida	Sceptrulophora	Farreidae	Farrea similaris	29/04/2021	1	11/02/2010	-44.2	-174.5	765	1345
3065	58	61930	577		FAR	Porifera	Hexactinellida	Sceptrulophora	Farreidae	Farrea similaris	29/04/2021	1	11/02/2010	-44.2	-174.5	765	1345
3177	37	65950	1126	SOC	ZAH	Cnidaria	Anthozoa	Zoantharia	Parazoanthidae	Bullagummizoanthus	24/03/2021	5	01/09/2010	-34.1	162.7	541	596
3219	23	69515	1234		FIS	Chordata				Fish	22/04/2021	1	26/10/2010	-37.5	176.6	380	402
3236	1	69570	1300		DSO	Porifera	Demospongiae	Dictyoceratida	Irciniidae	Psammocinia charadrodes	29/04/2021	1	05/12/2010	-44.3	173.2	117	149
3306	8	69655	1783		SSQ	Mollusca	Cephalopoda	Sepiida	Sepiadariidae	Sepioloidea n.sp. I	27/10/2020	1	04/04/2011	-43.0	178.3	550	
3319	16	75727	1881	EGG	MOL	Mollusca				Mollusca eggs	16/07/2020	50	25/05/2011	-49.6	166.8	455	473
3406	192	75800	2030	HYA	HYA	Porifera	Hexactinellida	Lyssacinosida	Rossellidae	Hyalascus maui	23/02/2021	1	08/12/2011	-48.6	175.4	851	864
3415	10	87606c			APH	Arthropoda	Malacostraca	Amphipoda	Acanthaspidiidae	Acanthaspidiidae	03/05/2021	1	22/11/2011	-44.4	174.7	624	635
3415	10	87606a			APH	Arthropoda	Malacostraca	Amphipoda	Lysianassidae?	Lysianassidae?	03/05/2021	1	22/11/2011	-44.4	174.7	624	635

TRIP	TOW	Catalog Number	OSD Number	Initial ID Code	Expert ID code	Phylum	Class	Order	Family	Preferred Taxon [Formatted]	Determined Date	Count	Date	Latitude1	Longitude1	Depth 1	Depth 2
3415	10	87606b			APH	Arthropoda	Malacostraca	Amphipoda	Pardaliscidae	Pardaliscidae	03/05/2021	1	22/11/2011	-44.4	174.7	624	635
3460	49	146435	5250		NAT	Arthropoda	Malacostraca	Decapoda	Axiidae	Spongiaxius novaezealandiae	21/04/2021	1	13/03/2012	-48.7	167.1	250	203
3460	49	75872	2179	HYA	GLS	Porifera	Hexactinellida	Lyssacinosida	Rossellidae	Symplectella rowi	29/04/2021	1	13/03/2012	-48.7	167.1	250	203
3460	71	75873	2180	HYA	GLS	Porifera	Hexactinellida	Lyssacinosida	Rossellidae	Symplectella rowi	29/04/2021	1	21/03/2012	-48.7	166.4	173	174
3465	2	75864	2167	SQX	SSQ	Mollusca	Cephalopoda	Sepiida	Sepiadariidae	Sepioloidea n.sp. I	27/10/2020	1	14/03/2012	-50.7	167	260	139
3494	22	75881	2195	HYA	HYA	Porifera	Hexactinellida	Lyssacinosida	Rossellidae	Hyalascus maui	23/02/2021	1	11/05/2012	-50.6	167.3	170	168
3618	26	75934	2324		SCY	Cnidaria	Scyphozoa			Scyphozoa indet.	04/03/2021	1	02/12/2012	-38.5	173.8	125	
3657	27	87023	2453		ASC	Chordata	Ascidiacea	Stolidobranchia	Styelidae	Botrylloides	22/04/2021	1	29/01/2013	-48.9	166.8		198
3659	3	75997	2423		ASC	Chordata	Ascidiacea	Stolidobranchia	Styelidae	Asterocarpa humilis	22/04/2021	1	21/01/2013	-46.1	170.9	139	
3659	3	75994	2420		ASC	Chordata	Ascidiacea	Stolidobranchia	Pyuridae	Pyura picta	22/04/2021	1	21/01/2013	-46.1	170.9	139	
3676	43	75975	2376		ASC	Chordata	Ascidiacea			Ascidiacea indet.	22/04/2021	1	25/02/2013	-48.8	166.9	189	236
3682	4	87011	2441		SSQ	Mollusca	Cephalopoda	Sepiida	Sepiadariidae	Sepioloidea n.sp. I	27/10/2020	1	17/02/2013	-50.6	167.2	238	262
3716	39	87027	2458		ASC	Chordata	Ascidiacea	Aplousobranchia	Polyclinidae	Polyclinidae	22/04/2021	1	12/04/2013	-46.6	166.1		213
3716	45	87031	2466		ASC	Chordata	Ascidiacea	Aplousobranchia	Polyclinidae	Synoicum	22/04/2021	4	15/04/2013	-46.4	166.1	201	196
3751	10	87082	2544		SSQ	Mollusca	Cephalopoda	Sepiida	Sepiadariidae	Sepioloidea n.sp. I	27/10/2020	1	18/05/2013	-50.8	167.5		
3933	23	88622	2681		NAT	Arthropoda	Malacostraca	Decapoda	Spongicolidae	Spongiocaris n. sp. a	09/04/2021	2	11/11/2013	-33.5	167.7	677	546
4256	87	95107	3075		ASC	Chordata	Ascidiacea	Stolidobranchia	Styelidae	Cnemidocarpa hemprichi	22/04/2021	1	13/12/2014	-36.3	175.2	50	
4344	68	95127	3112		SSQ	Mollusca	Cephalopoda	Sepiida	Sepiadariidae	Sepioloidea n. sp. 300	27/10/2020	330	21/03/2015	-48.7	167.2	90	
4344	68	95127	3112		SSQ	Mollusca	Cephalopoda	Sepiida	Sepiadariidae	Sepioloidea n. sp. 300	27/10/2020	7	21/03/2015	-48.7	167.2	90	
4355	12	95148	3141		ASC	Chordata	Ascidiacea	Aplousobranchia		Aplousobranchia indet.	22/04/2021	2	27/03/2015	-46.1	170.9	148	216
4355	4	95141	3133	SOC	SOC	Cnidaria	Anthozoa	Alcyonacea	Alcyoniidae	Heteropolypus	29/03/2021	1	23/03/2015	-44.4	173	272	284
4459	32	119402	3201		SOC	Cnidaria	Anthozoa	Alcyonacea	Clavulariidae	Clavulariidae	23/03/2021	1	30/07/2015	-48.8	166.4	503	
4567	80	95247	3316		SSQ	Mollusca	Cephalopoda	Sepiida	Sepiadariidae	Sepioloidea	27/10/2020	1	10/01/2016	-43.6	-177.4	187	170
4642	40	95295	3372	ONG	ASC	Chordata	Ascidiacea	Aplousobranchia	Pseudodistomidae	Pseudodistoma	16/03/2021	1	10/04/2016	-34.7	172.6		
4669	23	95297	3374	SSQ	SSQ	Mollusca	Cephalopoda	Sepiida	Sepiadariidae	Sepioloidea n. sp. 300	09/12/2020	1	15/04/2016	-50.6	167.3	160	228
4869	5	106544	3540	OCT	ARN	Mollusca	Cephalopoda	Octopoda	Argonautidae	Argonauta argo	03/11/2020	2	03/12/2016	-38.0	174.1	103	
4874	30	106490	3448	UNI	ARN	Mollusca	Cephalopoda	Octopoda	Argonautidae	Argonauta argo	03/11/2020	4	13/12/2016	-38.6	173.8	107	
4874	30	106490	3448	UNI	ARN	Mollusca	Cephalopoda	Octopoda	Argonautidae	Argonauta argo	03/11/2020	1	13/12/2016	-38.6	173.8	107	
5063	47	106567	3612	DWO	AMP	Mollusca	Cephalopoda	Octopoda	Amphitretidae	Amphitretus pelagicus	03/11/2020	1	27/07/2017	-45.0	174.3	998	990

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5426	83	129019	4170	ECH	DHO	Echinodermata	Echinoidea	Camarodonta	Echinidae	Dermechinus horridus	19/03/2021	1	28/09/2018	-49.7	168	615	580
5438	97	129021	4151	UMB	CMT	Echinodermata	Crinoidea	Comatulida	Phrynocrinidae	Phrynocrinus nudus	24/03/2021	3	05/10/2018	-47.6	177.9		951
5451	18	129026	4165	ONG	ASC	Chordata	Ascidiacea	Aplousobranchia	Polyclinidae	Synoicum otagoensis	22/04/2021	3	17/09/2018	-50.2	168.2	536	572
5503	90	129058	4201	ONG	SOC	Cnidaria	Anthozoa	Alcyonacea	Alcyoniidae	Heteropolypus	24/03/2021	2	07/12/2018	-44.3	-177.5		515
5544	17	129097	4266	EGA	EGA	Mollusca	Bivalvia	Pholadomyida	Euciroidae	Euciroa galatheae	16/07/2020	2	08/01/2019	-42.9	176.9	411	385
5544	9	129099	4268	UNF	GAS	Mollusca	Gastropoda			Gastropoda eggs	16/07/2020	30	04/01/2019	-42.9	177	403	330
5581	27	129095	4261		SOC	Cnidaria	Anthozoa	Alcyonacea	Clavulariidae	Clavulariidae	24/03/2021	10	25/02/2019	-48.2	168.2	142	190
5626	52	131864	4392	AER	AER	Mollusca	Gastropoda	Neogastropoda CLADE (Order)	Buccinulidae	Aeneator recens	16/07/2020	1	30/05/2019	-51.0	167.2	490	502
5626	52	131871	4381	CMR	CMR	Mollusca	Gastropoda	Neogastropoda CLADE (Order)	Turbinellidae	Coluzea mariae	16/07/2020	1	30/05/2019	-51.0	167.2	490	502
5844	65	131929	4803		HDR	Cnidaria	Hydrozoa	Leptothecata	Lafoeidae	Acryptolaria operculata	22/02/2021	10	10/12/2019	-44.2	-174.5	807	943
5844	25	131935	4805	PYC	PYC	Arthropoda	Pycnogonida	Pantopoda	Colossendeidae	Colossendeis australis	29/03/2021	1	30/11/2019	-44.1	178.6	915	903
5844	142	131938	4812	UNF	DGR	Cnidaria	Anthozoa	Pennatulacea	Protoptilidae	Distichoptilum gracile	28/05/2020	1	27/12/2019	-42.9	-175	1169	
5844	65	131928	4800	COU	GLS	Porifera	Hexactinellida	Lyssacinosida	Rossellidae	Lanuginellinae	17/02/2021	1	10/12/2019	-44.2	-174.5	807	943
5844	65	131930	4802		TLO	Cnidaria	Anthozoa	Telestacea	Telestidae	Telestidae	07/07/2020	40	10/12/2019	-44.2	-174.5	807	943
5854	24	131915	4789	UNI	CLC	Porifera	Hexactinellida	Lyssacinosida	Rossellidae	Caulophacus (Caulophacus) discohexaster	18/02/2021	3	05/12/2019	-34.8	171.6	1050	1166
5854	25	131927	4798	UNI	CMT	Echinodermata	Crinoidea	Comatulida	Charitometridae	Charitometridae	24/03/2021	1	05/12/2019	-34.8	171.6	1050	1055
5854	25	131926	4799	UNI	ASC	Chordata	Ascidiacea	Stolidobranchia	Pyuridae	Culeolus hospitalis	16/03/2021	1	05/12/2019	-34.8	171.6	1050	1055
5854	24	131925	4795	UNI	DSO	Porifera	Demospongiae	Poecilosclerida	Phellodermidae	Echinostylinos n.sp. 1	29/04/2021	1	05/12/2019	-34.8	171.6	1050	1166
5854	24	131921	4793	ONG	DSO	Porifera	Demospongiae	Suberitida	Halichondriidae	Halichondria (Halichondria) n. sp. 8	29/04/2021	1	05/12/2019	-34.8	171.6	1050	1166
5854	37	131920	4791	COU	CMT	Echinodermata	Crinoidea	Comatulida	Phrynocrinidae	Phrynocrinus nudus	24/03/2021	1	10/12/2019	-41.4	176.3	1086	1120
5901	25	131975	4854	UNI	HDR	Cnidaria	Hydrozoa	Leptothecata	Plumulariidae	Plumulariidae	22/02/2021	1	2020				
5904	26	145299	5232	GSC	GSC	Arthropoda	Malacostraca	Decapoda	Majidae	Jacquinotia edwardsii	04/09/2020	1	26/02/2020	-49.9	166.2	233	174
5904	19	146427	5233	GSC	GSC	Arthropoda	Malacostraca	Decapoda	Majidae	Jacquinotia edwardsii	04/09/2020	1	22/02/2020	-50.7	167	150	161
5904	9	146431	5229	PHI	PHI	Echinodermata	Echinoidea	Clypeasteroida	Laganidae	Peronella hinemoae	24/03/2021	1	18/02/2020	-48.6	167.8	145	213
5918	106	146430	5240	UNF	SED					Sediment	16/03/2021	10	27/04/2020	-46.3	170.5	197	247
5980	41	146423	5220	ASC	ASC	Chordata	Ascidiacea	Aplousobranchia	Polyclinidae	Synoicum otagoensis	16/03/2021	2	06/08/2021				
6135	151	146464	5280	UNF	ARO	Cnidaria	Anthozoa	Alcyonacea	Alcyoniidae	Anthomastus	24/03/2021	1	30/11/2020	-44.9	-177	1124	1290
6135	101	146469	5286	OPH	AWA	Echinodermata	Ophiuroidea	Euryalida	Gorgonocephalidae	Astrothorax waitei	01/02/2021	2	24/11/2020	-44.2	-174.5	850	1180
6135	71	146492	5312	BTD	BTD	Echinodermata	Holothuroidea	Elasipodida	Psychropotidae	Benthodytes	12/03/2021	1	11/11/2020	-44.9	-177.1	1126	1310

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6135	174	146467	5283	GLS	FAR	Porifera	Hexactinellida	Sceptrulophora	Farreidae	Farrea similaris	29/04/2021	1	03/12/2020	-44.2	-174.6	850	1250
6135	40	146478	5296	GLS	FAR	Porifera	Hexactinellida	Sceptrulophora	Farreidae	Farrea similaris	29/04/2021	1	05/11/2020	-44.2	-174.5	815	1170
6135	23	146483	5302		MNI	Arthropoda	Malacostraca	Decapoda	Munididae	Munida isos	16/03/2021	2	03/11/2020	-44.6	-175.2	990	1280
6135	78	146484	5303	SED	OAB	Echinodermata	Ophiuroidea	Amphilepidida	Ophiactidae	Ophiactis abyssicola	29/03/2021	5	14/11/2020	-44.4	-178.7	680	850
6135	151	146476	5293		OPC	Echinodermata	Ophiuroidea	Euryalida	Euryalidae	Ophiocreas	16/02/2021	5	30/11/2020	-44.9	-177	1124	1290
6135	62	146498	5298	UNI	HDR	Cnidaria	Hydrozoa	Siphonophora	Rhodaliidae	Rhodaliidae	11/03/2021	1	09/11/2020	-43.0	-174.4	910	1125
6184	5	146473	5290	COR	NEE	Cnidaria	Hydrozoa	Leptothecata	Plumulariidae	Nemertesia elongata	22/02/2021	1	28/01/2022				
6194	70	146495	5324		SOC	Cnidaria	Anthozoa	Alcyonacea	Clavulariidae	Clavulariidae	23/03/2021	100	08/03/2021				
6194	70	146494	5323	ATP	HDR	Cnidaria	Hydrozoa			Hydrozoa indet.	09/03/2021	1	08/03/2021				
6196	81	146493	5316	UNF	HDR	Cnidaria	Hydrozoa	Leptothecata	Aglaopheniidae	Lytocarpia spiralis	08/03/2021	1	05/03/2022				
6223	9	146509	5342	ANT	GAS	Mollusca	Gastropoda	Umbraculida	Umbraculidae	Umbraculum	28/04/2021	1	21/04/2021				
6223	9	146509	5342	ANT	GAS	Mollusca	Gastropoda	Umbraculida	Umbraculidae	Umbraculum	28/04/2021	1	21/04/2021				
Seafire	007/83	154119			NAT	Arthropoda	Malacostraca	Decapoda	Pasiphaeidae	Eupasiphae gilesii	06/08/2020	1	15/09/2021				
Z10989		15833			HDR	Cnidaria	Hydrozoa	Leptothecata	Lafoeidae	Acryptolaria operculata	03/04/2021	1	22/01/2002	-33.9	167.9	1082	1082

(B) Research trawl samples

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TAN1801	54	126884	169	GAS	300	UNI					Animalia indet.	01/04/2021	1	16/01/2018	-44.3	-176.5	683	659	
TAN2001	85	141783	I326	WOD	2000	WOD					Wood	16/07/2020	1	23/01/2020	-44.6	176.8	1116	1097	
TAN1003	144	76701				APH	Arthropoda	Malacostraca	Amphipoda	Calliopiidae	Oradarea sp. 1	03/05/2021	1	04/04/2010	-42.9	174.1	1208		
TAN1008	37	76456				APH	Arthropoda	Malacostraca	Amphipoda	Lysianassidae	Phoxostoma sp. 1	03/05/2021	1	10/06/2010	-43.4	-180.0	401	407	
TAN9202	46	154122				APE	Arthropoda	Malacostraca	Decapoda	Acanthephyridae	Acanthephyra pelagica	06/08/2020	4	17/02/1992	-44.8	177.2	370	30	
TAN9202	46	154306				APE	Arthropoda	Malacostraca	Decapoda	Acanthephyridae	Acanthephyra pelagica	05/08/2020	6	17/02/1992	-44.8	177.2	370	30	
TAN9908	38	156902				APE	Arthropoda	Malacostraca	Decapoda	Acanthephyridae	Acanthephyra pelagica	21/04/2021	1	10/07/1999	-42.8	-180.0	958	1013	
DRY9602	2	11496				AFO	Arthropoda	Malacostraca	Decapoda	Aristeidae	Aristaeomorpha foliacea	21/04/2021	20	18/10/1996	-36.9	176.3	405		
TAN2001	32	147897	I589	PED	92	PED	Arthropoda	Malacostraca	Decapoda	Aristeidae	Aristaeopsis edwardsiana	13/04/2021	1	11/01/2020	-42.7	-178.8	892	900	
KAH9917	2	11960				ARI	Arthropoda	Malacostraca	Decapoda	Aristeidae	Aristeus mabahissae	21/04/2021	2	16/06/1999	-37.2	177.2	862		
TAN2001	51	147894	I114	PLM	23	ARI	Arthropoda	Malacostraca	Decapoda	Aristeidae	Aristeus mabahissae	13/04/2021	1	15/01/2020	-43.7	-174.3	932	924	
TAN2001	118	147896	I589	NAT	78	ARI	Arthropoda	Malacostraca	Decapoda	Aristeidae	Aristeus mabahissae	13/04/2021	1	28/01/2020	-42.7	175.8	1078	1058	
TAN9202	46	154120				GGI	Arthropoda	Malacostraca	Decapoda	Benthesicymidae	Gennadas	05/08/2020	1	17/02/1992	-44.8	177.2	370	30	
TAN9202	46	154124				GGI	Arthropoda	Malacostraca	Decapoda	Benthesicymidae	Gennadas	05/08/2020	3	17/02/1992	-44.8	177.2	370	30	
KAH0108	21	156107				URP	Arthropoda	Malacostraca	Decapoda	Chirostylidae	Uroptychus belli	08/03/2021	15	04/09/2001	-43.1	175.8	467		
KAH0001	71	154065				PCT	Arthropoda	Malacostraca	Decapoda	Crangonidae	Philocheras acutirostratus	17/08/2020	4	19/02/2000	-37.4	178.2	0	299	
KAH0004	74	83654				PAG	Arthropoda	Malacostraca	Decapoda	Diogenidae	Areopaguristes pilosus	06/05/2021	1	06/04/2000	-41.4	171.4	143	145	
KAH0004	64	157002				PAG	Arthropoda	Malacostraca	Decapoda	Diogenidae	Areopaguristes pilosus	06/05/2021	1	03/04/2000	-41.8	171.3	138	140	
KAH9809	112	17750				PAG	Arthropoda	Malacostraca	Decapoda	Diogenidae	Areopaguristes setosus	06/05/2021	2		-45.1	171.7	134		
KAH9809	62	17758				PAG	Arthropoda	Malacostraca	Decapoda	Diogenidae	Areopaguristes setosus	06/05/2021	6	30/12/1998	-43.6	173.9	105	106	
TAN9812	5	41608				NEB	Arthropoda	Malacostraca	Decapoda	Lithodidae	Neolithodes brodiei	06/05/2021	2	30/09/1998	-44.1	178.5	952		
TAN2001	50	147892	I108	GAL	10	GAL	Arthropoda	Malacostraca	Decapoda	Munidopsidae	Munidopsis victoriae	16/03/2021	18	15/01/2020	-43.1	-174.2	1066	1047	
TAN2001	61	147917	I111	WOD	1231	GAL	Arthropoda	Malacostraca	Decapoda	Munidopsidae	Munidopsis victoriae	16/03/2021	5	18/01/2020	-44.3	-178.4	630	641	
TAN9908	38	156901				LHO	Arthropoda	Malacostraca	Decapoda	Nematocarcinidae	Lipkius holthuisi	21/04/2021	6	10/07/1999	-42.8	-180.0	958	1013	
TAN9202	46	154123				ONO	Arthropoda	Malacostraca	Decapoda	Oplophoridae	Oplophorus novaezeelandiae	05/08/2020	1	17/02/1992	-44.8	177.2	370	30	
KAH9704	8	12109				NCA	Arthropoda	Malacostraca	Decapoda	Ovalipidae	Nectocarcinus antarcticus	06/02/2021	1	04/12/1997	-43.4	173.2	35	35	
KAH9704	12	12927				NCA	Arthropoda	Malacostraca	Decapoda	Ovalipidae	Nectocarcinus antarcticus	06/05/2021	2	05/12/1997	-43.5	173.6	114	113	
KAH9809	119	13126				NCA	Arthropoda	Malacostraca	Decapoda	Ovalipidae	Nectocarcinus antarcticus	06/05/2021	2		-44.4	172.1	63		

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KAH0014	88	13127				NCA	Arthropoda	Malacostraca	Decapoda	Ovalipidae	Nectocarcinus antarcticus	06/05/2021	1	30/12/2000	-43.7	173.9	111		
KAH9915	49	13129				NCA	Arthropoda	Malacostraca	Decapoda	Ovalipidae	Nectocarcinus antarcticus	06/05/2021	2	01/01/2000	-45.5	171.1	97		
TAN0001	79	13132				NCA	Arthropoda	Malacostraca	Decapoda	Ovalipidae	Nectocarcinus antarcticus	06/05/2021	1	12/01/2000	-43.5	177.2	254	246	
KAH9809	104	83738				NCA	Arthropoda	Malacostraca	Decapoda	Ovalipidae	Nectocarcinus antarcticus	06/05/2021	1	08/01/1999	-44.2	172.0	40		
KAH9915	64	157004				PAD	Arthropoda	Malacostraca	Decapoda	Ovalipidae	Ovalipes catharus	06/05/2021	2	25/10/1999	-36	173.7	43		
TAN9801	30	13142				OVM	Arthropoda	Malacostraca	Decapoda	Ovalipidae	Ovalipes molleri	06/05/2021	5	08/01/1998	-43.2	-177.0	327	310	
TAN9801	30	13143				OVM	Arthropoda	Malacostraca	Decapoda	Ovalipidae	Ovalipes molleri	06/05/2021	4	08/01/1998	-43.2	-177.0	327	310	
TAN9801	30	13157				OVM	Arthropoda	Malacostraca	Decapoda	Ovalipidae	Ovalipes molleri	06/05/2021	4	08/01/1998	-43.2	-177.0	327	310	
KAH9801	21	17674				DIR	Arthropoda	Malacostraca	Decapoda	Paguridae	Diacanthurus rubricatus	18/03/2021	4	21/01/1998	-37.6	176.8	360		
KAH9801	25	17685				DIR	Arthropoda	Malacostraca	Decapoda	Paguridae	Diacanthurus rubricatus	18/03/2021	10	22/01/1998	-37.2	176.2	224		
KAH9906	2	17741				DIR	Arthropoda	Malacostraca	Decapoda	Paguridae	Diacanthurus rubricatus	16/03/2021	18	08/05/1999	-41.1	176.4	351		
KAH9906	3	17742				DIR	Arthropoda	Malacostraca	Decapoda	Paguridae	Diacanthurus rubricatus	16/03/2021	3	08/05/1999	-41.1	176.4	404		
KAH9809	71	17743				DIR	Arthropoda	Malacostraca	Decapoda	Paguridae	Diacanthurus rubricatus	16/03/2021	2	31/12/1998	-44.5	171.9	78	78	
KAH9906	1	17745				DIR	Arthropoda	Malacostraca	Decapoda	Paguridae	Diacanthurus rubricatus	16/03/2021	1	08/05/1999	-41.1	176.4	309		
KAH9809	58	17746				DIR	Arthropoda	Malacostraca	Decapoda	Paguridae	Diacanthurus rubricatus	16/03/2021	2	29/12/1998	-43	173.7	303		
KAH9809	65	17749				DIR	Arthropoda	Malacostraca	Decapoda	Paguridae	Diacanthurus rubricatus	16/03/2021	1	30/12/1998	-43.7	174.0	231	219	
KAH9906	2	17751				DIR	Arthropoda	Malacostraca	Decapoda	Paguridae	Diacanthurus rubricatus	16/03/2021	2	08/05/1999	-41.1	176.4	351		
KAH9906	6	17752				DIR	Arthropoda	Malacostraca	Decapoda	Paguridae	Diacanthurus rubricatus	16/03/2021	2	09/05/1999	-41.1	176.4	353		
KAH9910	4	17753				DIR	Arthropoda	Malacostraca	Decapoda	Paguridae	Diacanthurus rubricatus	16/03/2021	2	15/07/1999	-41.1	176.4	346		
KAH9910	1	17754				DIR	Arthropoda	Malacostraca	Decapoda	Paguridae	Diacanthurus rubricatus	16/03/2021	2	15/07/1999	-41.1	176.4	400		
KAH9910	10	17757				DIR	Arthropoda	Malacostraca	Decapoda	Paguridae	Diacanthurus rubricatus	16/03/2021	15	16/07/1999	-41.1	176.4	302		
KAH9910	5	17760				DIR	Arthropoda	Malacostraca	Decapoda	Paguridae	Diacanthurus rubricatus	16/03/2021	9	15/07/1999	-41.1	176.4	294		
KAH9906	7	17762				DIR	Arthropoda	Malacostraca	Decapoda	Paguridae	Diacanthurus rubricatus	16/03/2021	4	09/05/1999	-41.1	176.4	401		
KAH9906	6	17763				DIR	Arthropoda	Malacostraca	Decapoda	Paguridae	Diacanthurus rubricatus	16/03/2021	14	09/05/1999	-41.1	176.4	353		
KAH9906	5	17764				DIR	Arthropoda	Malacostraca	Decapoda	Paguridae	Diacanthurus rubricatus	16/03/2021	23	09/05/1999	-41.1	176.4	315		
KAH9906	1	17765				DIR	Arthropoda	Malacostraca	Decapoda	Paguridae	Diacanthurus rubricatus	16/03/2021	12	08/05/1999	-41.1	176.4	309		
KAH0004	52	155820				DIR	Arthropoda	Malacostraca	Decapoda	Paguridae	Diacanthurus rubricatus	16/03/2021	1	29/03/2000	-43.1	169.8	184		
KAH0004	76	155938				DIR	Arthropoda	Malacostraca	Decapoda	Paguridae	Diacanthurus rubricatus	16/03/2021	1	06/04/2000	-41.5	171.4	136	139	
KAH0004	65	155940				DIR	Arthropoda	Malacostraca	Decapoda	Paguridae	Diacanthurus rubricatus	16/03/2021	1	03/04/2000	-42.2	171.1	118		

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KAH0004	85	155941				DIR	Arthropoda	Malacostraca	Decapoda	Paguridae	Diacanthurus rubricatus	16/03/2021	1	20/04/2000	-40.8	172.0	109		
KAH0004	77	155942				DIR	Arthropoda	Malacostraca	Decapoda	Paguridae	Diacanthurus rubricatus	16/03/2021	2	12/04/2000	-41.6	171.2	151		
KAH0014	7	155943				DIR	Arthropoda	Malacostraca	Decapoda	Paguridae	Diacanthurus rubricatus	16/03/2021	1	11/12/2000	-43.4	172.8	25		
KAH0004	79	155944				DIR	Arthropoda	Malacostraca	Decapoda	Paguridae	Diacanthurus rubricatus	16/03/2021	4	07/04/2000	-43.3	169.5	303	302	
KAH0004	81	155945				DIR	Arthropoda	Malacostraca	Decapoda	Paguridae	Diacanthurus rubricatus	16/03/2021	3	16/04/2000	-43.4	169.4	336		
KAH0014	104	155946				DIR	Arthropoda	Malacostraca	Decapoda	Paguridae	Diacanthurus rubricatus	16/03/2021	1	03/01/2001	-44.3	172.5	70		
KAH0004	69	155948				DIR	Arthropoda	Malacostraca	Decapoda	Paguridae	Diacanthurus rubricatus	16/03/2021	5	04/04/2000	-42.9	170.2	131	137	
KAH0004	70	155949				DIR	Arthropoda	Malacostraca	Decapoda	Paguridae	Diacanthurus rubricatus	16/03/2021	2	05/04/2000	-42.8	170.4	75	80	
KAH0004	68	155951				DIR	Arthropoda	Malacostraca	Decapoda	Paguridae	Diacanthurus rubricatus	16/03/2021	2	04/04/2000	-42.9	170.1	163		
KAH9801	14	156001				DIR	Arthropoda	Malacostraca	Decapoda	Paguridae	Diacanthurus rubricatus	18/03/2021	1	19/01/1998	-37.5	176.6	251		
KAH9801	1	156002				DIR	Arthropoda	Malacostraca	Decapoda	Paguridae	Diacanthurus rubricatus	18/03/2021	9	17/01/1998	-37.5	176.5	247		
KAH9801	11	156003				DIR	Arthropoda	Malacostraca	Decapoda	Paguridae	Diacanthurus rubricatus	18/03/2021	6	19/01/1998	-37.4	176.4	303		
KAH9801	14	156004				DIR	Arthropoda	Malacostraca	Decapoda	Paguridae	Diacanthurus rubricatus	18/03/2021	5	19/01/1998	-37.5	176.6	251		
KAH9801	9	156005				DIR	Arthropoda	Malacostraca	Decapoda	Paguridae	Diacanthurus rubricatus	18/03/2021	14	18/01/1998	-37.6	176.7	242		
KAH9801	17	156006				DIR	Arthropoda	Malacostraca	Decapoda	Paguridae	Diacanthurus rubricatus	18/03/2021	9	20/01/1998	-37.6	177.2	205		
KAH0102	6	156007				DIR	Arthropoda	Malacostraca	Decapoda	Paguridae	Diacanthurus rubricatus	18/03/2021	4	31/01/2001	-37.5	176.6	301		
KAH9809	117	156008				DIR	Arthropoda	Malacostraca	Decapoda	Paguridae	Diacanthurus rubricatus	18/03/2021	2		-44.6	171.9	83		
DRY9601	5	156010				DIR	Arthropoda	Malacostraca	Decapoda	Paguridae	Diacanthurus rubricatus	18/03/2021	3	25/09/1996	-36.9	176.3	368		
KAH9801	38	156014				DIR	Arthropoda	Malacostraca	Decapoda	Paguridae	Diacanthurus rubricatus	18/03/2021	6	24/01/1998	-36.6	176.2	288		
KAH0004	73	156015				DIR	Arthropoda	Malacostraca	Decapoda	Paguridae	Diacanthurus rubricatus	18/03/2021	2	08/04/2000	-42.8	170.8	42		
KAH0001	72	156016				DIR	Arthropoda	Malacostraca	Decapoda	Paguridae	Diacanthurus rubricatus	18/03/2021	1	20/02/2000	-37.5	177.1	339	360	
DRY9602	9	156090				DIR	Arthropoda	Malacostraca	Decapoda	Paguridae	Diacanthurus rubricatus	19/03/2021	1	20/10/1996	-37	176.3	417		
KAH0102	4	156101				DIR	Arthropoda	Malacostraca	Decapoda	Paguridae	Diacanthurus rubricatus	18/03/2021	4	31/01/2001	-37.6	176.7	370		
KAH9704	16	156104				DIR	Arthropoda	Malacostraca	Decapoda	Paguridae	Diacanthurus rubricatus	18/03/2021	5	05/12/1997	-43.8	173.3	81	72	
KAH9801	31	156111				DIR	Arthropoda	Malacostraca	Decapoda	Paguridae	Diacanthurus rubricatus	19/03/2021	2	23/01/1998	-36.9	176.3	307		
KAH9801	10	156112				DIR	Arthropoda	Malacostraca	Decapoda	Paguridae	Diacanthurus rubricatus	19/03/2021	6	19/01/1998	-37.3	176.4	297		
KAH9801	10	156113				DIR	Arthropoda	Malacostraca	Decapoda	Paguridae	Diacanthurus rubricatus	19/03/2021	3	19/01/1998	-37.3	176.4	297		
DRY9601	8	156114				DIR	Arthropoda	Malacostraca	Decapoda	Paguridae	Diacanthurus rubricatus	19/03/2021	3	26/09/1996	-37	176.3	375		
KAH9801	19	156115				DIR	Arthropoda	Malacostraca	Decapoda	Paguridae	Diacanthurus rubricatus	19/03/2021	4	20/01/1998	-37.5	177.1	323		

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KAH9801	18	156116				DIR	Arthropoda	Malacostraca	Decapoda	Paguridae	Diacanthurus rubricatus	19/03/2021	4	20/01/1998	-37.6	177.1			
KAH9801	34	156117				DIR	Arthropoda	Malacostraca	Decapoda	Paguridae	Diacanthurus rubricatus	19/03/2021	5	24/01/1998	-36.9	176.2	247		
KAH9801	35	156118				DIR	Arthropoda	Malacostraca	Decapoda	Paguridae	Diacanthurus rubricatus	19/03/2021	2	24/01/1998	-36.9	176.2	200		
KAH9801	2	156119				DIR	Arthropoda	Malacostraca	Decapoda	Paguridae	Diacanthurus rubricatus	19/03/2021	2	17/01/1998	-37.5	176.6	330		
KAH9704	12	155815				PAG	Arthropoda	Malacostraca	Decapoda	Paguridae	Diacanthurus spinulimanus	16/03/2021	2	05/12/1997	-43.5	173.6	114	113	
KAH9704	13	155816				PAG	Arthropoda	Malacostraca	Decapoda	Paguridae	Diacanthurus spinulimanus	16/03/2021	2	05/12/1987	-43.5	173.6	88	90	
KAH9704	14	155818				PAG	Arthropoda	Malacostraca	Decapoda	Paguridae	Diacanthurus spinulimanus	16/03/2021	1	05/12/1997	-43.7	173.6	89	88	
KAH0004	43	156124				PAG	Arthropoda	Malacostraca	Decapoda	Paguridae	Lophopagurus cf. cristatus	19/03/2021	4	26/03/2000	-43.3	169.9	74	73	
KAH0004	72	156125				PAG	Arthropoda	Malacostraca	Decapoda	Paguridae	Lophopagurus cf. cristatus	19/03/2021	6	07/04/2000	-42.7	170.6	60		
KAH9809	119	16973				PAG	Arthropoda	Malacostraca	Decapoda	Paguridae	Lophopagurus cristatus	18/03/2021	2		-44.4	172.1	63		
KAH0004	40	156120				PAG	Arthropoda	Malacostraca	Decapoda	Paguridae	Lophopagurus cristatus	19/03/2021	1	25/03/2000	-43.5	169.5	63	69	
KAH9704	14	16974				PAG	Arthropoda	Malacostraca	Decapoda	Paguridae	Lophopagurus foresti	18/03/2021	1	05/12/1997	-43.7	173.6	89	88	
KAH9809	119	16976				PAG	Arthropoda	Malacostraca	Decapoda	Paguridae	Lophopagurus foresti	19/03/2021	2		-44.4	172.1	63		
KAH0108	21	156105				PAG	Arthropoda	Malacostraca	Decapoda	Paguridae	Lophopagurus foresti	08/03/2021	3	04/09/2001	-43.1	175.8	467		
TAN0012	45	156121				PAG	Arthropoda	Malacostraca	Decapoda	Paguridae	Lophopagurus foresti	19/03/2021	1	07/12/2000	-49.2	167.9	702		
KAH0109	22	156122				PAG	Arthropoda	Malacostraca	Decapoda	Paguridae	Lophopagurus foresti	19/03/2021	1	30/10/2001	-43.1	175.8	441		
KAH0108	21	156123				PAG	Arthropoda	Malacostraca	Decapoda	Paguridae	Lophopagurus foresti	19/03/2021	13	04/09/2001	-43.1	175.8	467		
KAH0004	35	16970				PAG	Arthropoda	Malacostraca	Decapoda	Paguridae	Lophopagurus lacertosus	18/03/2021	4	24/03/2000	-43.4	169.4	127	133	
KAH0108	21	156106				PFI	Arthropoda	Malacostraca	Decapoda	Paguridae	Porcellanopagurus filholi	08/03/2021	2	04/09/2001	-43.1	175.8	467		
OFR9901	4	154683				PPA	Arthropoda	Malacostraca	Decapoda	Palinuridae	Projasus parkeri	24/11/2020	1	24/06/1998	-36.5	176.5	912		
KAH9910	3	156102				SDM	Arthropoda	Malacostraca	Decapoda	Parapaguridae	Sympagurus dimorphus	18/03/2021	41	15/07/1999	-41.1	176.4	446		
TAN9202	46	154314				AAT	Arthropoda	Malacostraca	Decapoda	Pasiphaeidae	Alainopasiphaea australis	06/08/2020	1	17/02/1992	-44.8	177.2	370	30	
TAN9202	46	154313				NAT	Arthropoda	Malacostraca	Decapoda	Pasiphaeidae	Pasiphaea barnardi	06/08/2020	1	17/02/1992	-44.8	177.2	370	30	
KAH9915	42	16853				CRB	Arthropoda	Malacostraca	Decapoda	Raninidae	Lyreidus tridentatus	06/05/2021	1	23/10/1999	-34.7	172.6	117		
TAN9202	24	154305				SER	Arthropoda	Malacostraca	Decapoda	Sergestidae	Eusergestes antarcticus	05/08/2020	25	14/02/1992	-47	174.6	300	50	
DRY9602	1	11498				HSI	Arthropoda	Malacostraca	Decapoda	Solenoceridae	Haliporoides sibogae	21/04/2021	10	18/10/1996	-37	176.3	395		
DRY9602	4	11509				HSI	Arthropoda	Malacostraca	Decapoda	Solenoceridae	Haliporoides sibogae	21/04/2021	10	19/10/1996	-36.9	176.3	421		
DRY9602	10	11510				HSI	Arthropoda	Malacostraca	Decapoda	Solenoceridae	Haliporoides sibogae	21/04/2021	7	20/10/1996	-36.9	176.3	415		
DRY9601	7	11512				HSI	Arthropoda	Malacostraca	Decapoda	Solenoceridae	Haliporoides sibogae	21/04/2021	5	25/09/1996	-36.9	176.3	400		

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DRY9601	12	11513				HSI	Arthropoda	Malacostraca	Decapoda	Solenoceridae	Haliporoides sibogae	21/04/2021	8	29/09/1996	-37	176.3	386		
DRY9601	3	11515				HSI	Arthropoda	Malacostraca	Decapoda	Solenoceridae	Haliporoides sibogae	21/04/2021	15	24/09/1996	-36.9	176.3	357		
DRY9601	9	11528				HSI	Arthropoda	Malacostraca	Decapoda	Solenoceridae	Haliporoides sibogae	21/04/2021	15	26/09/1996	-36.9	176.3	369		
DRY9602	7	11803				HSI	Arthropoda	Malacostraca	Decapoda	Solenoceridae	Haliporoides sibogae	21/04/2021	15	20/10/1996	-37	176.3	405		
DRY9602	9	11806				HSI	Arthropoda	Malacostraca	Decapoda	Solenoceridae	Haliporoides sibogae	21/04/2021	15	20/10/1996	-37	176.3	417		
DRY9601	8	11825				HSI	Arthropoda	Malacostraca	Decapoda	Solenoceridae	Haliporoides sibogae	21/04/2021	25	26/09/1996	-37	176.3	375		
DRY9601	11	11826				HSI	Arthropoda	Malacostraca	Decapoda	Solenoceridae	Haliporoides sibogae	21/04/2021	20	29/09/1996	-36.9	176.3	411		
DRY9601	10	11830				HSI	Arthropoda	Malacostraca	Decapoda	Solenoceridae	Haliporoides sibogae	21/04/2021	20	26/09/1996	-37	176.3	420		
DRY9601	1	11832				HSI	Arthropoda	Malacostraca	Decapoda	Solenoceridae	Haliporoides sibogae	21/04/2021	20	24/09/1996	-36.9	176.3	400		
DRY9601	5	11833				HSI	Arthropoda	Malacostraca	Decapoda	Solenoceridae	Haliporoides sibogae	21/04/2021	40	25/09/1996	-36.9	176.3	368		
DRY9601	4	11835				HSI	Arthropoda	Malacostraca	Decapoda	Solenoceridae	Haliporoides sibogae	21/04/2021	10	25/09/1996	-37	176.3	382		
DRY9601	6	11836				HSI	Arthropoda	Malacostraca	Decapoda	Solenoceridae	Haliporoides sibogae	21/04/2021	20	25/09/1996	-37	176.3	377		
DRY9602	12	11838				HSI	Arthropoda	Malacostraca	Decapoda	Solenoceridae	Haliporoides sibogae	21/04/2021	20	21/10/1996	-36.9	176.3	410		
TAN0101	117	14291				TFA	Arthropoda	Malacostraca	Decapoda	Trichopeltariidae	Trichopeltarion fantasticum	06/05/2021	1	20/01/2001	-44.2	173.6	464		
TAN0101	113	14299				TFA	Arthropoda	Malacostraca	Decapoda	Trichopeltariidae	Trichopeltarion fantasticum	06/05/2021	1	19/01/2001	-43.8	174.6	526		
TAN0001	48	16554				TFA	Arthropoda	Malacostraca	Decapoda	Trichopeltariidae	Trichopeltarion fantasticum	06/05/2021	1	05/01/2000			391		
V416B		16562				TFA	Arthropoda	Malacostraca	Decapoda	Trichopeltariidae	Trichopeltarion fantasticum	06/05/2021	1	06/09/1992	-42.6	170.5	577		
KAH9501	64	157003				TFA	Arthropoda	Malacostraca	Decapoda	Trichopeltariidae	Trichopeltarion fantasticum	06/05/2021	1	19/01/1995	-39.8	177.5	408	431	
TAN9202	46	154121				ZTA	Arthropoda	Malacostraca	Euphausiacea	Euphausiidae	Thysanopoda acutifrons	05/08/2020	2	17/02/1992	-44.8	177.2	370	30	
TAN2001	61	147918	I111	WOD	1231	ISO	Arthropoda	Malacostraca	Isopoda	Munnidae	Uromunna cf. schauinslandi	03/05/2021	1	18/01/2020	-44.3	-178.4	630	641	
X536		154298				NEI	Arthropoda	Malacostraca	Lophogastrida (Mysidacea)	Lophogastridae	Neognathophausia ingens	02/07/2020	1	14/07/1994	-42.8	-175.2	1363		
X498		154334				NEI	Arthropoda	Malacostraca	Lophogastrida (Mysidacea)	Lophogastridae	Neognathophausia ingens	02/07/2020	1	07/07/1994	-43.8	-174.4	926		
TAN0701	11	27618				ASC	Chordata	Ascidiacea			Ascidiacea indet.	16/03/2021	1	30/12/2006	-43.5	178.3	348	361	
AEX9901	6	76821				ASC	Chordata	Ascidiacea			Ascidiacea indet.	16/03/2021	1	23/06/1999	-42.6	-179.9	1173	1173	
KAH0014	89	100402	MNP0847, ID#: 848		13	ASC	Chordata	Ascidiacea	Aplousobranchia		Aplousobranchia indet.	16/03/2021	1	30/12/2000	-43.7	173.8	97	95	
KAH9801	26	145349				ASC	Chordata	Ascidiacea	Aplousobranchia	Polyclinidae	Aplidium orthium	03/03/2021	1	22/01/1998	-37.1	176.2	205		
TAN0601	26	76419		ONG		ASC	Chordata	Ascidiacea	Aplousobranchia	Polyclinidae	Synoicum	16/03/2021	4	01/01/2006	-43.9	-179.2	287	311	
TAN0101	8	16440				ASC	Chordata	Ascidiacea	Aplousobranchia	Polyclinidae	Synoicum otagoensis	16/03/2021	1	30/12/2000	-43.1	178.3	341		
TAN0601	27	67225				ASC	Chordata	Ascidiacea	Aplousobranchia	Polyclinidae	Synoicum otagoensis	22/04/2021	1	01/01/2006	-43.9	-179.2	294	296	

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TAN9701	59	77011				ASC	Chordata	Ascidiacea	Aplousobranchia	Polyclinidae	Synoicum otagoensis	03/03/2021	1	13/01/1997	-44.1	-178.6	482	483	
KAH9704	12	145875				ASC	Chordata	Ascidiacea	Stolidobranchia	Pyuridae	Pyura picta	22/04/2021	1	05/12/1997	-43.5	173.6	114	113	
KAH0014	113	139514				ASC	Chordata	Ascidiacea	Stolidobranchia	Styelidae	Cnemidocarpa stewartensis	16/03/2021	1	04/01/2000	-44.1	173.4	120	121	
TAN2001	36	147899	I633	PTU	40	PTU	Cnidaria	Anthozoa	Pennatulacea		Pennatulacea indet.	29/03/2021	1	12/01/2020	-43.2	-178.0	498	496	
TAN0701	18	27636		PTY		HWL	Cnidaria	Anthozoa	Pennatulacea	Halipteridae	Halipteris willemoesi	27/05/2020	2	31/12/2006	-43	-179.7	574	579	
TAN2001	36	147893	I632	PTU	29	HWL	Cnidaria	Anthozoa	Pennatulacea	Halipteridae	Halipteris willemoesi	29/03/2021	1	12/01/2020	-43.2	-178.0	498	496	
TAN2001	28	147895	I41	AGF	24	HWL	Cnidaria	Anthozoa	Pennatulacea	Halipteridae	Halipteris willemoesi	29/03/2021	1	11/01/2020	-43.1	-179.3	548	547	
DRY9602	11	92836				UMB	Cnidaria	Anthozoa	Pennatulacea	Umbellulidae	Umbellula	27/05/2020	1	21/10/1996	-37	176.3	415		
KAH9906	6	92837				UMB	Cnidaria	Anthozoa	Pennatulacea	Umbellulidae	Umbellula	27/05/2020	1	09/05/1999	-41.1	176.4	353		
DRY9602	7	92838				UMB	Cnidaria	Anthozoa	Pennatulacea	Umbellulidae	Umbellula	27/05/2020	1	20/10/1996	-37	176.3	405		
KAH9801	3	92841				UMB	Cnidaria	Anthozoa	Pennatulacea	Umbellulidae	Umbellula	27/05/2020	1	17/01/1998	-37.5	176.7	460		
TAN9511	68	92843				UMB	Cnidaria	Anthozoa	Pennatulacea	Umbellulidae	Umbellula	27/05/2020	1	16/10/1995			1126		
TAN0501	58	25538				HDR	Cnidaria	Hydrozoa			Hydrozoa indet.	04/03/2021	1	06/01/2005	-43.6	-178.8	447	442	
KAH9917	60	15849				HDF	Cnidaria	Hydrozoa	Anthoathecata	Solanderiidae	Solanderia ericopsis	04/03/2021	1	16/12/1999	-43.2	173.2	42		
KAH9915	40	5996				HDF	Cnidaria	Hydrozoa	Leptothecata	Aglaopheniidae	Lytocarpia spiralis	04/03/2021	1	22/10/1999	-36.9	174.3	46	47	
X542		97289				HDF	Cnidaria	Hydrozoa	Leptothecata	Lafoeidae	Acryptolaria	04/03/2021	1	15/07/1994	-42.8	-177.3	987	996	
TAN1101	36	70527				ZSP	Cnidaria	Hydrozoa	Siphonophora	Rhodaliidae	Rhodaliidae	04/03/2021	1	09/01/2011	-42.8	-175.8	1010	1033	
TAN2001	50	141793	I10	UNI	165	ZSP	Cnidaria	Hydrozoa	Siphonophora	Rhodaliidae	Rhodaliidae	04/03/2021	2	15/01/2020	-43.1	-174.2	1066	1047	
TAN2001	37	141794	I65			ZSP	Cnidaria	Hydrozoa	Siphonophora	Rhodaliidae	Rhodaliidae	04/03/2021	1	13/01/2020	-42.8	-176.5	1140	1134	
TAN2001	50	147876	I110	UNI	165	ZSP	Cnidaria	Hydrozoa	Siphonophora	Rhodaliidae	Rhodaliidae	04/03/2021	1	15/01/2020	-43.1	-174.2	1066	1047	
TAN2001	37	147879	I64	UNI	23	ZSP	Cnidaria	Hydrozoa	Siphonophora	Rhodaliidae	Rhodaliidae	04/03/2021	1	13/01/2020	-42.8	-176.5	1140	1134	
TAN9805	6	155835				ZSP	Cnidaria	Hydrozoa	Siphonophora	Rhodaliidae	Rhodaliidae	04/03/2021	1	09/04/1998	-46.8	166.9	755	777	
TAN1003	89	76505		JFI		SCY	Cnidaria	Scyphozoa			Scyphozoa indet.	04/03/2021	1	29/03/2010	-41.2	176.5	1151		
TAN1208	24	85034	41	JFI	10	SCY	Cnidaria	Scyphozoa			Scyphozoa indet.	05/03/2021	1	16/06/2012	-42.3	179.4	1639	2425	
TAN1208	25	85155	72	JFI	200	SCY	Cnidaria	Scyphozoa	Coronatae	Atollidae	Atolla	05/03/2021	1	16/06/2012	-42.2	179.4	2613	2613	
TAN1208	26	85156		JFI		SCY	Cnidaria	Scyphozoa	Coronatae	Atollidae	Atolla	05/03/2021	2	17/06/2012	-42	179.7	2730	2730	
TAN1208	47	85278	202	JFI	200	SCY	Cnidaria	Scyphozoa	Coronatae	Atollidae	Atolla	05/03/2021	2	21/06/2012	-42.3	179.5	2508	2508	
TAN0408	22	155658				ASR	Echinodermata	Asteroidea	Forcipulatida	Stichasteridae	Smilasterias actinata	21/01/2021	1	12/07/2004	-42.7	-177.9	958	968	
X540		24337				BES	Echinodermata	Asteroidea	Notomyotida	Benthopectinidae	Benthopecten	30/03/2021	2	15/07/1994	-42.7	-175.5	1482		

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TAN9701	105	24338				BES	Echinodermata	Asteroidea	Notomyotida	Benthopectinidae	Benthopecten munidae	30/03/2021	1	22/01/1997	-43.2	178.4	372	386	
TAN0201	74	24343				BES	Echinodermata	Asteroidea	Notomyotida	Benthopectinidae	Benthopecten munidae	30/03/2021	1	09/01/2002	-43.5	179.8	415		
TAN0201	123	24344				BES	Echinodermata	Asteroidea	Notomyotida	Benthopectinidae	Benthopecten munidae	30/03/2021	1	18/01/2002	-43.1	174.1	745		
TAN0201	123	24342				BES	Echinodermata	Asteroidea	Notomyotida	Benthopectinidae	Benthopecten pikei	30/03/2021	1	18/01/2002	-43.1	174.1	745		
TAN0201	34	24345				BES	Echinodermata	Asteroidea	Notomyotida	Benthopectinidae	Benthopecten pikei	30/03/2021	1	03/01/2002	-43	179.2	535		
KAH9401	18	155662				PSG	Echinodermata	Asteroidea	Paxillosida	Pseudarchasteridae	Pseudarchaster garricki	22/01/2021	2	08/01/1994	-36.6	176.2	305	304	
TAN9701	59	114961				ECS	Echinodermata	Asteroidea	Spinulosida	Echinasteridae	Henricia aucklandiae	30/03/2021	1	13/01/1997	-44.1	-178.6	482	483	
KAH0001	62	117788				ASR	Echinodermata	Asteroidea	Valvatida	Goniasteridae	Anthenoides cristatus	30/03/2021	1	17/02/2000	-36.3	176.1	242	237	
KAH0001	75	117791				ASR	Echinodermata	Asteroidea	Valvatida	Goniasteridae	Anthenoides cristatus	30/03/2021	1	20/02/2000	-37.5	176.6	324	294	
KAH9401	18	155663				ASR	Echinodermata	Asteroidea	Valvatida	Goniasteridae	Anthenoides epixanthus	22/01/2021	1	08/01/1994	-36.6	176.2	305	304	
KAH0102	2	117787				ASR	Echinodermata	Asteroidea	Valvatida	Goniasteridae	Anthenoides granulosus	30/03/2021	1	31/01/2001	-37.5	177.1	321		
KAH0001	72	117789				ASR	Echinodermata	Asteroidea	Valvatida	Goniasteridae	Anthenoides granulosus	30/03/2021	3	20/02/2000	-37.5	177.1	339	360	
KAH0102	2	117790				ASR	Echinodermata	Asteroidea	Valvatida	Goniasteridae	Anthenoides granulosus	30/03/2021	6	31/01/2001	-37.5	177.1	321		
KAH0001	72	117792				ASR	Echinodermata	Asteroidea	Valvatida	Goniasteridae	Anthenoides granulosus	30/03/2021	4	20/02/2000	-37.5	177.1	339	360	
KAH0001	66	117793				ASR	Echinodermata	Asteroidea	Valvatida	Goniasteridae	Anthenoides granulosus	30/03/2021	1	18/02/2000	-36.2	176.2	343	336	
KAH0102	2	117794				ASR	Echinodermata	Asteroidea	Valvatida	Goniasteridae	Anthenoides granulosus	30/03/2021	1	31/01/2001	-37.5	177.1	321		
KAH0102	2	117795				ASR	Echinodermata	Asteroidea	Valvatida	Goniasteridae	Anthenoides granulosus	30/03/2021	3	31/01/2001	-37.5	177.1	321		
TAN0219	104	47748				MAT	Echinodermata	Asteroidea	Valvatida	Goniasteridae	Mediaster arcuatus	30/03/2021	1	19/12/2002	-46.8	166.8	918	927	
TAN9812	8	115863				MAT	Echinodermata	Asteroidea	Valvatida	Goniasteridae	Mediaster arcuatus	30/03/2021	1	01/10/1998	-44.2	179.0	923		
TAN9812	15	115870				MAT	Echinodermata	Asteroidea	Valvatida	Goniasteridae	Mediaster arcuatus	30/03/2021	2	02/10/1998	-44.2	179.1	959		
TAN9713	52	115871				MAT	Echinodermata	Asteroidea	Valvatida	Goniasteridae	Mediaster arcuatus	30/03/2021	1	13/12/1997	-44.4	-178.0	858	891	
SWA9501	90	47747				MSL	Echinodermata	Asteroidea	Valvatida	Goniasteridae	Mediaster sladeni	30/03/2021	1	12/01/2000	-43.7	177.0	461		
TAN0101	28	115868				MSL	Echinodermata	Asteroidea	Valvatida	Goniasteridae	Mediaster sladeni	30/03/2021	1	02/01/2001	-43.2	-176.8	363		
TAN0617	75	139329		ECN		GRM	Echinodermata	Echinoidea	Camarodonta	Echinidae	Echinus multidentatus	19/03/2021	2	16/12/2006	-46.8	166.8	820	824	
TAN9812	85	18943				CID	Echinodermata	Echinoidea	Cidaroida	Cidaridae	Austrocidaris pawsoni	12/11/2020	1	25/10/1998	-44.5	-178.5	940	956	
TAN2001	97	147891	I394	ECN	6	GPA	Echinodermata	Echinoidea	Cidaroida	Cidaridae	Goniocidaris (Aspidocidaris) parasol	19/03/2021	1	25/01/2020	-43.8	174.2	835		
TAN1801	112	126868	319	ANT	45	PSO	Echinodermata	Holothuroidea	Dendrochirotida	Psolidae	Psolus squamatus segregatus	12/03/2021	2	28/01/2018	-43.1	175.5	414	422	
TAN2001	110	147885	I515	OPH		AWA	Echinodermata	Ophiuroidea	Euryalida	Gorgonocephalidae	Astrothorax waitei	18/01/2021	1	27/01/2020	-43.1	175.1	261	278	
TAN1807	32	155587				ORE	Echinodermata	Ophiuroidea	Ophiacanthida	Ophiacanthidae	Ophiophthalmus relictus	18/01/2021	1	01/08/2018	-41.3	169.5	940	938	

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TAN0208	124	148587				BIV	Mollusca	Bivalvia	Mytilida	Mytilidae	Idas	2021	3	18/07/2002	-42.8	179.9	1130	1138	
KAH1901	61	145300	21			BIV	Mollusca	Bivalvia	Pectinida	Anomiidae	Monia	16/07/2020	7	08/03/2019	-51	166.7	501		
KAH1901	54	145729	15			BIV	Mollusca	Bivalvia	Pectinida	Anomiidae	Monia	16/07/2020	13	06/03/2019	-50.9	166.9	418		
KAH1905	41	145721	4			EGA	Mollusca	Bivalvia	Pholadomyida	Euciroidae	Euciroa galatheae	16/07/2020	1	18/09/2019	-43.2	175.7	404		
KAH1905	57	145745	61	BIV	500	EGA	Mollusca	Bivalvia	Pholadomyida	Euciroidae	Euciroa galatheae	16/07/2020	11	22/09/2019	-45.1	176.2	452		
KAH1905	56	145758	59			EGA	Mollusca	Bivalvia	Pholadomyida	Euciroidae	Euciroa galatheae	16/07/2020	1	22/09/2019	-44	177.0	381		
TAN9202	24	147843				AMP	Mollusca	Cephalopoda	Octopoda	Amphitretidae	Amphitretus	11/08/2020	1	14/02/1992	-47	174.6	300	50	
TAN1807	74	145634	312	BNO	216	BNO	Mollusca	Cephalopoda	Octopoda	Enteroctopodidae	Muusoctopus cf. tegginmathae	28/10/2020	1	11/08/2018	-42.4	169.5	800	792	
TAN1908	4	145637	I9	BNO	465	BNO	Mollusca	Cephalopoda	Octopoda	Enteroctopodidae	Muusoctopus cf. tegginmathae	28/10/2020	1	14/11/2019	-46.7	170.3	711	708	
TAN2001	102	147908	I416	BNO	1072	BNO	Mollusca	Cephalopoda	Octopoda	Enteroctopodidae	Muusoctopus cf. tegginmathae	28/10/2020	1	26/01/2020	-44	174.4	580	573	
TAN1807	65	145635	250	BNO	540	BNO	Mollusca	Cephalopoda	Octopoda	Enteroctopodidae	Muusoctopus tangaroa	28/10/2020	1	07/08/2018	-42	169.5	971	974	
TAN1908	4	145638	I7	BNO	636	BNO	Mollusca	Cephalopoda	Octopoda	Enteroctopodidae	Muusoctopus tangaroa	28/10/2020	1	14/11/2019	-46.7	170.3	711	708	
TAN1801	77	154703	301	DWO		GCL	Mollusca	Cephalopoda	Octopoda	Megaleledonidae	Graneledone challengeri	03/11/2020	1	21/01/2018	-44.2	178.2	1150	1173	
TAN1908	8	145639	I29	GTA	713	GTA	Mollusca	Cephalopoda	Octopoda	Megaleledonidae	Graneledone taniwha	28/10/2020	1	15/11/2019	-47.2	170.1	971	980	
TAN1908	29	145621	I67	GTA	4640	GTA	Mollusca	Cephalopoda	Octopoda	Megaleledonidae	Graneledone taniwha taniwha	29/10/2020	1	19/11/2019	-48.6	167.9	551	550	
TAN1908	4	145622	I5	GTA	5600	GTA	Mollusca	Cephalopoda	Octopoda	Megaleledonidae	Graneledone taniwha taniwha	28/10/2020	1	14/11/2019	-46.7	170.3	711	708	
TAN2001	91	147904	I349	DWO	1700	GTA	Mollusca	Cephalopoda	Octopoda	Megaleledonidae	Graneledone taniwha taniwha	28/10/2020	1	23/01/2020	-44.5	176.3	868	883	
TAN2001	92	147905	I366	GTA	293	GTA	Mollusca	Cephalopoda	Octopoda	Megaleledonidae	Graneledone taniwha taniwha	28/10/2020	1	24/01/2020	-44.6	176.0	991	940	
TAN2001	84	147906	I392	DWO	1070	GTA	Mollusca	Cephalopoda	Octopoda	Megaleledonidae	Graneledone taniwha taniwha	28/10/2020	2	22/01/2020	-44.4	176.7	910	910	
TAN2001	97	147907	I395	GTA	1136	GTA	Mollusca	Cephalopoda	Octopoda	Megaleledonidae	Graneledone taniwha taniwha	28/10/2020	1	25/01/2020	-43.8	174.2	835		
TAN2001	103	147909	I417	OCT	2	OCP	Mollusca	Cephalopoda	Octopoda	Octopodidae	Octopodidae	28/10/2020	1	26/01/2020	-43.5	174.0	420	435	
TAN1801	103	126972	316	OCO	74	OCO	Mollusca	Cephalopoda	Octopoda	Octopodidae	Octopus	03/11/2020	1	26/01/2018	-43	177.0	315	336	
TAN1807	29	145632	30	OCT	10	OHU	Mollusca	Cephalopoda	Octopoda	Octopodidae	Octopus huttoni	28/10/2020	1	31/07/2018	-41.2	170.4	492	488	
TAN1807	30	145633	111	OCT	100	OHU	Mollusca	Cephalopoda	Octopoda	Octopodidae	Octopus huttoni	28/10/2020	3	31/07/2018	-41.3	170.4	482	481	
TAN1801	116	154540	411	DWO		OHU	Mollusca	Cephalopoda	Octopoda	Octopodidae	Octopus huttoni	03/11/2020	2	29/01/2018	-43.4	176.4	448	447	
TAN1908	84	145623	I154	OPI	1840	OPI	Mollusca	Cephalopoda	Octopoda	Opisthoteuthidae	Opisthoteuthis robsoni	28/10/2020	1	02/12/2019	-49.1	167.3	734	749	
TAN1908	61	145624	I101	OPI	5560	OPI	Mollusca	Cephalopoda	Octopoda	Opisthoteuthidae	Opisthoteuthis robsoni	28/10/2020	2	26/11/2019	-52	168.2	652	648	
TAN2001	98	147911	I396	SQX	1	TAO	Mollusca	Cephalopoda	Oegopsida	Cranchiidae	Taonius notalia	14/08/2020	1	25/01/2020	-45	174.0	1207	1192	
TAN2001	113	147912	I521	SQX	20	GOA	Mollusca	Cephalopoda	Oegopsida	Gonatidae	Gonatus antarcticus	14/08/2020	1	28/01/2020	-42.7	175.6	1208	1190	

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TAN1412	38	98551	73	SQX	100	WSQ	Mollusca	Cephalopoda	Oegopsida	Onychoteuthidae	Onykia	03/11/2020	1	08/12/2014	-48.7	172.1	691		
TAN2001	49	147910	I105	ESQ	1	SQX	Mollusca	Cephalopoda	Oegopsida	Pholidoteuthidae	Pholidoteuthis n. sp. 2	14/08/2020	1	15/01/2020	-43.2	-174.6	868	883	
TAN1801	109	155092			39.4	SSQ	Mollusca	Cephalopoda	Sepiida	Sepiadariidae	Sepioloidea n. sp. 1	12/2020	1	27/01/2018	-43.3	177.1	250	275	
TAN1609	41	121888	35	SQX	5	SSQ	Mollusca	Cephalopoda	Sepiida	Sepiadariidae	Sepioloidea n. sp. 300	27/10/2020	1	13/08/2017	-42.3	170.7	213	221	
KAH0001	76	142272				SSQ	Mollusca	Cephalopoda	Sepiida	Sepiadariidae	Sepioloidea n. sp. 300	27/10/2020	7	20/02/2000	-37.5	176.5	219	217	
TON0801	68	49162				SSQ	Mollusca	Cephalopoda	Sepiida	Sepiadariidae	Sepioloidea n. sp. I	27/10/2020	1	28/03/2008	-50.8	167.0	405	404	
TAN0601	63	70805				SSQ	Mollusca	Cephalopoda	Sepiida	Sepiadariidae	Sepioloidea n. sp. I	27/10/2020	1	08/01/2006	-43.6	-178.7	452	448	
TAN9805	59	84771				SSQ	Mollusca	Cephalopoda	Sepiida	Sepiadariidae	Sepioloidea n. sp. I	27/10/2020	2	26/04/1998	-48.9	169.6	800		
KAH9511	41	84773				SSQ	Mollusca	Cephalopoda	Sepiida	Sepiadariidae	Sepioloidea n. sp. I	27/10/2020	1	27/09/1995	-37	176.3	415		
KAH9801	27	84774				SSQ	Mollusca	Cephalopoda	Sepiida	Sepiadariidae	Sepioloidea n. sp. I	27/10/2020	1	22/01/1998	-37.1	176.3	393		
KAH9801	27	84775				SSQ	Mollusca	Cephalopoda	Sepiida	Sepiadariidae	Sepioloidea n. sp. I	27/10/2020	1	22/01/1998	-37.1	176.3	393		
DRY9602	13	84776				SSQ	Mollusca	Cephalopoda	Sepiida	Sepiadariidae	Sepioloidea n. sp. I	27/10/2020	1	21/10/1996	-37	176.3	425		
KAH9906	1	84777				SSQ	Mollusca	Cephalopoda	Sepiida	Sepiadariidae	Sepioloidea n. sp. I	27/10/2020	1	08/05/1999	-41.1	176.4	309		
KAH0102	9	84778				SSQ	Mollusca	Cephalopoda	Sepiida	Sepiadariidae	Sepioloidea n. sp. I	27/10/2020	2	01/02/2001	-37.2	176.3	392		
KAH9910	5	84779				SSQ	Mollusca	Cephalopoda	Sepiida	Sepiadariidae	Sepioloidea n. sp. I	27/10/2020	2	15/07/1999	-41.1	176.4	294		
TAN0101	68	84780				SSQ	Mollusca	Cephalopoda	Sepiida	Sepiadariidae	Sepioloidea n. sp. I	27/10/2020	1	10/01/2001	-43.9	179.8	409	408	
TAN0001	112	84781				SSQ	Mollusca	Cephalopoda	Sepiida	Sepiadariidae	Sepioloidea n. sp. I	27/10/2020	1	17/01/2000	-43	175.7	506		
KAH9801	27	84782				SSQ	Mollusca	Cephalopoda	Sepiida	Sepiadariidae	Sepioloidea n. sp. I	27/10/2020	4	22/01/1998	-37.1	176.3	393		
KAH9801	7	84788				SSQ	Mollusca	Cephalopoda	Sepiida	Sepiadariidae	Sepioloidea n. sp. I	27/10/2020	1	18/01/1998	-37.6	176.7	440		
TAN1401	128	92512				SSQ	Mollusca	Cephalopoda	Sepiida	Sepiadariidae	Sepioloidea n. sp. I	27/10/2020	1	25/01/2014	-43.3	174.8	429		
TAN1401	116	92513				SSQ	Mollusca	Cephalopoda	Sepiida	Sepiadariidae	Sepioloidea n. sp. I	27/10/2020	1	22/01/2014	-43.7	175.5	304		
TAN1401	131	92514				SSQ	Mollusca	Cephalopoda	Sepiida	Sepiadariidae	Sepioloidea n. sp. I	27/10/2020	1	25/01/2014	-42.9	174.6	911		
DRY9602	1	103995				SSQ	Mollusca	Cephalopoda	Sepiida	Sepiadariidae	Sepioloidea n. sp. I	27/10/2020	2	18/10/1996	-37	176.3	395		
X536		103998				SSQ	Mollusca	Cephalopoda	Sepiida	Sepiadariidae	Sepioloidea n. sp. I	27/10/2020	1	14/07/1994	-42.8	-175.2	1363		
TAN1601	112	105544	689	SSQ	18	SSQ	Mollusca	Cephalopoda	Sepiida	Sepiadariidae	Sepioloidea n. sp. I	27/10/2020	1	25/01/2016	-43.2	175.8	425	442	
TAN1601	102	105545	621	SSQ	24	SSQ	Mollusca	Cephalopoda	Sepiida	Sepiadariidae	Sepioloidea n. sp. I	27/10/2020	1	23/01/2016	-43.5	174.8	349	372	
TAN1601	98	105547	579	SSQ	17.6	SSQ	Mollusca	Cephalopoda	Sepiida	Sepiadariidae	Sepioloidea n. sp. I	27/10/2020	1	22/01/2016	-43.1	174.8	450	480	
DRY9602	9	106401				SSQ	Mollusca	Cephalopoda	Sepiida	Sepiadariidae	Sepioloidea n. sp. I	27/10/2020	1	20/10/1996	-37	176.3	417		
TAN1801	112	126973	320	IRM	100	SSQ	Mollusca	Cephalopoda	Sepiida	Sepiadariidae	Sepioloidea n. sp. I	09/12/2020	1	28/01/2018	-43.1	175.5	414	422	

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TON0701	55	128471		?		SSQ	Mollusca	Cephalopoda	Sepiida	Sepiadariidae	Sepioloidea n. sp. I	27/10/2020	2	09/03/2007	-51	167.1	492	492	PARATYPE
TAN9508	tow 168-170	142273				SSQ	Mollusca	Cephalopoda	Sepiida	Sepiadariidae	Sepioloidea n. sp. I	27/10/2020	1	03/08/1995	-42.9	-176.0	861	950	
DRY9602	7	142274				SSQ	Mollusca	Cephalopoda	Sepiida	Sepiadariidae	Sepioloidea n. sp. I	27/10/2020	3	20/10/1996	-37	176.3	405		
KAH9801	21	142275				SSQ	Mollusca	Cephalopoda	Sepiida	Sepiadariidae	Sepioloidea n. sp. I	27/10/2020	1	21/01/1998	-37.6	176.8	367	362	
DRY9601	11	142276				SSQ	Mollusca	Cephalopoda	Sepiida	Sepiadariidae	Sepioloidea n. sp. I	27/10/2020	1	29/09/1996	-36.9	176.3	411		
KAH9604	4	142277				SSQ	Mollusca	Cephalopoda	Sepiida	Sepiadariidae	Sepioloidea n. sp. I	27/10/2020	1	07/04/1996	-36.9	176.3	509	512	
DRY9601	8	142278				SSQ	Mollusca	Cephalopoda	Sepiida	Sepiadariidae	Sepioloidea n. sp. I	27/10/2020	3	26/09/1996	-37	176.3	375		
KAH9801	6	142281				SSQ	Mollusca	Cephalopoda	Sepiida	Sepiadariidae	Sepioloidea n. sp. I	27/10/2020	2	18/01/1998	-37.5	176.8	576	590	
KAH9604	10	142284				SSQ	Mollusca	Cephalopoda	Sepiida	Sepiadariidae	Sepioloidea n. sp. I	27/10/2020	1	09/04/1996	-36.9	176.3	349	352	
KAH9801	37	142285				SSQ	Mollusca	Cephalopoda	Sepiida	Sepiadariidae	Sepioloidea n. sp. I	27/10/2020	1	24/01/1998	-36.7	176.2	470	468	
KAH9511	39	142287				SSQ	Mollusca	Cephalopoda	Sepiida	Sepiadariidae	Sepioloidea n. sp. I	27/10/2020	1	27/09/1995	-36.9	176.3	374		
DRY9601	9	142290				SSQ	Mollusca	Cephalopoda	Sepiida	Sepiadariidae	Sepioloidea n. sp. I	27/10/2020	1	26/09/1996	-36.9	176.3	369		
KAH9604	6	142291				SSQ	Mollusca	Cephalopoda	Sepiida	Sepiadariidae	Sepioloidea n. sp. I	27/10/2020	1	08/04/1996	-37	176.3	567	568	
DRY9601	4	142292				SSQ	Mollusca	Cephalopoda	Sepiida	Sepiadariidae	Sepioloidea n. sp. I	27/10/2020	1	25/09/1996	-37	176.3	382		
KAH9604	11	142294				SSQ	Mollusca	Cephalopoda	Sepiida	Sepiadariidae	Sepioloidea n. sp. I	27/10/2020	1	09/04/1996	-36.8	176.3	440	440	
KAH9801	12	142296				SSQ	Mollusca	Cephalopoda	Sepiida	Sepiadariidae	Sepioloidea n. sp. I	27/10/2020	1	19/01/1998	-37.4	176.5	552	527	
KAH9801	23	142297				SSQ	Mollusca	Cephalopoda	Sepiida	Sepiadariidae	Sepioloidea n. sp. I	27/10/2020	1	21/01/1998	-37.1	176.3	472	473	
KAH9604	8	142298				SSQ	Mollusca	Cephalopoda	Sepiida	Sepiadariidae	Sepioloidea n. sp. I	27/10/2020	1	08/04/1996	-36.9	176.3	349	351	
KAH9801	13	142299				SSQ	Mollusca	Cephalopoda	Sepiida	Sepiadariidae	Sepioloidea n. sp. I	27/10/2020	2	19/01/1998	-37.4	176.6	557	537	
DRY9602	8	142303				SSQ	Mollusca	Cephalopoda	Sepiida	Sepiadariidae	Sepioloidea n. sp. I	27/10/2020	1	20/10/1996	-36.9	176.3	413		
DRY9601	5	142304				SSQ	Mollusca	Cephalopoda	Sepiida	Sepiadariidae	Sepioloidea n. sp. I	27/10/2020	1	25/09/1996	-36.9	176.3	368		
KAH9511	51	142306				SSQ	Mollusca	Cephalopoda	Sepiida	Sepiadariidae	Sepioloidea n. sp. I	27/10/2020	3	28/09/1995	-36.9	176.3	415		
TAN0201	19	142307		SEQ		SSQ	Mollusca	Cephalopoda	Sepiida	Sepiadariidae	Sepioloidea n. sp. I	27/10/2020	1	01/01/2002	-43	178.8	422		
KAH9801	38	84790				SEQ	Mollusca	Cephalopoda	Sepiida	Sepiolidae	Iridoteuthis n. sp.	25/03/2021	3	24/01/1998	-36.6	176.2	288		
KAH9801	38	156131				IRM	Mollusca	Cephalopoda	Sepiida	Sepiolidae	Stoloteuthis maoria	25/03/2021	1	24/01/1998	-36.6	176.2	288		
KAH1905	46	145755a	20	GAS	100	FMA	Mollusca	Gastropoda	Littorinimorpha CLADE (order)	Ranellidae	Fusitriton magellanicus laudandus	16/07/2020	1	19/09/2019	-43	177.5	342		
KAH1905	46	145755b	20	GAS	100	AER	Mollusca	Gastropoda	Neogastropoda CLADE (Order)	Buccinulidae	Aeneator recens	16/07/2020	1	19/09/2019	-43	177.5	342		
TAN1801	36	97045	157	POL	250	GAS	Mollusca	Gastropoda		Pectinodontidae	Pectinodonta morioria	16/07/2020	4	13/01/2018	-43	-174.5	906	903	
KAH1901	60	145304	20	GAS		GAS	Mollusca	Gastropoda	Littorinimorpha CLADE (order)	Cassidae	Galeodea triganceae	16/07/2020	1	08/03/2019	-50.9	166.8	450		

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KAH1901	54	145730	15			GAS	Mollusca	Gastropoda	Littorinimorpha CLADE (order)	Cassidae	Galeodea triganceae	16/07/2020	2	06/03/2019	-50.9	166.9	418		
KAH1905	44	145752	13			SPY	Mollusca	Gastropoda	Littorinimorpha CLADE (order)	Cassidae	Semicassis pyrum	16/07/2020	1	19/09/2019	-43	177.6	338		
KAH1905	62	145759	74	GAS	100	SPY	Mollusca	Gastropoda	Littorinimorpha CLADE (order)	Cassidae	Semicassis pyrum	16/07/2020	1	24/09/2019	-43.4	176.0	373		
KAH1901	72	145033	37	GAS	400	MCC	Mollusca	Gastropoda	Littorinimorpha CLADE (order)	Hipponicidae	Malluvium calcareum	16/07/2020	33	12/03/2019	-51.1	166.9	477		
KAH1901	67	145725	29			MCC	Mollusca	Gastropoda	Littorinimorpha CLADE (order)	Hipponicidae	Malluvium calcareum	16/07/2020	6	10/03/2019	-50.7	167.3	432		
KAH1901	72	145736	39			MCC	Mollusca	Gastropoda	Littorinimorpha CLADE (order)	Hipponicidae	Malluvium calcareum	16/07/2020	10	12/03/2019	-51.1	166.9	477		
KAH1905	46	145741	19			MCC	Mollusca	Gastropoda	Littorinimorpha CLADE (order)	Hipponicidae	Malluvium calcareum	16/07/2020	1	19/09/2019	-43	177.5	342		
KAH1901	71	147919	34	GAS	100	MCC	Mollusca	Gastropoda	Littorinimorpha CLADE (order)	Hipponicidae	Malluvium calcareum	16/07/2020	1	12/03/2019	-51	167.2	488		
TAN0219	21	156309				GAS	Mollusca	Gastropoda	Littorinimorpha CLADE (order)	Ranellidae	Fusitriton	09/04/2021	1	30/11/2002	-52.8	173.5	640	688	
TAN1811	81	145022	129	FMA	53	FMA	Mollusca	Gastropoda	Littorinimorpha CLADE (order)	Ranellidae	Fusitriton magellanicus laudandus	16/07/2020	1	17/12/2018	-49	166.6	490	511	
TAN1811	85	145026	131	FMA	50	FMA	Mollusca	Gastropoda	Littorinimorpha CLADE (order)	Ranellidae	Fusitriton magellanicus laudandus	16/07/2020	1	18/12/2018	-49.4	166.4	663	665	
KAH1901	60	145303	20	GAS	100	FMA	Mollusca	Gastropoda	Littorinimorpha CLADE (order)	Ranellidae	Fusitriton magellanicus laudandus	16/07/2020	1	08/03/2019	-50.9	166.8	450		
KAH1901	72	145496	38	GAS	1000	FMA	Mollusca	Gastropoda	Littorinimorpha CLADE (order)	Ranellidae	Fusitriton magellanicus laudandus	16/07/2020	14	12/03/2019	-51.1	166.9	477		
KAH1901	23	145498	9			FMA	Mollusca	Gastropoda	Littorinimorpha CLADE (order)	Ranellidae	Fusitriton magellanicus laudandus	16/07/2020	4	18/02/2019	-51.2	166.5	496		
KAH1901	62	145506	22	GAS		FMA	Mollusca	Gastropoda	Littorinimorpha CLADE (order)	Ranellidae	Fusitriton magellanicus laudandus	16/07/2020	1	08/03/2019	-51.1	166.6	502		
KAH1901	67	145509	29			FMA	Mollusca	Gastropoda	Littorinimorpha CLADE (order)	Ranellidae	Fusitriton magellanicus laudandus	16/07/2020	1	10/03/2019	-50.7	167.3	432		
KAH1905	49	145718	31			FMA	Mollusca	Gastropoda	Littorinimorpha CLADE (order)	Ranellidae	Fusitriton magellanicus laudandus	16/07/2020	2	20/09/2019	-43.7	176.2	361		
KAH1905	41	145737	4			FMA	Mollusca	Gastropoda	Littorinimorpha CLADE (order)	Ranellidae	Fusitriton magellanicus laudandus	16/07/2020	1	18/09/2019	-43.2	175.7	404		
KAH1905	44	147890	13	GAS	300	FMA	Mollusca	Gastropoda	Littorinimorpha CLADE (order)	Ranellidae	Fusitriton magellanicus laudandus	16/07/2020	1	19/09/2019	-43	177.6	338		
KAH1905	41	145720	4			GAS	Mollusca	Gastropoda	Neogastropoda CLADE (Order)	Buccinulidae	Aeneator benthicolus	16/07/2020	1	18/09/2019	-43.2	175.7	404		
KAH1901	72	145499	39	GAS	100	AER	Mollusca	Gastropoda	Neogastropoda CLADE (Order)	Buccinulidae	Aeneator recens	16/07/2020	1	12/03/2019	-51.1	166.9	477		
KAH1901	71	145501	34	GAS	100	AER	Mollusca	Gastropoda	Neogastropoda CLADE (Order)	Buccinulidae	Aeneator recens	16/07/2020	4	12/03/2019	-51	167.2	488		
KAH1901	53	145511	13	GAS	100	AER	Mollusca	Gastropoda	Neogastropoda CLADE (Order)	Buccinulidae	Aeneator recens	16/07/2020	3	06/03/2019	-50.8	167.0	425		
KAH1901	61	145515	21	GAS	100	AER	Mollusca	Gastropoda	Neogastropoda CLADE (Order)	Buccinulidae	Aeneator recens	16/07/2020	5	08/03/2019	-51	166.7	501		
KAH1901	54	145696	15	GAS	100	AER	Mollusca	Gastropoda	Neogastropoda CLADE (Order)	Buccinulidae	Aeneator recens	16/07/2020	7	06/03/2019	-50.9	166.9	418		
KAH1901	23	145733	9			AER	Mollusca	Gastropoda	Neogastropoda CLADE (Order)	Buccinulidae	Aeneator recens	16/07/2020	1	18/02/2019	-51.2	166.5	496		

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KAH1905	46	145743	19			PCH	Mollusca	Gastropoda	Neogastropoda CLADE (Order)	Buccinulidae	Penion chathamensis	16/07/2020	1	19/09/2019	-43	177.5	342		
KAH1905	58	145744	66	AER	200	PCH	Mollusca	Gastropoda	Neogastropoda CLADE (Order)	Buccinulidae	Penion chathamensis	16/07/2020	1	22/09/2019	-45.1	176.3	403		
KAH1905	45	145750	15			PCH	Mollusca	Gastropoda	Neogastropoda CLADE (Order)	Buccinulidae	Penion chathamensis	16/07/2020	2	19/09/2019	-43	177.6	354		
KAH1905	44	145751	13	GAS	300	PCH	Mollusca	Gastropoda	Neogastropoda CLADE (Order)	Buccinulidae	Penion chathamensis	16/07/2020	1	19/09/2019	-43	177.6	338		
KAH1905	64	145761	78	GAS	100	POZ	Mollusca	Gastropoda	Neogastropoda CLADE (Order)	Muricidae	Poirieria zelandica	16/07/2020	1	25/09/2019	-43.1	176.6	368		
KAH1905	46	145742	19			COV	Mollusca	Gastropoda	Neogastropoda CLADE (Order)	Pseudomelatomidae	Comitas onokeana vivens	16/07/2020	1	19/09/2019	-43	177.5	342		
KAH1901	23	145302	9	GAS		CMR	Mollusca	Gastropoda	Neogastropoda CLADE (Order)	Turbinellidae	Coluzea mariae	16/07/2020	1	18/02/2019	-51.2	166.5	496		
TAN1811	64	145025	98	GAS	15	AFL	Mollusca	Gastropoda	Neogastropoda CLADE (Order)	Volutidae	Alcithoe flemingi	16/07/2020	1	13/12/2018	-51.4	170.0	517	511	
KAH1905	49	145717	31	GAS	100	AWI	Mollusca	Gastropoda	Neogastropoda CLADE (Order)	Volutidae	Alcithoe wilsonae	16/07/2020	1	20/09/2019	-43.7	176.2	361		
KAH1905	57	145760	62	GVO	100	AWI	Mollusca	Gastropoda	Neogastropoda CLADE (Order)	Volutidae	Alcithoe wilsonae	16/07/2020	1	22/09/2019	-45.1	176.2	452		
KAH1901	72	145032	37	GAS	400	GVO	Mollusca	Gastropoda	Neogastropoda CLADE (Order)	Volutidae	Provocator mirabilis	16/07/2020	5	12/03/2019	-51.1	166.9	477		
KAH1901	61	145034	21	GAS	100	GVO	Mollusca	Gastropoda	Neogastropoda CLADE (Order)	Volutidae	Provocator mirabilis	16/07/2020	2	08/03/2019	-51	166.7	501		
KAH1901	62	145503	22	GAS	100	GVO	Mollusca	Gastropoda	Neogastropoda CLADE (Order)	Volutidae	Provocator mirabilis	16/07/2020	1	08/03/2019	-51.1	166.6	502		
KAH1901	67	145508	29			GVO	Mollusca	Gastropoda	Neogastropoda CLADE (Order)	Volutidae	Provocator mirabilis	16/07/2020	6	10/03/2019	-50.7	167.3	432		
KAH1901	23	145512	9	GAS	100	GVO	Mollusca	Gastropoda	Neogastropoda CLADE (Order)	Volutidae	Provocator mirabilis	16/07/2020	2	18/02/2019	-51.2	166.5	496		
KAH1901	69	145594	30	GAS	10	GVO	Mollusca	Gastropoda	Neogastropoda CLADE (Order)	Volutidae	Provocator mirabilis	16/07/2020	1	10/03/2019	-50.6	167.2	389		
KAH1901	71	145595	33	GAS	200	GVO	Mollusca	Gastropoda	Neogastropoda CLADE (Order)	Volutidae	Provocator mirabilis	16/07/2020	18	12/03/2019	-51	167.2	488		
KAH1901	63	145727	25	GAS	100	GVO	Mollusca	Gastropoda	Neogastropoda CLADE (Order)	Volutidae	Provocator mirabilis	16/07/2020	2	10/03/2019	-50.9	167.0	444		
KAH1901	25	145732	10			GVO	Mollusca	Gastropoda	Neogastropoda CLADE (Order)	Volutidae	Provocator mirabilis	16/07/2020	1	19/02/2019	-50.6	167.4	409		
KAH1905	55	145747	54			GVO	Mollusca	Gastropoda	Neogastropoda CLADE (Order)	Volutidae	Provocator mirabilis	16/07/2020	2	22/09/2019	-43.1	176.0	382		
KAH1905	50	145753	34	GAS	100	GVO	Mollusca	Gastropoda	Neogastropoda CLADE (Order)	Volutidae	Provocator mirabilis	16/07/2020	2	20/09/2019	-43.3	176.2	353		
KAH1905	48	145754	28	GVO	100	GVO	Mollusca	Gastropoda	Neogastropoda CLADE (Order)	Volutidae	Provocator mirabilis	16/07/2020	1	20/09/2019	-43.7	176.2	389		
KAH1905	46	145756	18	GVO	100	GVO	Mollusca	Gastropoda	Neogastropoda CLADE (Order)	Volutidae	Provocator mirabilis	16/07/2020	1	19/09/2019	-43	177.5	342		
AEX9901	7	99810				WRM	Nematoda	Enoplea	Marimermithida		Marimermithida	02/12/2020	6	23/06/1999	-42.6	-179.9	1225		
KAH0014	84	100401	MNP0856, ID#: 857		15	DSO	Porifera	Demospongiae	Haplosclerida	Callyspongiidae	Callyspongia (Callyspongia) n. sp. 11	06/05/2021	1	29/12/2000	-43.4	173.8	118	105	
TAN2001	8	147898	I1	DSO	48	DSO	Porifera	Demospongiae	Haplosclerida	Callyspongiidae	Callyspongia (Callyspongia) n. sp. 12	29/04/2021	1	06/01/2020	-43.3	177.6	291	285	
KAH0108	21	154423				SUA	Porifera	Demospongiae	Suberitida	Suberitidae	Suberites affinis	29/04/2021	5	04/09/2001	-43.1	175.8	467		
KAH9915	64	100417	MNP0657, ID#: 658		0	APU	Porifera	Demospongiae	Tetractinellida	Scleritodermidae	Aciculites pulchra	29/04/2021	1	23/10/1999	-35	172.5	194		
TAN9812	71	93015				TLD	Porifera	Demospongiae	Tetractinellida	Tetillidae	Antarctotetilla leptoderma	29/04/2021	3	20/10/1998	-44.6	-177.0	938		

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TAN9812	10	154076				TLD	Porifera	Demospongiae	Tetractinellida	Tetillidae	Antarctotetilla leptoderma	29/04/2021	5	01/10/1998	-44.2	178.8	922		
TAN9812	70	154408				TLD	Porifera	Demospongiae	Tetractinellida	Tetillidae	Antarctotetilla leptoderma	29/04/2021	16	20/10/1998	-44.7	-176.6	1000	1048	
TAN9812	42	154411				TLD	Porifera	Demospongiae	Tetractinellida	Tetillidae	Antarctotetilla leptoderma	29/04/2021	15	12/10/1998	-44.7	-177.2	1175		
TAN9812	26	154415				TLD	Porifera	Demospongiae	Tetractinellida	Tetillidae	Antarctotetilla leptoderma	29/04/2021	5	07/10/1998	-44.6	-178.1	1088		
TAN9812	39	154416				TLD	Porifera	Demospongiae	Tetractinellida	Tetillidae	Antarctotetilla leptoderma	29/04/2021	6	11/10/1998	-44.7	-177.3	1100		
TAN9812	2	154420				TLD	Porifera	Demospongiae	Tetractinellida	Tetillidae	Antarctotetilla leptoderma	29/04/2021	2	29/09/1998	-44.2	178.4	1105	1117	
TAN9812	30	154424				TLD	Porifera	Demospongiae	Tetractinellida	Tetillidae	Antarctotetilla leptoderma	29/04/2021	1	09/10/1998	-44.5	-177.8	856		
TAN9812	68	154428				TLD	Porifera	Demospongiae	Tetractinellida	Tetillidae	Antarctotetilla leptoderma	29/04/2021	1	20/10/1998	-44.7	-176.8	965		
TAN9812	66	154429				TLD	Porifera	Demospongiae	Tetractinellida	Tetillidae	Antarctotetilla leptoderma	29/04/2021	1	19/10/1998	-44.6	-176.1	800		
TAN9812	15	154430				TLD	Porifera	Demospongiae	Tetractinellida	Tetillidae	Antarctotetilla leptoderma	29/04/2021	1	02/10/1998	-44.2	179.1	959		
TAN9805	59	154431				TLD	Porifera	Demospongiae	Tetractinellida	Tetillidae	Antarctotetilla leptoderma	29/04/2021	1	26/04/1998	-48.9	169.6	800		
TAN9812	10	154432				TLD	Porifera	Demospongiae	Tetractinellida	Tetillidae	Antarctotetilla leptoderma	29/04/2021	1	01/10/1998	-44.2	178.8	922		
TAN0118	1	154434				TLD	Porifera	Demospongiae	Tetractinellida	Tetillidae	Antarctotetilla leptoderma	29/04/2021	2	21/11/2001	-48.6	170.9	903		
TAN9812	3	154439				TLD	Porifera	Demospongiae	Tetractinellida	Tetillidae	Antarctotetilla leptoderma	29/04/2021	8	29/09/1998	-44.2	178.4	1090		
TAN9812	58	154440				TLD	Porifera	Demospongiae	Tetractinellida	Tetillidae	Antarctotetilla leptoderma	29/04/2021	15	17/10/1998	-44.7	-176.6	1016		
TAN0012	79	154442				TLD	Porifera	Demospongiae	Tetractinellida	Tetillidae	Antarctotetilla leptoderma	29/04/2021	20	15/12/2000	-48	169.9	910		
TAN9812	25	154446				TLD	Porifera	Demospongiae	Tetractinellida	Tetillidae	Antarctotetilla leptoderma	29/04/2021	1	07/10/1998	-44.4	-178.2	805		
TAN9812	39	154447				TLD	Porifera	Demospongiae	Tetractinellida	Tetillidae	Antarctotetilla leptoderma	29/04/2021	1	11/10/1998	-44.7	-177.3	1100		
TAN9812	72	154454				TLD	Porifera	Demospongiae	Tetractinellida	Tetillidae	Antarctotetilla leptoderma	29/04/2021	3	20/10/1998	-44.6	-177.0	848	898	
TAN9812	72	154463				TLD	Porifera	Demospongiae	Tetractinellida	Tetillidae	Antarctotetilla leptoderma	29/04/2021	3	20/10/1998	-44.6	-177.0	848	898	
TAN9812	47	154464				TLD	Porifera	Demospongiae	Tetractinellida	Tetillidae	Antarctotetilla leptoderma	29/04/2021	2	12/10/1998	-44.6	-177.5	850		
TAN9812	67	154466				TLD	Porifera	Demospongiae	Tetractinellida	Tetillidae	Antarctotetilla leptoderma	29/04/2021	2	19/10/1998	-44.7	-176.1	1003		
TAN9812	44	154469				TLD	Porifera	Demospongiae	Tetractinellida	Tetillidae	Antarctotetilla leptoderma	29/04/2021	2	12/10/1998	-44.6	-177.3	865		
TAN9805	37	154419				DSO	Porifera	Demospongiae	Tetractinellida	Tetillidae	Cinachyra n. sp. 4	29/04/2021	1	20/04/1998	-53.5	169.0	706		
SMT9801	36	154455				DSO	Porifera	Demospongiae	Tetractinellida	Tetillidae	Cinachyra n. sp. 4	29/04/2021	1	29/07/1995	-42.8	-176.9	710		
TAN9911	2	155018				THN	Porifera	Demospongiae	Tetractinellida	Theneidae	Thenea novaezealandiae	06/05/2021	1	01/09/1999	-42.3	170.1	796		
TAN0601	28	155795				HYA	Porifera	Hexactinellida	Lyssacinosida	Rossellidae	Hyalascus n. sp. 1	06/05/2021	1	02/01/2006	-43.8	179.9	403	404	

APPENDIX 2: EXTRACT OF DETAILS LOADED INTO *COD*.

niwa_no	trip_number	station_number	target_species	fishing_method	event_start_date	start_obs_fma	start_seabed_depth	trunc_start_latitude	trunc_start_longitude	event_end_date	end_obs_fma	end_seabed_depth	trunc_end_latitude	trunc_end_longitude	expert_species	phylum	class	order	family	expert_scientific	determined_date	count
142286	1054	4	SCI	TWL	1997-11-16	SOE	375	-43	176.7		SOE	355	-43.1	176.4	SSQ	Mollusca	Cephalopoda	Sepiida	Sepiadariidae	Sepioloidea n.sp. l	27/10/2020	1
105967	1054	4	SCI	TWL	1997-11-16	SOE	375	-43	176.7		SOE	355	-43.1	176.4	SSQ	Mollusca	Cephalopoda	Sepiida	Sepiadariidae	Sepioloidea n.sp. l	27/10/2020	1
92839	1124	50	ORH	TWL	1998-07-23	AKE	974	-37	176.7		AKE	1181	-37	176.7	UMB	Cnidaria	Anthozoa	Pennatulacea	Umbellulidae	Umbellula	27/05/2020	1
154427	1124	58	ORH	TWL	1998-08-06	AKE	843	-37.1	176.5		AKE	1011	-37	176.7	DSO	Porifera	Demospongiae	Tetractinellida	Tetillidae	Cinachyra n. sp. 4	29/04/2021	1
127503	1137	6	ORH	TWL	1998-08-08	TMAR	1024	-47.4	148.9		TMAR	1095	-47.4	148.9	DSO	Porifera	Demospongiae	Poecilosclerida	Cladorhizidae	Abyssocladia n. sp. l	Feb-21	1
101764	1152	7	BYS	TWL	1998-09-10	CET	581	-37.4	167.6		CET	904	-37.5	167.7	DSO	Porifera	Demospongiae	Tetractinellida	Pleromidae	Pleroma aotea	29/04/2021	1
101765	1152	7	BYS	TWL	1998-09-10	CET	581	-37.4	167.6		CET	904	-37.5	167.7	SLT	Porifera	Demospongiae	Tetractinellida	Ancorinidae	Stelletta n. sp. 2	6/05/2021	1
101766	1152	35	BYS	TWL	1998-09-18	HOWE	351	-34.1	162.8		HOWE	791	-34.1	162.8	DSO	Porifera	Demospongiae	Tetractinellida	Pleromidae	Pleroma turbinatum	6/05/2021	1
155654	1153	52	ORH	TWL	1998-09-10	TMAR	965	-47.6	147.4		TMAR	1045	-47.6	147.4	ASR	Echinodermata	Asteroidea	Forcipulatida	Stichasteridae	Smilasterias actinata	21/01/2021	1
154437	1158	18	HOK	TWL	1998-09-17	SOI	590	-49.6	167.9		SUB	580	-49.9	168.1	DSO	Porifera	Demospongiae	Tetractinellida	Tetillidae	Craniella n.sp. 1	29/04/2021	1
154449	1160	55	HOK	TWL	1998-10-13	SOE	538	-43.8	178.4		SOE	550	-43.9	178.9	DSO	Porifera	Demospongiae	Tetractinellida	Tetillidae	Antarctotetilla leptoderma	29/04/2021	1
2557	1160	57	HOK	TWL	1998-10-14	SOE	490	-43.8	178.5		SOE	485	-43.8	178.9	ASC	Chordata	Ascidiacea	Aplousobranchia	Polyclinidae	Synoicum otagoensis	16/03/2021	1
154433	1160	60	HOK	TWL	1998-10-15	SOE	502	-43.8	178.8		SOE	515	-43.8	178.4	DSO	Porifera	Demospongiae	Tetractinellida	Tetillidae	Antarctotetilla leptoderma	29/04/2021	1
155652	1171	24	OEO	TWL	1998-11-27	SOU	930	-48	166.1		SOU	1130	-48	166.1	ASR	Echinodermata	Asteroidea	Forcipulatida	Stichasteridae	Smilasterias actinata	21/01/2021	1
155834	1171	38	OEO	TWL	1998-11-29	SOU	1061	-48.5	164.9		SOU	1248	-48.5	164.9	HDR	Cnidaria	Hydrozoa	Leptothecata	Aglaopheniidae	Lytocarpia alata	4/03/2021	1
155620	1171	76	ORH	TWL	1998-12-04	SOI	850	-50	165.9		SOI	960	-50	165.9	ASR	Echinodermata	Asteroidea	Forcipulatida	Stichasteridae	Smilasterias	20/01/2021	1
156126	1171	113	OEO	TWL	1998-12-11	SOU	1079	-48.5	164.9		SOU	1205	-48.5	164.9	OAB	Echinodermata	Ophiuroidea	Amphilepidida	Ophiactidae	Ophiactis abyssicola	24/03/2021	106
156127	1171	114	OEO	TWL	1998-12-11	SOU	1033	-48.5	164.9		SOU	1292	-48.5	164.9	OPV	Echinodermata	Ophiuroidea	Ophiacanthida	Ophiacanthidae	Ophiacantha vivipara	24/03/2021	39
156128	1171	115	OEO	TWL	1998-12-11	SOU	1067	-48.5	164.9		SOU	1264	-48.5	164.9	OPH	Echinodermata	Ophiuroidea	Ophiacanthida	Ophiacanthidae	Ophiacantha densispina	24/03/2021	7
24341	1172	40	ORH	TWL	1998-12-09	SEC	1010	-42.9	173.8		SEC	1145	-42.9	173.8	BPI	Echinodermata	Asteroidea	Notomyotida	Benthopectinidae	Benthopecten pikei	30/03/2021	1
154565	1337	31	CDL	TWL	2000-03-31	AKE	750	-37.1	177.2		AKE	869	-37.1	177.2	CHO	Arthropoda	Malacostraca	Decapoda	Geryonidae	Chaceon	22/10/2020	1
154704	1417	32	ORH	TWL	2000-12-01	SOE	890	-42.7	176.9		SOE	900	-42.6	176.4	GCL	Mollusca	Cephalopoda	Octopoda	Megaleledonidae	Graneledone challengeri	3/11/2020	2
148586	1585	13	ORH	TWL	2001-11-21	SOE	1100	-42.8	184.4		SOE	1100	-42.8	183.9	BIV	Mollusca	Bivalvia	Mytilida	Mytilidae	Idas	2021	1
103643	1597	42	BYS	TWL	2002-01-27	AKW	500	-34.9	169.9		AKW	710	-34.9	169.9	PPA	Arthropoda	Malacostraca	Decapoda	Palinuridae	Projasus parkeri	6/05/2021	1

niwa_no	trip_number	station_number	target_species	fishing_method	event_start_date	start_obs_fma	start_seabed_depth	trunc_start_latitude	trunc_start_longitude	event_end_date	end_obs_fma	end_seabed_depth	trunc_end_latitude	trunc_end_longitude	expert_species	phylum	class	order	family	expert_scientific	determined_date	count
154460	1683	19	ORH	TWL	2002-08-20	AKW	929	-36	173.1		AKW	845	-36.1	173.2	DSO	Porifera	Demospongiae	Tetractinellida	Tetillidae	Cinachyra n. sp. 4	29/04/2021	1
103642	1718	10	ORH	TWL	2002-11-15	WANB	977	-34	167.5		WANB	1146	-34	167.5	PPA	Arthropoda	Malacostraca	Decapoda	Palinuridae	Projasus parkeri	6/05/2021	1
83657	2251	113	ORH	TWL	2006-06-07	SOE	1033	-43.1	186		SOE	1169	-43.1	186	PYC	Arthropoda	Pycnogonida	Pantopoda	Colossendeidae	Colossendeis	27/05/2020	1
71147	2413	89	HOK	TWL	2007-05-13	SOE	495	-43.8	179.4		SOE	574	-43.9	179.2	CID	Echinodermata	Echinoidea	Cidaroida		Cidaroida	19/10/2020	1
131510	2496	30	SBW	TWL	2007-09-27	SOI	434	-52.4	170.4	2007-09-28	SOI	449	-52.1	170.6	SCY	Cnidaria	Scyphozoa	Semaeostomeae	Ulmaridae	Stygiomedusa	5/05/2021	1
43991	2496	42	HOK	TWL	2007-10-07	SEC	593	-43.2	174.1	2007-10-07	SEC	520	-43.5	174.2	ASC	Chordata	Ascidiacea	Aplousobranchia	Polyclinidae	Synoicum otagoensis	22/04/2021	1
49089	2520	33	SSO	TWL	2007-11-12	SOE	1283	-44.6	181	2007-11-13	SOE		-44.6	181	EEX	Echinodermata	Holothuroidea	Elasipodida	Pelagothuriidae	Enypniastes eximia	12/03/2021	1
49097	2520	144	ORH	TWL	2007-11-26	SOE		-44.1	185.5	2007-11-26	SOE	1262	-44.1	185.5	SCY	Cnidaria	Scyphozoa			Scyphozoa indet.	4/03/2021	1
49090	2521	19	ORH	TWL	2007-11-09	SOE		-44.7	183.7	2007-11-09	SOE		-44.6	183.8	EEX	Echinodermata	Holothuroidea	Elasipodida	Pelagothuriidae	Enypniastes eximia	12/03/2021	1
62968	2533	20	SCI	TWL	2007-11-14	SOI	500	-50.9	167.2	2007-11-14	SOI	486	-50.8	167.5	SSQ	Mollusca	Cephalopoda	Sepiida	Sepiadariidae	Sepioloidea n.sp. I	27/10/2020	1
42475	2617	137	HOK	TWL	2008-05-19	SEC	506	-44	174.8	2008-05-19	SEC	553	-43.8	174.4	ASC	Chordata	Ascidiacea	Aplousobranchia	Polyclinidae	Synoicum otagoensis	22/04/2021	1
49489	2653	162	BOE	TWL	2008-08-03	SUB	1069	-50	175.2	2008-08-03	SUB	1201	-50	175.2	APH	Arthropoda	Malacostraca	Amphipoda		Amphipoda indet.	3/05/2021	1
47946	2692	62	HOK	TWL	2008-09-09	SUB	654	-49.4	166.3	2008-09-09	SUB		-49.2	166.5	GYS	Cnidaria	Anthozoa	Pennatulacea	Pennatulidae	Gyrophyllum sibogae	29/03/2021	1
67927	2692	128	HOK	TWL	2008-09-29	SEC	506	-43.9	174.7	2008-09-29	SEC	540	-43.8	174.3	ASC	Chordata	Ascidiacea	Aplousobranchia	Polyclinidae	Synoicum otagoensis	22/04/2021	1
67187	2704	8	ORH	TWL	2008-10-02	AKW	978	-34.8	171.6	2008-10-02	AKW	1005	-34.8	171.6	ASC	Chordata	Ascidiacea	Stolidobranchia	Pyuridae	Culeolus hospitalis	22/04/2021	1
67832	2714	85	ORH	TWL	2008-11-13	SOE	923	-44.5	184.7	2008-11-13	SOE	962	-44.5	184.7	ASR	Echinodermata	Asteroidea	Forcipulatida	Stichasteridae	Smilasterias actinata	12/01/2021	1
65877	2911	68	ORH	TWL	2009-08-02	SEC		-42.6	175.9	2009-08-02	SOE	1100	-42.6	176		Chordata	Thaliacea	Pyrosomida		Pyrosomida	4/03/2021	1
65598	2943	5	HAK	TWL	2009-09-09	CHA		-41.9	170.3	2009-09-09	CHA	535	-42.4	170.3	HWL	Cnidaria	Anthozoa	Pennatulacea	Halipteridae	Halipteris willemoesi	27/05/2020	1
61930	3065	58	ORH	TWL	2010-02-11	SOE		-44.2	185.5	2010-02-11	SOE		-44.1	185.5	FAR	Porifera	Hexactinellida	Sceptrulophora	Farreidae	Farrea similaris	29/04/2021	1
61927	3065	58	ORH	TWL	2010-02-11	SOE		-44.2	185.5	2010-02-11	SOE		-44.1	185.5	FAR	Porifera	Hexactinellida	Sceptrulophora	Farreidae	Farrea similaris	29/04/2021	1
65950	3177	37	BYX	TWL	2010-09-01	HOWE	780	-34	162.7	2010-09-01	HOWE	760	-34	162.7	ZAH	Cnidaria	Anthozoa	Zoantharia	Parazoanthidae	Bullagummizoanthus	24/03/2021	5
69515	3219	23	SCI	TWL	2010-10-26	AKE	380	-37.4	176.5	2010-10-26	AKE	402	-37.6	176.8	FIS	Chordata				Fish	22/04/2021	1
69570	3236	1	SWA	TWL	2010-12-05	SEC	135	-44.3	173.1	2010-12-05	SEC	153	-44.4	172.7	DSO	Porifera	Demospongiae	Dictyoceratida	Irciniidae	Psammocinia charadrodes	29/04/2021	1
69655	3306	8	HOK	TWL	2011-04-04	SOE	543	-42.9	178.3	2011-04-04	SOE		-42.9	178.5	SSQ	Mollusca	Cephalopoda	Sepiida	Sepiadariidae	Sepioloidea n.sp. I	27/10/2020	1
75727	3319	16	SWA	TWL	2011-05-25	SOI	452	-49.6	166.7	2011-05-26	SOI	467	-49.6	166.7	MOL	Mollusca				Mollusca eggs	16/07/2020	50

niwa_no	trip_number	station_number	target_species	fishing_method	event_start_date	start_obs_fma	start_seabed_depth	trunc_start_latitude	trunc_start_longitude	event_end_date	end_obs_fma	end_seabed_depth	trunc_end_latitude	trunc_end_longitude	expert_species	phylum	class	order	family	expert_scientific	determined_date	count
75800	3406	192	BOE	TWL	2011-12-08	SUB	865	-48.5	175.3	2011-12-08	SUB	859	-48.5	175.4	HYA	Porifera	Hexactinellida	Lyssacinosida	Rossellidae	Hyalascus maui	23/02/2021	1
87606b	3415	10	MIX	TWL	2011-11-22	SEC	624	-44.3	174.7	2011-11-23	SEC	636	-44.3	174.7	APH	Arthropoda	Malacostraca	Amphipoda	Pardaliscidae	Pardaliscidae	3/05/2021	1
87606a	3415	10	MIX	TWL	2011-11-22	SEC	624	-44.3	174.7	2011-11-23	SEC	636	-44.3	174.7	APH	Arthropoda	Malacostraca	Amphipoda	Lysianassidae?	Lysianassidae?	3/05/2021	1
87606c	3415	10	MIX	TWL	2011-11-22	SEC	624	-44.3	174.7	2011-11-23	SEC	636	-44.3	174.7	APH	Arthropoda	Malacostraca	Amphipoda	Acanthaspidiidae	Acanthaspidiidae	3/05/2021	1
146435	3460	49	SQU	TWL	2012-03-13	SOU	250	-48.6	167.1	2012-03-13	SOU	203	-48.8	167.1	NAT	Arthropoda	Malacostraca	Decapoda	Axiidae	Spongiaxius novaezealandiae	21/04/2021	1
75872	3460	49	SQU	TWL	2012-03-13	SOU	250	-48.6	167.1	2012-03-13	SOU	203	-48.8	167.1	GLS	Porifera	Hexactinellida	Lyssacinosida	Rossellidae	Symplectella rowi	29/04/2021	1
75873	3460	71	SQU	TWL	2012-03-21	SOU	173	-48.6	166.4	2012-03-21	SOU	174	-48.8	166.6	GLS	Porifera	Hexactinellida	Lyssacinosida	Rossellidae	Symplectella rowi	29/04/2021	1
75864	3465	2	NOS	TWL	2012-03-14	SOI	277	-50.7	166.9	2012-03-14	SOI	150	-50.6	166.9	SSQ	Mollusca	Cephalopoda	Sepiida	Sepiadariidae	Sepioloidea n.sp. l	27/10/2020	1
75881	3494	22	SQU	TWL	2012-05-11	SOI	166	-50.5	167.3	2012-05-11	SOI	168	-50.3	167.7	HYA	Porifera	Hexactinellida	Lyssacinosida	Rossellidae	Hyalascus maui	23/02/2021	1
75934	3618	26	JMA	TWL	2012-12-02	CEW	125	-38.5	173.7	2012-12-02	CEW		-38.4	173.8	SCY	Cnidaria	Scyphozoa			Scyphozoa indet.	4/03/2021	1
87023	3657	27	SQU	TWL	2013-01-29	SOU	226	-48.8	166.8	2013-01-29	SOU	190	-48.8	167.3	ASC	Chordata	Ascidiacea	Stolidobranchia	Styelidae	Botrylloides	22/04/2021	1
75994	3659	3	SWA	TWL	2013-01-21	SEC	139	-46	170.9	2013-01-21	SEC		-46.2	170.6	ASC	Chordata	Ascidiacea	Stolidobranchia	Pyuridae	Pyura picta	22/04/2021	1
75997	3659	3	SWA	TWL	2013-01-21	SEC	139	-46	170.9	2013-01-21	SEC		-46.2	170.6	ASC	Chordata	Ascidiacea	Stolidobranchia	Styelidae	Asterocarpa humilis	22/04/2021	1
75975	3676	43	SQU	TWL	2013-02-25	SOU	189	-48.8	166.8	2013-02-25	SOU	218	-48.7	167.4	ASC	Chordata	Ascidiacea			Ascidiacea indet.	22/04/2021	1
87011	3682	4	SQU	TWL	2013-02-17	SOI	252	-50.6	167.2	2013-02-17	SOI		-50.5	167.3	SSQ	Mollusca	Cephalopoda	Sepiida	Sepiadariidae	Sepioloidea n.sp. l	27/10/2020	1
87027	3716	39	SQU	TWL	2013-04-12	SOU	243	-46.5	166	2013-04-12	SOU	220	-46.4	166	ASC	Chordata	Ascidiacea	Aplousobranchia	Polyclinidae	Polyclinidae	22/04/2021	1
87031	3716	45	SQU	TWL	2013-04-15	SOU	195	-46.4	166	2013-04-15	SOU	202	-46.5	166	ASC	Chordata	Ascidiacea	Aplousobranchia	Polyclinidae	Synoicum	22/04/2021	4
87082	3751	10	SCI	TWL	2013-05-18	SOI	469	-50.7	167.5	2013-05-18	SOI	460	-50.8	167.1	SSQ	Mollusca	Cephalopoda	Sepiida	Sepiadariidae	Sepioloidea n.sp. l	27/10/2020	1
88622	3933	23	BNS	BLL	2013-11-11	WANB	677	-33.5	167.6	2013-11-11	WANB	546	-33.3	167.5	NAT	Arthropoda	Malacostraca	Decapoda	Spongicolidae	Spongiocaris n. sp. a	9/04/2021	2
95107	4256	87	SNA	TWL	2014-12-13	AKE	50	-36.3	175.2	2014-12-13	AKE		-36.3	175	ASC	Chordata	Ascidiacea	Stolidobranchia	Styelidae	Cnemidocarpa hemprichi	22/04/2021	1
95127	4344	68	JMA	TWL	2015-03-21	SOU	128	-48.7	167.2	2015-03-21	SOU		-48.6	167.1	SSQ	Mollusca	Cephalopoda	Sepiida	Sepiadariidae	Sepioloidea n. sp. 300	27/10/2020	7
95127	4344	68	JMA	TWL	2015-03-21	SOU	128	-48.7	167.2	2015-03-21	SOU		-48.6	167.1	SSQ	Mollusca	Cephalopoda	Sepiida	Sepiadariidae	Sepioloidea n. sp. 300	27/10/2020	330
95141	4355	4	SQU	TWL	2015-03-23	SEC	272	-44.4	173	2015-03-23	SEC	284	-44.4	172.9	SOC	Cnidaria	Anthozoa	Alcyonacea	Alcyoniidae	Heteropolypus	29/03/2021	1
95148	4355	12	SQU	TWL	2015-03-27	SEC	148	-46.1	170.8	2015-03-27	SEC	205	-46.1	170.7	ASC	Chordata	Ascidiacea	Aplousobranchia		Aplousobranchia indet.	22/04/2021	2
119402	4459	32	WWA	TWL	2015-07-30	SOU	503	-48.7	166.4	2015-07-30	SOU		-48.6	166.3	SOC	Cnidaria	Anthozoa	Alcyonacea	Clavulariidae	Clavulariidae	23/03/2021	1

niwa_no	trip_number	station_number	target_species	fishing_method	event_start_date	start_obs_fma	start_seabed_depth	trunc_start_latitude	trunc_start_longitude	event_end_date	end_obs_fma	end_seabed_depth	trunc_end_latitude	trunc_end_longitude	expert_species	phylum	class	order	family	expert_scientific	determined_date	count
95247	4567	80	BAR	TWL	2016-01-10	SOE	187	-43.5	182.6	2016-01-10	SOE	174	-43.7	182.6	SSQ	Mollusca	Cephalopoda	Sepiida	Sepiadariidae	Sepioloidea	27/10/2020	1
95295	4642	40	GUR	TWL	2016-04-10	AKW	32	-34.6	172.5	2016-04-10	AKW	41	-34.6	172.7	ASC	Chordata	Ascidiacea	Aplousobranchia	Pseudodistomidae	Pseudodistoma	16/03/2021	1
95297	4669	23	SQU	TWL	2016-04-15	SOI	160	-50.5	167.3	2016-04-15	SOI	223	-50.7	166.9	SSQ	Mollusca	Cephalopoda	Sepiida	Sepiadariidae	Sepioloidea n. sp. 300	9/12/2020	1
106544	4869	5	JMA	TWL	2016-12-03	AKW	103	-37.9	174.1	2016-12-03	AKW		-37.7	174.1	ARN	Mollusca	Cephalopoda	Octopoda	Argonautidae	Argonauta argo	3/11/2020	2
106490	4874	30	JMA	TWL	2016-12-13	CEW	107	-38.5	173.8	2016-12-13	CEW		-38.6	173.7	ARN	Mollusca	Cephalopoda	Octopoda	Argonautidae	Argonauta argo	3/11/2020	4
106490	4874	30	JMA	TWL	2016-12-13	CEW	107	-38.5	173.8	2016-12-13	CEW		-38.6	173.7	ARN	Mollusca	Cephalopoda	Octopoda	Argonautidae	Argonauta argo	3/11/2020	1
106567	5063	47	SSO	TWL	2017-07-27	SEC	1005	-44.9	174.2	2017-07-27	SEC	1040	-44.9	174.3	AMP	Mollusca	Cephalopoda	Octopoda	Amphitretidae	Amphitretus pelagicus	3/11/2020	1
129019	5426	83	HOK	TWL	2018-09-28	SUB	615	-49.6	168	2018-09-28	SUB	580	-50	168.2	DHO	Echinodermata	Echinoidea	Camarodonta	Echinidae	Dermechinus horridus	19/03/2021	1
129021	5438	97	SSO	TWL	2018-10-05	SUB		-47.5	177.8	2018-10-05	SUB	977	-47.5	177.8	CMT	Echinodermata	Crinoidea	Comatulida	Phrynocrinidae	Phrynocrinus nudus	24/03/2021	3
129026	5451	18	LIN	TWL	2018-09-17	SUB	536	-50.2	168.2	2018-09-18	SUB	597	-49.8	168	ASC	Chordata	Ascidiacea	Aplousobranchia	Polyclinidae	Synoicum otagoensis	22/04/2021	3
129058	5503	90	HOK	TWL	2018-12-07	SOE	502	-44.2	182.5	2018-12-07	SOE	512	-44.2	182.2	SOC	Cnidaria	Anthozoa	Alcyonacea	Alcyoniidae	Heteropolypus	24/03/2021	2
129099	5544	9	SCI	TWL	2019-01-04	SOE	403	-42.8	176.9	2019-01-05	SOE	330	-43	177.2	GAS	Mollusca	Gastropoda			Gastropoda eggs	16/07/2020	30
129097	5544	17	SCI	TWL	2019-01-08	SOE	411	-42.8	176.9	2019-01-08	SOE	385	-43	176.7	EGA	Mollusca	Bivalvia	Pholadomyida	Euciroidae	Euciroa galatheae	16/07/2020	2
129095	5581	27	SQU	TWL	2019-02-25	SOU	142	-48.2	168.2	2019-02-25	SOU	190	-48	168.5	SOC	Cnidaria	Anthozoa	Alcyonacea	Clavulariidae	Clavulariidae	24/03/2021	10
131864	5626	52	SCI	TWL	2019-05-30	SOI	490	-50.9	167.1	2019-05-30	SOI	502	-50.8	167.6	AER	Mollusca	Gastropoda	Neogastropoda CLADE (Order)	Buccinulidae	Aeneator recens	16/07/2020	1
131871	5626	52	SCI	TWL	2019-05-30	SOI	490	-50.9	167.1	2019-05-30	SOI	502	-50.8	167.6	CMR	Mollusca	Gastropoda	Neogastropoda CLADE (Order)	Turbinellidae	Coluzea mariae	16/07/2020	1
131935	5844	25	BOE	TWL	2019-11-30	SOE	915	-44.1	178.5	2019-11-30	SOE	903	-44	178.5	PYC	Arthropoda	Pycnogonida	Pantopoda	Colossendeidae	Colossendeis australis	29/03/2021	1
131930	5844	65	ORH	TWL	2019-12-10	SOE	807	-44.2	185.5	2019-12-10	SOE	943	-44.1	185.5	TLO	Cnidaria	Anthozoa	Telestacea	Telestidae	Telestidae	7/07/2020	40
131929	5844	65	ORH	TWL	2019-12-10	SOE	807	-44.2	185.5	2019-12-10	SOE	943	-44.1	185.5	HDR	Cnidaria	Hydrozoa	Leptothecata	Lafoeidae	Acryptolaria operculata	22/02/2021	10
131928	5844	65	ORH	TWL	2019-12-10	SOE	807	-44.2	185.5	2019-12-10	SOE	943	-44.1	185.5	GLS	Porifera	Hexactinellida	Lyssacinosida	Rossellidae	Lanuginellinae	17/02/2021	1
131938	5844	142	ORH	TWL	2019-12-27	SOE	1169	-42.8	185	2019-12-27	SOE		-42.8	184.7	DGR	Cnidaria	Anthozoa	Pennatulacea	Protoptilidae	Distichoptilum gracile	28/05/2020	1
131915	5854	24	ORH	TWL	2019-12-05	AKW	1050	-34.7	171.6	2019-12-05	AKW	1166	-34.7	171.6	CLC	Porifera	Hexactinellida	Lyssacinosida	Rossellidae	Caulophacus (Caulophacus) discohexaster	18/02/2021	3
131925	5854	24	ORH	TWL	2019-12-05	AKW	1050	-34.7	171.6	2019-12-05	AKW	1166	-34.7	171.6	DSO	Porifera	Demospongiae	Poecilosclerida	Phellodermidae	Echinostylinos n.sp. 1	29/04/2021	1
131921	5854	24	ORH	TWL	2019-12-05	AKW	1050	-34.7	171.6	2019-12-05	AKW	1166	-34.7	171.6	DSO	Porifera	Demospongiae	Suberitida	Halichondriidae	Halichondria (Halichondria) n. sp. 8	29/04/2021	1
131927	5854	25	ORH	TWL	2019-12-05	AKW	1050	-34.7	171.6	2019-12-05	AKW	1055	-34.7	171.6	CMT	Echinodermata	Crinoidea	Comatulida	Charitometridae	Charitometridae	24/03/2021	1

niwa_no	trip_number	station_number	target_species	fishing_method	event_start_date	start_obs_fma	start_seabed_depth	trunc_start_latitude	trunc_start_longitude	event_end_date	end_obs_fma	end_seabed_depth	trunc_end_latitude	trunc_end_longitude	expert_species	phylum	class	order	family	expert_scientific	determined_date	count
131926	5854	25	ORH	TWL	2019-12-05	AKW	1050	-34.7	171.6	2019-12-05	AKW	1055	-34.7	171.6	ASC	Chordata	Ascidiacea	Stolidobranchia	Pyuridae	Culeolus hospitalis	16/03/2021	1
131920	5854	37	ORH	TWL	2019-12-10	CEE	1086	-41.4	176.2	2019-12-10	CEE	1120	-41.4	176.2	CMT	Echinodermata	Crinoidea	Comatulida	Phrynocrinidae	Phrynocrinus nudus	24/03/2021	1
131975	5901	25	TRE	BT	2020-02-12	CEW		-39.9	174	2020-02-12	CEW		-39.7	173.9	HDR	Cnidaria	Hydrozoa	Leptothecata	Plumulariidae	Plumulariidae	22/02/2021	1
146431	5904	9	SQU	TWL	2020-02-18	SOU	142	-48.6	167.8	2020-02-18	SOU	210	-48.8	167.2	PHI	Echinodermata	Echinoidea	Clypeasteroida	Laganidae	Peronella hinemoae	24/03/2021	1
146427	5904	19	SQU	TWL	2020-02-22	SOI	147	-50.7	166.9	2020-02-22	SOI	158	-50.5	167.3	GSC	Arthropoda	Malacostraca	Decapoda	Majidae	Jacquinotia edwardsii	4/09/2020	1
145299	5904	26	SQU	TWL	2020-02-26	SOI	230	-49.8	166.1	2020-02-26	SOI	171	-50.1	166.3	GSC	Arthropoda	Malacostraca	Decapoda	Majidae	Jacquinotia edwardsii	4/09/2020	1
146430	5918	106	SQU	TWL	2020-04-27	SEC	183	-46.2	170.5	2020-04-27	SEC	183	-46.2	170.6	SED					Sediment	16/03/2021	10
146483	6135	23	ORH	TWL	2020-11-03	SOE	990	-44.6	184.7	2020-11-03	SOE	1280	-44.6	184.8	MNI	Arthropoda	Malacostraca	Decapoda	Munididae	Munida isos	16/03/2021	2
146478	6135	40	ORH	TWL	2020-11-05	SOE	815	-44.2	185.5	2020-11-05	SOE	1170	-44.2	185.4	FAR	Porifera	Hexactinellida	Sceptrulophora	Farreidae	Farrea similaris	29/04/2021	1
146498	6135	62	ORH	TWL	2020-11-09	SOE	910	-42.9	185.5	2020-11-09	SOE	1125	-42.9	185.5	HDR	Cnidaria	Hydrozoa	Siphonophora	Rhodaliidae	Rhodaliidae	11/03/2021	1
146492	6135	71	SSO	TWL	2020-11-11	SOE	1126	-44.8	182.9	2020-11-11	SOE	1310	-44.8	182.9	BTD	Echinodermata	Holothuroidea	Elasipodida	Psychropotidae	Benthodytes	12/03/2021	1
146484	6135	78	BOE	TWL	2020-11-14	SOE	680	-44.4	181.2	2020-11-14	SOE	850	-44.4	181.2	OAB	Echinodermata	Ophiuroidea	Amphilepidida	Ophiactidae	Ophiactis abyssicola	29/03/2021	5
146469	6135	101	ORH	TWL	2020-11-24	SOE	850	-44.2	185.4	2020-11-24	SOE	1180	-44.1	185.5	AWA	Echinodermata	Ophiuroidea	Euryalida	Gorgonocephalidae	Astrothorax waitei	1/02/2021	2
146464	6135	151	SSO	TWL	2020-11-30	SOE	1124	-44.8	182.9	2020-11-30	SOE	1290	-44.8	182.9	ARO	Cnidaria	Anthozoa	Alcyonacea	Alcyoniidae	Anthomastus	24/03/2021	1
146476	6135	151	SSO	TWL	2020-11-30	SOE	1124	-44.8	182.9	2020-11-30	SOE	1290	-44.8	182.9	OPC	Echinodermata	Ophiuroidea	Euryalida	Euryalidae	Ophiocreas	16/02/2021	5
146467	6135	174	ORH	TWL	2020-12-03	SOE	850	-44.2	185.4	2020-12-03	SOE	1250	-44.2	185.4	FAR	Porifera	Hexactinellida	Sceptrulophora	Farreidae	Farrea similaris	29/04/2021	1