

## Species composition and checklist of the demersal ichthyofauna of the continental slope off Western Australia (20–35°S)

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**Abstract** – The first regional collection of fishes from the continental slope off the west coast of Australia was taken between 1989 and 1991 during exploratory trawling. Collections were taken from 95 trawls completed during an exploratory fishing survey by a research vessel at latitudinally and depth-stratified stations, and from 56 trawls aboard commercial vessels. The region trawled was between latitudes 20–35°S in depths from 200 to about 1500 m.

The demersal slope fish fauna in this region is highly speciose: 388 species from 108 families were identified and these are presented in a checklist. Approximately 100 of these species are recorded from Australian waters for the first time and many represent undescribed taxa. We present criteria which establish the reliability of identifications in the checklist. Overall, the Macrouridae are the most speciose family with 50 species; 10 or more species were also recorded from the Squalidae (22 species), Alepocephalidae (17), Ophidiidae (17), Moridae (13), Triglidae (13), Scyliorhinidae (10) and Scorpaenidae (10).

The most abundant families (in numbers of individuals) in 200–600 m include the Acropomatidae, Trachichthyidae, Chlorophthalmidae and Scorpaenidae. Between 600 and 800 m, the Macrouridae, Bathyclupeidae, Chaunacidae and Neosopelidae are most abundant, while the Macrouridae, Alepocephalidae, Oreosomatidae and Synphobranchidae dominate depths below 800 m.

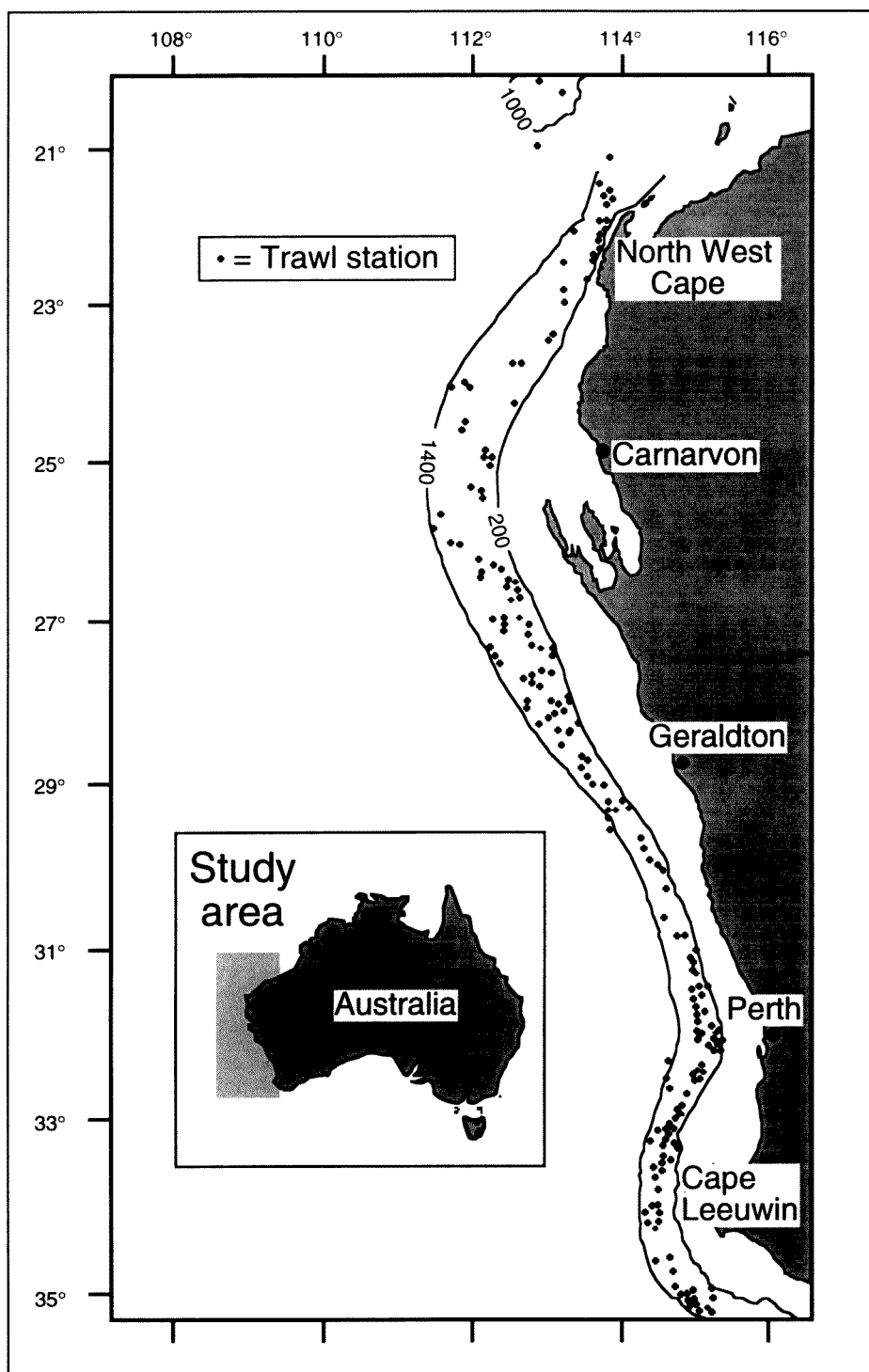
### INTRODUCTION

In their recent treatment of the Australian fish fauna, Paxton *et al.* (1989) described the offshore waters of Western Australia as virtually unsampled from an ichthyological perspective. Fish collections had been made during an exploratory fishing survey by a Japanese trawler on the continental shelf and upper-continental slope to a depth of 600 m (Heald and Walker 1982). However, few specimens from that work are represented in museum collections and consequently species identifications cannot be verified. Similarly, few results from surveys undertaken by the Soviets in Western Australian waters between 1962 and 1974, (E. Nosov, TINRO, Vladivostok, Russia, pers. comm.) are available. Locality and depth of capture data in occasional descriptions of new species, e.g., Sazonov and Shcherbachev (1982) and Iwamoto and Shcherbachev (1991), indicated those cruises had fished on the western slope region. More recently, fish collections have been taken during exploratory fishing by Australian trawlers and foreign vessels in collaborative fishing ventures. These operations included a survey by the CSIRO Division of

Fisheries' research vessel, FRV *Southern Surveyor*, based around a series of stations stratified by depth and latitude. This paper is based on collections of demersal fishes taken during these operations between 1989 and 1991.

Collections of deep water fishes from the Australian region have expanded rapidly in recent years following the commercial exploitation of continental slope resources. Commercial fishing has occurred primarily on the slope region of southeastern Australia and the Great Australian Bight (GAB) where blue grenadier (*Macruronus novaezelandiae*), gemfish (*Rexea solandri*) and orange roughy (*Hoplostethus atlanticus*) were targeted. The demersal fish faunas of these regions were documented in preliminary checklists: the mid-slope (~700–1200 m) region off southeastern Australia by Last and Harris (1981) and Koslow *et al.*, (1994); the GAB by Newton and Klaer (1991), and the upper continental slope (~500 m) off southeastern Australia by May and Blaber (1989). Many of the 448 new Australian records in Paxton *et al.* (1989) were deep water species.

In this paper we provide an overview of the faunal composition of fishes from the upper and



**Figure 1** Map of the study area showing the approximate positions of the 200 m and 1400 m isobaths and the trawl stations from which fish collections were taken.

mid-slope region off the western coast of Australia, along with a checklist of species taken. Distributional range information and museum registration details are provided. The data are based primarily on a 30-day research survey undertaken in 1991, supplemented with collections from commercial fishing vessels. Samples were taken from an area between latitudes 20° and 35°S over a depth range of approximately 200–1500 m.

## MATERIALS AND METHODS

### Data collection and analysis

Fishes were collected from 95 demersal trawl stations during an exploratory survey (CSIRO Division of Fisheries, FRV *Southern Surveyor* research cruise SS01/91) and from 56 commercial trawls. Details of trawl stations are given in Table 1 and their approximate positions shown in a

**Table 1** Position and depths of stations sampled with demersal trawls during this study. Vessel code refers to the CSIRO research vessel (RV) or commercial fishing vessels (CV).

| Vessel | Latitude<br>(°S) | Longitude<br>(°E) | Depth (m)<br>(start) | Depth (m)<br>(end) | Vessel | Latitude<br>(°S) | Longitude<br>(°E) | Depth (m)<br>(start) | Depth (m)<br>(end) |
|--------|------------------|-------------------|----------------------|--------------------|--------|------------------|-------------------|----------------------|--------------------|
| RV     | 20°16'           | 113°13'           | 913                  | 914                | RV     | 32°04'           | 115°09'           | 270                  | 285                |
| RV     | 20°07'           | 112°55'           | 868                  | 854                | RV     | 32°02'           | 115°08'           | 510                  | 510                |
| RV     | 20°55'           | 112°51'           | 1139                 | 1128               | RV     | 32°02'           | 114°52'           | 700                  | 1200               |
| RV     | 21°28'           | 113°38'           | 1022                 | 1023               | RV     | 32°14'           | 115°06'           | 286                  | 287                |
| RV     | 21°37'           | 113°55'           | 328                  | 328                | RV     | 32°10'           | 115°08'           | 225                  | 230                |
| RV     | 21°39'           | 113°58'           | 209                  | 215                | RV     | 32°19'           | 114°28'           | 1280                 | 1310               |
| RV     | 21°44'           | 113°52'           | 320                  | 290                | RV     | 32°34'           | 114°27'           | 1030                 | 1140               |
| RV     | 21°44'           | 113°52'           | 274                  | 273                | RV     | 32°40'           | 114°28'           | 880                  | 960                |
| RV     | 21°50'           | 113°46'           | 685                  | 650                | RV     | 33°17'           | 114°12'           | 982                  | 982                |
| RV     | 21°54'           | 113°40'           | 1158                 | 1100               | RV     | 33°18'           | 114°31'           | 220                  | 220                |
| RV     | 22°00'           | 113°08'           | 1460                 | ~1500              | RV     | 33°17'           | 114°30'           | 468                  | 430                |
| RV     | 22°28'           | 113°12'           | 1258                 | 1305               | RV     | 33°24'           | 114°31'           | 203                  | 204                |
| RV     | 22°47'           | 113°13'           | 880                  | 910                | RV     | 33°22'           | 114°29'           | 399                  | 350                |
| RV     | 22°59'           | 113°14'           | 482                  | 544                | RV     | 33°25'           | 114°21'           | 817                  | 780                |
| RV     | 23°25'           | 113°03'           | 297                  | 311                | RV     | 33°49'           | 114°17'           | 1050                 | 1050               |
| RV     | 23°25'           | 113°03'           | 300                  | 302                | RV     | 34°12'           | 114°07'           | 1240                 | 1225               |
| RV     | 23°46'           | 112°36'           | 576                  | 587                | RV     | 34°39'           | 114°15'           | 890                  | 890                |
| RV     | 23°44'           | 112°35'           | 612                  | 620                | RV     | 34°56'           | 114°29'           | 900                  | 958                |
| RV     | 23°44'           | 112°35'           | 612                  | 623                | RV     | 34°59'           | 114°43'           | 738                  | 750                |
| RV     | 24°00'           | 111°54'           | 1060                 | 1064               | RV     | 35°04'           | 114°59'           | 870                  | 920                |
| RV     | 23°59'           | 111°54'           | 1061                 | 1071               | CV     | 35°08'           | 115°01'           | 1003                 | —                  |
| RV     | 24°09'           | 111°39'           | 1293                 | 1320               | CV     | 35°07'           | 115°01'           | 945                  | —                  |
| RV     | 24°30'           | 111°50'           | 892                  | 905                | CV     | 35°02'           | 115°02'           | 673                  | —                  |
| RV     | 24°30'           | 111°50'           | 895                  | 901                | CV     | 34°59'           | 114°53'           | 712                  | —                  |
| RV     | 24°51'           | 112°07'           | 467                  | 478                | CV     | 34°45'           | 114°26'           | 727                  | —                  |
| RV     | 24°52'           | 112°07'           | 444                  | 468                | CV     | 34°15'           | 114°20'           | 825                  | —                  |
| RV     | 24°55'           | 112°11'           | 318                  | 344                | CV     | 34°10'           | 114°16'           | 1030                 | —                  |
| RV     | 25°07'           | 112°09'           | 306                  | 319                | CV     | 33°58'           | 114°22'           | 870                  | —                  |
| RV     | 25°07'           | 112°09'           | 312                  | 312                | CV     | 33°44'           | 114°22'           | 740                  | —                  |
| RV     | 25°19'           | 111°56'           | 612                  | 610                | CV     | 33°17'           | 114°13'           | 976                  | —                  |
| RV     | 25°41'           | 111°30'           | 1115                 | 1125               | CV     | 33°20'           | 114°30'           | 435                  | —                  |
| RV     | 25°52'           | 111°27'           | 1254                 | 1277               | CV     | 33°13'           | 114°31'           | 440                  | —                  |
| RV     | 26°02'           | 111°39'           | 1000                 | 1005               | CV     | 33°06'           | 114°30'           | 596                  | —                  |
| RV     | 26°05'           | 111°46'           | 882                  | 874                | CV     | 32°52'           | 114°35'           | 571                  | —                  |
| RV     | 26°14'           | 112°03'           | 690                  | 691                | CV     | 30°57'           | 114°48'           | 470                  | —                  |
| RV     | 26°35'           | 112°29'           | 508                  | 500                | CV     | 29°50'           | 114°21'           | 413                  | —                  |
| RV     | 26°40'           | 112°32'           | 478                  | 456                | CV     | 29°43'           | 114°18'           | 450                  | —                  |
| RV     | 26°42'           | 112°41'           | 200                  | 194                | CV     | 28°48'           | 113°37'           | 457                  | —                  |
| RV     | 26°42'           | 112°38'           | 285                  | 285                | CV     | 28°06'           | 113°27'           | 649                  | —                  |
| RV     | 26°45'           | 112°36'           | 346                  | 367                | CV     | 28°13'           | 113°07'           | 616                  | —                  |
| RV     | 26°57'           | 112°22'           | 666                  | 688                | CV     | 27°49'           | 113°01'           | 437                  | —                  |
| RV     | 27°06'           | 112°22'           | 714                  | 713                | CV     | 26°59'           | 112°38'           | 435                  | —                  |
| RV     | 27°22'           | 112°10'           | 1009                 | 996                | CV     | 26°36'           | 112°09'           | 760                  | —                  |
| RV     | 27°28'           | 112°13'           | 750                  | 900                | CV     | 25°36'           | 112°10'           | 435                  | —                  |
| RV     | 27°32'           | 112°15'           | 1107                 | 1140               | CV     | 26°25'           | 112°20'           | 565                  | —                  |
| RV     | 27°32'           | 112°15'           | 1104                 | 1110               | CV     | 32°06'           | 115°10'           | 244                  | —                  |
| RV     | 28°00'           | 112°41'           | 945                  | 946                | CV     | 31°59'           | 115°12'           | 230                  | —                  |
| RV     | 28°04'           | 112°42'           | 854                  | 853                | CV     | 32°29'           | 114°53'           | 385                  | —                  |
| RV     | 28°16'           | 113°17'           | 520                  | 520                | CV     | 32°21'           | 114°59'           | 362                  | —                  |
| RV     | 27°17'           | 112°45'           | 510                  | 520                | CV     | 32°20'           | 114°59'           | 360                  | —                  |
| RV     | 27°08'           | 112°44'           | 438                  | 370                | CV     | 32°21'           | 114°59'           | 348                  | —                  |
| RV     | 27°04'           | 112°44'           | 303                  | 333                | CV     | 20°40'           | 113°43'           | 225                  | —                  |
| RV     | 27°23'           | 112°51'           | 306                  | 279                | CV     | 22°30'           | 113°35'           | 250                  | —                  |
| RV     | 27°38'           | 113°00'           | 248                  | 252                | CV     | 22°22'           | 113°40'           | 225                  | —                  |
| RV     | 29°15'           | 113°56'           | 320                  | 325                | CV     | 21°35'           | 113°40'           | 240                  | —                  |
| RV     | 29°20'           | 113°58'           | 490                  | 505                | CV     | 22°13'           | 113°44'           | 270                  | —                  |
| RV     | 29°21'           | 113°46'           | 942                  | 970                | CV     | 31°34'           | 115°00'           | 213                  | —                  |
| RV     | 29°22'           | 113°42'           | 1160                 | 1167               | CV     | 31°12'           | 114°56'           | 213                  | —                  |
| RV     | 29°28'           | 113°42'           | 1160                 | 1160               | CV     | 32°38'           | 114°47'           | 376                  | —                  |
| RV     | 29°35'           | 113°44'           | 1132                 | 1136               | CV     | 32°55'           | 114°39'           | 373                  | —                  |
| RV     | 29°51'           | 114°11'           | 770                  | 760                | CV     | 32°41'           | 114°47'           | 342                  | —                  |
| RV     | 30°01'           | 114°29'           | 255                  | 265                | CV     | 32°18'           | 114°58'           | 350                  | —                  |
| RV     | 30°00'           | 114°27'           | 380                  | 380                | CV     | 35°05'           | 114°53'           | 989                  | —                  |
| RV     | 30°00'           | 114°27'           | 480                  | 490                | CV     | 35°03'           | 114°51'           | 900                  | —                  |
| RV     | 30°16'           | 114°30'           | 684                  | 684                | CV     | 29°14'           | 113°52'           | 556                  | —                  |
| RV     | 30°39'           | 114°27'           | 1058                 | 1080               | CV     | 27°53'           | 113°08'           | 225                  | —                  |
| RV     | 30°51'           | 114°37'           | 893                  | 887                | CV     | 31°31'           | 114°53'           | 470                  | —                  |
| RV     | 31°16'           | 114°50'           | 613                  | 614                | CV     | 28°03'           | 113°15'           | 204                  | —                  |
| RV     | 31°17'           | 114°52'           | 475                  | 512                | CV     | 27°33'           | 112°58'           | 218                  | —                  |
| RV     | 31°44'           | 114°59'           | 390                  | 485                | CV     | 27°29'           | 112°50'           | 250                  | —                  |
| RV     | 32°02'           | 114°54'           | 670                  | 640                | CV     | 34°57'           | 114°56'           | 201                  | —                  |
| RV     | 31°53'           | 115°05'           | 411                  | 550                | CV     | 28°30'           | 112°55'           | 960                  | —                  |
| RV     | 31°55'           | 115°10'           | 320                  | 850                | CV     | 31°20'           | 114°54'           | 390                  | —                  |
| RV     | 32°09'           | 115°02'           | 484                  | 470                | CV     | 31°49'           | 115°01'           | 390                  | —                  |
| RV     | 32°07'           | 115°06'           | 308                  | 295                | CV     | 31°31'           | 114°57'           | 390                  | —                  |
|        |                  |                   |                      |                    | CV     | 31°29'           | 114°55'           | 390                  | —                  |

diagram (Figure 1). In brief, sampling was carried out within the Western Deep Water Trawl Fishery (WDWTF), a management zone bounded in the north at 20°S by the 114°E meridian (North West Cape) and in the south at ~35°S by the 115°08'E meridian (Cape Leeuwin). Trawling operations involved the use of a variety of nets, although typically these nets had a large headline length (> 35.5 m) and heavy rubber-bobbin ground gear. Details of the net and trawl configuration used in the research survey are provided elsewhere (Williams *et al.*, submitted). A random-stratified sampling design was used for the survey based on six depth strata of 200 m within eight latitudinal strata of 100 nautical miles each. In addition, one trawl (#12) sampled in a depth range of 1460–1500+ m. Sixty five of the 95 stations were random-stratified; the remainder were targeted on fish schools detected by echosounder. About 90,000 fishes were caught during the research vessel survey, with the number of fish taken in the commercial catches unknown. About 90% of the fish species were recorded from survey operations.

Aboard the research vessel, fish specimens retained for museum collections were sorted on ice and placed in 10% formalin solution at the earliest opportunity. On commercial vessels specimens were frozen and preserved later in the laboratory. Most of the material retained is deposited in the I.S.R. Munro Ichthyological Collection at the CSIRO Division of Fisheries Laboratories in Hobart (CSIRO), at the Australian Museum in Sydney (AMS), and the Museum of Victoria, Melbourne (NMV). A few voucher specimens are also lodged at the Western Australian Museum, Perth (WAM).

Numerical abundances were calculated from numbers and weights, and standardised by the area swept and duration of trawls. Abundance data relate only to the 65 random stratified stations from the research vessel survey.

As the purpose of this paper is to present information on demersal fishes, pelagic species from the following taxa were excluded from the checklist: Serrivomeridae, Nemichthyidae, Eurypharyngidae, Bathylagidae, Opisthoproctidae, Gonostomatidae, Sternoptychidae, Astronesthidae, Melanostomiidae, Malacosteidae, Chauliodontidae, Stomiidae, Idiacanthidae, Myctophidae, Notosudidae, Paralepididae, Omosudidae, Alepisauridae, Evermannellidae, Scopelarchidae, Rondeletidae, Ogcocephalidae (only *Coelophrys* sp.), Ceratoidea, Macrouridae (only *Hymenocephalus* species, *Mesobius* species, *Squalogadus modifucus*), Melamphaidae, Anoplogastridae, Carangidae, Bramidae, Chiasmodontidae, Gempylidae (only *Lepidocybium flavobrunneum*, *Ruvettus pretiosus*, *Thyrsoitoides marleyi*) and Trichiuridae.

## Taxonomic identifications

As noted by Paxton *et al.* (1989), the taxonomic understanding of Australian fishes has only just begun for some groups. This is especially true for those occurring in the continental slope region. Many of the species encountered in this study are poorly known; indeed many are recorded from Australian waters here for the first time and many of these are yet to be described. A continuity in field identifications was ensured by the preparation of identification sheets for each taxon and by updating them on a station by station basis. Our family classification follows Nelson (1994).

The order of reliability of identification of each species was provided using a five level system presently in use at the CSIRO fish collection. It takes into consideration the taxonomic experience of the identifier, their knowledge of the group considered, and the amount of effort given to making the identification. In this scheme identifications below level 2 are not considered fully reliable; an explanation is given in Table 2.

**Table 2** Criteria for assessing the reliability of identifications based on the taxonomic expertise of the identifier and their intentions as used in the checklist.

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**Level 1: Highly reliable identification** – Specimen identified by (a) an internationally recognised authority of the group, or (b) a specialist that is presently studying or has reviewed the group in the Australian region.

**Level 2: Identification made with high degree of confidence at all levels** – Specimen identified by a trained identifier who had prior knowledge of the group in the Australian region or used available literature to identify the specimen.

**Level 3: Identification made with high confidence to genus but less so to species** – Specimen identified by (a) a trained identifier who was confident of its generic placement but did not substantiate their species identification using the literature, or (b) a trained identifier who used the literature but still could not make a positive identification to species, or (c) an untrained identifier who used most of the available literature to make the identification.

**Level 4: Identification made with limited confidence** – Specimen identified by (a) a trained identifier who was confident of its family placement but unsure of generic or species identifications (no literature used apart from illustrations), or (b) an untrained identifier who had/used limited literature to make the identification.

**Level 5: Identification superficial** – Specimen identified by (a) a trained identifier who is uncertain of the family placement of the species (cataloguing identification only), (b) an untrained identifier using, at best, figures in a guide, or (c) where the status and expertise of the identifier is unknown.

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RESULTS

Faunal overview

A total of 388 fish species from 108 families are recorded from the western continental slope region between the 200 and 1500 m isobaths (Appendix 1). A high number, around 100 species, are recorded from Australian waters for the first time, and many are undescribed.

The most species-rich family is the Macrouridae with 50 species; in our collections it has about 2.5 times the number of species of any other family and accounts for about one seventh of all species caught. Other speciose families, in decreasing order of numbers of species taken, are the Squalidae (22 species), Alepocephalidae (17), Ophidiidae (17), Moridae (13), Triglidae (13), Scyliorhinidae (10) and Scorpaenidae (10). Of the remaining families, 44, or over 40% of the total, are represented by only a single species. The composition of dominant families changes markedly in the shallower strata (200–600 m) but is dominated in depths exceeding 800 m primarily by macrourids, alepocephalids and oreosomatids (Table 3).

Dominant taxa within depth strata

Within the shallow upper-slope depth range (200–400 m) the numerically dominant families are the Acropomatidae, Trachichthyidae, and Macrurocyttidae (Table 3). Acropomatids are primarily *Malakichthys* sp. A, *Acropoma japonicum*, *Apogonops anomolous* and *Synagrops philippinensis* (~36%, 9%, 3% and 2% of total individuals, respectively). Trachichthyid representatives include *Gephyroberyx darwini* (23%) and a suite of small *Hoplostethus* species dominated by *H. latus*

(less than 1%). The Macrurocyttidae is represented by a single species, *Zenion* sp. A.

The Chlorophthalmidae is the dominant family in the 400–600 m stratum but represents only 20% of individuals. Of the five species collected, *Chlorophthalmus nigripinnis* and *Chlorophthalmus* sp. C are most numerous (13% and 6%, respectively) and, as with the other chlorophthalmid species, are restricted to the shallow and mid-depths of the upper-slope. The prevalence of the Acropomatidae in this depth range is due to *Apogonops anomolus* (13%) and *Malakichthys* sp. A (3%). The Scorpaenidae is among the most speciose families taken on the western slope region. It is represented by several species in this depth range with *Helicolenus barathri* accounting for about 7% of individuals. The most abundant macrourids in this depth range are *Caelorinchus* species, the most numerous being *C. maurofasciatus*, *C. mirus* and *C. parvifasciatus*.

Macrourids are numerically dominant in depths below 600 m. *Caelorinchus maurofasciatus* (11%), *Malacocephalus laevis* (8%), *Nezumia* sp. A (6%), *Ventrifossa macropogon* (6%) and *Lepidorhynchus denticulatus* (2%) have the highest numbers of individuals in 600–800 m. The species with the highest number of individuals is *Bathyclupea* sp. A (Bathyclupeidae), accounting for about 20% of the total catch. The Chaunacidae is represented mostly by *Chaunax* cf. *fimbriatus* (8%) and the Neoscopelidae by an unidentified species, *Neoscopelus* sp. A (4%).

In depths greater than 800 m the Macrouridae is the most speciose family, accounting for between 41% and 50% of the individuals in each of the three mid-slope strata. *Cetonus globiceps*, *Gadomus* sp.

Table 3 Numerically dominant four families in each 200 m depth stratum. Figures are the percentage of the total number of individuals per stratum (based on survey data only).

| Depth stratum (m)                      | 200–400 | 400–600 | 600–800 | 800–1000 | 1000–1200 | 1200–1400 |
|----------------------------------------|---------|---------|---------|----------|-----------|-----------|
| Acropomatidae (temperate sea basses)   | 50      | 17      |         |          |           |           |
| Trachichthyidae (sawbellies)           | 24      |         |         |          |           |           |
| Macrurocyttidae (dwarf dories)         | 5       |         |         |          |           |           |
| Gempylidae (snake mackerels)           | 3       |         |         |          |           |           |
| Chlorophthalmidae (greeneyes)          |         | 20      |         |          |           |           |
| Scorpaenidae (scorpionfishes)          |         | 10      |         |          |           |           |
| Macrouridae (grenadiers)               |         | 8       | 42      | 41       | 50        | 49        |
| Bathyclupeidae (bathyclupeids)         |         |         | 19      |          |           |           |
| Chaunacidae (coffinfishes)             |         |         | 8       |          |           |           |
| Neoscopelidae (new lanternfishes)      |         |         | 6       | 10       |           |           |
| Oreosomatidae (oreo dories)            |         |         |         | 10       | 12        |           |
| Alepocephalidae (slickheads)           |         |         |         | 14       | 12        | 7         |
| Synaphobranchidae (basketwork eels)    |         |         |         |          | 10        | 7         |
| Ipnopidae (tripodfishes)               |         |         |         |          |           | 7         |
| Mean number of fish per standard trawl | 3229    | 510     | 223     | 202      | 157       | 160       |
| Number of samples                      | 12      | 12      | 10      | 15       | 11        | 5         |

B, three unidentified species of *Trachonurus* and *Bathygadus cottoides* have the greatest number of specimens; several species of the genera *Caelorinchus*, *Coryphaenoides*, *Nezumia* and *Ventrifossa* are also well represented. Several species account for the prominence of the Alepocephalidae. In 800–1000 m *Xenodermichthys copei* and *Rouleina guentheri* are the most abundant (10% and 3% respectively); in the two deepest strata *Alepocephalus triangularis*, *A. cf. productus* and *Narctes lloydii* each make up between 1 and 4% of numbers. Oreosomatids are represented by four species, but *Allocyttus verrucosus* is the most abundant, making up 10% and 12% of numbers in the 800–1000 m and 1000–1200 m strata, respectively. The Synphobranchidae, comprising four species, ranks fourth and third in the two deepest strata (1000–1200 m and 1200–1400 m). *Diastobranchius capensis* and *Synphobranchius brevidorsalis* are most numerous with a combined proportion of about 7% of numbers in each stratum; *S. affinis* and *S. kaupi* contribute about 3% of the total number of individuals between 1000–1200 m. *Neoscopelus macrolepidotus* (Neoscopelidae) accounts for 10% of the total number of specimens taken in the 800–1000 m stratum and *Bathypterois ventralis* (Bathypteroidae) 7% of the numbers in the 1200–1400 m stratum.

Other groups are prominent in terms of species numbers or biomass but account for relatively few individuals. Overall, the Squalidae, with 22 species, ranks second in terms of numbers of species and, in the six strata sampled, ranks eleventh, sixth, ninth, seventh, eighth and eleventh, respectively, in numbers of individuals. *Squalus megalops* and *S. mitsukurii* are the dominant squalids on the upper-slope (1–3% and ~1% of numbers, respectively), with *Deania calcea* relatively common (~1%) on the shallow mid-slope, and *Zameus squamulosus* widespread and relatively common (~1%) in the 800–1500 m range. The Triglidae is represented by 13 species, dominated by members of *Lepidotrigla* and *Satyrichthys*. This family is restricted mainly to the shallow and mid-range of the upper-slope with only the distribution of *S. cf. investigatoris* extending below 500 m. Representatives of the Ophidiidae range from the upper-slope to the deep mid-slope. The upper-slope species, *Dannevigia tusca* and *Genypterus blacodes*, are relatively large but rare in this region, whereas several of the deep-dwelling species are more numerous and contribute to the prominent ranking of this family (fifth and seventh) in the two deepest strata. In these strata, the dominant species, *Monomitopus* sp. A, accounts for ~1–3% of total numbers of individuals.

#### Dominant taxa at different latitudes

The shallow upper-slope (~200–400 m) fauna

north of Shark Bay includes many tropical Indo-West Pacific species and species whose distributions include the outer shelf area of northwestern Australia (e.g., Sainsbury *et al.* 1985). The most abundant components in survey trawls include *Dentex tumifrons*, *Acropoma japonicum*, *Malakichthys* sp. A, *Synagrops philippinensis* and *Nemipterus bathybius*; commercial catches from this region are dominated by the lutjanid *Etelis carbunculus* with a by-catch of other tropical lutjanids, serranids and priacanthids. The shallow upper-slope fauna south of Perth comprises mainly temperate fishes whose distributions also encompass the outer shelf. Dominant elements include *Dannevigia tusca*, *Neosebastes thetidis*, *Pterygotrigla polyommata*, *Neoplatycephalus conatus*, *Lepidoperca filamenta*, *Zanclistius elevatus*, *Oplegnathus woodwardi*, *Nemadactylus macropterus*, and *Nelusetta ayraudi*.

A similar overlap of warm and cool water species is evident on the deeper reaches of the upper-slope (~400–800 m), but the most abundant species are generally more widely distributed. Abundant tropical/sub-tropical species include *Synagrops japonicus*, *Setarches guentheri*, *Epigonus macrops*, *Bathyclupea* sp. A and *Champsodon* cf. *longipinnis*. The dominant temperate elements of the deeper upper-slope fauna include some species which did not occur further north than the southernmost section of the west coast, and others which ranged northward well into warm waters. The former group includes several species endemic to southern Australia (e.g., *Galeus boardmani*, *Urolophus expansus* and *Lepidoperca filamenta*), and other species with restricted southern Australian and New Zealand distributions (*Chlorophthalmus nigripinnis*, *Caelorinchus maurofasciatus*, *Lepidorhynchus denticulatus* and *Helicolenus* cf. *percoides*). Temperate species with distributions extending into waters north of Shark Bay (~26°S) include *Hoplostethus latus*, *Pentaceros decacanthus*, *Zenopsis nebulosus* and *Notopogon xenosoma*. Other abundant species have temperate/subtropical distributions: *Caelorinchus mirus*, *Apogonops anomalous*, *Rexea solandri*, *Euclichthys polynemus*, *Tripteryphycis gilchristi* and *Malacocephalus laevis*.

Fishes from mid-slope depths (~800–1500 m) are typically wide ranging with southern circumglobal, Indo-Atlantic or cosmopolitan distributions. Some, however, exhibit restricted latitudinal ranges, primarily confined to the region between Cape Leeuwin and Shark Bay. Tropical mid-slope species that are both abundant and have restricted distributions include *Anacanthobatis* sp. A, *Bathypterois guentheri*, *B. ventralis*, *Lamprogrammus* cf. *niger* and *Mataeocephalus acipenserinus*. The abundant, wide-ranging species are *Pavoraja* sp. B, *Synphobranchius brevidorsalis*, *Aldrovandia affinis*, *A. phalacra*, *Alepocephalus triangularis*, *Xenodermichthys*

*copei*, *Monomitopus* sp. A and *Scombrolabrax heterolepis*. Slope fishes that are abundant on the southern temperate Australian mid-slope and widely distributed on the west coast (extending north beyond Shark Bay) include *Centroscymnus owstoni*, *Deania calcea*, *Diastobranchius capensis*, *Synaphobranchius affinis*, *S. kaupi*, *Alepocephalus* cf. *productus*, *Rouleina guentheri*, *Neoscopelus macrolepidotus*, *Antimora rostrata*, *Bathygadus cottoides*, *Cetonurus globiceps*, *Coryphaenoides serrulatus*, *Neocyttus rhomboidalis* and *Alloctytus verrucosus*.

Many other species which are abundant on the temperate Australian mid-slope did not appear to occur north of Cape Leeuwin (~35°S). Conspicuous by their absence are the species which are commercially important in southeastern Australia. *Hoplostethus atlanticus* (orange roughy) and *Pseudocyttus maculatus* (smooth oreo) were even scarce in our more southern collections, whilst *Alloctytus niger* (black oreo) was not taken at all.

### DISCUSSION

The high species richness is the most striking feature of the slope fish fauna in this region, and it is likely that further sampling with a variety of gears would substantially enlarge the number of species. Williams *et al.* (submitted) noted that sampling density during this study was low overall and that uncommon or aggregated species may have been missed. Furthermore, the selectivity of large-mesh trawls fitted with heavy ground gear most likely undersampled small species and groups which retain close contact with the bottom.

The great abundance of the Macrouridae (grenadiers) is also noteworthy. Despite their dominance, the group was poorly known in Australia at the time of the survey: only 32 of the 57 Australian species recorded by Paxton *et al.* (1989) were identified. It is apparent from our collections that at least 60 species are found on the Western Australian slope region (Iwamoto and Williams in prep.).

The west coast fish fauna is a mixture of warm and cold water species at all upper and mid-slope depths. However, latitudinal separation of tropical and sub-tropical species from temperate species is less evident as sampling depth increases. On the upper-slope (600–800 m) there is a change in the top-ranked families between 200 m depth strata, whereas on the mid-slope (800–1400 m) the Macrouridae, and to a lesser extent, Alepocephalidae, Oreosomatidae and Synaphobranchidae, are dominant throughout. In all strata, except for the 400–600 m stratum, the most abundant family accounts for 40–50% of individuals.

These ecological themes are developed in a

second paper. In that work, the patterns of diversity, biomass and assemblage structure of this slope fish fauna are discussed and compared to others from slope regions off southeastern Australia and the northern hemisphere (Williams *et al.* submitted).

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**Appendix 1** Checklist of demersal fishes collected from the western Australian continental slope in 200–1500 m between 20°S and 35°S. ID level refers to the reliability criteria detailed in Table 2; new record (\*) refers to the first record of a species in Australian waters (Aust). Distributional limits of species based on our collections are shown by minimum and maximum depths, latitudes and longitudes; registration numbers identify museum voucher specimens in the CSIRO (H- codes), AMS (I- codes), WAM (P- codes) collections; '–' indicates no specimen was registered or retained; 'photo' indicates where non-retained specimens were photographed.

| Species                                                   | ID level | New record (Aust) | Min. depth (m) | Max depth (m) | Min. latitude | Min. longitude | Max. latitude | Max. longitude | Registration number |
|-----------------------------------------------------------|----------|-------------------|----------------|---------------|---------------|----------------|---------------|----------------|---------------------|
| <b>HEXANCHIDAE</b>                                        |          |                   |                |               |               |                |               |                |                     |
| <i>Heptranchias perlo</i> (Bonnaterre, 1788)              | 1        |                   | 318            | 484           | 24°53'        | 112°08'        | 32°10'        | 115°03'        | H2013-02            |
| <b>HETERODONTIDAE</b>                                     |          |                   |                |               |               |                |               |                |                     |
| <i>Heterodontus zebra</i> (Gray, 1831)                    | 1        |                   | 221            | 229           | 22°22'        | 113°39'        | 22°22'        | 113°39'        | P.30424-001         |
| <b>ALOPIIDAE</b>                                          |          |                   |                |               |               |                |               |                |                     |
| <i>Alopias pelagicus</i> Nakamura, 1935                   | 3        |                   | 240            | 240           | 21°35'        | 113°40'        | 21°35'        | 113°40'        | photo               |
| <b>PARASYLLIDAE</b>                                       |          |                   |                |               |               |                |               |                |                     |
| <i>Parasyllium</i> sp. A (of Last and Stevens, 1994)      | 1        |                   | 245            | 245           | 32°08'        | 115°08'        | 32°08'        | 115°08'        | H2360-01            |
| <b>SCYLIORHINIDAE</b>                                     |          |                   |                |               |               |                |               |                |                     |
| <i>Apristurus longicephalus</i> Nakaya, 1975              | 1        |                   | 685            | 685           | 21°51'        | 113°47'        | 21°51'        | 113°47'        | H2549-08            |
| <i>Apristurus</i> sp. A (of Last and Stevens, 1994)       | 3        |                   | 328            | 1060          | 21°38'        | 113°56'        | 34°57'        | 114°29'        | H2592-02            |
| <i>Apristurus</i> sp. B (of Last and Stevens, 1994)       | 3        |                   | 942            | 942           | 29°22'        | 113°47'        | 29°22'        | 113°47'        | H2624-01            |
| <i>Apristurus</i> sp. D (of Last and Stevens, 1994)       | 1        |                   | 1240           | 1240          | 34°13'        | 114°07'        | 34°13'        | 114°08'        | H2623-03            |
| <i>Apristurus</i> sp. F (of Last and Stevens, 1994)       | 2        |                   | 1030           | 1050          | 32°35'        | 114°27'        | 33°50'        | 114°17'        | H2615-01            |
| <i>Apristurus</i> sp. G (of Last and Stevens, 1994)       | 1        |                   | 684            | 942           | 26°15'        | 112°03'        | 30°17'        | 114°30'        | H2573-01            |
| <i>Asymbolus</i> sp. F (of Last and Stevens, 1994)        | 1        |                   | 225            | 400           | 32°10'        | 115°08'        | 33°23'        | 114°30'        | H2613-01            |
| <i>Cephaloscyllium fasciatum</i> Chan, 1966               | 1        |                   | 320            | 320           | 29°16'        | 113°57'        | 29°16'        | 113°57'        | H2590-07            |
| <i>Galeus boardmani</i> (Whitley, 1928)                   | 1        |                   | 213            | 510           | 24°53'        | 112°08'        | 33°23'        | 111°54'        | H2591-10            |
| <i>Galeus gracilis</i> Compagno and Stevens, 1993         | 1        |                   | 467            | 467           | 24°51'        | 112°07'        | 24°51'        | 112°07'        | –                   |
| <b>TRIAKIDAE</b>                                          |          |                   |                |               |               |                |               |                |                     |
| <i>Galeorhinus galeus</i> (Linnaeus, 1758)                | 1        |                   | 213            | 213           | 31°34'        | 114°59'        | 31°34'        | 114°59'        | –                   |
| <i>Iago garricki</i> (Fourmanoir and Rivaton, 1979)       | 2        |                   | 467            | 467           | 24°51'        | 112°07'        | 24°51'        | 112°07'        | H2564-09            |
| <i>Mustelus antarcticus</i> Günther, 1870                 | 1        |                   | 225            | 225           | 32°10'        | 115°08'        | 32°10'        | 115°08'        | H2613-15            |
| <i>Mustelus</i> sp. B (of Last and Stevens, 1994)         | 3        |                   | 297            | 346           | 23°25'        | 113°04'        | 27°23'        | 112°52'        | H2356-02            |
| <b>CARCHARHINIDAE</b>                                     |          |                   |                |               |               |                |               |                |                     |
| <i>Carcharhinus altimus</i> (Springer, 1950)              | 1        |                   | 240            | 240           | 21°35'        | 113°40'        | 21°35'        | 113°40'        | photo               |
| <i>Galeocerdo cuvier</i> (Péron and Lesueur, 1822)        | 1        |                   | 240            | 240           | 21°35'        | 113°40'        | 21°35'        | 113°40'        | photo               |
| <b>SQUALIDAE</b>                                          |          |                   |                |               |               |                |               |                |                     |
| <i>Centrophorus granulosus</i> (Bloch and Scheider, 1801) | 1        |                   | 868            | 868           | 20°08'        | 112°55'        | 20°08'        | 112°55'        | H2543-05            |
| <i>Centrophorus moluccensis</i> Bleeker, 1860             | 1        |                   | 320            | 510           | 31°53'        | 115°06'        | 32°10'        | 115°03'        | H2564-07            |
| <i>Centrophorus squamosus</i> (Bonnaterre, 1788)          | 1        |                   | 882            | 882           | 26°05'        | 111°47'        | 26°05'        | 111°47'        | H2572-01            |
| <i>Centrophorus uyato</i> (Rafinesque, 1810)              | 1        |                   | 200            | 854           | 24°51'        | 112°07'        | 34°59'        | 114°44'        | H2606-01            |

| Species                                                    | ID level | New record (Aust) | Min. depth (m) | Max depth (m) | Min.     |           | Max.     |           | Registration number |
|------------------------------------------------------------|----------|-------------------|----------------|---------------|----------|-----------|----------|-----------|---------------------|
|                                                            |          |                   |                |               | latitude | longitude | latitude | longitude |                     |
| <i>Centroscyllium kamoharai</i> Abe, 1966                  | 2        |                   | 942            | 1254          | 23°60'   | 111°54'   | 33°18'   | 114°31'   | H2560-02            |
| <i>Centroscymnus crepidater</i> (Bocage and Capello, 1864) | 1        |                   | 870            | 880           | 32°40'   | 114°28'   | 35°05'   | 114°60'   | H1815-02            |
| <i>Centroscymnus owstoni</i> Garman, 1906                  | 1        |                   | 868            | 1254          | 20°08'   | 112°55'   | 35°05'   | 114°60'   | H2570-10            |
| <i>Dalatias licha</i> (Bonnaterre, 1788)                   | 1        |                   | 373            | 508           | 26°36'   | 112°29'   | 32°55'   | 114°39'   | —                   |
| <i>Deania calcea</i> (Lowe, 1839)                          | 1        |                   | 738            | 900           | 30°52'   | 114°37'   | 35°05'   | 114°60'   | —                   |
| <i>Deania quadrispinosa</i> (McCulloch, 1915)              | 1        |                   | 738            | 854           | 28°04'   | 112°43'   | 34°59'   | 114°44'   | H2357-04            |
| <i>Etmopterus brachyurus</i> Smith and Radcliffe, 1912     | 1        |                   | 475            | 612           | 25°19'   | 111°56'   | 31°17'   | 114°53'   | H2604-01            |
| <i>Etmopterus lucifer</i> Jordan and Snyder, 1902          | 1        |                   | 738            | 817           | 33°26'   | 114°21'   | 34°59'   | 114°44'   | H2625-04            |
| <i>Etmopterus pusillus</i> (Lowe, 1839)                    | 3        |                   | 320            | 882           | 26°05'   | 111°47'   | 33°26'   | 114°21'   | H2621-04            |
| <i>Etmopterus</i> sp. A (of Last and Stevens, 1994)        | 1        |                   | 320            | 850           | 25°36'   | 112°10'   | 31°57'   | 115°09'   | H2572-02            |
| <i>Etmopterus</i> sp. B (of Last and Stevens, 1994)        | 1        |                   | 870            | 880           | 32°40'   | 114°28'   | 35°05'   | 114°60'   | H2616-10            |
| <i>Euprotomicrus bispinatus</i> (Quoy and Gaimard, 1824)   | 1        |                   | 913            | 913           | 20°16'   | 113°13'   | 20°16'   | 113°13'   | H2541-01            |
| <i>Squalus megalops</i> (Macleay, 1881)                    | 1        |                   | 203            | 510           | 24°53'   | 112°08'   | 33°24'   | 114°31'   | H2566-01            |
| <i>Squalus mitsukurii</i> Jordan and Snyder, 1903          | 3        |                   | 220            | 670           | 24°51'   | 112°07'   | 33°19'   | 114°32'   | H2564-01            |
| <i>Squalus</i> sp. C (of Last and Stevens, 1994)           | 1        |                   | 300            | 300           | 23°25'   | 113°04'   | 23°25'   | 113°04'   | H2014-01            |
| <i>Squalus</i> sp. D (of Last and Stevens, 1994)           | 1        |                   | 209            | 478           | 21°39'   | 113°58'   | 27°23'   | 112°52'   | H2547-06            |
| <i>Squalus</i> sp. E (of Last and Stevens, 1994)           | 1        |                   | 312            | 508           | 25°08'   | 112°09'   | 31°55'   | 115°10'   | H2032-01            |
| <i>Zameus squamulosus</i> (Günther, 1877)                  | 1        |                   | 854            | 1254          | 20°08'   | 112°55'   | 32°35'   | 114°27'   | H2560-03            |
| PRISTIOPHORIDAE                                            |          |                   |                |               |          |           |          |           |                     |
| <i>Pristiophorus cirratus</i> (Latham, 1794)               | 3        |                   | 203            | 400           | 30°00'   | 114°28'   | 33°24'   | 114°31'   | H2620-05            |
| SQUATINIDAE                                                |          |                   |                |               |          |           |          |           |                     |
| <i>Squatina tergocellata</i> McCulloch, 1914               | 1        |                   | 203            | 400           | 29°16'   | 113°57'   | 33°24'   | 114°31'   | H3053-02            |
| <i>Squatina</i> sp. B (of Last and Stevens, 1994)          | 1        |                   | 312            | 312           | 25°08'   | 112°09'   | 25°08'   | 112°09'   | H2567-01            |
| NARCINIDAE                                                 |          |                   |                |               |          |           |          |           |                     |
| <i>Narcine</i> sp. B (of Last and Stevens, 1994)           | 1        |                   | 209            | 346           | 21°39'   | 113°58'   | 32°05'   | 115°09'   | H3054-03            |
| <i>Torpedo macneilli</i> (Whitley, 1932)                   | 1        |                   | 490            | 490           | 29°21'   | 113°58'   | 29°21'   | 113°58'   | H2591-06            |
| RAJIDAE                                                    |          |                   |                |               |          |           |          |           |                     |
| <i>Notoraja</i> sp. C (of Last and Stevens, 1994)          | 1        |                   | 508            | 690           | 26°15'   | 112°03'   | 26°36'   | 112°29'   | H2573-02            |
| <i>Pavoraja alleni</i> McEachran and Fechhelm, 1982        | 1        |                   | 200            | 475           | 24°51'   | 112°07'   | 31°55'   | 115°10'   | H3015-02            |
| <i>Pavoraja</i> sp. B (of Last and Stevens, 1994)          | 1        |                   | 520            | 1500          | 21°54'   | 113°41'   | 31°16'   | 114°50'   | H2603-03            |
| <i>Raja gudgeri</i> (Whitley, 1940)                        | 1        |                   | 468            | 490           | 29°21'   | 113°58'   | 33°18'   | 114°31'   | H2519-02            |
| <i>Raja</i> sp. E (of Last and Stevens, 1994)              | 1        |                   | 203            | 362           | 32°10'   | 115°08'   | 33°24'   | 114°31'   | H2619-02            |
| <i>Raja</i> sp. F (of Last and Stevens, 1994)              | 1        |                   | 200            | 510           | 26°43'   | 112°41'   | 32°02'   | 115°09'   | H2570-01            |
| <i>Raja</i> sp. I (of Last and Stevens, 1994)              | 1        |                   | 1254           | 1254          | 25°52'   | 111°27'   | 25°52'   | 111°27'   | H2611-02            |
| <i>Raja</i> sp. N (of Last and Stevens, 1994)              | 1        |                   | 203            | 490           | 27°09'   | 112°45'   | 33°24'   | 114°31'   | H2591-01            |
| ANACANTHOBATIDAE                                           |          |                   |                |               |          |           |          |           |                     |
| <i>Anacanthobatis</i> sp. A (of Last and Stevens, 1994)    | 1        |                   | 482            | 1115          | 22°60'   | 113°14'   | 25°41'   | 111°31'   | H2557-01            |
| <i>Anacanthobatis</i> sp. C                                | 1        |                   | 1115           | 1158          | 21°54'   | 113°41'   | 25°41'   | 111°31'   | H2569-02            |

|                                                       |   |   |      |      |        |         |        |         |             |
|-------------------------------------------------------|---|---|------|------|--------|---------|--------|---------|-------------|
| HEXATRYGONIDAE                                        |   |   |      |      |        |         |        |         |             |
| <i>Hexatrygon</i> sp. A (of Last and Stevens, 1994)   | 3 |   | 868  | 1115 | 20°08' | 112°55' | 25°41' | 111°31' | H2543-07    |
| UROLOPHIDAE                                           |   |   |      |      |        |         |        |         |             |
| <i>Urolophus expansus</i> McCulloch, 1916             | 1 |   | 203  | 400  | 31°55' | 115°10' | 33°24' | 114°31' | H2619-03    |
| <i>Urolophus flavomosaicus</i> Last and Gomon, 1987   | 1 |   | 200  | 306  | 26°43' | 112°41' | 27°23' | 112°52' | —           |
| <i>Urolophus viridis</i> McCulloch, 1916              | 1 |   | 200  | 380  | 26°43' | 112°41' | 30°00' | 114°28' | H2590-04    |
| <i>Plesiobatis daviesi</i> (Wallace, 1967)            | 1 |   | 508  | 508  | 26°36' | 112°29' | 26°36' | 112°29' | —           |
| MYLIOBATIDAE                                          |   |   |      |      |        |         |        |         |             |
| <i>Myliobatis hamlyni</i> Ogilby, 1911                | 3 |   | 346  | 346  | 26°45' | 112°37' | 26°45' | 112°37' | H2578-01    |
| CHIMAERIDAE                                           |   |   |      |      |        |         |        |         |             |
| <i>Chimaera</i> sp. A (of Last and Stevens, 1994)     | 3 |   | 670  | 854  | 28°04' | 112°43' | 32°02' | 114°54' | H2621-02    |
| <i>Chimaera</i> sp. C (of Last and Stevens, 1994)     | 3 |   | 685  | 1293 | 21°51' | 113°47' | 24°10' | 111°39' | H2549-06    |
| <i>Chimaera</i> sp. E (of Last and Stevens, 1994)     | 2 |   | 438  | 520  | 27°09' | 112°45' | 28°17' | 113°18' | H2585-01    |
| <i>Hydrolagus lemures</i> (Whitley, 1939)             | 2 |   | 286  | 510  | 23°25' | 113°04' | 33°23' | 114°30' | H2590-10    |
| RHINOCHIMAERIDAE                                      |   |   |      |      |        |         |        |         |             |
| <i>Harriotta raleighana</i> Goode and Bean, 1895      | 2 |   | 1030 | 1030 | 34°10' | 114°16' | 34°10' | 114°16' | H2367-01    |
| <i>Rhinochimaera pacifica</i> (Mitsukuri, 1895)       | 2 |   | 760  | 1293 | 22°29' | 113°12' | 34°10' | 114°16' | H2552-02    |
| MURAENIDAE                                            |   |   |      |      |        |         |        |         |             |
| <i>Gymnothorax woodwardi</i> McCulloch, 1912          | 2 |   | 244  | 244  | 32°06' | 115°10' | 32°06' | 115°10' | H3096-02    |
| NETTASTOMATIDAE                                       |   |   |      |      |        |         |        |         |             |
| <i>Hoplunnis</i> sp. A                                | 4 | * | 312  | 312  | 25°08' | 112°09' | 25°08' | 112°09' | H2567-02    |
| <i>Nettastoma melanura</i> Rafinesque, 1810           | 2 | * | 612  | 612  | 23°45' | 112°35' | 23°45' | 112°35' | H2557-02    |
| <i>Venefica</i> cf <i>multiporosa</i> Karrer, 1982    | 3 | * | 1254 | 1254 | 25°52' | 111°27' | 25°52' | 111°27' | H2570-04    |
| CONGRIDAE                                             |   |   |      |      |        |         |        |         |             |
| <i>Bassanago</i> cf <i>bulbiceps</i> Whitley, 1948    | 3 |   | 701  | 870  | 33°03' |         | 35°02' | 114°60' | —           |
| <i>Bassanago</i> sp. A                                | 3 |   | 690  | 690  | 26°15' | 112°03' | 26°15' | 112°03' | I.31170-007 |
| <i>Bathyuroconger vicinus</i> (Vaillant, 1888)        | 2 | * | 854  | 1139 | 20°55' | 112°51' | 28°04' | 112°43' | H2544-19    |
| <i>Blachea xenobranchialis</i> Karrer and Smith, 1980 | 2 |   | 300  | 312  | 23°25' | 113°04' | 25°08' | 112°09' | H2567-03    |
| COLOCONGRIDAE                                         |   |   |      |      |        |         |        |         |             |
| <i>Coloconger</i> cf <i>raniceps</i> Alcock, 1899     | 3 | * | 892  | 892  | 24°30' | 111°51' | 24°30' | 111°51' | H2562-03    |
| <i>Coloconger</i> sp. A                               | 3 |   | 760  | 892  | 24°30' | 111°51' | 26°36' | 112°36' | H3041-10    |
| SYNAPHOBRANCHIDAE                                     |   |   |      |      |        |         |        |         |             |
| <i>Diastobranchius capensis</i> Barnard, 1923         | 2 |   | 825  | 1280 | 25°52' | 111°27' | 35°05' | 114°60' | H3010-01    |
| <i>Synaphobranchius affinis</i> Günther, 1877         | 2 |   | 854  | 1061 | 23°60' | 111°54' | 32°40' | 114°28' | I.31157-003 |
| <i>Synaphobranchius brevidorsalis</i> Günther, 1887   | 2 | * | 880  | 1500 | 20°55' | 112°51' | 34°57' | 114°29' | H2544-20    |
| <i>Synaphobranchius kaupii</i> Johnson, 1862          | 2 |   | 1030 | 1030 | 32°35' | 114°27' | 32°35' | 114°27' | H2616-05    |
| HALOSAURIDAE                                          |   |   |      |      |        |         |        |         |             |
| <i>Aldrovandia affinis</i> (Günther, 1877)            | 2 |   | 868  | 1500 | 20°08' | 112°55' | 32°40' | 114°28' | H2544-04    |
| <i>Aldrovandia phalacra</i> (Vaillant, 1888)          | 2 | * | 1022 | 1500 | 20°55' | 112°51' | 32°35' | 114°27' | H2544-11    |
| <i>Aldrovandia</i> cf <i>rostrata</i> (Günther, 1887) | 3 | * | 854  | 854  | 28°04' | 112°43' | 28°04' | 112°43' | H2584-16    |

| Species                                                       | ID level | New record (Aust) | Min. depth (m) | Max depth (m) | Min. latitude | Min. longitude | Max. latitude | Max. longitude | Registration number |
|---------------------------------------------------------------|----------|-------------------|----------------|---------------|---------------|----------------|---------------|----------------|---------------------|
| <i>Halosaurus ovenii</i> Johnson, 1863                        | 3        | *                 | 690            | 690           | 26°15'        | 112°03'        | 26°15'        | 112°03'        | H2573-20            |
| <i>Halosauropsis macrochir</i> (Günther, 1878)                | 3        |                   | 948            | 948           | 35°25'        | 117°21'        | 35°25'        | 117°21'        | H3008-03            |
| NOTACANTHIDAE                                                 |          |                   |                |               |               |                |               |                |                     |
| <i>Notacanthus sexspinis</i> Richardson, 1846                 | 2        |                   | 870            | 982           | 33°18'        | 114°13'        | 35°05'        | 114°60'        | photo               |
| ARGENTINIDAE                                                  |          |                   |                |               |               |                |               |                |                     |
| <i>Glossanodon</i> sp. A                                      | 3        |                   | 255            | 438           | 25°08'        | 112°09'        | 32°14'        | 115°06'        | H2597-01            |
| LEPTOCHILICHTHYIDAE                                           |          |                   |                |               |               |                |               |                |                     |
| <i>Leptochilichthys microlepis</i> Machida and Shiogaki, 1988 | 1        | *                 | 1139           | 1158          | 20°55'        | 112°51'        | 21°54'        | 113°41'        | H2544-23            |
| ALEPOCEPHALIDAE                                               |          |                   |                |               |               |                |               |                |                     |
| <i>Alepocephalus australis</i> Barnard, 1923                  | 1        | *                 | 982            | 1030          | 33°18'        | 114°13'        | 34°10'        | 114°16'        | H3017-02            |
| <i>Alepocephalus owstoni</i> Tanaka, 1908                     | 1        | *                 | 880            | 960           | 22°47'        | 113°13'        | 28°30'        | 112°55'        | H3061-01            |
| <i>Alepocephalus triangularis</i> Okamura and Kawanishi, 1984 | 1        | *                 | 1022           | 1132          | 21°28'        | 113°39'        | 29°35'        | 113°45'        | H2541-11            |
| <i>Alepocephalus cf productus</i> (Gill, 1890)                | 3        | *                 | 1030           | 1280          | 20°55'        | 112°51'        | 32°35'        | 114°27'        | H2544-18            |
| <i>Bajacalifornia calcarata</i> (Weber, 1913)                 | 1        | *                 | 880            | 880           | 22°47'        | 113°13'        | 22°47'        | 113°13'        | H2553-02            |
| <i>Bathytroctes squamosus</i> Alcock, 1890                    | 1        | *                 | 913            | 1139          | 20°16'        | 113°13'        | 20°55'        | 112°51'        | H2541-10            |
| <i>Conocara microlepis</i> (Lloyd, 1909)                      | 1        | *                 | 1258           | 1258          | 22°29'        | 113°12'        | 22°29'        | 113°12'        | H2552-07            |
| <i>Leptoderma affine</i> Alcock, 1899                         | 1        | *                 | 1280           | 1280          | 32°20'        | 114°29'        | 32°20'        | 114°29'        | H2614-01            |
| <i>Leptoderma cf affine</i> Alcock, 1899                      | 3        | *                 | 913            | 913           | 20°16'        | 113°13'        | 20°16'        | 113°13'        | H2541-20            |
| <i>Leptoderma cf retrospinna</i> Fowler, 1943                 | 3        | *                 | 1139           | 1258          | 20°55'        | 112°51'        | 22°29'        | 113°12'        | H2552-01            |
| <i>Narcetes lloydii</i> Fowler, 1934                          | 1        | *                 | 913            | 1258          | 20°16'        | 113°13'        | 32°35'        | 114°27'        | H2552-05            |
| <i>Rouleina attrita</i> (Vaillant, 1888)                      | 1        |                   | 1139           | 1258          | 20°55'        | 112°51'        | 25°52'        | 111°27'        | H2570-05            |
| <i>Rouleina guentheri</i> Alcock, 1892                        | 1        | *                 | 685            | 1061          | 20°08'        | 112°55'        | 30°52'        | 114°37'        | H2542-11            |
| <i>Talismania antillarum</i> (Goode and Bean, 1896)           | 1        |                   | 685            | 1009          | 20°08'        | 112°55'        | 28°00'        | 112°41'        | H2543-04            |
| <i>Talismania longifilis</i> (Brauer, 1902)                   | 1        |                   | 913            | 913           | 20°16'        | 113°13'        | 20°16'        | 113°13'        | H2541-09            |
| <i>Talismania mekistonema</i> Sulak, 1975                     | 1        | *                 | 1115           | 1254          | 25°41'        | 111°31'        | 25°52'        | 111°27'        | H2569-08            |
| <i>Xenodermichthys copei</i> (Gill, 1884)                     | 1        |                   | 320            | 1030          | 21°51'        | 113°47'        | 34°57'        | 114°29'        | H2549-02            |
| PLATYTROCTIDAE                                                |          |                   |                |               |               |                |               |                |                     |
| <i>Maulisia acuticeps</i> Sazonov, 1976                       | 1        | *                 | 1460           | 1500          | 21°58'        | 113°08'        | 21°58'        | 113°08'        | H2551-12            |
| <i>Maulisia microlepis</i> Sazonov and Golovan, 1976          | 1        | *                 | 1280           | 1500          | 20°01'        | 113°08'        | 32°20'        | 114°29'        | H2614-02            |
| PHOSICHTHYIDAE                                                |          |                   |                |               |               |                |               |                |                     |
| <i>Polymetme corythaeola</i> (Alcock, 1898)                   | 2        |                   | 411            | 1115          | 22°60'        | 112°13'        | 32°52'        | 114°35'        | H3035-01            |
| ATELEOPODIDAE                                                 |          |                   |                |               |               |                |               |                |                     |
| <i>Ateleopus cf japonicus</i> Bleeker, 1853                   | 3        |                   | 457            | 684           | 26°40'        | 112°33'        | 30°17'        | 114°30'        | H2019-01            |
| AULOPIDAE                                                     |          |                   |                |               |               |                |               |                |                     |
| <i>Aulopus purpurissatus</i> Richardson, 1843                 | 2        |                   | 210            | 210           | 33°45'        | 114°28'        | 33°45'        | 114°28'        | H2054-01            |

|                                                                  |   |   |      |      |        |         |        |         |             |
|------------------------------------------------------------------|---|---|------|------|--------|---------|--------|---------|-------------|
| CHLOROPHTHALMIDAE                                                |   |   |      |      |        |         |        |         |             |
| <i>Chlorophthalmus nigripinnis</i> Günther, 1878                 | 2 |   | 220  | 727  | 28°48' | 113°37' | 35°02' | 115°02' | H2590-01    |
| <i>Chlorophthalmus</i> cf <i>acutifrons</i> Hiyama, 1940         | 3 | * | 320  | 467  | 21°38' | 113°56' | 24°51' | 112°07' | H2103-01    |
| <i>Chlorophthalmus</i> cf <i>nigromarginatus</i> Kamohara, 1953  | 3 | * | 328  | 328  | 21°37' | 113°56' | 21°37' | 113°56' | H2546-04    |
| <i>Chlorophthalmus</i> sp. A                                     | 2 | * | 328  | 510  | 21°38' | 113°56' | 27°17' | 112°45' | H2100-01    |
| <i>Chlorophthalmus</i> sp. B                                     | 2 | * | 200  | 346  | 21°39' | 113°58' | 26°45' | 112°37' | H2566-02    |
| <i>Chlorophthalmus</i> sp. C                                     | 2 | * | 200  | 670  | 26°36' | 112°29' | 32°10' | 115°03' | H2574-02    |
| IPNOPIDAE                                                        |   |   |      |      |        |         |        |         |             |
| <i>Bathypterois guentheri</i> Alcock, 1889                       | 2 |   | 868  | 1500 | 20°08' | 112°55' | 24°30' | 111°51' | H2542-13    |
| <i>Bathypterois ventralis</i> Garman, 1899                       | 2 | * | 690  | 1500 | 20°16' | 113°13' | 27°33' | 112°15' | H2544-13    |
| <i>Bathypterois grallator</i> (Goode and Bean, 1886)             | 3 | * | 1460 | 1500 | 22°01' | 113°08' | 22°01' | 113°08' | I.31151-002 |
| SYNODONTIDAE                                                     |   |   |      |      |        |         |        |         |             |
| <i>Bathysaurus ferox</i> Günther, 1878                           | 2 |   | 945  | 1104 | 27°33' | 112°15' | 35°07' | 115°01' | H3006-01    |
| <i>Saurida longimanus</i> Norman, 1939                           | 3 |   | 297  | 297  | 23°25' | 113°04' | 23°25' | 113°04' | -           |
| <i>Saurida tumbil</i> (Bloch, 1795)                              | 3 |   | 200  | 320  | 21°39' | 113°58' | 26°43' | 112°41' | H2547-18    |
| <i>Saurida</i> sp. 2 (of Sainsbury <i>et al.</i> , 1985)         | 3 |   | 244  | 244  | 32°06' | 115°10' | 32°06' | 115°10' | H3096-03    |
| NEOSCOPELIDAE                                                    |   |   |      |      |        |         |        |         |             |
| <i>Neoscopelus macrolepidotus</i> Johnson, 1863                  | 1 |   | 435  | 1022 | 20°08' | 112°55' | 35°05' | 114°60' | H2563-01    |
| <i>Neoscopelus</i> sp. A                                         | 2 |   | 612  | 690  | 21°51' | 113°47' | 30°17' | 114°30' | H3089-01    |
| VELIFERIDAE                                                      |   |   |      |      |        |         |        |         |             |
| <i>Velifer multiradiatus</i> Regan, 1907                         | 2 |   | 210  | 210  | 28°09' | 113°17' | 28°09' | 113°17' | H2020-01    |
| POLYMIXIIDAE                                                     |   |   |      |      |        |         |        |         |             |
| <i>Polymixia japonicus</i> Günther, 1877                         | 2 | * | 300  | 510  | 22°60' | 113°14' | 30°00' | 114°28' | H2554-03    |
| <i>Polymixia</i> sp. B                                           | 2 |   | 444  | 467  | 24°51' | 112°07' | 24°53' | 112°08' | H2565-09    |
| MORIDAE                                                          |   |   |      |      |        |         |        |         |             |
| <i>Antimora rostrata</i> (Günther, 1978)                         | 1 |   | 825  | 1500 | 22°01' | 113°08' | 34°57' | 114°29' | I.31159-003 |
| <i>Euclichthys polynemus</i> McCulloch, 1926                     | 1 |   | 306  | 571  | 24°51' | 112°07' | 33°18' | 114°31' | H3045-07    |
| <i>Halargyreus johnsonii</i> Günther, 1862                       | 1 |   | 843  | 843  | 35°26' | 117°25' | 35°26' | 117°25' | H3002-01    |
| <i>Laemonema</i> sp. A                                           | 3 | * | 982  | 982  | 33°18' | 114°13' | 33°18' | 114°13' | H2617-01    |
| <i>Lepidion inosimae</i> (Günther, 1887)                         | 2 |   | 945  | 945  | 35°07' | 115°01' | 35°07' | 115°01' | H3010-10    |
| <i>Lepidion microcephalus</i> Cowper, 1956                       | 2 |   | 843  | 843  | 35°26' | 117°25' | 35°26' | 117°25' | H3007-06    |
| <i>Lepidion</i> cf <i>schmidti</i> Svetovidov, 1936              | 3 | * | 785  | 800  | 35°03' | 114°55' | 35°03' | 114°55' | H3102-01    |
| <i>Mora moro</i> (Risso, 1810)                                   | 2 |   | 673  | 989  | 33°26' | 114°21' | 35°05' | 115°00' | -           |
| <i>Physiculus</i> cf <i>longifilis</i> Weber, 1913               | 3 | * | 320  | 320  | 21°45' | 113°52' | 21°45' | 113°52' | H2548-07    |
| <i>Physiculus</i> cf <i>luminosa</i> Paulin, 1983                | 3 | * | 320  | 508  | 26°36' | 112°29' | 31°55' | 115°10' | H2574-08    |
| <i>Physiculus</i> cf <i>nigrescens</i> Smith and Radcliffe, 1912 | 3 | * | 320  | 320  | 21°45' | 113°52' | 21°45' | 113°52' | H2084-01    |
| <i>Physiculus</i> cf <i>roseus</i> Alcock, 1891                  | 3 | * | 290  | 320  | 21°45' | 113°52' | 21°45' | 113°52' | H2548-06    |
| <i>Tripteryphycis gilchristi</i> Boulenger, 1902                 | 3 |   | 571  | 770  | 26°15' | 112°03' | 35°02' | 115°02' | H2596-02    |
| BREGMACEROTIDAE                                                  |   |   |      |      |        |         |        |         |             |
| <i>Bregmaceros</i> sp. A                                         | 1 | * | 413  | 413  | 29°50' | 114°21' | 29°50' | 114°21' | H3029-04    |
| MELANONIDAE                                                      |   |   |      |      |        |         |        |         |             |
| <i>Melanonus zugmayeri</i> Norman, 1903                          | 2 |   | 880  | 913  | 20°16' | 113°13' | 20°16' | 113°13' | H3110-02    |

| Species                                                              | ID level | New record (Aust) | Min. depth (m) | Max depth (m) | Min. latitude | Min. longitude | Max. latitude | Max. longitude | Registration number |
|----------------------------------------------------------------------|----------|-------------------|----------------|---------------|---------------|----------------|---------------|----------------|---------------------|
| MERLUCCIDAE                                                          |          |                   |                |               |               |                |               |                |                     |
| <i>Macruronus novaezelandiae</i> (Hector, 1871)                      | 1        |                   | 596            | 825           | 33°06'        | 114°30'        | 34°15'        | 114°20'        | H3025-07            |
| OPHIDIIDAE                                                           |          |                   |                |               |               |                |               |                |                     |
| <i>Bassozetus</i> sp. A                                              | 3        | *                 | 1460           | 1500          | 22°01'        | 113°08'        | 22°01'        | 113°08'        | H2551-01            |
| <i>Dannevigia tusca</i> Whitley, 1941                                | 2        |                   | 203            | 390           | 28°53'        | 113°41'        | 33°24'        | 114°31'        | H3052-01            |
| <i>Dicrolene</i> sp. A                                               | 2        |                   | 435            | 945           | 25°59'        | 112°38'        | 30°52'        | 114°37'        | H2583-11            |
| <i>Dicrolene</i> sp. B                                               | 2        | *                 | 1158           | 1158          | 21°54'        | 113°41'        | 21°54'        | 113°41'        | H2550-06            |
| <i>Epetriodus freddy</i> Cohen and Nielsen, 1978                     | 2        | *                 | 714            | 892           | 24°30'        | 111°51'        | 27°07'        | 112°23'        | H2562-02            |
| <i>Eretmichthys</i> sp. A                                            | 3        | *                 | 1460           | 1500          | 21°50'        | 113°59'        | 21°50'        | 113°59'        | H2559-09            |
| <i>Genypterus blacodes</i> (Forster, 1801)                           | 1        |                   | 596            | 989           | 33°06'        | 114°30'        | 35°05'        | 114°53'        | H3178-02            |
| <i>Glyptophidium japonicum</i> Kamohara, 1936                        | 2        |                   | 437            | 478           | 26°40'        | 112°33'        | 27°49'        | 113°01'        | H2575-05            |
| <i>Hoplobrotula armata</i> (Temminck and Schlegel, 1847)             | 3        |                   | 320            | 438           | 21°45'        | 113°52'        | 27°09'        | 112°45'        | H2578-11            |
| <i>Homostolus acer</i> Smith and Radcliffe, 1913                     | 2        | *                 | 612            | 612           | 23°44'        | 112°35'        | 23°44'        | 112°35'        | H2558-02            |
| <i>Lamprogrammus</i> cf <i>niger</i> Alcock, 1891                    | 3        | *                 | 868            | 868           | 20°08'        | 112°55'        | 20°08'        | 112°55'        | H2542-01            |
| <i>Monomitopus</i> sp. A                                             | 2        |                   | 868            | 1258          | 20°08'        | 112°55'        | 32°35'        | 114°27'        | H2615-03            |
| <i>Monomitopus</i> sp. B                                             | 2        | *                 | 1254           | 1254          | 25°52'        | 111°27'        | 25°52'        | 111°27'        | H2544-15            |
| <i>Monomitopus</i> sp. C                                             | 4        | *                 | 1254           | 1254          | 25°52'        | 111°27'        | 25°52'        | 111°27'        | H2570-11            |
| <i>Porogadus</i> sp. A                                               | 2        | *                 | 1104           | 1104          | 27°33'        | 112°15'        | 27°33'        | 112°15'        | H2582-01            |
| <i>Xyelacyba myersi</i> Cohen, 1961                                  | 2        | *                 | 1158           | 1158          | 21°54'        | 113°41'        | 21°54'        | 113°41'        | H2550-07            |
| Ophidiidae gen. sp.                                                  | 4        | *                 | 913            | 913           | 20°16'        | 113°13'        | 20°16'        | 113°13'        | H2541-08            |
| BYTHITIDAE                                                           |          |                   |                |               |               |                |               |                |                     |
| <i>Diplacanthopoma</i> sp. A                                         | 2        | *                 | 868            | 868           | 20°08'        | 112°55'        | 20°08'        | 112°55'        | H2542-22            |
| CARAPIDAE                                                            |          |                   |                |               |               |                |               |                |                     |
| <i>Pyramodon ventralis</i> Smith and Radcliffe, 1913                 | 2        |                   | 346            | 510           | 25°36'        | 112°33'        | 33°18'        | 114°31'        | I.31174-008         |
| MACROURIDAE                                                          |          |                   |                |               |               |                |               |                |                     |
| <i>Bathygadus cottoides</i> Günther, 1878                            | 1        |                   | 913            | 1280          | 20°16'        | 113°13'        | 34°10'        | 114°16'        | H2571-02            |
| <i>Bathygadus</i> sp. A                                              | 3        | *                 | 1030           | 1030          | 34°10'        | 114°16'        | 34°10'        | 114°16'        | H3017-08            |
| <i>Caelorinchus acanthiger</i> Barnard, 1925                         | 1        | *                 | 510            | 1132          | 27°17'        | 112°45'        | 35°05'        | 114°60'        | H3008-08            |
| <i>Caelorinchus innotabilis</i> McCulloch, 1907                      | 1        |                   | 770            | 1030          | 29°52'        | 114°12'        | 35°05'        | 114°60'        | H3007-10            |
| <i>Caelorinchus matamua</i> (McCann and McKnight, 1980)              | 1        | 870               | 870            | 35°05'        | 114°60'       | 35°05'         | 114°60'       | H3008-09       |                     |
| <i>Caelorinchus maurofasciatus</i> McMillan and Paulin, 1993         | 1        |                   | 320            | 714           | 26°15'        | 112°03'        | 35°02'        | 115°02'        | H2604-10            |
| <i>Caelorinchus mirus</i> McCulloch, 1926                            | 1        |                   | 306            | 510           | 24°53'        | 112°08'        | 32°54'        | 114°39'        | H3028-03            |
| <i>Caelorinchus parvifasciatus</i> McMillan and Paulin, 1993         | 1        | 390               | 475            | 31°17'        | 114°53'       | 33°18'         | 114°31'       | H2604-02       |                     |
| <i>Caelorinchus</i> cf <i>argentatus</i> (Smith and Radcliffe, 1912) | 3        | *                 | 320            | 320           | 21°45'        | 113°13'        | 21°45'        | 113°52'        | H2305-02            |
| <i>Caelorinchus</i> sp. A                                            | 1        | *                 | 390            | 475           | 31°17'        | 114°53'        | 33°18'        | 114°31'        | H2604-02            |
| <i>Caelorinchus</i> sp. C                                            | 1        | *                 | 482            | 612           | 22°60'        | 113°14'        | 23°45'        | 112°35'        | H1514-19            |
| <i>Caelorinchus</i> sp. D                                            | 1        | *                 | 685            | 685           | 21°51'        | 113°47'        | 21°51'        | 113°47'        | H2549-04            |
| <i>Caelorinchus</i> sp. E                                            | 1        | *                 | 478            | 1104          | 22°60'        | 113°14'        | 30°17'        | 114°30'        | H2024-01            |
| <i>Caelorinchus</i> sp. F                                            | 1        | *                 | 685            | 1022          | 21°28'        | 113°39'        | 24°31'        | 111°50'        | H2553-03            |

|                                                                  |   |   |      |      |        |         |        |         |          |
|------------------------------------------------------------------|---|---|------|------|--------|---------|--------|---------|----------|
| <i>Caelorinchus</i> sp. G                                        | 1 | * | 1030 | 1030 | 32°35' | 114°27' | 32°35' | 114°27' | H2615-02 |
| <i>Cetunurichthys subinflatus</i> Sazonov and Shcherbachev, 1982 | 1 | * | 1258 | 1258 | 22°29' | 113°12' | 22°29' | 113°12' | H2551-13 |
| <i>Cetonus globiceps</i> (Vaillant, 1884)                        | 1 |   | 740  | 1500 | 22°01' | 113°08' | 34°13' | 114°08' | H2551-15 |
| <i>Coryphaenoides rudis</i> Günther, 1878                        | 1 | * | 982  | 982  | 33°18' | 114°13' | 33°18' | 114°13' | H2617-02 |
| <i>Coryphaenoides serrulatus</i> Günther, 1878                   | 1 |   | 740  | 982  | 32°40' | 114°28' | 35°05' | 114°60' | H2616-02 |
| <i>Coryphaenoides striatulus</i> Barnard, 1925                   | 1 | * | 982  | 1030 | 33°18' | 114°13' | 34°10' | 114°16' | H3017-06 |
| <i>Coryphaenoides</i> sp. A                                      | 1 | * | 945  | 1030 | 32°35' | 114°27' | 35°07' | 115°01' | H3010-09 |
| <i>Coryphaenoides</i> sp. B                                      | 1 | * | 1254 | 1500 | 22°01' | 113°08' | 25°52' | 111°27' | H2561-03 |
| <i>Gadomus</i> sp. A                                             | 1 |   | 320  | 1158 | 21°51' | 113°47' | 31°55' | 115°10' | H2596-03 |
| <i>Gadomus</i> sp. B                                             | 1 |   | 817  | 1500 | 20°08' | 112°55' | 34°15' | 114°20' | H3001-01 |
| <i>Hymenocephalus adelscottii</i> Iwamoto and Merrett, 1996      | 2 | * | 430  | 690  | 17°45' | 118°32' | 26°15' | 112°03' | H2573-14 |
| <i>Hyomacrurus</i> sp. A                                         | 2 |   | 685  | 685  | 21°51' | 113°47' | 21°51' | 113°47' | H2549-13 |
| <i>Idiolorhynchus andriashevi</i> Sazonov, 1981                  | 1 |   | 1240 | 1240 | 34°13' | 114°08' | 34°13' | 114°08' | H2623-01 |
| <i>Kuronezumia leonis</i> (Barnard, 1925)                        | 1 | * | 842  | 842  | 35°25' | 117°21' | 35°25' | 117°21' | H3008-10 |
| <i>Kuronezumia pallida</i> Sazonov and Iwamoto, 1992             | 2 | * | 760  | 760  | 26°36' | 112°09' | 26°36' | 112°09' | H3041-14 |
| <i>Lepidorhynchus denticulatus</i> (Richardson, 1846)            | 1 |   | 320  | 817  | 22°60' | 113°14' | 35°02' | 115°02' | H2023-01 |
| <i>Lucigadus ori</i> (Smith, 1968)                               | 1 | * | 666  | 738  | 26°57' | 112°22' | 34°59' | 114°44' | H2579-02 |
| <i>Malacocephalus laevis</i> (Lowe, 1843)                        | 1 |   | 411  | 870  | 22°60' | 113°14' | 34°59' | 114°44' | H2023-05 |
| <i>Mataeocephalus acipenserinus</i> (Gilbert and Cramer, 1897)   | 2 | * | 685  | 945  | 20°08' | 112°55' | 29°22' | 113°47' | H2542-30 |
| <i>Nezumia evides</i> Gilbert and Hubbs, 1920                    | 1 | * | 612  | 913  | 20°16' | 113°13' | 25°19' | 111°56' | H2549-17 |
| <i>Nezumia spinosa</i> (Gilbert and Hubbs, 1916)                 | 1 |   | 685  | 1258 | 20°08' | 112°55' | 29°22' | 113°47' | H1492-01 |
| <i>Nezumia</i> sp. A                                             | 1 | * | 320  | 1009 | 26°15' | 112°03' | 32°02' | 114°54' | H2573-12 |
| <i>Nezumia</i> sp. B                                             | 1 | * | 714  | 945  | 27°07' | 112°23' | 28°04' | 112°43' | H2580-04 |
| <i>Nezumia</i> sp. C                                             | 1 | * | 1293 | 1500 | 22°01' | 113°08' | 24°10' | 111°39' | H2551-17 |
| <i>Nezumia</i> sp. D                                             | 1 | * | 685  | 1258 | 20°55' | 112°51' | 33°18' | 114°13' | H3041-12 |
| <i>Nezumia</i> sp. E                                             | 1 | * | 842  | 945  | 28°00' | 112°41' | 35°25' | 117°21' | H3008-11 |
| <i>Pseudonezumia puscilla</i> Sazonov and Shcherbachev, 1981     | 1 | * | 1460 | 1500 | 22°01' | 113°08' | 22°01' | 113°08' | H2551-19 |
| <i>Sphagemacrurus pumiliceps</i> (Alcock, 1894)                  | 1 | * | 882  | 1500 | 22°01' | 113°08' | 33°18' | 114°13' | H2617-03 |
| <i>Trachonurus</i> sp. A                                         | 2 | * | 892  | 1030 | 24°30' | 111°51' | 34°10' | 114°16' | H3002-05 |
| <i>Trachonurus</i> sp. B                                         | 2 | * | 770  | 1132 | 20°08' | 112°55' | 32°40' | 114°28' | H2596-04 |
| <i>Trachonurus</i> sp. C                                         | 2 | * | 770  | 1293 | 20°16' | 113°13' | 34°13' | 114°08' | H2596-01 |
| <i>Ventrifossa johnbaborum</i> Iwamoto, 1982                     | 1 | * | 684  | 882  | 20°08' | 112°55' | 30°17' | 114°30' | H2573-21 |
| <i>Ventrifossa macropogon</i> Marshall, 1973                     | 1 | * | 320  | 760  | 21°51' | 113°47' | 33°26' | 114°21' | H2549-09 |
| <i>Ventrifossa nigradorsalis</i> Gilbert and Hubbs, 1920         | 1 |   | 482  | 901  | 23°00' | 113°14' | 24°32' | 111°49' | H2554-11 |
| <i>Ventrifossa</i> sp. A                                         | 1 | * | 482  | 714  | 21°51' | 113°47' | 28°06' | 113°27' | H2580-03 |
| <i>Ventrifossa</i> sp. B                                         | 1 | * | 780  | 817  | 33°26' | 114°21' | 33°25' | 114°23' | —        |
| LOPHIIDAE                                                        |   |   |      |      |        |         |        |         |          |
| <i>Lophioides</i> sp. A                                          | 3 |   | 300  | 300  | 23°52' | 113°04' | 23°25' | 113°04' | —        |
| <i>Lophiomus setigerus</i> (Vahl, 1797)                          | 2 |   | 250  | 612  | 21°45' | 113°52' | 32°14' | 115°06' | H3056-04 |
| <i>Sladenia</i> sp. A                                            | 3 | * | 1139 | 1158 | 20°55' | 112°51' | 24°00' | 111°54' | H2544-02 |
| CHAUNACIDAE                                                      |   |   |      |      |        |         |        |         |          |
| <i>Bathychaunax melanostomus</i> Caruso, 1989                    | 2 |   | 893  | 1500 | 20°55' | 112°51' | 30°52' | 114°37' | H2551-03 |
| <i>Chaunax</i> cf <i>fimbriatus</i> Hilgendorf, 1879             | 3 | * | 320  | 1060 | 21°38' | 113°56' | 33°23' | 114°30' | H2565-13 |
| <i>Chaunax</i> sp. A                                             | 3 | * | 380  | 510  | 30°00' | 114°28' | 32°02' | 115°09' | H2611-01 |
| <i>Chaunax</i> sp. B                                             | 3 | * | 444  | 444  | 24°53' | 112°08' | 24°53' | 112°08' | H2565-14 |

| Species                                                 | ID<br>level | New<br>record<br>(Aust) | Min.<br>depth<br>(m) | Max<br>depth<br>(m) | Min.<br>latitude | Min.<br>longitude | Max.<br>latitude | Max.<br>longitude | Registration<br>number |
|---------------------------------------------------------|-------------|-------------------------|----------------------|---------------------|------------------|-------------------|------------------|-------------------|------------------------|
| OGCOCEPHALIDAE                                          |             |                         |                      |                     |                  |                   |                  |                   |                        |
| <i>Coelophrys</i> sp. A                                 | 3           | *                       | 1009                 | 1139                | 20°55'           | 112°51'           | 27°22'           | 112°11'           | H2544-07               |
| <i>Dibranchus</i> sp. A                                 | 3           | *                       | 297                  | 297                 | 23°25'           | 113°04'           | 23°25'           | 113°04'           | H2555-01               |
| <i>Halieutea</i> cf <i>stellata</i> (Vahl, 1797)        | 3           | *                       | 435                  | 1115                | 24°53'           | 113°13'           | 27°17'           | 112°45'           | H3040-10               |
| <i>Halieutopsis</i> cf <i>micropus</i> (Alcock, 1891)   | 3           | *                       | 942                  | 942                 | 29°22'           | 113°47'           | 29°22'           | 113°47'           | H2593-01               |
| <i>Halieutopsis</i> sp. A                               | 3           | *                       | 942                  | 942                 | 29°22'           | 113°47'           | 29°22'           | 113°47'           | H2592-05               |
| BARBOURISIIDAE                                          |             |                         |                      |                     |                  |                   |                  |                   |                        |
| <i>Barbourisia rufa</i> Parr, 1945                      | 1           |                         | 1139                 | 1460                | 20°55'           | 112°51'           | 24°10'           | 111°39'           | H2551-02               |
| DIRETMIDAE                                              |             |                         |                      |                     |                  |                   |                  |                   |                        |
| <i>Diretmichthys parini</i> (Post and Quero, 1981)      | 2           |                         | 740                  | 1293                | 20°55'           | 112°51'           | 35°02'           | 115°01'           | H3009-01               |
| <i>Diretmus argenteus</i> Johnson, 1864                 | 2           |                         | 685                  | 1139                | 20°08'           | 112°55'           | 21°51'           | 113°47'           | H2542-07               |
| TRACHICHTHYIDAE                                         |             |                         |                      |                     |                  |                   |                  |                   |                        |
| <i>Gephyroberyx darwinii</i> (Johnson, 1866)            | 2           |                         | 274                  | 490                 | 21°44'           | 113°52'           | 33°13'           | 114°31'           | H2044-01               |
| <i>Hoplostethus atlanticus</i> Collett, 1889            | 1           |                         | 812                  | 870                 | 33°58'           | 114°22'           | 35°05'           | 114°60'           | H1251-01               |
| <i>Hoplostethus intermedius</i> (Hector, 1875)          | 1           |                         | 673                  | 673                 | 35°02'           | 115°02'           | 35°02'           | 115°02'           | H3011-03               |
| <i>Hoplostethus latus</i> McCulloch, 1914               | 1           | *                       | 320                  | 510                 | 24°53'           | 112°08'           | 33°18'           | 114°31'           | H3023-06               |
| <i>Hoplostethus</i> cf <i>melanopus</i> (Weber, 1913)   | 3           | *                       | 435                  | 760                 | 18°14'           | 117°54'           | 27°07'           | 112°23'           | H3041-01               |
| BERYCIDAE                                               |             |                         |                      |                     |                  |                   |                  |                   |                        |
| <i>Beryx splendens</i> Lowe, 1833                       | 2           |                         | 209                  | 670                 | 21°38'           | 113°56'           | 32°02'           | 114°54'           | H2599-02               |
| <i>Centroberyx australis</i> Shimizu and Hutchins, 1987 | 2           |                         | 203                  | 380                 | 26°42'           | 112°38'           | 33°24'           | 114°31'           | H2577-01               |
| <i>Centroberyx gerrardi</i> (Günther, 1887)             | 2           |                         | 210                  | 210                 | 33°45'           | 114°28'           | 33°45'           | 114°28'           | H2008-01               |
| HOLOCENTRIDAE                                           |             |                         |                      |                     |                  |                   |                  |                   |                        |
| <i>Ostichthys japonicus</i> (Cuvier, 1829)              | 2           |                         | 200                  | 225                 | 21°39'           | 113°58'           | 26°43'           | 112°41'           | H2576-04               |
| PARAZENIDAE                                             |             |                         |                      |                     |                  |                   |                  |                   |                        |
| <i>Parazen pacificus</i> Kamohara, 1935                 | 2           |                         | 297                  | 478                 | 21°45'           | 113°52'           | 27°23'           | 112°52'           | H3045-03               |
| MACROUROCYTTIDAE                                        |             |                         |                      |                     |                  |                   |                  |                   |                        |
| <i>Zenion</i> sp. A                                     | 3           |                         | 306                  | 735                 | 21°45'           | 113°52'           | 27°23'           | 112°52'           | H3040-01               |
| ZEIDAE                                                  |             |                         |                      |                     |                  |                   |                  |                   |                        |
| <i>Cyttopsis cypho</i> (Fowler, 1934)                   | 2           |                         | 297                  | 510                 | 21°45'           | 113°52'           | 32°02'           | 115°09'           | H2556-08               |
| <i>Cyttopsis roseus</i> (Lowe, 1843)                    | 2           |                         | 209                  | 616                 | 21°39'           | 113°58'           | 29°50'           | 114°21'           | H2591-04               |
| <i>Cyttus traversi</i> Hutton, 1872                     | 1           |                         | 490                  | 1003                | 28°13'           | 113°07'           | 35°08'           | 115°01'           | H3009-02               |
| <i>Zenopsis nebulosus</i> (Temminck and Schlegel, 1845) | 1           |                         | 209                  | 712                 | 21°39'           | 113°58'           | 34°59'           | 114°53'           | H2040-01               |
| <i>Zenopsis</i> sp. A                                   | 2           |                         | 209                  | 392                 | 16°54'           | 120°25'           | 21°45'           | 113°52'           | H2046-01               |
| <i>Zeus faber</i> Linnaeus, 1758                        | 1           |                         | 200                  | 230                 | 26°43'           | 112°41'           | 32°00'           | 115°13'           | H2576-05               |
| GRAMMICOLEPIDIDAE                                       |             |                         |                      |                     |                  |                   |                  |                   |                        |
| <i>Grammicolepis brachiusculus</i> Poey, 1873           | 2           |                         | 565                  | 612                 | 25°19'           | 111°56'           | 26°25'           | 112°20'           | H3046-04               |
| <i>Xenolepidichthys dalgleishi</i> Gilchrist, 1922      | 2           |                         | 405                  | 612                 | 17°00'           | 120°11'           | 31°31'           | 114°43'           | H2079-01               |



|                                                                  |   |   |     |      |        |         |        |         |             |
|------------------------------------------------------------------|---|---|-----|------|--------|---------|--------|---------|-------------|
| OREOSOMATIDAE                                                    |   |   |     |      |        |         |        |         |             |
| <i>Allocyttus verrucosus</i> (Gilchrist, 1906)                   | 1 |   | 613 | 1293 | 20°08' | 112°55' | 35°05' | 114°60' | H2036-01    |
| <i>Neocyttus rhomboidalis</i> Gilchrist, 1906                    | 1 |   | 596 | 1240 | 26°36' | 112°09' | 35°05' | 114°60' | H2034-01    |
| <i>Oreosoma atlanticum</i> Cuvier, 1829                          | 1 |   | 670 | 825  | 32°02' | 114°54' | 34°15' | 114°20' | H3016-01    |
| <i>Pseudocyttus maculatus</i> Gilchrist, 1906                    | 1 |   | 900 | 1003 | 35°03' | 115°01' | 35°08' | 114°51' | H3008-01    |
| CAPROIDAE                                                        |   |   |     |      |        |         |        |         |             |
| <i>Antigonia rhomboidea</i> McCulloch, 1915                      | 2 |   | 297 | 435  | 22°30' | 113°35' | 25°36' | 112°10' | H3045-04    |
| <i>Antigonia rubicunda</i> Ogilby, 1910                          | 2 |   | 312 | 312  | 25°08' | 112°09' | 25°08' | 112°09' | H2567-17    |
| FISTULARIIDAE                                                    |   |   |     |      |        |         |        |         |             |
| <i>Fistularia petimba</i> Lacépède, 1803                         | 2 |   | 218 | 218  | 27°33' | 112°59' | 27°33' | 112°59' | P.30431-001 |
| MACRORAMPHOSIDAE                                                 |   |   |     |      |        |         |        |         |             |
| <i>Centriscoptus humerosus</i> (Richardson, 1846)                | 2 |   | 306 | 673  | 27°23' | 112°52' | 35°02' | 115°02' | H3071-01    |
| <i>Macroramphosus scolopax</i> (Linnaeus, 1758)                  | 2 |   | 225 | 308  | 23°25' | 113°04' | 32°14' | 115°06' | I.31185-009 |
| <i>Notopogon xenosoma</i> Regan, 1914                            | 2 |   | 270 | 712  | 24°51' | 112°07' | 34°59' | 114°53' | H2567-04    |
| SCORPAENIDAE                                                     |   |   |     |      |        |         |        |         |             |
| <i>Helicolenus barathri</i> (Hector, 1875)                       | 2 |   | 320 | 770  | 26°36' | 112°29' | 33°18' | 114°31' | H2574-01    |
| <i>Helicolenus</i> cf <i>percoides</i> (Richardson, 1842)        | 3 |   | 203 | 225  | 32°10' | 115°08' | 33°24' | 114°31' | H2613-03    |
| <i>Neomerinthe</i> cf <i>neilseni</i> (Smith, 1964)              | 3 | * | 320 | 438  | 27°09' | 112°45' | 31°55' | 115°10' | I.31184-004 |
| <i>Neosebastes nigropunctatus</i> McCulloch, 1915                | 2 |   | 203 | 225  | 32°10' | 115°08' | 33°24' | 114°31' | H2613-07    |
| <i>Neosebastes pandus</i> (Richardson, 1842)                     | 2 |   | 201 | 201  | 34°57' | 114°56' | 34°57' | 114°56' | H3063-01    |
| <i>Neosebastes thetidis</i> (Waite, 1899)                        | 2 |   | 203 | 225  | 32°10' | 115°08' | 33°24' | 114°31' | H2613-08    |
| <i>Setarches guentheri</i> Johnson, 1862                         | 2 |   | 318 | 649  | 17°50' | 118°33' | 30°57' | 114°48' | H2006-02    |
| <i>Setarches longimanus</i> (Alcock, 1894)                       | 2 |   | 297 | 297  | 23°25' | 113°04' | 23°25' | 113°04' | I.31155-008 |
| <i>Trachyscorpia capensis</i> (Gilchrist and von Bonde, 1924)    | 2 |   | 738 | 870  | 34°59' | 114°44' | 35°05' | 114°60' | H2625-02    |
| <i>Trachyscorpia</i> cf <i>cristulata</i> (Goode and Bean, 1896) | 3 | * | 880 | 880  | 32°40' | 114°28' | 32°40' | 114°28' | H2616-01    |
| TRIGLIDAE                                                        |   |   |     |      |        |         |        |         |             |
| <i>Heminodus</i> sp. A                                           | 3 | * | 297 | 508  | 22°60' | 113°14' | 27°09' | 112°45' | H2564-13    |
| <i>Lepidotrigla modesta</i> Waite, 1899                          | 1 |   | 270 | 308  | 32°05' | 115°09' | 32°14' | 115°06' | H2609-01    |
| <i>Lepidotrigla</i> sp. A                                        | 2 |   | 209 | 346  | 21°39' | 113°58' | 29°16' | 113°57' | H2547-07    |
| <i>Lepidotrigla</i> sp. B                                        | 2 |   | 209 | 320  | 21°39' | 113°58' | 25°08' | 112°09' | H2547-08    |
| <i>Parapterygotrigla</i> sp. A                                   | 2 |   | 297 | 300  | 23°25' | 113°04' | 23°25' | 113°04' | H2555-05    |
| <i>Parapterygotrigla</i> sp. B                                   | 3 |   | 300 | 300  | 23°25' | 113°04' | 23°25' | 113°04' | H2556-10    |
| <i>Peristedion</i> cf <i>liorhynchus</i> (Günther, 1872)         | 3 |   | 297 | 467  | 23°25' | 113°04' | 24°56' | 112°11' | H2564-10    |
| <i>Pterygotrigla hemisticta</i> (Temminck and Schlegel, 1844)    | 2 |   | 300 | 320  | 21°45' | 113°52' | 23°25' | 113°04' | H2548-11    |
| <i>Pterygotrigla polyommata</i> (Richardson, 1839)               | 3 |   | 203 | 400  | 30°01' | 114°29' | 33°24' | 114°31' | H2597-04    |
| <i>Satyrichthys</i> cf <i>adeni</i> (Lloyd, 1907)                | 4 | * | 444 | 444  | 24°53' | 112°08' | 24°53' | 112°08' | H2115-01    |
| <i>Satyrichthys</i> cf <i>investigatoris</i> (Alcock, 1898)      | 3 | * | 320 | 714  | 26°15' | 112°03' | 31°55' | 115°10' | H2608-03    |
| <i>Satyrichthys</i> cf <i>murrayi</i> (Günther, 1878)            | 4 | * | 297 | 300  | 23°25' | 113°04' | 23°25' | 113°04' | H2555-07    |
| <i>Satyrichthys</i> cf <i>welchi</i> (Herre, 1925)               | 4 | * | 209 | 346  | 21°39' | 113°58' | 32°05' | 115°09' | H2547-05    |

| Species                                                       | ID level | New record (Aust) | Min. depth (m) | Max depth (m) | Min. latitude | Min. longitude | Max. latitude | Max. longitude | Registration number |
|---------------------------------------------------------------|----------|-------------------|----------------|---------------|---------------|----------------|---------------|----------------|---------------------|
| PLATYCEPHALIDAE                                               |          |                   |                |               |               |                |               |                |                     |
| <i>Bembras</i> sp. A                                          | 2        |                   | 209            | 297           | 21°39'        | 113°58'        | 23°25'        | 113°04'        | H2547-04            |
| <i>Elates ransonnetii</i> (Steindachner, 1877)                | 3        |                   | 221            | 221           | 22°22'        | 113°39'        | 22°22'        | 113°39'        | H3055-02            |
| <i>Neoplatycephalus conatus</i> Waite and McCulloch, 1915     | 1        |                   | 201            | 413           | 28°53'        | 113°41'        | 33°24'        | 114°31'        | H2610-08            |
| <i>Ratabulus diversidens</i> (McCulloch, 1914)                | 2        |                   | 209            | 209           | 21°39'        | 113°58'        | 21°39'        | 113°58'        | H2547-15            |
| HOPLICHTHYIDAE                                                |          |                   |                |               |               |                |               |                |                     |
| <i>Hoplichthys citrinus</i> Gilbert, 1905                     | 2        |                   | 300            | 612           | 23°25'        | 113°04'        | 27°09'        | 112°45'        | H3045-09            |
| <i>Hoplichthys haswelli</i> McCulloch, 1907                   | 1        |                   | 373            | 712           | 29°21'        | 113°58'        | 34°59'        | 114°53'        | H1807-01            |
| <i>Hoplichthys</i> sp. A                                      | 3        |                   | 510            | 1058          | 30°39'        | 114°28'        | 34°59'        | 114°53'        | H2601-01            |
| EREUNIIDAE                                                    |          |                   |                |               |               |                |               |                |                     |
| <i>Ereunias</i> cf <i>grallator</i> Jordan and Snyder, 1901   | 3        | *                 | 565            | 760           | 26°25'        | 112°20'        | 28°13'        | 113°07'        | I.31175-001         |
| PSYCHROLUTIDAE                                                |          |                   |                |               |               |                |               |                |                     |
| <i>Psychrolutes</i> cf <i>inermis</i> (Vaillant, 1888)        | 3        |                   | 435            | 565           | 26°25'        | 112°20'        | 26°25'        | 112°20'        | H3046-05            |
| <i>Psychrolutes</i> cf <i>marcidus</i> (McCulloch, 1926)      | 3        |                   | 571            | 945           | 26°15'        | 112°03'        | 32°52'        | 114°35'        | H3026-01            |
| CYCLOPTERIDAE                                                 |          |                   |                |               |               |                |               |                |                     |
| <i>Paraliparis</i> sp. A                                      | 3        |                   | 1030           | 1030          | 32°35'        | 114°27'        | 32°35'        | 114°27'        | H2615-10            |
| DACTYLOPTERIDAE                                               |          |                   |                |               |               |                |               |                |                     |
| <i>Dactyloptena peterseni</i> (Nyström, 1887)                 | 3        |                   | 250            | 250           | 27°29'        | 112°50'        | 27°29'        | 112°50'        | H3066-03            |
| SERRANIDAE                                                    |          |                   |                |               |               |                |               |                |                     |
| <i>Callanthias</i> sp. A                                      | 2        | *                 | 203            | 270           | 27°39'        | 113°00'        | 33°24'        | 114°31'        | H2610-01            |
| <i>Caprodon</i> sp. A                                         | 2        | *                 | 212            | 373           | 22°22'        | 113°39'        | 32°54'        | 114°39'        | H2307-01            |
| <i>Epinephelus radiatus</i> (Day, 1868)                       | 2        |                   | 218            | 250           | 21°19'        | 113°42'        | 22°30'        | 113°35'        | -                   |
| <i>Epinephelus septemfasciatus</i> (Thunberg, 1793)           | 2        |                   | 200            | 331           | 31°09'        | 114°52'        | 32°09'        | 115°10'        | H2130-01            |
| <i>Lepidoperca filamenta</i> Roberts, 1987                    | 2        |                   | 203            | 225           | 32°10'        | 115°08'        | 33°24'        | 114°31'        | H2613-05            |
| <i>Lepidoperca occidentalis</i> Whitley, 1951                 | 2        |                   | 203            | 225           | 32°10'        | 115°08'        | 33°24'        | 114°31'        | H2613-04            |
| <i>Plectranthias</i> cf <i>japonicus</i> (Steindachner, 1884) | 3        |                   | 320            | 320           | 21°45'        | 113°52'        | 21°45'        | 113°52'        | H2548-02            |
| GLAUCOSOMATIDAE                                               |          |                   |                |               |               |                |               |                |                     |
| <i>Glaucosoma buergeri</i> Richardson, 1845                   | 2        |                   | 220            | 250           | 22°25'        | 113°37'        | 22°29'        | 113°36'        | P.30423-001         |
| BANJOSIDAE                                                    |          |                   |                |               |               |                |               |                |                     |
| <i>Banjos banjos</i> (Richardson, 1846)                       | 2        |                   | 216            | 216           | 28°34'        | 113°29'        | 28°34'        | 113°29'        | H2037-02            |
| PRIACANTHIDAE                                                 |          |                   |                |               |               |                |               |                |                     |
| <i>Cookeolus boops</i> (Forster, 1801)                        | 2        |                   | 200            | 300           | 23°25'        | 113°04'        | 27°53'        | 113°08'        | H2575-03            |
| <i>Priacanthus hamrur</i> (Forsskål, 1775)                    | 2        |                   | 218            | 250           | 21°19'        | 113°42'        | 22°30'        | 113°35'        | -                   |
| <i>Priacanthus macracanthus</i> Cuvier, 1829                  | 2        |                   | 209            | 320           | 21°39'        | 113°58'        | 21°39'        | 113°58'        | H2085-01            |
| <i>Priacanthus fitchi</i> Starnes, 1988                       | 2        |                   | 297            | 297           | 23°25'        | 113°04'        | 23°25'        | 113°04'        | -                   |
| <i>Pristigenys niphonia</i> (Cuvier, 1829)                    | 2        |                   | 220            | 250           | 22°25'        | 113°37'        | 22°29'        | 113°36'        | -                   |

|                                                              |   |   |     |     |        |          |        |         |             |
|--------------------------------------------------------------|---|---|-----|-----|--------|----------|--------|---------|-------------|
| EPIGONIDAE                                                   |   |   |     |     |        |          |        |         |             |
| <i>Epigonus macrops</i> (Brauer, 1906)                       | 2 |   | 612 | 895 | 24°30' | 111°51'  | 25°19' | 111°56' | H2562-01    |
| <i>Epigonus occidentalis</i> Goode and Bean, 1896            | 3 | * | 612 | 613 | 23°45' | 112°35'  | 31°16' | 114°50' | H2603-01    |
| <i>Epigonus robustus</i> (Barnard, 1927)                     | 2 |   | 976 | 982 | 33°17' | 114°13'  | 33°18' | 114°13' | H2617-10    |
| ACROPOMATIDAE                                                |   |   |     |     |        |          |        |         |             |
| <i>Acropoma japonica</i> Günther, 1859                       | 3 |   | 209 | 320 | 21°39' | 113°58'  | 27°23' | 112°52' | H2547-12    |
| <i>Apogonops anomalus</i> Ogilby, 1896                       | 2 |   | 200 | 510 | 21°45' | 113°52'  | 33°18' | 114°31' | —           |
| <i>Doderleinia berycoides</i> (Hilgendorf, 1879)             | 2 |   | 320 | 400 | 20°00' | 120°14'  | 21°45' | 113°52' | H2548-03    |
| <i>Malakichthys cf elegans</i> Matsubara and Yamaguchi, 1943 | 3 |   | 320 | 320 | 21°45' | 113°52'  | 21°45' | 113°52' | H2088-01    |
| <i>Malakichthys</i> sp. A                                    | 3 | * | 297 | 482 | 22°60' | 113°14'  | 27°23' | 112°52' | H2554-15    |
| <i>Polyprion americanus</i> (Bloch and Schneider, 1801)      | 2 |   | 270 | 270 | 32°05' | 115°09'  | 32°05' | 115°09' | —           |
| <i>Polyprion oxygeneois</i> (Forster, 1801)                  | 2 |   | 350 | 350 | 32°18' | 114°58'  | 32°18' | 114°58' | photo       |
| <i>Synagrops japonicus</i> (Döderlein, 1884)                 | 2 |   | 306 | 714 | 22°60' | 113°14'  | 32°10' | 115°03' | H2047-01    |
| <i>Synagrops philippinensis</i> (Günther, 1880)              | 2 |   | 306 | 478 | 21°45' | 113°52'  | 30°00' | 114°28' | —           |
| MALACANTHIDAE                                                |   |   |     |     |        |          |        |         |             |
| <i>Branchiostegus australiensis</i> Dooley and Kailola, 1988 | 2 |   | 207 | 230 | 20°40' | 113°43'  | 32°00' | 115°13' | H2547-03    |
| EMMELICHTHYIDAE                                              |   |   |     |     |        |          |        |         |             |
| <i>Plagiogenion macrolepis</i> McCulloch, 1914               | 3 |   | 203 | 230 | 32°00' | 115° 13' | 33°24' | 114°31' | H2619-04    |
| LUTJANIDAE                                                   |   |   |     |     |        |          |        |         |             |
| <i>Etelis carbunculus</i> Cuvier, 1828                       | 1 |   | 200 | 285 | 21°15' | 113°43'  | 26°24' | 112°38' | H2577-03    |
| <i>Etelis coruscans</i> Valenciennes, 1862                   | 1 |   | 285 | 285 | 26°42' | 112°38'  | 26°42' | 112°38' | H2577-02    |
| <i>Lipocheilus carnolabrum</i> (Chan, 1970)                  | 2 |   | 218 | 250 | 21°19' | 113°42'  | 22°30' | 113°35' | photo       |
| NEMIPTERIDAE                                                 |   |   |     |     |        |          |        |         |             |
| <i>Nemipterus bathybius</i> Snyder, 1911                     | 2 |   | 209 | 225 | 20°40' | 113°43'  | 21°39' | 113°58' | H3054-02    |
| <i>Parascolopsis rufomaculatus</i> Russell, 1986             | 2 |   | 209 | 312 | 21°39' | 112°58'  | 25°08' | 112°09' | H2567-05    |
| HAEMULIDAE                                                   |   |   |     |     |        |          |        |         |             |
| <i>Haplogeny kishinouyei</i> Smith and Pope, 1906            | 3 |   | 218 | 250 | 20°40' | 113°43'  | 22°30' | 113°35' | photo       |
| SPARIDAE                                                     |   |   |     |     |        |          |        |         |             |
| <i>Dentex tumifrons</i> (Temminck and Schlegel, 1842)        | 2 |   | 200 | 346 | 21°39' | 113°58'  | 32°10' | 115°08' | H3067-02    |
| <i>Pagrus auratus</i> (Bloch and Schneider, 1801)            | 2 |   | 200 | 296 | 21°15' | 113°43'  | 32°24' | 115°01' | H1698-01    |
| MULLIDAE                                                     |   |   |     |     |        |          |        |         |             |
| <i>Parupeneus chrysopleuron</i> (Schlegel, 1843)             | 2 |   | 200 | 200 | 26°43' | 112°41'  | 26°43' | 112°41' | I.31173-001 |
| BATHYCLUPEIDAE                                               |   |   |     |     |        |          |        |         |             |
| <i>Bathyclupea</i> sp. A                                     | 3 |   | 482 | 870 | 22°60' | 113°14'  | 33°58' | 114°22' | H3040-03    |
| SCORPIDIDAE                                                  |   |   |     |     |        |          |        |         |             |
| <i>Tilodon sexfasciatum</i> (Richardson, 1842)               | 2 |   | 201 | 201 | 34°57' | 114°56'  | 34°57' | 114°56' | H3063-03    |
| CHAETODONTIDAE                                               |   |   |     |     |        |          |        |         |             |
| <i>Chaetodon assarius</i> Waite, 1905                        | 2 |   | 200 | 250 | 32°00' | 115°30'  | 32°00' | 115°30' | P.30422-001 |
| PENTACEROTIDAE                                               |   |   |     |     |        |          |        |         |             |
| <i>Paristiopterus gallipavo</i> Whitley, 1944                | 2 |   | 204 | 213 | 28°03' | 113°15'  | 31°36' | 114°59' | H3068-01    |

| Species                                                            | ID level | New record (Aust) | Min. depth (m) | Max depth (m) | Min. latitude | Min. longitude | Max. latitude | Max. longitude | Registration number |
|--------------------------------------------------------------------|----------|-------------------|----------------|---------------|---------------|----------------|---------------|----------------|---------------------|
| <i>Pentaceros decacanthus</i> Günther, 1859                        | 2        |                   | 306            | 712           | 25°08'        | 112°09'        | 34°59'        | 114°53'        | H3069-04            |
| <i>Pseudopentaceros</i> cf <i>richardsoni</i> (Smith, 1844)        | 3        |                   | 376            | 596           | 28°48'        | 113°37'        | 33°13'        | 114°31'        | H3025-01            |
| <i>Zanclistius elevatus</i> (Ramsay and Ogilby, 1889)              | 2        |                   | 200            | 360           | 31°55'        | 115°11'        | 33°24'        | 114°31'        | H2002-02            |
| OPLEGNATHIDAE                                                      |          |                   |                |               |               |                |               |                |                     |
| <i>Oplegnathus woodwardi</i> (Waite, 1900)                         | 2        |                   | 203            | 380           | 29°57'        | 114°27'        | 33°24'        | 114°31'        | H2608-05            |
| CHEILODACTYLIDAE                                                   |          |                   |                |               |               |                |               |                |                     |
| <i>Nemadactylus macropterus</i> (Bloch and Schneider, 1801)        | 2        |                   | 203            | 357           | 31°55'        | 115°10'        | 33°24'        | 114°31'        | H2608-14            |
| <i>Nemadactylus valenciennesi</i> (Whitley, 1937)                  | 2        |                   | 203            | 203           | 33°24'        | 114°31'        | 33°24'        | 114°31'        | H2619-05            |
| CEPOLIDAE                                                          |          |                   |                |               |               |                |               |                |                     |
| <i>Cepola</i> sp. A                                                | 3        |                   | 300            | 300           | 23°25'        | 113°04'        | 23°25'        | 113°04'        | H2556-01            |
| SPHYRAENIDAE                                                       |          |                   |                |               |               |                |               |                |                     |
| <i>Sphyaena</i> sp. A                                              | 3        |                   | 209            | 300           | 21°39'        | 113°58'        | 23°25'        | 113°04'        | H2547-14            |
| LABRIDAE                                                           |          |                   |                |               |               |                |               |                |                     |
| <i>Bodianus vulpinus</i> (Richardson, 1850)                        | 1        |                   | 218            | 218           | 27°33'        | 112°58'        | 27°33'        | 112°58'        | H2065-01            |
| PINGUIPEDIDAE                                                      |          |                   |                |               |               |                |               |                |                     |
| <i>Parapercis</i> sp. A                                            | 3        |                   | 225            | 390           | 31°55'        | 115°10'        | 32°14'        | 115°06'        | H2608-02            |
| <i>Parapercis</i> sp. B                                            | 3        |                   | 220            | 318           | 23°25'        | 113°04'        | 33°19'        | 114°32'        | I.31185-006         |
| <i>Parapercis</i> sp. C                                            | 3        |                   | 220            | 297           | 23°25'        | 113°04'        | 33°19'        | 114°32'        | H2556-09            |
| PERCOPHIDAE                                                        |          |                   |                |               |               |                |               |                |                     |
| <i>Bembrops</i> cf <i>curvatura</i> Ikada and Suzuki, 1952         | 3        |                   | 320            | 320           | 21°45'        | 113°52'        | 21°45'        | 113°52'        | —                   |
| URANOSCOPIDAE                                                      |          |                   |                |               |               |                |               |                |                     |
| <i>Gnathagnus australiensis</i> Kishamoto, 1989                    | 2        |                   | 290            | 320           | 21°45'        | 113°52'        | 21°45'        | 113°52'        | H2548-04            |
| <i>Kathetostoma nigrofasciatum</i> Waite and McCulloch, 1915       | 2        |                   | 201            | 320           | 30°01'        | 114°29'        | 34°57'        | 114°56'        | H2597-05            |
| <i>Pleuroscopus pseudodorsalis</i> Barnard, 1927                   | 2        |                   | 435            | 435           | 33°20'        | 114°30'        | 33°20'        | 114°30'        | H3023-04            |
| <i>Uranoscopus</i> sp. A                                           | 3        |                   | 209            | 320           | 21°39'        | 113°58'        | 21°45'        | 113°52'        | H2547-13            |
| CHAMPSODONTIDAE                                                    |          |                   |                |               |               |                |               |                |                     |
| <i>Champsodon</i> cf <i>longipinnis</i> Matsubara and Amaoka, 1964 | 3        |                   | 297            | 612           | 22°60'        | 113°14'        | 27°17'        | 112°45'        | H3046-01            |
| <i>Champsodon nudivittis</i> (Ogilby, 1895)                        | 2        |                   | 306            | 478           | 24°51'        | 112°07'        | 27°23'        | 112°52'        | H2575-03            |
| CALLIONYMIDAE                                                      |          |                   |                |               |               |                |               |                |                     |
| <i>Synchiropus apricus</i> (McCulloch, 1926)                       | 2        |                   | 390            | 490           | 27°09'        | 112°45'        | 31°49'        | 115°01'        | H2587-03            |
| SCOMBROLABRACIDAE                                                  |          |                   |                |               |               |                |               |                |                     |
| <i>Scombrolabrax heterolepis</i> Roule, 1921                       | 2        |                   | 854            | 1293          | 20°08'        | 112°55'        | 35°07'        | 115°01'        | H3010-05            |
| GEMPYLIDAE                                                         |          |                   |                |               |               |                |               |                |                     |
| <i>Neopinnula orientalis</i> (Gilchrist and von Bonde, 1924)       | 1        |                   | 435            | 510           | 24°51'        | 112°07'        | 27°17'        | 112°45'        | H2564-03            |
| <i>Rexea antefurcata</i> Parin, 1989                               | 2        |                   | 225            | 435           | 22°22'        | 113°39'        | 25°36'        | 112°10'        | H3058-01            |

|                                                            |   |     |     |        |         |        |         |             |
|------------------------------------------------------------|---|-----|-----|--------|---------|--------|---------|-------------|
| <i>Rexea bengalensis</i> (Alcock, 1894)                    | 2 | 270 | 270 | 22°13' | 113°44' | 22°13' | 113°44' | H3057-01    |
| <i>Rexea prometheoides</i> (Bleeker, 1856)                 | 1 | 297 | 320 | 21°45' | 113°52' | 23°25' | 113°04' | I.31147-001 |
| <i>Rexea solandri</i> (Cuvier, 1831)                       | 1 | 216 | 596 | 23°25' | 113°04' | 33°20' | 114°30' | H3023-05    |
| CENTROLOPHIDAE                                             |   |     |     |        |         |        |         |             |
| <i>Hyperoglyphe antarctica</i> (Carmichael, 1818)          | 2 | 380 | 380 | 30°00' | 114°28' | 30°00' | 114°28' | H2598-02    |
| <i>Psenopsis obscura</i> Haedrich, 1967                    | 2 | 868 | 868 | 20°08' | 112°55' | 20°08' | 112°55' | H2543-02    |
| NOMEIDAE                                                   |   |     |     |        |         |        |         |             |
| <i>Cubiceps pauciradiatus</i> Günther, 1872                | 2 | 868 | 868 | 20°08' | 112°55' | 20°08' | 112°55' | H2543-01    |
| <i>Cubiceps squamiceps</i> (Lloyd, 1909)                   | 2 | 467 | 467 | 24°51' | 112°07' | 24°51' | 112°07' | H2564-23    |
| ARIOMMATIDAE                                               |   |     |     |        |         |        |         |             |
| <i>Ariomma luridum</i> Jordan and Snyder, 1904             | 2 | 297 | 318 | 23°25' | 113°04' | 24°56' | 112°11' | -           |
| CITHARIDAE                                                 |   |     |     |        |         |        |         |             |
| <i>Citharoides macrolepidotus</i> (Gilchrist, 1905)        | 3 | 297 | 435 | 23°25' | 113°04' | 31°55' | 115°10' | H3045-05    |
| BOTHIDAE                                                   |   |     |     |        |         |        |         |             |
| <i>Chascanopsetta lugubris</i> Alcock, 1894                | 2 | 444 | 467 | 24°51' | 112°07' | 24°53' | 112°08' | H2564-21    |
| <i>Taeniopsetta</i> cf <i>ocellata</i> (Günther, 1880)     | 3 | 300 | 300 | 23°25' | 113°04' | 23°25' | 113°04' | H2556-02    |
| PARALICHTHYIDAE                                            |   |     |     |        |         |        |         |             |
| <i>Pseudorhombus megalops</i> Fowler, 1934                 | 3 | 297 | 300 | 23°25' | 113°04' | 23°25' | 113°04' | -           |
| PLEURONECTIDAE                                             |   |     |     |        |         |        |         |             |
| <i>Poecilopsetta</i> cf <i>prolonga</i> Alcock, 1894       | 3 | 312 | 320 | 21°45' | 113°52' | 25°08' | 112°09' | H2548-15    |
| Pleuronectidae gen. sp.                                    | 4 | 320 | 320 | 21°45' | 113°52' | 21°45' | 113°52' | H2567-15    |
| TRIACANTHODIDAE                                            |   |     |     |        |         |        |         |             |
| <i>Halimochirurgus alcocki</i> Weber, 1913                 | 1 | 438 | 438 | 27°09' | 112°45' | 27°09' | 112°45' | I.31184-002 |
| <i>Halimochirurgus centriscoides</i> Alcock, 1899          | 1 | 297 | 297 | 23°25' | 113°04' | 23°25' | 113°04' | I.31155-003 |
| <i>Paratriacanthodes retrospinus</i> Fowler, 193           | 1 | 467 | 482 | 22°60' | 113°14' | 24°51' | 112°07' | I.31154-001 |
| <i>Tydemania navigatoris</i> Weber, 1913                   | 1 | 482 | 482 | 22°60' | 113°14' | 22°60' | 113°14' | I.31154-002 |
| MONACANTHIDAE                                              |   |     |     |        |         |        |         |             |
| <i>Eubalichthys bucephalus</i> (Whitley, 1931)             | 1 | 204 | 213 | 31°13' | 114°56' | 34°56' | 114°59' | H1800-01    |
| <i>Eubalichthys quadrispinis</i> Hutchins, 1977            | 1 | 213 | 270 | 31°13' | 114°56' | 32°10' | 115°08' | H2610-04    |
| <i>Nelusetta ayraudi</i> (Quoy and Gaimard, 1824)          | 1 | 200 | 360 | 29°20' | 114°02' | 32°28' | 114°59' | H1800-02    |
| <i>Parika scaber</i> (Bloch and Schneider, 1801)           | 1 | 203 | 203 | 33°24' | 114°31' | 33°24' | 114°31' | H2619-07    |
| <i>Thamnaconus tessellatus</i> (Günther, 1880)             | 1 | 250 | 250 | 27°29' | 112°50' | 27°29' | 112°50' | H1802-01    |
| OSTRACIIDAE                                                |   |     |     |        |         |        |         |             |
| <i>Anaplocapros lenticularis</i> (Richardson, 1841)        | 2 | 203 | 324 | 31°12' | 114°56' | 33°24' | 114°31' | H2613-09    |
| <i>Capropygia unistriata</i> (Kaup, 1855)                  | 2 | 203 | 203 | 33°24' | 114°31' | 33°24' | 114°31' | -           |
| TETRAODONTIDAE                                             |   |     |     |        |         |        |         |             |
| <i>Omegophora armilla</i> (McCulloch and Waite, 1915)      | 2 | 255 | 255 | 30°01' | 114°29' | 30°01' | 114°29' | I.31186-002 |
| <i>Sphoeroides pachygaster</i> (Müller and Troschel, 1848) | 3 | 318 | 685 | 21°51' | 113°47' | 24°56' | 112°11' | H2566-03    |