

**RECORDS OF SHALLOW-WATER MARINE INVERTEBRATES FROM
FRENCH FRIGATE SHOALS, NORTHWESTERN HAWAIIAN ISLANDS,
WITH A NOTE ON NONINDIGENOUS SPECIES**



**Hawaii Biological Survey
Bishop Museum Honolulu
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Cover: Undescribed encrusting brain coral species at French Frigate Shoals [photo: Jim Maragos/U.S. Fish & Wildlife Service].

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Report to U.S. Fish & Wildlife Service

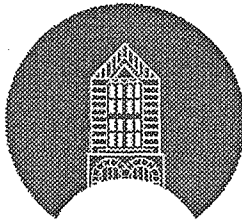
Ralph DeFelice
Hawaii Biological Survey
Bishop Museum

Duane Minton
Department of Zoology
University of Hawaii

Scott Godwin
Hawaii Biological Survey
Bishop Museum

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SUMMARY

In September of 2000, the Northwest Hawaiian Islands Rapid Assessment and Monitoring Program (NOW-RAMP) Expedition surveyed French Frigate Shoals (FFS) and a number of the remaining Northwest Hawaiian Islands (NWHI). At FFS, marine surveys were conducted at 39 stations by three different Rapid Ecological Assessment teams from two separate research vessels, the *Townsend Cromwell* (11 - 25 Sep 2000) and the *Rapture* (23 - 27 Sep 2000). An additional study of the seawall at Tern Island was conducted in March 2002. A total of 618 marine invertebrate taxa were collected and identified, about 75% to specific level. Of the 622 taxa identified, 502 are considered new records for FFS and perhaps 10 to 20% of these may be new records for the Hawaiian Archipelago. Of these new records, as many as 50 species may be undescribed and so far known only from FFS. Most of material collected by NOW-RAMP from the NWHI remains to be examined, and therefore no conclusions can be drawn yet regarding the distribution of these species throughout the island chain. Two species considered to be nonindigenous, the hydroid *Pennaria disticha*, and the barnacle *Balanus reticulatus*, were found at FFS. A number of specimens of some taxonomic groups collected from FFS remain to be examined thoroughly by specialists, most notably the polychaetes, which will certainly increase the final species tally. Further study will also be required of the 150 taxa which could not be identified to species level at the time of this report.

I. INTRODUCTION

French Frigate Shoals (FFS) is a coral atoll located roughly at the mid-point of the 2600 km long Hawaiian Archipelago. It is the southern-most atoll in the archipelago, lying between the latitudes of 23° 37' 18" and 23° 52' 50" North and the longitudes 166° 03' 14" and 166° 20' 04" West (Amerson, 1971).

The atoll consists of a crescent-shaped reef on a 20-fathom-deep oval platform, whose long axis is 19 nautical miles in a northwest to southwest direction (Fig. 1). The west-facing crescent shaped reef has an outer arc 31 miles long and an inner arc 18 miles long, and forms a 140 square mile lagoon which is 7 miles wide at its midpoint (Amerson 1971). La Perouse Pinnacle, the only remaining exposed basalt remnant, is six miles southeast of the northern tip of the reef and nine miles northwest of the southern tip of the crescent perimeter reef.

In addition to La Perouse, there are 12 sand islands. Tern Island, the largest, is located near the northwest tip of the crescent reef. Amerson (1971) provides a thorough description of each island and reviews the geology and climate of the atoll. Amerson (1971) also reviews the history of the atoll, and provides a number of early maps, figures, and some photographs.

Although FFS was designated a wildlife reserve by Theodore Roosevelt in 1909, like some other atolls in the Northwestern Western Hawaiian Islands, it was developed and used by the military during World War II. Tern Island was greatly enlarged by dredging the surrounding lagoon, and was used as a landing strip. The nearby lagoon was dredged to a depth that could accommodate naval vessels. After WWII, the US Coast Guard established a LORAN station which functioned until the mid-1980s. Since then the Department of the Interior, Fish and Wildlife Service has maintained the atoll as a bird sanctuary.

Given the heavy ship traffic during and post-WW II, and the very limited continuation of ship visits and the occasional accidental ship grounding, there was concern that this isolated atoll may have received alien species. Pending work on the seawall at Tern Island will result in increased shipping to the island in the next year. It is also possible that very abundant invasive species from the main Hawaiian Islands may have spread naturally by planktonic larvae transported by ocean currents. Therefore, special attention was made during the initial survey and in the analysis of specimens collected to the presence of nonindigenous species.

II. SCIENTIFIC ACTIVITY AT FRENCH FRIGATE SHOALS

The scientific activity on FFS has primarily been terrestrial research focusing on the plants, insects, birds, turtles, and mammals of the small islets of the atoll. The history of this research and a summary of many results are reviewed by Amerson (1971).

The first marine scientists to visit the atoll were members of the *Albatross* Expedition in 1902. The majority of this material was deposited at the Natural History Museum, Smithsonian Institution in Washington, D.C., and was the basis of some of the earliest thorough reviews of Hawaiian marine fauna [Clark 1908 and 1949 (echinoderms), Vaughn 1907 (stony corals), Treadwell 1906 (polychaetes), Rathbun 1906 (decapods)]. The second marine science expedition and most significant collecting of marine animals from FFS prior to the NOW-RAMP 2000 survey was conducted by the *Tanager* Expedition in June 1923, organized by U.S. Department of Agriculture and the Bishop Museum. Over 60% of the specimens from FFS housed in the Bishop Museum Invertebrate Zoology collection are from the *Tanager* (Appendix D).

In September of 2000, the Northwestern Hawaiian Islands Rapid Assessment and Monitoring Program (NOW-RAMP) Expedition resurveyed the Northwestern Hawaiian Islands. The purpose of this multi-agency project was to obtain more detailed information about the marine fauna of these remote islands and represents the first intensive marine invertebrate survey in this region since the *Tanager* in 1923. This report reviews the findings of the NOW-RAMP survey of French Frigate Shoals.

III. METHODS

Marine surveys were conducted at 39 stations (Figure 1) by three different Rapid Ecological Assessment (REA) teams, usually having 4 - 8 members, on two separate research vessels, the *Townsend Cromwell* (11 - 25 Sep 2000) and the *Rapture* (23 - 27 Sep 2000). Each REA team conducted surveys at different stations, and one member of each team was responsible for all invertebrate animals other than corals. Surveys were conducted using SCUBA and usually involved a combination of observations and collecting of large macroinvertebrates and small collections by hand of chunks of reef substrate, rubble, sand and algae in an attempt to collect microinvertebrates. Some large common invertebrates observed were recorded as present on underwater paper datasheets carried by researchers and were not collected. Specimens and rubble/sand collections were labeled and transferred to either 10% formalin or 70% EtOH upon returning to the research vessels. In the lab, animals were removed from coral rubble, if necessary, and then identified to lowest feasible taxonomic level. All collections and observations were made between 0 and 20 m. All reported species are based on observation or collections of living individuals except for molluscs. Empty mollusc shells were identified and those species were considered present despite not being found alive.

Due to logistical constraints (e.g., lack of space on support skiffs, inadequate lab facilities on the *Rapture*, and limited experienced personnel), both detailed observations and extensive collections for small invertebrates could not be made at all 39 stations at FFS.

An additional survey of the seawall at Tern Island was conducted by Steve Coles, Bishop Museum, in March 2002. The seawall, a likely place for nonindigenous species, was not accessible to NOW-RAMP REA teams during the initial study.

IV. STATION SUMMARIES

(See Appendix A for station information in tabular form, and Figure 1 for map of FFS stations)

Tern Island seawall

20 Mar 2002

N side of Tern Island, depth 0-5 m

The seawall inspected in this survey extends along the north side of the island from about the middle of the island to its western end. The seawall is relatively protected from wave exposure by an offshore reef about 200-300 m north of the island. It is constructed from iron sheet piling which was very deteriorated at the time of the survey, with gaping holes and sharp projections along its length. Water depth along the seawall is shallow, generally less than 5 m. Offshore of the seawall, the bottom is irregular in composition and depth, with intermittent areas of active coral growth interspersed among fossilized reef and sandy areas.

FFS-TC-06

23° 52.5 N, 166° 17.68 W

11 Sep 2000

N forereef, 1.5 km N of Tern Island, depth 5 - 12 m

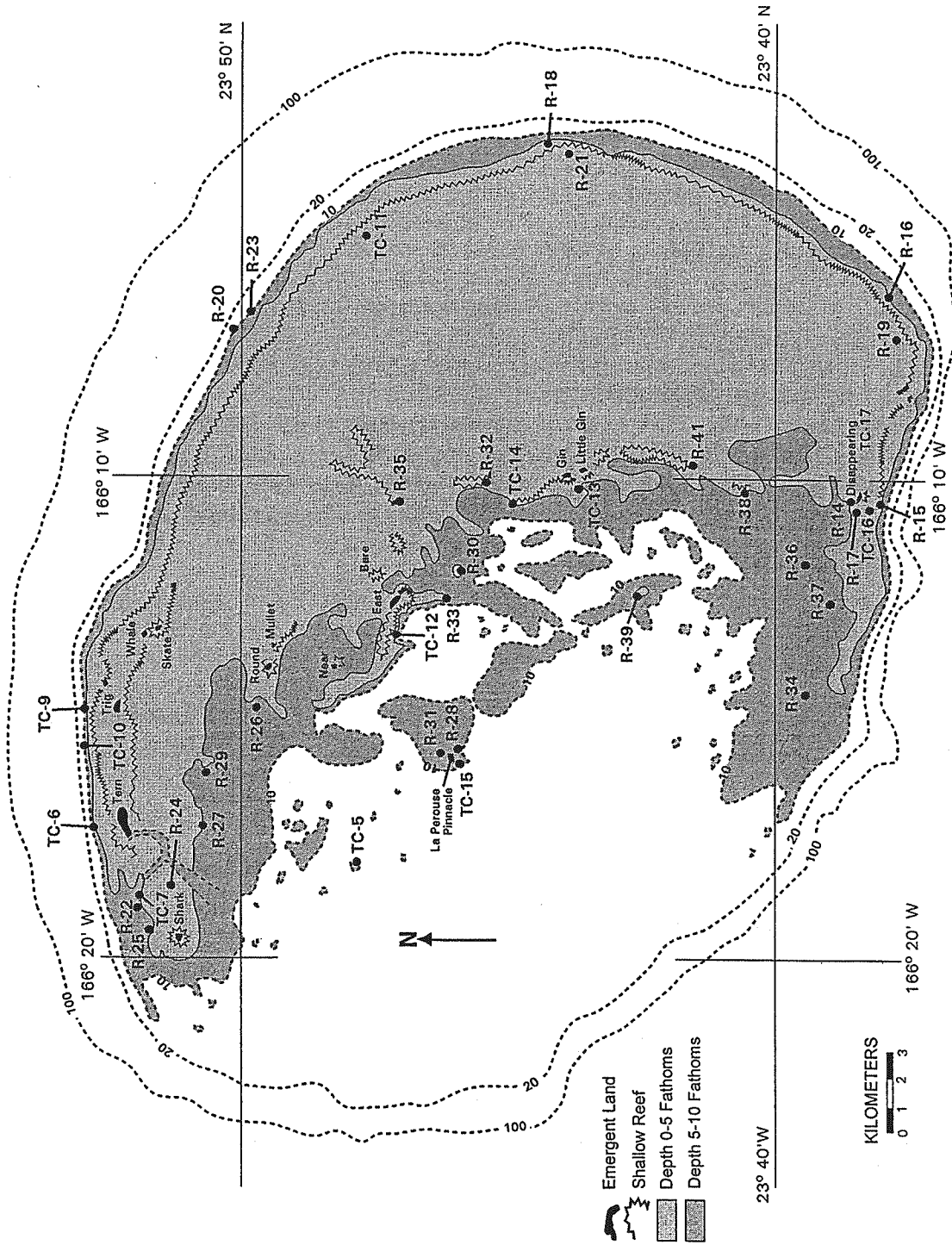


Figure 1. French Frigate Shoals showing NOW-RAMP 2000 stations (R = Rapture, TC = Townsend Cromwell).

Spur and groove habitat with moderate current and surge. Top of spurs at 5 m depth were scoured carbonate pavement with encrusting *Porites*. Some areas of dead coral matrix on spur top and slopes. Most common macroinvertebrate was the boring urchin *Echinostrephus aciculatus*. Grooves at 10 - 12 m with carbonate sediments and rubble deposits shifting with surge.

FFS-TC-07

23° 52.0 N, 166° 18.28 W

11 Sep 2000

N foreereef, 2 km W of Tern Island, depth 5 - 10 m

Spur and groove habitat with very little current or surge. Spurs about 5 m high and 5 m wide with encrusting *Porites lobata* dominating upper exposed surfaces. Undercut spur base showed evidence of occasional scour from intermittent surge. Groove floors at 10 m depth were about 5 m wide. Groove channels with abundant carbonate sediments and coral rubble. Unlike the previous station, *Echinostrephus* were relatively rare.

FFS-TC-08

23° 52.494 N, 166° 15.032 W

12 Sep 2000

N foreereef, N of Trig Island, depth 10 - 17 m

Spur and groove habitat with weak current and low surge at the time of the dive. Spurs more massive than FFS-TC-02 and with moderate coral cover, mainly encrusting *Porites lobata*. Spur slopes steep and groove floors with shifting carbonate sediments and rubble. Boring urchins, especially *Echinostrephus aciculatus*, were numerous on the upper exposed surface of the spurs.

FFS-TC-09

23° 52.9 N, 166° 15.1 W

12 Sep 2000

N foreereef, N of Tern Island, depth 10 - 15 m

Spur and groove habitat with some surge. Spurs of moderate height (4 m) and width (4 m), with low coral cover (encrusting *Porites lobata*) and considerable bare consolidated reef surfaces, evidence of frequent scour. *Echinostrephus aciculatus* was abundant and patches of *Palythoa caesia* (zoanthid) were common.

FFS-TC-10

23° 52.9 N, 166° 15.8

12 Sep 2000

N foreereef, W of Tern Island, near Shark Island, depth 3 - 10 m

Similar spur and groove habitat as FFS-TC-7, but consolidated reef with relatively lower relief and more discontinuous, separated by shallow sand/rubble grooves and patches. Surge was low at the time of dive, but unconsolidated sediments harbored few macroinvertebrates which suggests this area is frequently disturbed by ocean swell. Encrusting *Porites lobata* was the most abundant coral.

FFS-TC-11

23° 47.7 N, 166° 04.97 W

13 Sep 2000

E perimeter backreef, 14 km due E of East Island, depth 4 - 6 m

Shallow backreef habitat with heavy surge at the time of the dive. Reef is level but rugose pavement with pockets of semi-consolidated rubble and sand deposits. Small *Pocillopora meandrina* heads were common. Large echinoderms were abundant, especially *Echinometra mathaei*.

FFS-TC-12

23° 47.326 N, 166° 13.198 W

13 Sep 2000

Central lagoon patch reef, 1 km W of East Island, depth 5 - 15 m

Patch reef with base at 15 m, surrounded by coarse sand flats with some rubble fields and isolated deposits. *Porites lobata* was the most abundant coral on some of the upward-facing surfaces. Reef sides heavily eroded by an unusually dense population of *Arca ventricosa* with some *Chama iostoma*, forming a virtual "bivalve reef"

FFS-TC-13

23° 43.957 N, 166° 10.375 W

14 Sep 2000

Central lagoon patch reef, 0.5 km W of Gin Islands, depth 3 - 10 m

Isolated patch reef with base at about 10 m depth surrounded by flats of shifting coarse sediment with some rubble deposits. Patch reef heavily eroded with abundant turf algae and blue-greens. Top of reef with encrusting *Porites compressa*.

FFS-TC-14

23° 44.691 N, 166° 10.363 W

14 Sep 2000

Central lagoon reef, 1 km NW of Gin Islands, depth 0 - 6 m

Emergent linear reef subjected to breaking waves and surge from swells from the NW, top of which was domed with a coralline algae veneer. Upper surfaces of the patch reef slope with encrusting *Porites lobata*. Reef sides and base heavily eroded by dense populations of *Arca ventricosa*. Reef surrounded by sand/rubble fields and other small eroded reef mounds.

FFS-TC-15

23° 46.107 N, 166° 15.689 W

14 Sep 2000

Central lagoon, W side of La Perouse Pinnacle, depth 3 - 7 m

Caved-pocked vertical slope of basalt pinnacle with adjacent coral mounds and sand/rubble channels and patches. Coral mounds dominated by *Porites lobata* and *Porites* sp. Some large table coral (*Acropora* sp.) were present.

FFS-TC-16

23° 38.265 N, 166° 10.768 W

15 Sep 2000

S perimeter forereef, 1 km S of Disappearing Island, depth 12 - 18 m

Sloping forereef terrace with moderate relief of mounds, short ledges, shallow grooves and holes with some sand and rubble deposits. Dominant corals were *Porites lobata* and *Pocillopora* spp.

FFS-TC-17

23° 38.894' N, 166° 09.311' W

15 Sep 2000

S perimeter backreef, 2 km E of Disappearing Island, depth 3 - 7 m

Shallow backreef site with heavy surge at the time of the dive. Scoured pavement with shallow depressions with overlaying coarse sand and some rubble. Some *Pocillopora* spp. colonies were present.

FFS-R-14

23° 38.984' N, 166° 10.592 W

23 Sep 2000

S perimeter backreef, 1 km NW of Disappearing Island, depth 11 - 13 m

Eroded, level consolidated backreef flat with evenly distributed shallow depressions filled with coarse sand and loose rubble transected by shallow sand channels running perpendicular to outer reef crest. Encrusting *Porites lobata* and small *Pocillopora* and *Acropora* heads present.

FFS-R-15

23° 38.530' N, 166° 10.427' W

23 Sep 2000

S perimeter forereef, 0.5 km S of Disappearing Island, depth 2 - 7 m

Shallow forereef flat with substrate predominantly unconsolidated and poorly sorted reef rubble deposits mixed with carbonate sediments. Small patches and mounds of uneven consolidated substrate harbored the sparse coral at this site, predominantly *Pocillopora meandrina*. A strong current from east and surge from the south were present at the time of dive and suspended sediments were present in the water column. Many larger corals were broken or overturned suggesting recent or chronic disturbance from large waves striking the reef from the south.

FFS-R-16

23° 38.109' N, 166° 05.998' W

24 Sep 2000

SE perimeter forereef, 8 km E of Disappearing Island, depth 10 - 15 m

Forereef terrace of rutted consolidated carbonate pavement with overlaying thin veneer of coarse sand and loose coral rubble. Exposed to ocean swell from the south, this site showed evidence of chronic disturbance and scour by unconsolidated sediments. Coral cover was low and rock boring urchins were very abundant.

FFS-R-17

23° 38.738' N, 166° 10.468' W

23 Sep 2000

S perimeter backreef, 0.5 km W of Disappearing Island, depth 2 - 7 m

Shallow reef passage and backreef pool with large heads of *Porites lobata* surrounded by deep rippled sand bottom. Site appeared to be protected from impact of chronic ocean swell and recent storms. Coral cover was high on reef mounds and two rare table corals, *Acropora valida* and *A. cytherea* were present.

FFS-R-18

23° 43.744' N, 166° 03.268' W

24 Sep 2000

E perimeter forereef, 12 km E of Gin Islands, depth 5 - 10 m

Shallow gently seaward-sloping forereef terrace, just N of a shallow reef pass. Pavement with coralline algae and thin sand veneer surface pocked with holes and depressions with undercut ledges forming complex microhabitat structure for macroinvertebrates. Reef holes with coarse sand floors. Encrusting *Porites lobata* and *Pocillopora* spp. were the most abundant corals.

FFS-R-19

23° 37.963' N, 166° 07.465' W

24 Sep 2000

SE perimeter backreef, 5 km E of Disappearing Island, depth 6 - 9 m

Shallow backreef flat near a shallow reef pass with strong seaward-flowing current. Level consolidated bottom was jagged and pocked with evenly distributed shallow depressions with coarse sand and loose rubble. A few isolated *Porites lobata* heads and *Acropora* tables were present, but

overall coral cover was low. Macro-coralline and fleshy algae were abundant. A large floating dislodged FAD buoy held in place by a section of heavy chain was present at this site.

FFS-R-20

23° 50.036' N, 166° 06.948' W

24 Sep 2000

E perimeter forereef, 12 km NE of East Island, depth 15 - 20 m

Gently sloping forereef consolidated carbonate terrace with short blind channels (3 - 4 m deep) and holes with sand and rubble floors. Reef surface with sand and turf veneer with some encrusting *Porites lobata* and scattered *Pocillopora* spp. heads present.

FFS-R-21

23° 42.937' N, 166° 03.452' W

24 Sep 2000

E perimeter forereef, 12 km E of Gin Islands, depth 7 - 10 m

Gently sloping rutted consolidated forereef bench with holes and crevices with rubble and sand deposits. Small crevices and holes served as refugia for corals and macroalgae. The tops of mounds and rises also seemed to concentrate corals. Small young stubs buds of table coral (*Acropora cytherea*) were observed, evidence of recovery from a previous episode of storm or wave damage. Scattered *Pocillopora* spp. were common, but overall coral cover was below 10%.

FFS-R-22

23°52.121' N, 166° 18.412' W

25 Sep 2000

N perimeter forereef, 2 km W of Tern Island, depth 10 - 15 m

Gently sloping rutted consolidated forereef bench with holes and crevices with rubble and sand deposits. Similar features as FFS-R-21. Encrusting *Porites lobata* was most abundant coral.

FFS-R-23

23° 49.845' N, 166° 06.740' W

24 Sep 2000

E perimeter forereef, 5 km E of Whale-Skate Islands, depth 11 - 18 m

Gently sloping forereef bench above steeper forereef slope. Irregular consolidated substrate with holes, short channels, overhangs, small caves, and ledges. Channels with sand-rubble floors and undercut sides. More vertical relief than Station 21, but similar benthic community. Surface of hard substrate with turf and sand veneer, few macroalgae. Rock boring urchins were very abundant.

FFS-R-24

23° 51.680' N, 166° 17.979' W

25 Sep 2000

N perimeter backreef, 1.5 km SW of Tern Island, depth 8 - 12 m

Shallow backreef flat adjacent to a shallow reef pass. Reef surface with a thin sand veneer. Habitat moderately complex with potholes and channels with short overhangs. Coarse sand and rubble deposits in holes and channels. Encrusting *Porites lobata* common.

FFS-R-25

23° 51.614' N, 166° 19.523' W

25 Sep 2000

NW perimeter forereef, 1 km N of Shark Island, depth 6 - 12 m

Forereef slope with massive spurs (5 m high and wide) and wide channels (5 m wide) with shifting sandy floors. Spur upper surfaces with extensive *Porites lobata* crust. Spur sides steep with deeply

undercut ledges. Surge from NW swells were breaking off the west end of the reef, and there was evidence of severe scour on the bottom.

FFS-R-26

23° 49.292' N, 166° 14.924' W

25 Sep 2000

N lagoon pinnacle, 6 km S of Trig Island, depth 3 - 8 m

Lagoon pinnacle reef surrounded by sand and rubble flat. Pinnacle reef sides steep with an undercut base forming a short overhanging ledge and some small shallow caves. Reef sides dominated by two large bivalves, *Arca ventricosa* and *Spondylus* spp., forming a virtual bivalve reef.

FFS-R-27

23° 50.907' N, 166° 17.215' W

25 Sep 2000

N central lagoon pinnacle, 2 km S of Tern Island, depth 2 - 9 m

Lagoon pinnacle reef complex with mosaic of peaks, mounds, flat surfaces, shallow caves, and overhangs exhibiting high habitat complexity and vertical relief. Top of pinnacle exposed to ocean swell and dominated by coralline algae. Steeply sloping middle-depth regions of pinnacle dominated by *Porites lobata* and *Pocillopora meandrina*. Base of pinnacles undercut and scoured. Shifting sand patches and channels within and surrounding reef complex.

FFS-R-28

23° 46.057' N, 166° 15.882' W

26 Sep 2000

W central lagoon, S side of La Perouse Pinnacle, depth 15 - 20 m

Reef terrace adjacent to basalt pinnacle with deep sand channels and rounded buttresses or spurs with steep sides and undercut bases forming short overhanging ledges. Mounds of *Porites lobata* and *Acropora* spp. tables were the dominant corals.

FFS-R-29

23° 50.214' N, 166° 15.961' W

25 Sep 2000

N central lagoon pinnacle, 4 km SE of Tern Island, depth 4 - 10 m

Lagoon pinnacle with uneven consolidated substrate forming mounds with many holes, crevices, shallow overhangs, and short channels. Top of pinnacle dominated by hearty corals and coralline algae, at mid-depth pinnacle dominated by *Porites lobata* sheets and heads, and base of pinnacle dominated by *Porites compressa* fingers. Lagoon floor surrounding pinnacle is coarse sand, coral rubble and empty bivalve shells of *Arca* and *Trachycardium*. Pinnacle base undercut and *Arca ventricosa* very abundant on vertical and shaded surfaces.

FFS-R-30

23° 46.380' N, 166° 11.938' W

26 Sep 2000

Central lagoon pinnacle, 2 km SE of East Island, depth 4 - 12 m

Lagoon pinnacle with shallow top influenced by ocean swell and dominated by coralline algae. *Porites lobata* is most abundant coral on pinnacle sides, and *Porites compressa* abundant near base. Like previously surveyed lagoon pinnacles at FFS, the lower portions and undercut base of the pinnacle was dominated by very dense populations of the bivalves *Arca ventricosa* and *Spondylus* spp. The pinnacle is surrounded by an expanse of poorly sorted sand and coral rubble.

FFS-R-31

23° 46.280' N, 166° 15.737' W

26 Sep 2000

W central lagoon, N side of La Perouse Pinnacle, depth 10 - 15 m

Reef terrace adjacent to basalt pinnacle sloping from 10 to 15 m where and expansive sand flat extended indefinitely to the west. Coral abundance and diversity were spectacular on the reef slope with dozens of large table corals (*Acropora* spp.), and massive heads and sheets of lobe and finger coral (*Porites* spp.) and branching *Pocillopora* spp. corals. Live coral cover averaged 80% on the reef. Deep sand channels cut the reef parallel to reef-sand interface. *Arca ventricosa* was common on vertical and shaded reef surfaces along deep sand channels.

FFS-R-32

23° 45.844' N, 166° 10.143' W

26 Sep 2000

Central lagoon reef, 5 km SE of East Islands, depth 5 - 8 m

Isolated linear reef with high habitat complexity surrounded by extensive deep sand-rubble-shell flats. Again the vertical surfaces of reef sides and the undercut base with a very dense populations of *Arca vetricosa* and *Spondylus* spp.

FFS-R-33

23° 46.519' N, 166° 12.343' W

26 Sep 2000

Central lagoon patch reef, 2 km S of East Island, depth 2 - 10 m

Lagoon patch reef with domed top of coralline algal pavement subjected to breaking waves and surge from swells traversing the lagoon from the NW. The upper slopes of the patch reef to depths of 5m were vertical dominated by *Porites lobata* with numerous overhangs and caves. The base of patch reef was undercut and again dominated by a dense population of large bivalves *Arca* and *Spondylus*. The reef was surrounded by an extensive sand-rubble-shell field. *Halimeda* was very abundant around the base of reef and extending out onto the rubble flat.

FFS-R-34

23° 39.654' N, 166° 15.066' W

27 Sep 2000

SW end of perimeter reef, SW lagoon, 12 km S of La Perouse Pinnacle, depth 14 - 16 m

Isolated low-profile lagoon reef transected by sand channels, skirted by *Porites compressa* rubble, and surrounded by extensive sand flats. Patches of *Porites compressa* and *Acropora* spp. tables made up most of the structure of this reef.

FFS-R-35

23° 47.322' N, 166° 10.886' W

26 Sep 2000

E central lagoon patch reef, 3 km E of East Island, depth 1 - 7 m

Lagoon linear reef, with contorted pinnacles and projections of eroded consolidated substrate. Near surface coralline algae abundant. Reef surfaces uneven, pocked with holes and channels from rock boring urchins, but live urchins apparently no longer abundant. Coral cover low, mainly *Porites lobata* and some *Pocillopora damicornis*, reef surface mostly covered with brown encrusting algae *Lobophora*. *Halimeda* abundant on some shaded surfaces and in sandy patches. Base of reef with vertical or undercut surfaces dominated by *Arca ventricosa*. Reef surrounded by expansive coral rubble flat with numerous empty bivalve shells, mainly *Arca* and *Trachycardium*. Water clarity was reduced from suspension of fine particulate carbonates.

FFS-R-36

23° 39.554' N, 166° 12.481' W

27 Sep 2000

S lagoon reef, 4 km WNW of Disappearing Island, depth 10 - 13 m

Same habitat as R-34. Isolated low-profile lagoon reef transected by sand channels, skirted by *Porites compressa* rubble, and surrounded by extensive sand flats. Patches of *Porites compressa* and *Acropora* spp. tables made up most of the structure of this reef.

FFS-R-37

23° 39.166' N, 166° 13.225' W

27 Sep 2000

SW end of perimeter reef, SW lagoon, 6 km W of Disappearing Island, depth 10 - 14 m

Similar to R-34 & R-36. Lagoon reef in a series of low coral mounds and platforms, raised about 1 - 2 m above the surrounding broad expanses of rippled sand deposits. Visibility was exceptional (50+ m) at the time of the dive despite periodic swells traversing the site, stirring up sand on the bottom and bathing the coral formations in billowing clouds of suspended coarse sediments which would settle out for several minutes before the next set of large swells would approach from the NW. Coral coverage was high (~75%), dominated by *Porites* spp., *Pocillopora meandrina*, and some table *Acropora* sp., with little noticeable evidence of sediment stress.

FFS-R-38

23° 40.472' N, 166° 09.959' W

27 Sep 2000

S central lagoon reef, 6 km S of Gin Islands, depth 3 - 7 m

Lagoon linear reef with high microhabitat complexity. Top of reef near surface and dominated by coralline algae veneer. West side of reef sloping steeply with some vertical surfaces, overhangs, and small caves. Base of reef undercut with vertical surfaces dominated again by bivalves *Arca* and *Spondylus*. Reef surrounded by expanse of poorly sorted sand-rubble-shell deposits. Dominant coral was *Porites lobata*.

FFS-R-39

23° 42.556' N, 166° 12.148' W

27 Sep 2000

S central lagoon patch reef, 8 km S of East Island, depth 2 - 20 m

Large isolated patch reef in the central south lagoon where the lagoon floor averages 10 or more fathoms in depth. Large NW swells would break on its crest, which was dominated by pavement-like crustose coralline algae. At the time of the dive, water visibility was poor (3-4 m) and a strong 2 knot current was setting from the east. The sides of the reef were steep and dominated by *Porites lobata*. The base of reef, with nearly vertical sides, was dominated by dense populations of *Arca* and *Spondylus*. *Porites compressa* and *Halimeda* were also abundant. The lagoon bottom was an expanse of sand and rubble deposits surrounding the reef in all directions.

FFS-R-41

23° 41.481' N, 166° 09.575' W

27 Sep 2000

SE lagoon linear reef, 4 km S of Gin Islands, depth 1 - 7 m

Linear segment of a long reticular reef unit stretching along a north-south access in the SE lagoon with waves breaking on the crest and strong currents passing around both ends of the reef at the time of the dive. Visibility was low. The crest of the reef was dominated by coralline algae and the steep sides by dead and living *Porites lobata*. The floor of the lagoon around the reef was dominated by semi-consolidated accumulations of rubble and sand mixtures.

V. RESULTS

A total of 622 marine invertebrate taxa were observed or collected and identified from 40 stations at FFS, about 75% to specific level (Appendix B-D). Of the 622 taxa identified, 502 are considered new records for FFS and perhaps 10 to 20% of these may be new records for the Hawaiian Archipelago (Appendix D). Of these new records, 25 to 50 species may be undescribed and known so far only from FFS (Table 1; Appendix D). Two nonindigenous species, a hydroid and a barnacle, were discovered at FFS. The hydroid *Pennaria disticha*, was discovered on the Tern Island seawall and another lagoon station, and the barnacle, *Balanus reticulatus*, was found only on the Tern Island seawall.

Molluscs and crustaceans were the most speciose major taxonomic groups of the fauna so far identified, and both groups contributed the majority of the new reports for FFS (Table 1). Peracarid crustaceans accounted for most of the new reports for the Hawaiian Archipelago, and the highest number of species believed to undescribed that are so far only known from FFS.

Table 1. Major marine invertebrate groups collected and identified at FFS during the NOW-RAMP 200 survey, showing number of taxa identified for each group, percentage of taxa identified to species, number of new taxa reports for FFS, number of new taxa reports to the Hawaiian Islands, and number of undescribed species in each group that are known only from FFS.

Major Groups	# of taxa ID	% ID to species	# of new FFS recs	# of new HI recs ¹	# of new species ²
Porifera	23	20%	23	7	5
Cnidarians	56	75%	48	9	0
Scleractinia	40	90%	15	3	0
Polychaetes	47	5%	~45	~6	0 ³
Molluscs	250	65%	168	3	2
Gastropods	191	68%	129	2	1
Bivalves	49	53%	37	1	1
Arthropods	137	83%	117	~35	8
Peracarids	76	80%	74	~22	5
Decapods	56	80%	40	~10	3
Bryozoans	39	44%	39	~14	0 ³
Echinoderms	47	77%	31	2	0
Ascidians	23	4%	23	0	0 ³

¹ Numbers are preliminary estimates, as many taxa remain to be identified to species level.

² Species previously undescribed and known so far only from FFS. (Note: A number of undescribed species known from throughout the Hawaiian Islands were collected from FFS and are not included in this count.)

³ Most identifications in these groups are very preliminary. Further examination of specimens are needed to determine whether new species are present in the FFS collections.

VI. DISCUSSION

Not surprisingly, given the limited research on marine invertebrates conducted in the NWHI, there were a large number of new reports of species for FFS as a result of the NOW-RAMP 2000 surveys. Also expectedly, given the state of the taxonomy of many invertebrate groups, such as sponges, polychaetes, small crustaceans, bryozoans, and ascidians, a sizeable proportion of the specimens collected could not be identified to species level and many undescribed species were discovered. Further study of the material from FFS will undoubtedly uncover additional new species.

Only 25 of perhaps over 100 taxa that initially appear to be new records for the Hawaiian Archipelago could be reliably identified to species. It is difficult to draw conclusions about whether these 25 species may or may not be nonindigenous because of the limited amount of survey work previously conducted at FFS. In an area where thorough previous surveys had been conducted, a suddenly appearing species would typically be considered nonindigenous or at least cryptogenic (of unknown origin), especially if the newly discovered population was widely separated or disjunct from its known distribution. None of new records of FFS that are also new records for the Hawaiian Archipelago are considered remarkable or unusual extensions of the species distribution.

A number of the species are wide-spread Indo-Pacific species and some known from neighboring Johnston Atoll. FFS is known to have a slightly different reef community, most obvious is the presence of seven species of the coral *Acropora*, which is known from the main islands only from a few specimens found at Kauai. FFS is considered to be the center of distribution of *Acropora* in the Archipelago (Grigg 1981), and it is most likely the source of distribution of many other species largely unknown in the rest of the island chain. The Subtropical Countercurrent, which crosses the Archipelago at FFS, is thought to be a source of planktonic larvae from the southeast, accounting for the unusual fauna of the atoll (Grigg 1981). FFS shares a number of coral species with Johnston Island which sits in the path of the northeasterly flowing current. The Johnston-FFS connection may also be the dispersal pathway for other reef species.

VI.a. Major Taxonomic Groups

A large volume of material collected from the NWHI remains to be examined, and therefore no conclusions can be drawn yet regarding the distribution of these species throughout the NWHI. A number of specimens of some taxonomic groups collected from FFS remain to be examined thoroughly by specialists, most notably the polychaetes, which will certainly add a number of additional species to the final species tally. Further study will also be required of the 150 taxa which could not be identified to species level at the time of this writing.

Molluscs

The last intensive study of the marine molluscs of the Northwest Hawaiian Islands was conducted by *Tanager* Expedition malacologist Ditlev Thaanum in 1923. During this expedition, scientists surveyed most of the remote northwest islands, including French Frigate Shoals in June 1923. Specimens, accounting for approximately 100 species, were beach collected and eventually deposited in Bernice P. Bishop Museum. Kay (1971), later examining sediment samples from that expedition, added about 40 additional species to the known fauna of French Frigate Shoals, and, combined with a few other sporadic additions, the total fauna was brought to approximately 160 species.

A total of 233 species were collected on the NOW-RAMP expedition, covering four classes of mollusks (Gastropoda, Bivalvia, Cephalopoda, and Polyplacophora) and 66 families, including 186 (80% of total fauna) gastropods species, 49 (19%) bivalves, 1 (0.5%) polyplacophoran, and 1 (0.5%)

cephalopod. These faunal proportions are not unusual for the Hawaiian Islands, and are close to those described by Kay (1979) for the main islands and for Johnston Atolls (Coles et al. 2000), the nearest non-Hawaiian oceanic atoll to French Frigate Shoals. Sixty percent of the species observed were micromolluscs, or shells whose maximum dimension does not exceed 7mm. Of the 233 species at French Frigate Shoals, 168 were either new records for French Frigate Shoals (168 records) or for the Hawaiian Islands (3 records: *Pelycidion* sp., *Turbo articulatus*, and *Dacrydium* sp. (cf *zebra*)). The majority of new records are micro-molluscs (65%). With these new records, the total molluscan fauna of French Frigate Shoals is now 332 species.

The molluscan fauna is distinctly Hawaiian, and bears many similarities to that of the main islands. Kay (1979) noted several differences in the fauna of the Northwestern Islands compared to the main islands, some of which are also evident in this recent survey. *Latirus nodatus*, for example, was relatively common on the reef flats at French Frigate Shoals while it occurs in deeper water in the main islands. However, not all patterns noted by Kay are supported: *Euchelus corrugatus* was not found at French Frigate Shoals during this expedition, but specimens are in the *Tanager* material. The fauna also has strong affinity with that of Johnston Atoll (Coles et al. 2000). *Turbo articulatus*, a new record to Hawaii was common at Johnston Atoll and may represent a faunal link between these atolls.

Corals

Coral diversity and abundance may be relatively greater at FFS than other NWHI because of greater complexity and quantity of habitats. In addition, increased sampling intensity contributed to the higher reported species diversity at the atoll. However, wave action, large ocean swells, and periodic storms control coral and reef development, as evidenced from surveys especially along the eastern ocean reefs. Windward ocean fore reefs and reef terraces were composed of broken coral and rubble deposits, except for a few isolated patches of lobe and table corals. The best coral development occurred near the lagoon ends of the reef where exposure to waves and storms is reduced and where the influx of clean ocean water promotes habitat diversity and better water quality. Poorer reef habitats were concentrated in the shallow eastern lagoon dominated by shallow sediment deposits, strong currents, high turbidity, and poorer water quality.

FFS may be serving as the key "stepping stone" for the recruitment of table corals (*Acropora* spp.) to the Hawaiian Islands. The atoll the closest to nearby Johnston Atoll, where the same table coral species are very abundant. Moreover, four other contiguous islands to FFS also support *Acropora*, based on NOW-RAMP surveys, but in lesser abundance (Necker Island, Gardner Pinnacles, Maro Reef, and Laysan Island). FFS may be the key distribution point for table coral in Hawaii, both up the chain to the NW and down the chain to the SE, as far as Kauai where populations of the table coral, *Acropora cytherea*, have been recently reported.

Sponges

Previous to this survey, no sponges were reported from FFS. Preliminary work on the specimens collected from FFS show several typical reef species that are found throughout the main Hawaiian Islands. Despite being common in many areas, only a small number have been formally described. Five species of *Callyspongia* sp. were also discovered at FFS, and so far are known only from there. Further examination of the numerous specimens collected throughout the NWHI, may extend the known distribution of these undescribed species.

Polychaetes

Polychaetes remain to be examined thoroughly by a specialist. Polychaetes from only one station are completed at this time, and the majority are new reports for FFS. There will undoubtedly be a

number of new records for the Hawaiian Islands and many undescribed species found from the samples taken, as there are over 100 undescribed species already known from throughout the Hawaiian Islands (J. Brock, pers. comm.).

Crustaceans

The surveys of FFS, resulted in over 100 new reports of crustaceans from FFS. The majority of these new reports were peracarids (amphipods and isopods), which had not extensively collected from FFS before. There were about 20 peracarids collected that are considered new reports for the Hawaiian Archipelago, most of which appear to be undescribed species.

Large decapods, such as crabs and shrimp, were undersampled during the survey. No traps or dredges were used; sampling methods which accounted for many of the historical records of crustaceans in the NWHI. A number of smaller decapods were collected in the hand samples taken, including a new species of shrimp (*Oncycocaris* sp.) and two new species of crabs (*Liomera* sp. and *Platypodia* sp.).

Bryozoans

No previous reports of bryozoans existed for FFS. Of the 39 taxa identified, perhaps 5 are new records for Hawaii. Given the state of bryozoan taxonomy in the Pacific and the difficulty of confidently identifying species from existing literature, many of the identifications made are preliminary.

Echinoderms

Echinoderms are probably the most abundant conspicuous invertebrates on the reef at FFS, besides coral. The rock-boring urchins, *Echinometra* spp. and *Echinostrephus aciculatus*, were the dominant macro-invertebrates at many stations. Most of the echinoderms collected or observed are typical of the reefs throughout the Hawaiian Islands. Although more than half of echinoderms collected in 2000 were new records for FFS, so far none appear to be new records for the Archipelago.

Ascidians

The majority of the ascidians collected at FFS were small colonial species in the families Didemnidae and Polyclinidae, which are poorly described in the literature and notoriously difficult to identify, even to genus. Further identification of the specimens collected at FFS and throughout the NWHI will require a great deal of effort by a specialist.

VI.a. Human Impact

The coral reefs and associated shallow-water habitats and invertebrate communities appear to be in excellent health, with little human impact aside from the dredged areas around Tern Island and pieces of drift nets which sporadically become entangled in the reef. There was no evidence of chronic stress. In stark contrast to some harbors, embayments, and shallow reef flats in the main Hawaiian Islands, nonindigenous species seem to be largely absent from FFS. The nonindigenous hydroid *Pennaria disticha*, which is very abundant in the main islands, was discovered on the Tern Island seawall and at one lagoon station. The common alien barnacle, *Balanus reticulatus*, was found only on the metal seawall at Tern Island. The two nonindigenous species were not unusually abundant at FFS and did not appear to be adversely affecting the reef ecosystem. Both species are common fouling organisms and were likely transported to the atoll as fouling on ships' hulls. The presence of these nonindigenous species, however benign they may be, does show that transport and establishment of alien species is possible at FFS, and vigilance against further accidental transport of perhaps more deleterious marine invertebrate species to the isolated atoll should be maintained.

VII. ACKNOWLEDGEMENTS

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Appendix A

NOW-RAMP 2000 French Frigate Shoals station location, date, and depth range.

Station	Latitude	Longitude	Date	Depth (m)
FFS-TC-06	23° 52.5 N	166° 17.68 W	11 Sep 2000	5 - 12
FFS-TC-07	23° 52.0 N	166° 18.28 W	11 Sep 2000	5 - 10
FFS-TC-08	23° 52.494 N	166° 15.03 W	12 Sep 2000	10 - 17
FFS-TC-09	23° 52.9 N	166° 15.10 W	12 Sep 2000	10 - 15
FFS-TC-10	23° 52.9 N	166° 15.80 W	12 Sep 2000	3 - 10
FFS-TC-11	23° 47.7 N	166° 04.97 W	13 Sep 2000	4 - 6
FFS-TC-12	23° 47.326 N	166° 13.198 W	13 Sep 2000	5 - 15
FFS-TC-13	23° 43.957 N	166° 10.375 W	14 Sep 2000	3 - 10
FFS-TC-14	23° 44.691 N	166° 10.363 W	14 Sep 2000	0 - 6
FFS-TC-15	23° 46.107 N	166° 15.689 W	14 Sep 2000	3 - 7
FFS-TC-16	23° 38.265 N	166° 10.768 W	15 Sep 2000	12 - 18
FFS-TC-17	23° 38.894 N	166° 09.311 W	15 Sep 2000	3 - 7
FFS-R-14	23° 38.984 N	166° 10.592 W	23 Sep 2000	11 - 13
FFS-R-15	23° 38.530 N	166° 10.427 W	23 Sep 2000	2 - 7
FFS-R-16	23° 38.109 N	166° 05.998 W	24 Sep 2000	10 - 15
FFS-R-17	23° 38.738 N	166° 10.468 W	23 Sep 2000	2 - 7
FFS-R-18	23° 43.744 N	166° 03.268 W	24 Sep 2000	5 - 10
FFS-R-19	23° 37.963 N	166° 07.465 W	24 Sep 2000	6 - 9
FFS-R-20	23° 50.036 N	166° 06.948 W	24 Sep 2000	15 - 20
FFS-R-21	23° 42.937 N	166° 03.452 W	24 Sep 2000	7 - 10
FFS-R-22	23° 52.121 N	166° 18.412 W	25 Sep 2000	10 - 15
FFS-R-23	23° 49.845 N	166° 06.740 W	24 Sep 2000	11 - 18
FFS-R-24	23° 51.680 N	166° 17.979 W	25 Sep 2000	8 - 12
FFS-R-25	23° 51.614 N	166° 19.523 W	25 Sep 2000	6 - 12
FFS-R-26	23° 49.292 N	166° 14.924 W	25 Sep 2000	3 - 8
FFS-R-27	23° 50.907 N	166° 17.215 W	25 Sep 2000	2 - 9
FFS-R-28	23° 46.057 N	166° 15.882 W	26 Sep 2000	15 - 20
FFS-R-29	23° 50.214 N	166° 15.961 W	25 Sep 2000	4 - 10
FFS-R-30	23° 46.380 N	166° 11.938 W	26 Sep 2000	4 - 12
FFS-R-31	23° 46.280 N	166° 15.737 W	26 Sep 2000	10 - 15
FFS-R-32	23° 45.844 N	166° 10.143 W	26 Sep 2000	5 - 8
FFS-R-33	23° 46.519 N	166° 12.343 W	26 Sep 2000	2 - 10
FFS-R-34	23° 39.654 N	166° 15.066 W	27 Sep 2000	14 - 16
FFS-R-35	23° 47.322 N	166° 10.886 W	26 Sep 2000	1 - 7
FFS-R-36	23° 39.554 N	166° 12.481 W	27 Sep 2000	10 - 13
FFS-R-37	23° 39.166 N	166° 13.225 W	27 Sep 2000	10 - 14
FFS-R-38	23° 40.472 N	166° 09.959 W	27 Sep 2000	3 - 7
FFS-R-39	23° 42.556 N	166° 12.148 W	27 Sep 2000	2 - 20
FFS-R-41	23° 41.481 N	166° 09.575 W	27 Sep 2000	1 - 7

Appendix B

Marine invertebrates (not including micromolluscs) collected or observed at French Frigate Shoals stations during the NOW-RAMP 2000 Expedition.

TAXA FAMILY	SPECIES	Tern	R-14	R-15	R-16	R-17	R-18	R-19	R-20	R-21	R-22	R-23	R-24	R-25	R-26	R-27	R-28	R-29	R-30	R-31	R-32	R-33	R-34	R-35	R-36	R-37	R-38
FORIFERA																											
Calcarea																											
	Clathrinidae																										
	Clathrina sp. lemon																										
	Clathrina sp. white																										
	Calcarea blue																										
	Calcarea pink																										
Demospongiae																											
	Oscarella sp.?																										
	Epipolasis sp.																										
	Chondrosia chucalla																										
	Spirastrella keaukaha																										
	Prosuberites oleiteira																										
	Tethya sp. orange																										
	Clathrina sp. blood-red																										
	Hymedesmia sp.1																										
	Batzella sp. red																										
	Stylinos sp.																										
	Mycale sp.																										
	Halichondriidae																										
	Axinyssa sp.																										
	Callyspongia sp.1																										
	Callyspongia sp.2																										
	Callyspongia sp.3																										
	Callyspongia sp.4																										
	Callyspongia sp.5																										
	Cacospongia sp.																										
	Spongia sp.																										
	Spongia oceanica																										
	Dysidea herbaacea																										
CNIDARIA																											
Hydrozoa																											
	Halocordylidae																										
	Penneria disticha																										
	unid. hydroid																										
	unid. hydroid																										
	unid. hydroid																										
	unid. hydroid																										
Gorgonacea																											
	Acabaria bicolor																										
Alcyonacea																											
	Melithaeidae																										
	Alcyoniidae																										
Actiniaria																											
	Calliactis polyopus																										
	Sagartidae																										
	Anthothoe sp.																										
	Heteractis malu																										
Scleractinia																											
	Acroporidae																										
	Acropora cerealis																										
	Acropora cytherea																										
	Acropora gemmifera																										
	Acropora humilis																										
	Acropora masuta																										
	Acropora paniculata																										
	Acropora valida																										
	Montipora capitata																										
	Montipora flabellata																										
	Montipora patula																										
	Montipora stuederi																										
	Montipora tuberculosa																										
	Montipora verrilli																										
	Leptoseris incrustans																										
	Leptoseris scabra																										
	Pavona duerdeni																										
	Pavona maldivensis																										
	Pavona varians																										
	Balanophyllia sp. (pink)																										
Balanophyllidae																											

TAXA	FAMILY	SPECIES	Term	R-14	R-15	R-16	R-17	R-18	R-19	R-20	R-21	R-22	R-23	R-24	R-25	R-26	R-27	R-28	R-29	R-30	R-31	R-32	R-33	R-34	R-35	R-36	R-37	R-38		
Balanophyllidae	Balanophyllia sp. (yellow)																													
Dendrophylliidae	Tubastraea coccinea	X	X																											
Faviidae	Cyphastrea ocellina	X	X																											
Faviidae	Leptastrea bevicikensis	X	X																											
Faviidae	Leptastrea purpurea	X	X																											
Faviidae	Leptastrea sp.	X	X																											
Fungiidae	Fungia scularia	X	X																											
Pocilloporidae	Pocillopora capitata	X	X																											
Pocilloporidae	Pocillopora damicornis	X	X																											
Pocilloporidae	Pocillopora eydouxi	X	X																											
Pocilloporidae	Pocillopora ligulata	X	X																											
Pocilloporidae	Pocillopora meandrina	X	X																											
Pocilloporidae	Pocillopora molokensis	X	X																											
Poritidae	Porites brighami	X	X																											
Poritidae	Porites compressa	X	X																											
Poritidae	Porites dufrenoyi	X	X																											
Poritidae	Porites evermanni	X	X																											
Poritidae	Porites lobata	X	X																											
Poritidae	Porites niestrasi	X	X																											
Poritidae	Porites sp. cf. vaughani	X	X																											
Poritidae	Porites stellata	X	X																											
Zoanthidea																														
Parazoanthidae	Parazoanthus sp.																													
Zoanthidae	Palythoa caesia	X	X																											
Zoanthidae	Palythoa tuberculosa	X	X																											
Zoanthidae	Zoanthus pacificus	X	X																											
Zoanthidae	Zoanthus sp. B	X	X																											
Zoanthidae	Zoanthus sp. pink	X	X																											
PLATYHELMINTHES																														
Polycladida																														
Pseudocerotidae	Pseudoceros sp.																													
NEMERTEA																														
Anopla																														
ANNELIDA																														
Polychaeta																														
Chaetopteridae	Chaetopterus sp.	X	X																											
Terebellidae	Loimia medusa	X	X																											
SIPUNCULA																														
Phascosomatidea																														
Aspidosiphonidae	Aspidosiphon elegans	X	X																											
Phascosomatidae	Phascosoma stephensoni	X	X																											
MOLLUSCA																														
Gastropoda																														
Patellidae	Cellana exarata	X	X																											
Trochidae	Trochus inextus	X	X																											
Turbinidae	Turbo sandwicensis	X	X																											
Cerithiidae	Cerithium columna	X	X																											
Cerithiidae	Cerithium nesoticum	X	X																											
Cerithiidae	Cerithium placidum	X	X																											
Cerithiidae	Cerithium sp.	X	X																											
Cerithiidae	Rhinoclavis sinensis	X	X																											
Hipponicidae	Hipponix australis	X	X																											
Hipponicidae	Hipponix sp. (juv)	X	X																											
Hipponicidae	Sabia conica	X	X																											
Littorinidae	Littoraria pinnata	X	X																											
Vermetidae	Dendropoma sp.	X	X																											
Vermetidae	Evuletes tulipa	X	X																											
Vermetidae	Serpulorbis sp.	X	X																											
Vermetidae	Vermetid (juv.)	X	X																											
Cypraeidae	Cypraea allisonae	X	X																											

TAXA	FAMILY	SPECIES	Term	R-14	R-15	R-16	R-17	R-18	R-19	R-20	R-21	R-22	R-23	R-24	R-25	R-26	R-27	R-28	R-29	R-30	R-31	R-32	R-33	R-34	R-35	R-36	R-37	R-38	
	Cypraeidae	<i>Cypraea helvola</i>																											
	Cypraeidae	<i>Cypraea isabella</i>																											
	Cypraeidae	<i>Cypraea maculifera</i>				X																							
	Cypraeidae	<i>Cypraea mauritiana</i>																											
	Cypraeidae	<i>Cypraea tessellata</i>																											
	Eratoideae	<i>Erato sandwicensis</i>																											
	Bursidae	<i>Bursa granularis</i>																											
	Cassidae	<i>Casmaria efnaceus kalosmodix</i>																											
	Ranelidae	<i>Charonia tritonis</i>							X																				
	Ranelidae	<i>Cymatium nicobaricum</i>																											
	Tornidae	<i>Tonna perdrif</i>																											
	Buccinidae	<i>Prodolia ignea</i>																											
	Columbellidae	<i>Mitrella usiformis</i>																											
	Corallophilidae	<i>Corallophila erosa</i>																											
	Corallophilidae	<i>Corallophila violacea</i>																											
	Fasciolaridae	<i>Latirus nodatus</i>																											
	Fasciolaridae	<i>Peristernia chlorostoma</i>																											
	Muricideae	<i>Aspella producta</i>																											
	Thaididae	<i>Drupa (Drupa) morum</i>						X																					
	Thaididae	<i>Drupa (Drupa) ficina</i>																											
	Thaididae	<i>Drupa (Drupina) grossularia</i>																											
	Thaididae	<i>Drupa (Ricinella) rubusidaeus</i>																											
	Thaididae	<i>Drupella ochrostoma</i>																											
	Thaididae	<i>Morula dumosa</i>																											
	Thaididae	<i>Morula granulata</i>																											
	Thaididae	<i>Morula uva</i>																											
	Thaididae	<i>Thaididae</i> sp.																											
	Thaididae	<i>Thais armigera</i>						X																					
	Costellariidae	<i>Vexillum (Costellaria) pacificum</i>																											
	Costellariidae	<i>Vexillum (Pusia) capricornea</i>																											
	Costellariidae	<i>Vexillum</i> sp.																											
	Mitridae	<i>Cancellata cf. carnicolor</i>																											
	Mitridae	<i>Oliva richerti</i>																											
	Olividae	<i>Oliva richerti</i>																											
	Olividae	<i>Oliva richerti</i>																											
	Conidae	<i>Conus abbreviatus</i>													X													X	
	Conidae	<i>Conus flavidus</i>																											
	Conidae	<i>Conus lividus</i>																											
	Conidae	<i>Conus raitus</i>																											
	Conidae	<i>Conus</i> sp.																											
	Conidae	<i>Conus sponsalis</i>																											
	Conidae	<i>Conus striatus</i>																											
	Conidae	<i>Conus textile</i>																											
	Conidae	<i>Conus</i> sp.																											
	Terebridae	<i>Terebra crenulata</i>																											
	Terebridae	<i>Terebra</i> sp.																											
	Turridae	<i>Etrema acricula</i>																											
	Turridae	<i>Xenuroutaris cerithiformis</i>																											
	Hamineidae	<i>Aplysia semistriata</i>																											
	Hamineidae	<i>Aplysia</i> sp.																											
	Hamineidae	<i>Diniatys dentifer</i>																											
	Hamineidae	<i>Aplysia oculifera</i>																											
	Aplysiidae	<i>Aplysia parvula</i>																				X							X
	Aplysiidae	<i>Aplysia</i> sp.																											
	Aplysiidae	<i>Doabella auricularia</i>																											
	Aplysiidae	<i>Berthelina citrina</i>																											
	Pleurobranchidae	<i>Pleurobranchus</i> sp.																											
	Sacoglossa																												
	Plakobranchidae	<i>Plakobranchus ocellatus</i>																											
	Elysidae	<i>Thuridilla hofiae</i>																				X							
	Nudibranchia																						X						
	Chromodorididae	<i>Glossodoris atromarginata</i>																											X
	Chromodorididae	<i>Risbecia imperialis</i>																											

TAXA	FAMILY	SPECIES	Term	R-14	R-15	R-16	R-17	R-18	R-19	R-20	R-21	R-22	R-23	R-24	R-25	R-26	R-27	R-28	R-29	R-30	R-31	R-32	R-33	R-34	R-35	R-36	R-37	R-38
	Phyllidiidae	Phyllidia pustulosa																										
	Dorididae	Halgerda terramtuensis																		X								
	Pteraeolididae	Pteraeolidia lantana													X												X	
	Pteraeolididae	Pteraeolidia lantana																									X	
Bivalvia	Mytilidae	Brachidontes crebristriatus																										
	Mytilidae	Lithophaga fasciola			X																							
	Mytilidae	Septifer bysanae			X																							
	Mytilidae	Septifer sp.1																										
	Arcidae	Arca sp.																										
	Arcidae	Arca ventricosa	X																									X
	Isognomonidae	Isognomon perna																										
	Isognomonidae	Isognomon sp.																										
	Malleidae	Malleidae sp.1																										
	Malleidae	Malleidae sp.2																										
	Pterididae	Pinctada margaritifera							X	X																		
	Pinnidae	Pinna muricata																										X
	Pinnidae	Streptopinna saccata																										
	Ostreidae	Ostrea sp. 1																										
	Ostreidae	Ostreidae sp.				X																						
	Pectinidae	Pectinidae sp.																										
	Spondyliidae	Spondylus nicobaricus																										
	Spondyliidae	Spondylus violaceus													X	X	X											X
	Anomidae	Anomia nobilis																										
	Chamidae	Chama fibula																										
	Chamidae	Chama lostoma																										
	Lucinidae	Epicodakia sp.																										
	Gastrochaenidae	Gastrochaena cuneiformis																										
	Veneridae	Veneridopsis reticulata																										
	Glossidae	Glossidae sp.1																										
Cephalopoda																												
	Octopodidae	Octopus cyanea	X																									
ARTHROPODA																												
Pycnogonida																												
	Ammotheidae	Achelia nana																										
	Phoxichilidae	Anoplocheilus marshallensis																										
	Rhynchothoracidae	Rhynchothorax mediterraneus																										
Thoracica																												
	Balanidae	Megabalanus lanagrae							X																			
	Balanidae	Balanus reticulatus	X																									
	Chthamplidae	Nesochthamalus intertextus	X																									
Amphipoda																												
	Ampeliscidae	Ampelisca sp.1								X																		
	Amphilocheidae	Amphilocheus menehune				X																						
	Amphilocheidae	Gilana lillokalaniae								X																		
	Amphilocheidae	Gitaropsis pele								X																		
	Amphilocheidae	Amphioche kaneche																										
	Amphilocheidae	Amphioche ramondi																										
	Amphilocheidae	Amphioche sp.1																										
	Amphilocheidae	Amphioche spp.																										
	Amphilocheidae	Amphioche waihua				X																						
	Anamixidae	Anamixis moana				X																						
	Aoridae	Aoroides columbiae																										
	Aoridae	Aoroides nahili																										
	Aoridae	Bemios intermedius									X																	
	Aoridae	Bemios macromanus																										
	Aoridae	Bemios sp.1																										
	Aoridae	Bemios sp.2																										
	Aoridae	Bemios walpid																										
	Aoridae	Globosclerobos ovatus																										
	Aoridae	Lembos virgus				X																						

TAXA	FAMILY	SPECIES	Tern	R-14	R-15	R-16	R-17	R-18	R-19	R-20	R-21	R-22	R-23	R-24	R-25	R-26	R-27	R-28	R-29	R-30	R-31	R-32	R-33	R-34	R-35	R-36	R-37	R-38	
	Colomastigidae	Colomastix lunuliflo							X		X																		
	Corophiidae	Erichthonis brasiliensis							X																				
	Dexaminidae	Paradexamine maunaloa							X		X																		
	Eusiridae	Eusirioides diploonyx		X																									
	Gammaridae	Nuuanu amikal		X																									
	Isaeidae	Chevalla aviculae									X																		
	Isaeidae	Gammaropsis abra		X					X																				
	Isaeidae	Gammaropsis atlantica		X					X																				
	Isaeidae	Gammaropsis sp.1							X																				
	Isaeidae	Gammaropsis sp.2							X																				
	Isaeidae	Gammaropsis spp.							X																				
	Isaeidae	Photis hawaiiensis							X																				
	Ischyroceridae	Leucothoe hynella							X																				
	Ischyroceridae	Leucothoe micronesiae							X																				
	Ischyroceridae	Leucothoe sp.1							X																				
	Ischyroceridae	Leucothoe sp.2							X																				
	Ischyroceridae	Leucothoe tridens							X																				
	Ischyroceridae	Leucothoides pottsi							X																				
	Ischyroceridae	Notopoma n.sp.							X																				
	Ischyroceridae	Ventojassa ventosa							X																				
	Liljeborgiidae	Liljeborgia heeia							X																				
	Lysianassidae	Lysianassa ewa							X																				
	Melittidae	Ceradocus hawaiiensis							X																				
	Melittidae	Elaemopus diploonyx							X																				
	Melittidae	Elaemopus hawaiiensis							X																				
	Melittidae	Elaemopus hooheho							X																				
	Melittidae	Elaemopus moloakai							X																				
	Melittidae	Elaemopus pocillimanus							X																				
	Melittidae	Elaemopus rapax							X																				
	Melittidae	Maera cf. octodens							X																				
	Melittidae	Maera pacifica							X																				
	Melittidae	Maera quadrimana							X																				
	Melittidae	Maera sp.1							X																				
	Melittidae	Maera sp.2							X																				
	Melittidae	Mallacoota sp.							X																				
	Ochelesidae	Ochelesis alli							X																				
	Oedicerotidae	Kanaloa manoa							X																				
	Philanidae	Perionotus alaniphilias							X																				
	Podoceridae	Podocerus brasiliensis							X																				
	Podoceridae	Podocerus hanapepe							X																				
	Stenothoidae	Stenothoe valida							X																				
Isopoda	Gnathidae	Gnathia n.sp.							X																				
	Anthuridae	Mesanthura hieroglyphica							X																				
	Anthuridae	Panathura cf. collaris							X																				
	Anthuridae	Pendantura n.sp.							X																				
	Expanathuridae	Eisophistos n.sp.							X																				
	Leptanthuridae	Leptanthura n.sp.							X																				
	Paranthuridae	Colanthura n.sp.							X																				
	Paranthuridae	Paranthura bellicauda							X																				
	Gnathostemnetroididae	Maresiella n.sp.							X																				
	Janiridae	Bagatus alpicola							X																				
	Joeropsidae	Joeropsis hawaiiensis							X																				
	Munnidae	Munna acarina							X																				
	Munnidae	Munna n.sp.							X																				
	Santidae	Santia n.sp.							X																				
Stenopodidea	Steneltridae	Steneltrum medipacifica							X																				
Stenopodidea	Stenopodidae	Stenopus hispidus							X																				
Caridea																													

TAXA	FAMILY	SPECIES	Tern	R-14	R-15	R-16	R-17	R-18	R-19	R-20	R-21	R-22	R-23	R-24	R-25	R-26	R-27	R-28	R-29	R-30	R-31	R-32	R-33	R-34	R-35	R-36	R-37	R-38	
	Bugulidae	Bugula philippense?																											
	Bugulidae	Bugula sp.																										X	
	Bugulidae	Bugula vectifera?																											
	Cleporidae	Holoporella aperta			X																							X	
	Cleporidae	Schismopora cf. spathulata																											
	Cheiloporinidae	Cheiloporina haddoni																											
	Cheiloporinidae	und. Cheilosome																											
	Chloroporidae	Rhamphostomella argentea?			X																								
	Scrupocellariidae	Caberia boryi																										X	
	Cleidothasmatidae	Cleidothasma laterale																										X	
	Scrupocellariidae	Scrupocellaria maderensis				X																							
	Hippodomiidae	Cocciopsis fusca																											
	Margarettidae	Margaretta gracilior?																											
	Microporidae	Microrella orientalis																											
	Schizoporellidae	Schizomavella cf. torquata																											
	Schizoporellidae	Schizoporella cf. errata																											
	Schizoporellidae	Schizoporella decorata																											
	Sertellidae	Calyptotheca cf. suluensis																											
	Sertellidae	Reteporellina denticulata																											
	Sertellidae	Rhyrchozoon sp.																											
	Smitinidae	Parasmitina sp.																											
	Tetraporiidae	Tetracladia ventricosa																										X	
	Watersporidae	Waterspora edmondsoni																											
	Microporidae	Cateschata lewinsi																											
	Cateschata sp.	Cateschata sp.																											
	Stegoporinidae	Stegoporina magnilabris																											
	Thalamoporellidae	Thalamoporella stapifera																											
	Scrupariidae	Scruparia sp.																											
	Cyclostomata																												
	Crisinidae	Crisina sp.																											
	Crisinidae	Crisina radians																											
	Crisinidae	Crisina sp. 1																											
	Lichenoporidae	Disporina sp.																											
	Lichenoporidae	Disporina violacea																											
	Tubuliporidae	Tubulipora atlantica?																											
	Tubuliporidae	Tubulipora sp.?																											
	ECHINODERMATA																												
	Acanthasteridae	Acanthaster planci													X	X													
	Mithrodiidae	Mithrodiopsis fisheri																											
	Oreasteridae	Culcita novaequinae							X																				
	Ophiasteridae	Leleaster sp.							X																				
	Ophiasteridae	Linckia guildingi							X																				
	Ophiasteridae	Linckia multiflora								X																			
	Asteroidea	asteroid juv. sp. 1																											
	Ophiuroidea																												
	Ophiocomidae	Ophiocoma dentata																											
	Ophiocomidae	Ophiocoma ehnaceus																											
	Ophiocomidae	Ophiocoma pica								X																			
	Ophiocomidae	Ophiocoma sexradia												X															
	Ophiidermatidae	Distichophis clarkii																											
	Ophiidermatidae	Ophiocoris permixta																											
	Ophiidermatidae	und. Ophiidermatidae																											
	Ophiomereididae	Ophiomereis degeneri																											
	Ophiomereididae	Ophiomereis porrecta																											
	Ophiotrichidae	Macrophiothrix demessa																											
	Ophiotrichidae	und. Ophiotrichidae																											
	Amphitruidae	Amphitrua caelatus																											
	Amphitruidae	Amphipholis squamata								X																			
	Amphitruidae	Amphitrua immota								X																			

TAXA	FAMILY	SPECIES	Tem	R-14	R-15	R-16	R-17	R-18	R-19	R-20	R-21	R-22	R-23	R-24	R-25	R-26	R-27	R-28	R-29	R-30	R-31	R-32	R-33	R-34	R-35	R-36	R-37	R-38	
	Ophiactidae	Ophiactis savignyi									X																		
	Ophiactidae	Ophiactis sp. A									X																		
	Ophiuroidea	ophiuroid juv. sp. A									X																		
	Ophiuroidea	ophiuroid juv. sp. B									X																		
	Ophiuroidea	ophiuroid juv. sp. C									X																		
	Ophiuroidea	ophiuroid juv. sp. D									X																		
	Ophiuroidea	ophiuroid juv. sp. E									X																		
	Echinoidea																												
	Cidaridae	Actinocidaris thomasi								X																			
	Cidaridae	Eucidaris metularia																					X						
	Diadematidae	Echinothrix calamaris					X																						X
	Diadematidae	Echinothrix diadema					X																						
	Toxopneustidae	Triploneustes gratilla	X				X																						
	Echinometridae	Echinometra mathaei	X				X																X						X
	Echinometridae	Echinometra oblonga	X				X																X						X
	Echinometridae	Echinostrephus aculeatus	X				X																X						X
	Echinometridae	Heterocentrotus mammillatus	X				X																X						
	Echinometridae	Echinoneus cyclostomus																											
	Holothuroidea																												
	Holothuridae	Actinopyga mauritiana	X								X												X						X
	Holothuridae	Actinopyga obesa									X												X						
	Holothuridae	Bohadschia paradoxa					X																						X
	Holothuridae	Holothuria atra	X				X																						X
	Holothuridae	Holothuria whitmaei	X				X																						X
	Holothuridae	Holothuria ciferascens					X																						X
	Holothuridae	Holothuria hilla					X																						
	Holothuridae	Holothuria impatiens					X																						X
	Holothuridae	Holothuria sp.									X																		
	CHORDATA																												
	Asciaceae																												
	Didemnidae	beige didemnid #1									X																		
	Didemnidae	beige didemnid #2									X																		
	Didemnidae	black didemnid #1									X																		X
	Didemnidae	gray didemnid #1									X																		
	Didemnidae	gray didemnid #2									X																		
	Didemnidae	gray didemnid #3									X																		X
	Didemnidae	gray didemnid #4									X																		
	Didemnidae	green didemnid									X																		X
	Didemnidae	purple didemnid #1									X																		
	Didemnidae	white didemnid #1									X																		
	Didemnidae	white didemnid #2									X																		
	Didemnidae	white didemnid #3									X																		
	Didemnidae	white didemnid #4									X																		X
	Didemnidae	white didemnid #5									X																		
	Didemnidae	white didemnid #6									X																		X
	Polycilindidae	polycilind sp. 1																											
	Polycilindidae	polycilind sp. 2																											
	Polycilindidae	polycilind sp. 3																											
	Polycilindidae	polycilind sp. 4																											
	Styelidae	Botryllus sp.																											
	Pyuridae	Microcosmus exasperatus																											X
	Pyuridae	Pyurid sp. 1																											
	Pyuridae	Pyurid sp. 2																											

TAXA	FAMILY	SPECIES	R-39	R-41	TC-6	TC-7	TC-8	TC-9	TC-10	TC-11	TC-12	TC-13	TC-14	TC-15	TC-16	TC-17
PORIFERA																
	Calcarea															
		Clathrinidae														
		Clathrina sp. lemon														
		Clathrina sp. white														
		Calcarea blue														
		Calcarea pink														
	Demospongiae															
		Oscarella sp.?														
		Epipolais sp.														
		Chondrosia chucalla														
		Spirastrella keaukaha														
		Prosuberites oleleira														
		Tethya sp. orange														
		Clathria sp. blood-red														
		Hymedesmia sp.1														
		Bazella sp. red														
		Stylinos sp.														
		Mycalidae														
		Mycalidae														
		Halichondriidae														
		Axinyssa sp.														
		Callyspongia sp.1														
		Callyspongia sp.2														
		Callyspongia sp.3														
		Callyspongia sp.4														
		Callyspongia sp.5		X												
		Cacospongia sp.														
		Spongia oceanica														
		Dysidea herbacea														
CNIDARIA																
	Hydroida															
		Halocorythidae														
		unid. hydroid														
		unid. hydroid														
		unid. hydroid														
	Gorgonacea															
		Melithaeidae														
		Acabaria bicolor														
	Alcyonacea															
		Sinularia sp. (yellow)														
Actinaria																
		Calliacis polypus														
		Anthothoe sp.														
		Heteractis malu														
Scleractinia																
		Acropora cerealis			X	X										
		Acropora cytherea			X	X										
		Acropora gemmifera												X	X	
		Acropora humilis														
		Acropora nasuta														
		Acropora paniculata														
		Acropora valida			X	X										
		Montipora capitata			X	X										
		Montipora fibellata			X	X							X	X		
		Montipora patula			X	X							X	X		
		Montipora stuederi			X	X										
		Montipora tuberculosa			X	X										
		Montipora verrilli			X	X										
		Leptoseris incrustans														
		Leptoseris scabra														
		Pavona querdenti			X	X							X	X		
		Pavona maldivensis														
		Pavona varians			X	X										
		Balanophyllia sp. (pink)														X

TAXA	FAMILY	SPECIES	R-39	R-41	TC-6	TC-7	TC-8	TC-9	TC-10	TC-11	TC-12	TC-13	TC-14	TC-15	TC-16	TC-17
	Balanophyllidae	Balanophyllia sp. (yellow)														
	Dendrophylliidae	Tubastraea coccolina	X	X						X		X				
	Faviidae	Cyathostrea ocellina											X			
	Faviidae	Lepastrea bewickensis		X							X					
	Faviidae	Lepastrea purpurea		X									X			
	Faviidae	Lepastrea sp.														
	Fungidae	Fungia scutaria	X								X				X	
	Pocilloporidae	Pocillopora capitata		X						X						
	Pocilloporidae	Pocillopora damicornis								X						
	Pocilloporidae	Pocillopora eydouxi								X						
	Pocilloporidae	Pocillopora ligulata	X	X						X					X	X
	Pocilloporidae	Pocillopora meandrina	X	X						X					X	X
	Pocilloporidae	Pocillopora molokensis								X						
	Poritidae	Porites brighthami														
	Poritidae	Porites compressa	X	X						X					X	
	Poritidae	Porites diardeni														
	Poritidae	Porites evermanni								X						
	Poritidae	Porites lobata	X	X						X					X	X
	Poritidae	Porites niestrzsi	X													
	Poritidae	Porites sp. cf. vaughani														
	Poritidae	Porites stellata								X					X	
	Zoanthidea															
	Parazoanthidae	Parazoanthus sp.														
	Zoanthidae	Palythoa caesia					X					X				
	Zoanthidae	Palythoa tuberculosa												X		
	Zoanthidae	Zoanthus pacificus												X		
	Zoanthidae	Zoanthus sp. B						X								
	Zoanthidae	Zoanthus sp. pink														
	PLATYHELMINTHES															
	Polycladida															
	Pseudocerotidae	Pseudoceros sp.														
	NEMERTEA															
	Anoplia															
	Baseloidiscidae	Baseloidiscus cingulatus														
	ANNELIDA															
	Polychaeta															
	Chaetopteridae	Chaetopterus sp.														
	Terebellidae	Loimia medusa	X													
	SIPHUNCULA															
	Phascolosomatidae															
	Aspidosiphonidae	Aspidosiphon elegans														
	Phascolosomatidae	Phascolosoma stephensoni														
	MOLLUSCA															
	Gastropoda															
	Patellidae	Cellana exarata														
	Trochidae	Trochus intextus	X	X				X	X	X					X	X
	Turbinidae	Turbo sandwicensis	X	X				X	X	X					X	X
	Cerithiidae	Cerithium columna														
	Cerithiidae	Cerithium nesoliticum														
	Cerithiidae	Cerithium placidum								X						
	Cerithiidae	Cerithium sp.														
	Cerithiidae	Rhinoclavis sinensis														
	Hipponiciidae	Hipponix australis								X					X	X
	Hipponiciidae	Hipponix sp. (juv)								X					X	X
	Hipponiciidae	Sabia conica														
	Littorinidae	Littoraria pintado														
	Vermetidae	Dendropoma sp.														X
	Vermetidae	Eualetes tulipa								X						X
	Vermetidae	Serpulorbis sp.														X
	Vermetidae	Vermetid (juv.)											X		X	X
	Cypraea	Cypraea alisenseae														X

TAXA	FAMILY	SPECIES	R-39	R-41	TC-6	TC-7	TC-8	TC-9	TC-10	TC-11	TC-12	TC-13	TC-14	TC-15	TC-16	TC-17
	Cypraeidae	Cypraea helvola					X			X				X		X
	Cypraeidae	Cypraea isabella					X			X						
	Cypraeidae	Cypraea maculifera											X			
	Cypraeidae	Cypraea mauritiana					X									
	Cypraeidae	Cypraea tessellata			X	X	X									
	Eratoidae	Eratia sandwicensis			X		X									
	Bursidae	Bursa granulifera			X											
	Bursidae	Casmaria erinaceus kalosmodix			X					X				X		
	Renellidae	Charonia tritonis								X						X
	Ranellidae	Cymatium nicobaticum					X			X						X
	Ranellidae	Tonna perdit								X						X
	Tonnicidae	Prodotia ignea									X					
	Buccinidae	Mitrella fusiformis													X	
	Columbellidae	Corallophilia erosa					X		X							
	Corallophiliidae	Corallophilia violacea					X		X						X	
	Fasciolaridae	Laticus nodatus														
	Fasciolaridae	Peristernia chlorostoma			X	X										
	Muricidae	Aspella producta														
	Thaididae	Drupa (Drupa) morum					X									
	Thaididae	Drupa (Drupa) ricina														
	Thaididae	Drupa (Drupa) grossularia														
	Thaididae	Drupa (Richella) tubusidaeus			X		X								X	
	Thaididae	Drupella ochrostoma					X				X					
	Thaididae	Morula dumosa									X					
	Thaididae	Morula granulata			X	X									X	
	Thaididae	Morula ura														X
	Thaididae	Thaididae sp.		X												
	Thaididae	Thais armigera												X		
	Costellariidae	Vexillum (Costellaria) pacificum					X								X	
	Costellariidae	Vexillum (Pusia) capricomea		X			X		X					X		
	Costellariidae	Vexillum sp.														
	Mitridae	Cancilla cf. cannicolor		X												
	Mitridae	unid. Mitridae														
	Mitridae	Oliva richerti								X						
	Olividae	Conus abbreviatus														
	Conidae	Conus flavivittatus					X				X					
	Conidae	Conus lividus					X									
	Conidae	Conus ruttus					X									
	Conidae	Conus sp.					X									
	Conidae	Conus sponsalis														
	Conidae	Conus striatus														
	Conidae	Conus textile									X					
	Terebridae	Terebra crenulata												X		
	Terebridae	Terebra sp.														X
	Turridae	Etrema acricula			X	X										
	Turridae	Xenurularis cerithiformis									X					
	Hamineidae	Alys semistriata		X									X			
	Hamineidae	Alys sp.														
	Hamineidae	Diniatys dentifer			X											
	Hamineidae	Aplysia oculifera														
	Aplysiidae	Aplysia parvula														
	Aplysiidae	Aplysia sp.													X	
	Aplysiidae	Dolabella auricularia														X
	Pleurobranchidae	Berthelina citrina			X	X	X	X		X			X			
	Pleurobranchidae	Pleurobranchus sp.		X												
	Saccollosa	Plakobrancheus ocellatus														
	Plakobrancheidae	Thuridilla hoffae														
	Elysidae															
	Nudibranchia															
	Chromodorididae	Glossodoris atromarginata														
	Chromodorididae	Risbecia imperialis														

TAXA	FAMILY	SPECIES	R-39	R-41	TC-6	TC-7	TC-8	TC-9	TC-10	TC-11	TC-12	TC-13	TC-14	TC-15	TC-16	TC-17
	Phyllidiidae	Phyllidia pustulosa			X	X	X	X		X	X	X				X
	Dorididae	Halgeria terramulentis			X	X	X	X	X				X			
	Pteraeolidiidae	Pteraeolidia lanthina												X		
	Pteraeolidiidae	Pteraeolidia lanthina														
Bivalvia																
	Mytilidae	Brachidontes crebristriatus			X		X				X			X		
	Mytilidae	Lithophaga fasciola			X	X	X				X			X		
	Mytilidae	Septifer bryanae			X	X	X				X			X		
	Mytilidae	Septifer sp.1									X	X				
	Arcoidea	Arca sp.								X				X		
	Arcoidea	Arca ventricosa	X	X												
	Isognomonidae	Isognomon perna			X						X					
	Isognomonidae	Isognomon sp.			X						X					
	Malleidae	Malleidae sp.1					X									
	Malleidae	Malleidae sp.2					X									
	Pterididae	Pinctada margaritifera														
	Pinnidae	Pinna muricata				X										
	Pinnidae	Streptopinna saccata			X	X					X					X
	Ostreidae	Ostrea sp. 1			X	X										
	Ostreidae	Ostrea sp.														
	Pectinidae	Pectinidae sp.					X									
	Spondyliidae	Spondylus nicobaricus											X			
	Spondyliidae	Spondylus violaceus	X	X												
	Anomidae	Anomia nobilis										X				
	Chamidae	Chama fibula									X					
	Chamidae	Chama iostoma									X					
	Lucinidae	Epicodakia sp.											X			X
	Gastrochaenidae	Gastrochaena cuneiformis											X			X
	Veneridae	Periglypta reticulata							X							
	Glossidae	Glossidae sp.1											X			
Cephalopoda																
	Octopodidae	Octopus cyanea														
ARTHROPODA																
Pycnogonida																
	Ammonoidea	Acheilia nana					X	X					X			
	Phoxichilidiidae	Anoplodactylus matschallensis				X										
	Rhynchonellidae	Rhynchonella mediterranea			X	X	X									
Thoracica																
	Balanidae	Megabalanus tanagrae														
	Balanidae	Balanus reticulatus														
	Chthamallidae	Nesochthamalus intertextus														
Amphipoda																
	Ampeliscaidae	Ampelisca sp.1					X	X	X	X	X	X		X		X
	Amphilocheidae	Amphilocheus menehune		X	X											
	Amphilocheidae	Giana liliuokalani														
	Amphilocheidae	Gitanopsis pele												X		
	Amphilocheidae	Amphioe kaneohe														
	Amphilocheidae	Amphioe ramondi			X									X		
	Amphilocheidae	Amphioe sp.1														
	Amphilocheidae	Amphioe spp.		X												
	Amphilocheidae	Amphioe waiialua		X		X	X	X	X	X	X	X		X	X	X
	Anamixidae	Anamixis moana		X		X	X	X	X	X	X	X		X	X	X
	Aoridae	Aoridaes columbiae														
	Aoridae	Aoridaes nahili									X					
	Aoridae	Bemlos intermedius			X			X								
	Aoridae	Bemlos macromanus		X				X								
	Aoridae	Bemlos sp.1		X												
	Aoridae	Bemlos sp.2		X												
	Aoridae	Bemlos waipio				X	X	X								
	Aoridae	Globosolenbos ovatus				X	X	X								
	Aoridae	Lembos virgus		X						X					X	

TAXA	FAMILY	SPECIES	R-39	R-41	TC-6	TC-7	TC-8	TC-9	TC-10	TC-11	TC-12	TC-13	TC-14	TC-15	TC-16	TC-17
	Colomasitidae	Colomasix lunallo					X									
	Carophidae	Erichthonius brasiliensis		X	X	X	X	X		X						
	Dexaminiidae	Paradexamine matutata	X		X	X	X	X			X			X		X
	Euristidae	Euristoides diploxyx		X	X	X	X	X								
	Gammaridae	Nuuanu amikai												X	X	X
	Isaeidae	Chevalia aviculae		X	X					X				X		X
	Isaeidae	Gammaropsis abbotti			X	X	X	X						X		
	Isaeidae	Gammaropsis afra		X	X	X	X	X						X		
	Isaeidae	Gammaropsis atlantica		X	X	X	X	X						X		
	Isaeidae	Gammaropsis sp. 1			X	X	X	X								
	Isaeidae	Gammaropsis sp. 2			X	X	X	X								
	Isaeidae	Photis hawaiiensis				X										
	Isaeidae	Leucothoe hyhella	X				X	X			X			X		X
	Ischyroceridae	Leucothoe micronesiae	X				X	X			X			X		
	Ischyroceridae	Leucothoe sp. 1					X	X								
	Ischyroceridae	Leucothoe sp. 2	X								X					
	Ischyroceridae	Leucothoe tridens					X	X						X		X
	Ischyroceridae	Leucothoides portsi	X		X	X	X	X			X			X		X
	Ischyroceridae	Notopoma n.sp.	X		X	X	X	X			X			X		X
	Ischyroceridae	Ventajassa ventosa	X		X	X	X	X			X			X		X
	Lijeborgiidae	Lijeborgia heeia		X	X	X	X	X			X			X		
	Lysianassidae	Lysianassa eva		X	X	X	X	X			X			X		
	Melittidae	Ceradocus hawaiiensis					X	X								
	Melittidae	Eiasmopus diploxyx					X	X								
	Melittidae	Eiasmopus hawaiiensis					X	X								
	Melittidae	Eiasmopus hooheho	X		X	X	X	X			X			X		X
	Melittidae	Eiasmopus moloikai				X										
	Melittidae	Eiasmopus pocillimanus					X	X			X			X		X
	Melittidae	Eiasmopus rapax														
	Melittidae	Maera cf. octodens					X	X			X			X		X
	Melittidae	Maera pacifica			X	X	X	X			X			X		X
	Melittidae	Maera quadrimana				X	X	X			X			X		X
	Melittidae	Maera sp. 1	X			X	X	X			X					
	Melittidae	Maera sp. 2					X	X			X					
	Melittidae	Mallacoota sp.								X						
	Melittidae	Ochlesia alli		X		X					X					
	Oedicerotidae	Kanaloa manoa	X													
	Philantidae	Pereonolus alaniphias		X	X	X	X	X			X					
	Podoceridae	Podocerus brasiliensis				X	X	X						X		
	Podoceridae	Podocerus hanapepe				X	X	X								
	Stenothoidae	Stenothoe valida	X		X	X	X	X			X			X		X
	Isopoda	Gnathia n.sp.		X		X	X	X			X					X
	Anthuridae	Mesanthura hieroglyphica				X	X	X			X					X
	Anthuridae	Panathura cf. collaris			X	X	X	X						X	X	X
	Anthuridae	Pendanthura n.sp.		X	X	X	X	X						X		X
	Expanathuridae	Eisothisos n.sp.				X										
	Leptanthuridae	Leptanthura n.sp.				X										
	Paranthuridae	Colanthura n.sp.				X								X	X	X
	Paranthuridae	Paranthura bellicauda		X	X	X	X	X			X			X		X
	Gnathostomatoididae	Maresiella n.sp.				X	X	X								
	Janiridae	Bagatus algicola	X		X	X	X	X			X			X		X
	Joeropsidae	Joeropsis hawaiiensis	X		X	X	X	X			X			X		X
	Munnidae	Munna acarina		X	X	X	X	X								
	Munnidae	Munna n.sp.		X	X	X	X	X			X					
	Santidae	Santia n.sp.	X		X	X	X	X						X	X	X
	Stenetriidae	Stenetrium rmedipacifica	X		X	X	X	X						X	X	X
	Stenopodidae	Stenopoda														
	Stenopodidae	Stenopodus hispidus														
	Caridea	Caridea														

TAXA	FAMILY	SPECIES	R-39	R-41	TC-6	TC-7	TC-8	TC-9	TC-10	TC-11	TC-12	TC-13	TC-14	TC-15	TC-16	TC-17
	Systelodactylidae	Neostylodactylus littoralis					X									
	Gnathophylliidae	Gnathophyllioides mineri							X							
	Gnathophylliidae	Gnathophyllum americanum							X							
	Pontoniinae	Harpilopsis spingera							X							
	Pontoniinae	Onyocaris quadratophthalma								X						
	Pontoniinae	Onyocaris sp. nov.						X								
	Pontoniinae	Palaeononella lata														
	Pontoniinae	Periclimenaeus quadridentatus			X											
	Pontoniinae	Periclimenaeus sp.			X											
	Pontoniinae	Periclimenaeus cf. diversipes							X							
	Pontoniinae	unid. Pontoninae				X										
	Alpheidae	Alpheus clypeatus														
	Alpheidae	Alpheus colluminatus														
	Alpheidae	Metalpheus hawaiiensis												X		
	Alpheidae	Metalpheus paragraclis														
	Alpheidae	Synalpheus paraneomeris														
	Hippolytidae	Thor amboinensis		X									X			
	Hippolytidae	Thor sp.								X						X
	Hippolytidae	Thorina maldivensis									X					
	Pandalidae	Chlorocurtis jactans		X												
	Brachyura															
	Grapsidae	Peronon abbreviatum			X											
	Portunidae	Portunus granulatus										X				
	Portunidae	Thalassia picta											X			
	Portunidae	Thalassia sp. juv.						X								
	Pilumnidae	Pilumnus longicornis					X							X		X
	Trapezidae	Jonesius trunciculatus					X									
	Trapezidae	Tetraia sp.														
	Trapezidae	Trapezia ferruginea					X			X				X		X
	Xanthidae	Chlorodiella laevisima					X							X		X
	Xanthidae	Licarpilodes integerrimus									X					
	Xanthidae	Liomeria n.sp.									X					X
	Xanthidae	Paraxanthias sp.					X			X						X
	Xanthidae	Paraxanthias notatus					X			X						X
	Xanthidae	Phymodius nitidus														
	Xanthidae	Pilocius areolatus								X						
	Xanthidae	Pilocius flavus					X			X					X	X
	Xanthidae	Pilocius sp.									X					
	Xanthidae	Platypodia n.sp.					X									
	Xanthidae	Pseudoliomera helleri								X						
	Xanthidae	Pseudoliomera varicosa					X			X					X	
	Xanthidae	Tweedieia lavesani					X							X		
	Xanthidae	Xanthias pachyactylus														
	Dromiidae	Cryptodromiopsis tridens														
	Dynomeniidae	Dynomene hispida					X							X		X
	Majidae	Perinea tumida					X							X		X
	Majidae	unid. majid								X						X
	Majidae	Ebala sp.					X			X						
	Pallinuridae	Panulirus penicillatus														
	Diogenidae	Calcinus guamensis								X						
	Diogenidae	Calcinus laurentiae								X						
	Diogenidae	Dardanus gemmatus														
	Diogenidae	Dardanus sanguinocarpus		X												
	Galatheididae	Galathea spinosocristis					X			X					X	X
	Porcellanidae	Pachycheles pisolides														
	ECTOPROCTA															
	unid. bryozoan	unid. encrusting A										X				
	unid. bryozoan	unid. encrusting B										X				
	Cheilosomata															
	Beanidae	Beania discodermiae										X				

TAXA	FAMILY	SPECIES	R-39	R-41	TC-6	TC-7	TC-8	TC-9	TC-10	TC-11	TC-12	TC-13	TC-14	TC-15	TC-16	TC-17
	Bugulidae	Bugula philippense?														
	Bugulidae	Bugula sp.			X											
	Bugulidae	Bugula vectifera?			X									X		X
	Celleporidae	Holoporella aperta			X					X						
	Celleporidae	Schismopora cf. spatulata								X						
	Cheiloporinidae	Cheiloporina haddoni														
	Cheiloporinidae	unid. Cheilostome			X											
	Choiroporidae	Rhizophostomella argentea?			X									X		
	Scrupocellariidae	Caberia boyi														
	Cleidochasmatidae	Cleidochasma laterale			X											
	Scrupocellariidae	Scrupocellaria maderensis			X									X		X
	Hippopodidae	Coscinopsis fusca												X		
	Margaritidae	Margarita gracilior?		X												
	Microporellidae	Microporella orientalis														
	Schizoporellidae	Schizomavella cf. torquata														
	Schizoporellidae	Schizoporella cf. errata		X												
	Schizoporellidae	Schizoporella decorata			X											
	Sertellidae	Calypotheca cf. sulciensis														
	Sertellidae	Reteporellina denticulata														
	Sertellidae	Rhynchozoon sp.														
	Sertellidae	Parasmitina sp.		X												
	Smitinidae	unid. Smitinidae														
	Tetrapariidae	Tetraparia ventricosa		X												
	Watersporidae	Waterspora edmondsoni		X										X		X
	Microporidae	Caeschara lewinsi														
	Microporidae	Caeschara sp.		X												
	Microporellidae	Stegnoporella magnilabris		X												
	Thalamoporellidae	Thalamoporella stapifera		X										X		
	Scrupariidae	Scruparia sp.														
	Cyclotomata															
	Crisinidae	Crisina sp.			X											
	Crisinidae	Crisina radians														
	Crisinidae	Crisina sp.1														
	Crisinidae	Dispora sp.		X												
	Lichenoporidae	Dispora violacea														
	Tubuliporidae	Tubulipora atlantica?														
	Tubuliporidae	Tubulipora sp.?														
	ECHINODERMATA															
	Asteroidea															
	Acanthasteridae	Acanthaster planci														
	Mithrodiidae	Mithrodia fisheri														
	Oreasteridae	Culcita novaeguineae														
	Ophidiasteridae	Leiaster sp.														
	Ophidiasteridae	Linckia guildingi														
	Ophidiasteridae	Linckia multiflora														
	Asteroidea	asteroid juv. sp. 1														
	Ophiuridae															
	Ophiocomicidae	Ophiocoma dentata														
	Ophiocomicidae	Ophiocoma erinaceus			X									X		X
	Ophiocomicidae	Ophiocoma pica												X		X
	Ophiocomicidae	Ophiocoma sexradia														
	Ophiodermatidae	Distichophis clarkii														
	Ophiodermatidae	Ophiocentis pernix														
	Ophiodermatidae	unid. Ophiodermatidae														
	Ophiomerididae	Ophiomeris degeneri														
	Ophiomerididae	Ophiomeris porrecta														
	Ophiotrichidae	Macrophiotrix demessa		X												X
	Ophiotrichidae	unid. Ophiotrichidae														X
	Amphipuriidae	Amphipurus caelatus														X
	Amphipuriidae	Amphipholis squamata														X
	Amphipuriidae	Amphipura immira														X

TAXA	FAMILY	SPECIES	R-39	R-41	TC-6	TC-7	TC-8	TC-9	TC-10	TC-11	TC-12	TC-13	TC-14	TC-15	TC-16	TC-17
	Ophiactidae	<i>Ophiactis savignyi</i>														X
	Ophiactidae	<i>Ophiactis</i> sp. A												X		
	Ophiuroidea	<i>Ophiuroid</i> juv. sp. A			X											X
	Ophiuroidea	<i>Ophiuroid</i> juv. sp. B											X			X
	Ophiuroidea	<i>Ophiuroid</i> juv. sp. C						X							X	
	Ophiuroidea	<i>Ophiuroid</i> juv. sp. D													X	
	Ophiuroidea	<i>Ophiuroid</i> juv. sp. E														
	Echinoidea															
	Cidaridae	<i>Actinoidaris thomasi</i>						X							X	
	Cidaridae	<i>Eucidaris metularia</i>			X											
	Diademidae	<i>Echinothrix calamaris</i>														
	Diademidae	<i>Echinothrix diadema</i>														
	Toxopneustidae	<i>Tripeustus gratilla</i>														
	Echinometridae	<i>Echinometra mathaei</i>		X												X
	Echinometridae	<i>Echinometra oblonga</i>														
	Echinometridae	<i>Echinostrephus aciculatus</i>		X												
	Echinometridae	<i>Heterocentrotus mammillatus</i>								X					X	X
	Echinometridae	<i>Echinoneus cyclostomus</i>														
	Holothuroidea															
	Holothuriidae	<i>Actinopyga mauritiana</i>														
	Holothuriidae	<i>Actinopyga obesa</i>														
	Holothuriidae	<i>Bohadschia paradoxa</i>														
	Holothuriidae	<i>Holothuria atra</i>														
	Holothuriidae	<i>Holothuria whitmaei</i>														
	Holothuriidae	<i>Holothuria cinerascens</i>														
	Holothuriidae	<i>Holothuria hilla</i>														
	Holothuriidae	<i>Holothuria impatiens</i>														
	Holothuriidae	<i>Holothuria</i> sp.														
	CHORDATA															
	Ascidacea															
	Didemnidae	beige didemnid #1														
	Didemnidae	beige didemnid #2														
	Didemnidae	black didemnid #1					X									
	Didemnidae	gray didemnid #1														
	Didemnidae	gray didemnid #2														
	Didemnidae	gray didemnid #3					X									
	Didemnidae	gray didemnid #4														
	Didemnidae	green didemnid														
	Didemnidae	purple didemnid #1														
	Didemnidae	white didemnid #1														
	Didemnidae	white didemnid #2														
	Didemnidae	white didemnid #3														
	Didemnidae	white didemnid #4														
	Didemnidae	white didemnid #5														
	Didemnidae	white didemnid #6														
	Polycilindidae	polycilind sp. 1														
	Polycilindidae	polycilind sp. 2														
	Polycilindidae	polycilind sp. 3														
	Polycilindidae	polycilind sp. 4														
	Syrellidae	<i>Botryllus</i> sp.														
	Pyuridae	<i>Microcosmus exasperatus</i>						X								
	Pyuridae	pyurid sp. 1														
	Pyuridae	pyurid sp. 2														

Appendix C

Micromolluscs collected at French Frigate Shoals stations during the NOW-Ramp 2000 Expedition. Bishop Museum (BPBM) micromollusc specimens collected by the Tanager Expedition (T) in 1923 are shown in the first column.

CLASS	FAMILY	SPECIES	BPBM	TC-06	TC-07	TC-08	TC-09	TC-10	TC-11	TC-12	TC-13	TC-15	TC-16	TC-17	R-14	R-15	R-41	
GASTROPODA	Scissurellidae	Sinezona insignis		X	X	X			X		X				X			
	Diodora granifera		T			X		X										
	Polyclidon sp.									X								
	Phasianellidae	Tricolia variabilis	1	X	X	X	X	X	X	X	X	X	X	X			X	
	Skeneidae	Brookula iki																
	Skeneidae	Cyclofremicaeus emeryi	T		X													
	Skeneidae	Lophocochlias minutissimus	T		X					X	X	X	X	X				
	Stomatellidae	Synaptocholea cocinna	T	X	X	X	X	X	X	X	X	X	X	X	X			
	Trochidae	Alyna ocellata	T								X							
	Trochidae	Alyna subangulata							X									
	Trochidae	Euchelus gemmatus	T						X									
	Trochidae	Gibbula mamorea	T			X		X		X					X	X		
	Turbinidae	Collonista candida	T	X	X			X										
	Turbinidae	Leptothyra rubricincta	T	X	X			X			X				X			
	Turbinidae	Leptothyra verruca	T						X									
	Turbinidae	Turbo articulatus		X	X					X					X			
	Cerithiidae	Bitium impendens	T	X	X	X	X	X	X			X			X		X	
	Cerithiidae	Cerithidium diplox	T	X	X	X	X	X							X			
	Cerithiidae	Cerithidium perparvulum		X	X	X	X	X		X	X							
	Cerithiidae	Cerithiidae																
	Cerithiidae	Itibittium parcum																
	Cerithiidae	Pleisotrochus luteus							X	X	X	X						
	Dialidae	Cerithidium sp. (cf. Interstriatum)								X	X							
	Dialidae	Diala semistriata	T			X	X	X	X	X	X	X			X			X
	Dialidae	Finella sp.																
	Dialidae	Scalaia glareosa		X							X							
	Cingulopsidae	Rufodardania ponderi				X												
	Cingulopsidae	Rufodardania sp. (cf. ponderi)						X										
	Caecidae	Caecum sepimentum		X	X			X							X			
	Caecidae	Strebloceras subannulatum				X												
	Rissoidae	Alvinia isolata		X	X	X				X	X				X			
	Rissoidae	Merelina granulosa		X	X	X				X	X	X					X	
	Rissoidae	Merelina sp.	T								X						X	
	Rissoidae	Merelina wanawana							X		X	X						
	Rissoidae	Parasheila sp.				X												
	Rissoidae	Parasheila beetsi	T		X						X							
	Rissoidae	Pusillina marmorata			X			X						X	X	X		
	Rissoidae	Rissoina ambigua	T						X	X				X				
	Rissoidae	Rissoina costata	T															
	Rissoidae	Rissoina mitozona	T		X			X						X				
	Rissoidae	Rissoina pulchella						X										
Rissoidae	Sansonia kenneyi	T		X														
Rissoidae	Schwartziella ephamilla	T																
Rissoidae	Schwartziella triticea	T			X													
Rissoidae	Stosicia hiloense											X						
Rissoidae	Zebina bidentata																	
Rissoidae	Zebina sp.			X														
Rissoidae	Zebina sp. (cf. tridentata)						X			X								
Rissoidae	Zebina tridentata										X							
Eratoidae	Trivia edgari	T	X	X				X						X				

CLASS	FAMILY	SPECIES	BPBM	TC-06	TC-07	TC-08	TC-09	TC-10	TC-11	TC-12	TC-13	TC-15	TC-16	TC-17	R-14	R-15	R-41
	Cerithiopsidae	Cerithiopsidae							X								
	Cerithiopsidae	Cerithiopsis sp		X						X							X
	Cerithiopsidae	Cerithiopsis sp. (cf arga)		X	X												
	Cerithiopsidae	Joculator sp.		X													
	Triphoridae	Cautor intermissa								X							
	Triphoridae	Daphnellinae								X							
	Triphoridae	Inforis peleae			X												
	Triphoridae	Mastoninae							X								
	Triphoridae	Triphora coralina		X	X							X					X
	Triphoridae	Triphora peasi		X	X												
	Triphoridae	Triphora sp (cf coralina)		X													
	Triphoridae	Triphora sp (cf triticea)							X								
	Triphoridae	Triphora sp.1		X	X												
	Triphoridae	Triphora sp.2		X						X							
	Triphoridae	Triphora sp.3		X													
	Triphoridae	Triphoridae sp.1									X						X
	Triphoridae	Triphoridae sp.2															
	Triphoridae	Triphoridae sp.3							X								X
	Triphoridae	Triphoridae sp.4					X										
	Triphoridae	Triphoriidae															
	Triphoridae	Triphoriidae															
	Triphoridae	Virola sp. (cf fallax)		X													
	Epitoniidae	Parviscala sp. (cf paumotensis)												X			
	Eulimidae	Balcis brunnimaculata			X									X			
	Eulimidae	Balcis sp. (cf inflexa)							X								
	Eulimidae	Balcis sp1.			X					X							
	Eulimidae	Balcis sp2.															
	Eulimidae	Balcis sp3.					X								X		
	Eulimidae	Pyramidelloides gracilis									X						
	Eulimidae	Pyramidelloides miranda					X										
	Eulimidae	Scalenostoma carinata							X								
	Eulimidae	Trochostylifer sp. (cf hawaiiensis)										X					
	Columbellidae	Seminella peasei															X
	Columbellidae	Seminella smithi		X	X				X	X					X		X
	Columbellidae	Seminella sp. (cf peasei)															
	Columbellidae	Seminella sp. (juv)															
	Corallophilidae	Magilopsis tamarckii					X					X					
	Thaididae	Maculotrilon bracteatus	T														X
	Margineilidae	Cystiscus hunu		X	X				X	X			X	X			
	Margineilidae	Dentimargo sp.			X					X							
	Margineilidae	Granula sandwicensis	T							X							
	Margineilidae	Granula sp.			X						X						
	Margineilidae	Granulina sp. (cf vitrea)		X	X				X								X
	Margineilidae	Granulina vitrea					X							X			
	Margineilidae	Volvarina fusiformis															
	Turridae	Carinapex minutissima			X					X							
	Turridae	Carinapex sp.											X				
	Turridae	Daphnellinae					X										
	Turridae	Kermia antani		X													
	Turridae	Kermia sp.					X										
	Turridae	Kermia sp. (cf bifaciata)					X										
	Turridae	Mangeliinae						X									

CLASS	FAMILY	SPECIES	BPBM	TC-06	TC-07	TC-08	TC-09	TC-10	TC-11	TC-12	TC-13	TC-15	TC-16	TC-17	R-14	R-15	R-41
	Turridae	Microdaphne trichodes		X										X			
	Orbistellidae	Orbistella regina							X								
	Rissoellidae	Rissoella cf. confusa confusa								X							
	Rissoellidae	Rissoella longispira								X							
	Rissoellidae	Rissoella sp.1			X				X					X			
	Rissoellidae	Rissoella sp.2		X													
	Rissoellidae	Rissoella sp.3		X					X								
	Omalogyridae	Omalogyra japonica		X	X						X						
	Pyramidelidae	Herviera gilvella												X			
	Pyramidelidae	Odosoma sp. (cf. stearnsiella)		X										X			
	Pyramidelidae	Pyramidelidae sp.								X							
	Pyramidelidae	Turbonilla sp.															
	Pyramidelidae	Turbonilla sp. (cf. lirata)															X
	Pyramidelidae	Turbonilla sp. (cf. thanumi)		X	X				X	X				X			X
	Pyramidelidae	Turbonilla thanumi			X				X	X							
	Hamineidae	Haminoea sp.			X				X	X							
	Julidae	Julia exquista		X	X				X	X				X			
	Siphonariidae	Williamia radiata		X										X			
BIVALVIA	Mytilidae	Dacrydium sp. (cf. zebra)				X											
	Mytilidae	Musculus avianus											X				
	Philobryidae	Cosa waikiki				X				X			X		X		X
	Arcidae	Acar plicata												X			
	Arcidae	Acar sp. (cf. plicata)				X						X					
	Arcidae	Barbatia divaricata								X							
	Arcidae	Barbatia nuttingi						X		X							X
	Arcidae	Barbatia sp.									X						
	Arcidae	Barbatia sp. (cf. nuttingi)													X		
	Arcidae	Barbatia tenella															
	Arcidae	Bentharca sp.			X												
	Arcidae	Bentharca sp. (cf. decorata)				X											
	Pectinidae	Chlamys coruscan hawaiiensis		X	X			X	X				X	X			
	Pectinidae	Laevichlamys irregularis												X			X
	Pectinidae	Pectinidae (juv) (cf. Cryptopecten sp.)												X			
	Propeamussidae	Chlamydeila sp.				X								X			
	Lasaeidae	Lasaeidae (cf. Kellia rosea)								X							
	Lasaeidae	Lasaeidae sp.1												X			
	Lasaeidae	Lasaeidae sp.2								X			X	X			
	Lasaeidae	Nesobornia bartschi				X				X				X			
	Cardidae	Fragum mundum							X								
	Carditidae	Cardifella hawaiiensis			X				X	X							
	Mesodesmatidae	Rochefortina sandwicensis				X			X	X				X			
	Nuculidae	Nucula sp.								X							
	Ischnochitonidae	Ischnochiton sp.		X		X		X	X	X				X		X	
		Total		30	34	36	44	42	18	29	44	15	12	37	11	3	25

Appendix D

Listing of occurrences of shallow-water marine invertebrates collected or observed from French Frigate Shoals from all available sources, showing year of collection and source of species report or Bishop Museum (BPBM) specimen catalog number.

Phylum PORIFERA
 Class CALCAREA
 Subclass CALCINEA
 Order CLATHRINIDA
 Family CLATHRINIDAE
 Clathrina sp. lemon
 2000 NOW-RAMP
 Clathrina sp. white
 2000 NOW-RAMP
 UNID. CALCAREA
 Calcarea blue
 2000 NOW-RAMP
 Calcarea pink
 2000 NOW-RAMP
 Class DEMOSPONGIAE
 Subclass HOMOSCLEROMORPHA
 Order HOMOSCLEROPHORIDA
 Family PLAKINIDAE
 Oscarella sp.?
 2000 NOW-RAMP possible new HI record
 Subclass TTRACTINOMORPHA
 Order ASTROPHORIDA
 Family COPPATIIDAE
 Epipolasis sp.
 2000 NOW-RAMP
 Order HADROMERIDA
 Family CHONDRILLIDAE
 Chondrosia chucalla de Laubenfels, 1936
 2000 NOW-RAMP
 Family SPIRASTRELLIDAE
 Spirastrella keaukaha de Laubenfels, 1951
 2000 NOW-RAMP
 Family SUBERITIDAE
 Prosuberites oleteira de Laubenfels, 1957
 2000 NOW-RAMP
 Family TETHYIDAE
 Tethya sp. orange
 2000 NOW-RAMP
 Subclass CERACTINOMORPHA
 Order POECILOSCLERIDA
 Suborder MICROCIONINA
 Family MICROCIONIDAE
 Clathria sp. blood-red
 2000 NOW-RAMP
 Suborder MYXILLINA
 Family HYMEDESMIIDAE
 Hymedesmia sp.1
 2000 NOW-RAMP new HI record
 Family DESMACIDIDAE
 Batzella sp. red
 2000 NOW-RAMP
 Suborder MYCALINA
 Family MYCALIDAE
 Stylinos sp.
 2000 NOW-RAMP
 Order HALICHONDRIDA
 Family HALICHONDRIIDAE
 Axinyssa sp.
 2000 NOW-RAMP
 Order HAPLOSCLERIDA
 Family CALLYSPONGIIDAE
 Callyspongia (*Callyspongia*) sp.1
 2000 NOW-RAMP new HI record
 Callyspongia (*Callyspongia*) sp.2
 2000 NOW-RAMP new HI record
 Callyspongia (*Callyspongia*) sp.3
 2000 NOW-RAMP new HI record
 Callyspongia (*Callyspongia*) sp.4
 2000 NOW-RAMP new HI record
 Callyspongia (*Callyspongia*) sp.5
 2000 NOW-RAMP new HI record

Order DICTYOCERATIDA
 Family SPONGIIDAE
Cacospongia sp.
 2000 NOW-RAMP
Spongia oceania de Laubenfels, 1950
 2000 NOW-RAMP

Order DENDROCERATIDA
 Family DYSIDEIDAE
Dysidea herbacea (Keller, 1889)
 2000 NOW-RAMP

Phylum CNIDARIA
 Class HYDROZOA
 Order HYDROIDA
 Family HALOCORDYLIDAE
Pennaria disticha (Goldfuss, 1820)
 2000 NOW-RAMP nonindigenous
 Family SERTULARIIDAE
Sertularia dentifera
 1902 Nutting, 1906
 Family UNID. HYDROID
 hydroid sp.1
 2000 NOW-RAMP
 hydroid sp.2
 2000 NOW-RAMP
 hydroid sp.3
 2000 NOW-RAMP

Class ANTHOZOA
 Subclass OCTOCORALLIA
 Order GORGONACEA
 Family MELITHAEIDAE
Acabaria bicolor Nutting, 1908
 2000 NOW-RAMP

Order ALCYONACEA
 Family ALCYONIIDAE
Sinularia sp. (yellow)
 2000 NOW-RAMP possible new HI record

Subclass HEXACORALLIA
 Order ACTINIARIA
 Family HORMATHIIDAE
Calliactis polypus (Forskal, 1775)
 2000 NOW-RAMP
 Family SAGARTIIDAE
Anthothoe sp.
 2000 NOW-RAMP
 Family STICHODACTYLIDAE
Heteractis malu (Haddon & Shachleton, 1893)
 2000 NOW-RAMP

Order SCLERACTINIA
 Family ACROPORIDAE
Acropora cerealis (Dana, 1846)
 2000 NOW-RAMP
Acropora cytherea (Dana, 1848)
 1978 BPBM-SC 660
 1979 BPBM-SC 3252
 2000 NOW-RAMP
Acropora gemmifera (Dana, 1846)
 2000 NOW-RAMP new HI record
Acropora humilis (Dana, 1846)
 1979 BPBM-SC 3259
 2000 NOW-RAMP
Acropora nasuta (Dana, 1846)
 2000 NOW-RAMP new HI record
Acropora paniculata Verrill, 1902
 2000 NOW-RAMP
Acropora valida (Dana, 1846)
 1978 BPBM-SC 658
 1979 BPBM-SC 3255
 2000 NOW-RAMP
Montipora capitata (Dana, 1846)
 2000 NOW-RAMP
Montipora flabellata Studer, 1902

2000 NOW-RAMP
Montipora patula Verrill, 1864
 2000 NOW-RAMP
Montipora studeri Vaughan, 1907
 2000 NOW-RAMP
Montipora tuberculosa (Lamarck, 1816)
 2000 NOW-RAMP
Montipora verrilli Vaughan, 1907
 1978 BPBM-SC 2562
 2000 NOW-RAMP

Family AGARICIIDAE

Leptoseris incrustans (Quelch, 1886)
 2000 NOW-RAMP
Leptoseris scabra Vaughan, 1907
 2000 NOW-RAMP
Leptoseris sp.
 1981 BPBM-SC 3292
Pavona duerdeni Vaughan, 1907
 2000 NOW-RAMP
Pavona maldivensis (Gardiner, 1905)
 2000 NOW-RAMP
Pavona varians Verrill, 1864
 2000 NOW-RAMP

Family BALANOPHYLLIDAE

Balanophyllia sp. (pink) possible new HI record
 2000 NOW-RAMP
Balanophyllia sp. (yellow) possible new HI record
 2000 NOW-RAMP

Family DENDROPHYLLIIDAE

Tubastraea coccinea Lesson, 1829
 2000 NOW-RAMP

Family FAVIIDAE

Cyphastrea ocellina (Dana, 1846)
 2000 NOW-RAMP
Leptastrea bewickensis (Veron et al., 1977)
 2000 NOW-RAMP
Leptastrea purpurea Dana, 1846
 2000 NOW-RAMP
Leptastrea sp. new HI record
 2000 NOW-RAMP

Family FUNGIIDAE

Fungia scutaria Lamarck, 1801
 2000 NOW-RAMP

Family POCILLOPORIDAE

Pocillopora capitata Verrill, 1864 new HI record
 2000 NOW-RAMP
Pocillopora damicornis (Linnaeus, 1758)
 1902 Vaughan, 1907
 2000 NOW-RAMP
Pocillopora eydouxi Milne Edwards & Haime, 1849
 2000 NOW-RAMP
Pocillopora lingulata Dana, 1846
 1902 Vaughan, 1907
 2000 NOW-RAMP
Pocillopora meandrina Dana, 1846
 2000 NOW-RAMP
Pocillopora molokensis Vaughan, 1907
 2000 NOW-RAMP
Pocillopora sp.
 1981 BPBM-SC 2265

Family PORITIDAE

Porites brighami Vaughan, 1907
 2000 NOW-RAMP
Porites compressa Dana, 1846
 1902 Vaughan, 1907
 2000 NOW-RAMP
Porites duerdeni Vaughan, 1907
 2000 NOW-RAMP
Porites evermanni Vaughan, 1907
 2000 NOW-RAMP
Porites lobata Dana, 1846

2000 NOW-RAMP
Porites cf. vaughani new HI record
 2000 NOW-RAMP
 Family SIDERASTREIDAE
Psammocora nierstraszi Horst, 1921
 2000 NOW-RAMP
Psammocora stellata Verrill, 1864
 2000 NOW-RAMP
 Order ZOANTHIDEA
 Family PARAZOANTHIDAE
Parazoanthus sp. possible new HI record
 2000 NOW-RAMP
 Family ZOANTHIDAE
Palythoa caesia Dana, 1848
 2000 NOW-RAMP
Palythoa tuberculosa (Esper, 1791)
 2000 NOW-RAMP
Zoanthus pacificus Walsh & Bowers, 1971
 2000 NOW-RAMP
Zoanthus sp. B
 2000 NOW-RAMP
Zoanthus sp. pink
 2000 NOW-RAMP
 Phylum PLATYHELMINTHES
 Class TURBELLARIA
 Order POLYCLADIDA
 Suborder COTYLEA
 Family PSEUDOCEROTIDAE
Pseudobiceros sp. possible new HI record
 2000 NOW-RAMP
 Phylum NEMERTEA
 Class ANOPLA
 Order HETERONEMERTEA
 Family BASEODISCIDAE
Baseodiscus cingulatus (Coe, 1906)
 2000 NOW-RAMP
 Phylum ANNELIDA
 Class POLYCHAETA
 Family POLYNOIDAE
Chone sp. new HI record
 2000 NOW-RAMP
Harmothoe haliaeti
 1902 Treadwell, 1906
Iphione muricata (Savigny, 1818)
 1902 Treadwell, 1906
 2000 NOW-RAMP
Kermadecella magnipalpa
 1902 Treadwell, 1906 (as *Polynoe magnipalpa*)
Thormora atrata (Treadwell, 1940)
 2000 NOW-RAMP
 unid. Polynoidae
 2000 NOW-RAMP
 Family AMPHINOMIDAE
Eurythoe complanata (Pallas, 1766)
 2000 NOW-RAMP
 Family PHYLLODOCIDAE
Phyllodoce sp.
 2000 NOW-RAMP
 unid. Phyllococidae
 2000 NOW-RAMP
 Family HESIONIDAE
Hesione splendida Savigny, 1818
 1902 Treadwell, 1906
 Family SYLLIDAE
Branchiosyllis exilis
 2000 NOW-RAMP
Brania sp. 1
 2000 NOW-RAMP
Haplosyllis spongicola (Grube, 1855)
 2000 NOW-RAMP

Opisthosyllis sp.
 2000 NOW-RAMP
Parasphaerosyllis sp.
 2000 NOW-RAMP
Proceraea sp. 1
 2000 NOW-RAMP new HI record
Trypanosyllis sp.
 2000 NOW-RAMP
Typosyllis sp.1
 2000 NOW-RAMP
 unid. Syllidae
 2000 NOW-RAMP
 Family NEREIDIDAE
Ceratonereis sp.
 2000 NOW-RAMP
Ceratonereis tentaculata Kinberg, 1866
 2000 NOW-RAMP
Neanthes cf. *arenaceodentata*
 2000 NOW-RAMP
Neanthes sp.
 2000 NOW-RAMP
Nereis sp. 1
 2000 NOW-RAMP
Platynereis sp. 1
 2000 NOW-RAMP
Platynereis sp. 2
 2000 NOW-RAMP
Platynereis tongatabuensis McIntosh, 1885
 1902 Treadwell, 1906
 Family GLYCERIDAE
Scoletoma sp.
 2000 NOW-RAMP new HI record
 unid. Glyceridae
 2000 NOW-RAMP
 Family EUNICIDAE
Eunice sp.
 2000 NOW-RAMP
Eunice sp. 1
 2000 NOW-RAMP
Eunice sp. 2
 2000 NOW-RAMP
Lysidice sp. 1
 2000 NOW-RAMP
Marphysa sp.
 2000 NOW-RAMP
Nematonereis unicornis
 2000 NOW-RAMP
Palola siciliensis
 2000 NOW-RAMP
 Family DORVILLEIDAE
Dorvillea sp.
 2000 NOW-RAMP
 unid. Dorvilleidae
 2000 NOW-RAMP
 Family SPIONIDAE
Tripolydora spinosa Woodwick, 1964
 2000 NOW-RAMP
 Family CHAETOPTERIDAE
Chaetopterus sp.
 2000 NOW-RAMP
 Family OPHELIIDAE
Polyopthalmus pictus
 2000 NOW-RAMP
 Family CAPITELLIDAE
Bhawania sp.
 2000 NOW-RAMP possible new HI record
Dasybranchus sp.
 2000 NOW-RAMP
Notomastus sp.
 2000 NOW-RAMP possible new HI record
 Family TERESELLIDAE

Loimia medusa (Savigny, 1818)
 2000 NOW-RAMP
 Family SABELLIDAE
Branchiomma sp. possible new HI record
 2000 NOW-RAMP
Demonax sp. possible new HI record
 2000 NOW-RAMP
 Family SERPULIDAE
 unid. Serpulidae
 2000 NOW-RAMP

Phylum SIPUNCULA
 Class PHASCOLOSOMATIDEA
 Order ASPIDOSIPHONIFORMES
 Family ASPIDOSIPHONIDAE
Aspidosiphon elegans (Chamisso and Eysenhardt, 1821)
 2000 NOW-RAMP
Aspidosiphon sp.
 2000 NOW-RAMP
 Order PHASCOLOSOMATIFORMES
 Family PHASCOLOSOMATIDAE
Phascolosoma stephensoni (Stephen, 1942)
 2000 NOW-RAMP

Class SIPUNCULIDEA
 Order SIPUNCULIFORMES
 Family SIPUNCULIDAE
 unid. Sipuncula
 1982 BPBM-N 300
 2000 NOW-RAMP

Phylum MOLLUSCA
 Class GASTROPODA
 Subclass PROSOBRANCHIA
 Order ARCHAEOGASTROPODA
 Family SCISSURELLIDAE
Scissurella aequatoria
 1923 BPBM specimen (Tanager Expedition)
 1990 Kay
Sinezona insignis (Smith, 1910)
 2000 NOW-RAMP
 Family FISSURELLIDAE (DIODORINAE)
Diodora granifera (Pease, 1861)
 1923 BPBM specimen (Tanager Expedition)
 1990 Kay
 2000 NOW-RAMP
 Family FISSURELLIDAE (EMARGINULINAE)
Emarginula dilecta A. Adams, 1852
 1923 BPBM specimen (Tanager Expedition)
 1990 Kay
 Family PATELLIDAE
Cellana exarata (Reeve, 1854)
 2000 NOW-RAMP
Cellana melanostoma (Pilsbry, 1891)
 1923 BPBM specimen (Tanager Expedition) (as *Cellana exarata melanostoma*)
 Family PELYCIDIIDAE
Pelycidion sp. new HI record
 2000 NOW-RAMP
 Family PHASIANELLIDAE
Tricolia variabilis (Pease, 1861)
 2000 NOW-RAMP
 unknown BPBM specimen
 Family SKENEIDAE
Brookula iki Kay, 1979
 2000 NOW-RAMP
Cyclostremiscus emery (Ladd, 1966)
 1923 BPBM specimen (Tanager Expedition)
 1990 Kay
 2000 NOW-RAMP
Lophocochlias minutissimus (Pilsbry, 1921)
 1923 BPBM specimen (Tanager Expedition)
 1990 Kay
 2000 NOW-RAMP
 Family STOMATELLIDAE

***Synaptocochlea cocinna* (Gould, 1854)**
 1923 BPBM specimen (*Tanager Expedition*)
 1990 Kay
 2000 NOW-RAMP
 Family TROCHIDAE (ENCYCLINAE)
***Euchelus corrugatus* Pease, 1861**
 1923 BPBM specimen (*Tanager Expedition*)
 1990 Kay
***Euchelus gemmatus* (Gould, 1845)**
 1923 BPBM specimen (*Tanager Expedition*)
 1990 Kay
 2000 NOW-RAMP
***Gibbula mamorea* (Pease, 1861)**
 1923 BPBM specimen (*Tanager Expedition*)
 1990 Kay
 2000 NOW-RAMP
 Family TROCHIDAE (TROCHINAE)
***Alcyna ocellata* Hickman & McLean, 1995**
 1923 BPBM specimen (*Tanager Expedition*)
 1990 Kay
 2000 NOW-RAMP
***Alcyna subangulata* Hickman & McLean, 1995**
 2000 NOW-RAMP
***Trochus intextus* Kiener, 1850**
 1923 BPBM specimen (*Tanager Expedition*)
 1990 Kay
 2000 NOW-RAMP
 Family TURBINIDAE (COLLONINAE)
***Collonista candida* (Hickman & McLean, 1995)**
 1923 BPBM specimen (*Tanager Expedition*)
 1990 Kay
 2000 NOW-RAMP
***Leptothyra rubricincta* (Mighels, 1845)**
 1923 BPBM specimen (*Tanager Expedition*)
 1990 Kay
 2000 NOW-RAMP
***Leptothyra* sp.**
 1923 BPBM specimen (*Tanager Expedition*)
***Leptothyra verruca* (Gould, 1845)**
 1923 BPBM specimen (*Tanager Expedition*)
 1990 Kay
 2000 NOW-RAMP
 Family TURBINIDAE (TURBININAE)
Turbo articulatus
 2000 NOW-RAMP
***Turbo sandwicensis* Pease, 1861**
 1923 BPBM specimen (*Tanager Expedition*)
 2000 NOW-RAMP
***Turbo* sp.**
 unknown BPBM specimen
 Family NERITIDAE (NERITINAE)
***Nerita picea* (Recluz, 1841)**
 1923 BPBM specimen (*Tanager Expedition*)
 Order NEOTAENIOGLOSSA
 Suborder DISCOPODA
 Family CERITHIIDAE
Bittium hiloensis
 1923 BPBM specimen (*Tanager Expedition*)
 1990 Kay
***Bittium impendens* (Hedley, 1899)**
 1923 BPBM specimen (*Tanager Expedition*)
 1990 Kay
 2000 NOW-RAMP
***Bittium* sp.**
 unknown BPBM specimen
***Bittium zebrum* (Kiener, 1841)**
 1923 BPBM specimen (*Tanager Expedition*)
 1990 Kay
 Cerithiidae
 2000 NOW-RAMP
***Cerithium columna* Sowerby, 1834**

new HI record

1923 BPBM specimen (*Tanager Expedition*)
 2000 NOW-RAMP
***Cerithium nesioticum* Pilsbry and Vanatta, 1905**
 1923 BPBM specimen (*Tanager Expedition*)
 1990 Kay
 2000 NOW-RAMP
***Cerithium placidum* Gould, 1861**
 2000 NOW-RAMP
***Cerithium* sp.**
 1923 BPBM specimen (*Tanager Expedition*)
 2000 NOW-RAMP
***Ittibittium parcum* (Houbrick, 1993)**
 2000 NOW-RAMP
***Pleisotrochus luteus* (Gould, 1861)**
 2000 NOW-RAMP
Pleisotrochus souverbianus
 1923 BPBM specimen (*Tanager Expedition*)
 1990 Kay
***Rhinoclavis sinensis* (Gmelin, 1791)**
 1923 BPBM specimen (*Tanager Expedition*)
 2000 NOW-RAMP
 Family DIALIDAE
***Cerithidium diplax* (Watson, 1886)**
 1923 BPBM specimen (*Tanager Expedition*)
 1990 Kay
 2000 NOW-RAMP
***Cerithidium perparvulum* (Watson, 1886)**
 2000 NOW-RAMP
***Cerithidium* sp. (cf. *interstriatum*) Sowerby, 1855**
 2000 NOW-RAMP
***Diala semistriata* (Philippi, 1845)**
 1923 BPBM specimen (*Tanager Expedition*)
 1990 Kay
 2000 NOW-RAMP
 Family MODULIDAE
***Modulus tectum* (Gmelin, 1791)**
 1923 BPBM specimen (*Tanager Expedition*)
 1990 Kay
 Family OBTORTIONIDAE
***Finella* sp.**
 2000 NOW-RAMP
 Family LITTORINIDAE (LITTORININAE)
***Littoraria pintado* (Wood, 1828)**
 1923 BPBM specimen (*Tanager Expedition*)
 2000 NOW-RAMP
Nodilittorina hawaiiensis
 1923 BPBM specimen (*Tanager Expedition*)
 Family CINGULOPSIDAE
***Rufodardanula ponderi* Kay, 1979**
 2000 NOW-RAMP
***Rufodardanula* sp. (cf. *ponderi*) Kay, 1979**
 2000 NOW-RAMP
 Family CAECIDAE
***Caecum sepimentum* de Folin, 1867**
 2000 NOW-RAMP
***Strebloceras subannulatum* de Folin, 1879**
 2000 NOW-RAMP
 Family RISSOIDAE (RISSOINAE)
***Alvinia isolata* (Laseron, 1956)**
 2000 NOW-RAMP
Alvinia kermadecansic
 1923 BPBM specimen (*Tanager Expedition*)
 1990 Kay
***Parashiela beetsi* Ladd, 1966**
 1923 BPBM specimen (*Tanager Expedition*)
 1990 Kay
 2000 NOW-RAMP
***Pusillina marmorata* Ponder, 1985**
 2000 NOW-RAMP
***Sansonina kenneyi* (Ladd, 1966)**
 1923 BPBM specimen (*Tanager Expedition*)

1990 Kay
 2000 NOW-RAMP
***Stosicia hiloense* Ponder, 1985**
 2000 NOW-RAMP
 Family RISSOIDAE (RISSOININAE)
***Merelina granulosa* (Pease, 1862)**
 1923 BPBM specimen (*Tanager Expedition*)
 1990 Kay
 2000 NOW-RAMP
***Merelina* sp.**
 2000 NOW-RAMP
***Merelina wanawana* Kay, 1979**
 2000 NOW-RAMP
***Pyramidelloides gracilis* Ponder, 1985**
 2000 NOW-RAMP
***Pyramidelloides miranda* (A. Adams, 1861)**
 2000 NOW-RAMP
***Rissoina ambigua* (Gould, 1849)**
 1923 BPBM specimen (*Tanager Expedition*)
 1990 Kay
 2000 NOW-RAMP
***Rissoina costata* A. Adams, 1851**
 1923 BPBM specimen (*Tanager Expedition*)
 1990 Kay
 2000 NOW-RAMP
***Rissoina mitozona* Tomlin, 1915**
 1923 BPBM specimen (*Tanager Expedition*)
 1990 Kay
 2000 NOW-RAMP
***Rissoina pulchella* (Brazier, 1877)**
 2000 NOW-RAMP
***Schwartziella ephamilla* Ponder, 1985**
 1923 BPBM specimen (*Tanager Expedition*)
 1990 Kay
 2000 NOW-RAMP
***Schwartziella triticae* Pease, 1861**
 1923 BPBM specimen (*Tanager Expedition*)
 1990 Kay
 2000 NOW-RAMP
***Zebina bidentata* (Philippi, 1845)**
 2000 NOW-RAMP
***Zebina* sp.**
 2000 NOW-RAMP
***Zebina tridentata* (Michaud, 1830)**
 1923 BPBM specimen (*Tanager Expedition*)
 1990 Kay
 2000 NOW-RAMP
 Family VITRINELLIDAE
***Cithna* sp.**
 1923 BPBM specimen (*Tanager Expedition*)
 1990 Kay
 Family STROMBIDAE
***Strombus maculatus* Sowerby, 1842**
 1923 BPBM specimen (*Tanager Expedition*)
 Family HIPPONICIDAE
***Hipponix (Antisabia) foliaceus* (Quoy and Gaimard, 1835)**
 1923 BPBM specimen (*Tanager Expedition*) (as *Hipponyx foliaceus*)
***Hipponix (Pilosabia) pilosus* (Deshayes, 1832)**
 1923 BPBM specimen (*Tanager Expedition*) (as *Hipponix pilosus*)
Hipponix australis
 2000 NOW-RAMP
***Hipponix* sp. (juv)**
 2000 NOW-RAMP
***Sabia conica* (Schumacher, 1817)**
 2000 NOW-RAMP
 Family CALYPTRAEIDAE
***Cheilea equestris* (Linnaeus, 1758)**
 unknown BPBM specimen
 Family VERMETIDAE
***Dendropoma* sp.**
 2000 NOW-RAMP

Eualetes tulipa (Chenu, 1843)
2000 NOW-RAMP

Serpulorbis sp.
2000 NOW-RAMP

Family CYPRAEIDAE

Cypraea alisoneae Burgess, 1983
2000 NOW-RAMP

Cypraea caputserpentis Linnaeus, 1758
1923 BPBM specimen (*Tanager* Expedition)

Cypraea carneola Linnaeus, 1758
1923 BPBM specimen (*Tanager* Expedition)

Cypraea fimbriata Gmelin, 1791
1923 BPBM specimen (*Tanager* Expedition)

Cypraea granulata Pease, 1863
1923 BPBM specimen (*Tanager* Expedition)

Cypraea helvola Linnaeus, 1758
1923 BPBM specimen (*Tanager* Expedition)
2000 NOW-RAMP

Cypraea isabella Linnaeus, 1758
1923 BPBM specimen (*Tanager* Expedition)
2000 NOW-RAMP

Cypraea maculifera Schilder, 1932
1923 BPBM specimen (*Tanager* Expedition)
2000 NOW-RAMP

Cypraea mauritiana Linnaeus, 1758
2000 NOW-RAMP

Cypraea schilderorum (Iredale, 1939)
1923 BPBM specimen (*Tanager* Expedition)

Cypraea scurra Gmelin, 1791
1923 BPBM specimen (*Tanager* Expedition)

Cypraea semiplota Mighels, 1845
1923 BPBM specimen (*Tanager* Expedition)

Cypraea sulcidentata Gray, 1824
1923 BPBM specimen (*Tanager* Expedition)

Cypraea teres Gmelin, 1791
1923 BPBM specimen (*Tanager* Expedition)

Cypraea tessellata Swainson, 1822
1923 BPBM specimen (*Tanager* Expedition)
2000 NOW-RAMP

Family ERATOIDAE

Erato sandwicensis Pease, 1860
2000 NOW-RAMP

Family TRIVIIDAE

Trivia edgari Shaw, 1909
2000 NOW-RAMP

Family NATICIDAE (POLINICINAE)

Polinices tumidus (Swainson, 1840)
1923 BPBM specimen (*Tanager* Expedition)

Family BURSIDAE

Bursa cruentata Sowerby, 1841
1923 BPBM specimen (*Tanager* Expedition)

Bursa granularis (Röding, 1798)
2000 NOW-RAMP

Family CASSIDAE (CASSINAE)

Cassis sp.
1923 BPBM specimen (*Tanager* Expedition)

Family CASSIDAE (PHALINAE)

Casmaria erinaceus kalosmodix (Melvill, 1883)
1923 BPBM specimen (*Tanager* Expedition)
2000 NOW-RAMP

Family PERSONIDAE

Distorsio anus (Linnaeus, 1758)
1923 BPBM specimen (*Tanager* Expedition)

Family RANELLIDAE (CYMATIINAE)

Charonia tritonis (Linnaeus, 1767)
1923 BPBM specimen (*Tanager* Expedition)
2000 NOW-RAMP

Cymatium (*Cymatium*) *nicobaricum* (Röding, 1798)
1923 BPBM specimen (*Tanager* Expedition) (as *Cymatium chlorostomum*)
2000 NOW-RAMP

Cymatium (*Septa*) *pileare* (Linnaeus, 1758)

1923 BPBM specimen (*Tanager Expedition*) (as *Cymatium pileare*)
 Family TONNIDAE
Malea pomum (Linnaeus, 1758)
 1923 BPBM specimen (*Tanager Expedition*)
Tonna melanostoma (Jay, 1839)
 1923 BPBM specimen (*Tanager Expedition*)
Tonna perdix (Linnaeus, 1758)
 1923 BPBM specimen (*Tanager Expedition*)
 2000 NOW-RAMP
 Suborder PTENOGLOSSA
 Family CERITHIOPSIDAE
Cerithiopsis sp. (cf. *arga*) Kay, 1979
 2000 NOW-RAMP
Cerithiopsis sp.2
 1923 BPBM specimen (*Tanager Expedition*)
 1990 Kay
Joculator sp.
 2000 NOW-RAMP
 unid. Cerithiopsidae
 2000 NOW-RAMP
 Family TRIPHORIDAE (DAPHNELLINAE)
 unid. Daphnellinae
 2000 NOW-RAMP
 Family TRIPHORIDAE (INIFORINAE)
Iniforis peleae (Baker and Spicer)
 2000 NOW-RAMP
 Family TRIPHORIDAE (MASTONIINAE)
Cautor intermissa (Laseron, 1958)
 2000 NOW-RAMP
Cautor similis (Pease, 1871)
 unknown BPBM specimen
Viriola flammulata (Pease, 1871)
 unknown BPBM specimen
Viriola sp. (cf. *fallax*) Kay, 1979
 2000 NOW-RAMP
 unid. Mastoninae
 2000 NOW-RAMP
 Family TRIPHORIDAE (TRIPHORINAE)
Triphora bicolor (Pease, 1868)
 unknown BPBM specimen
Triphora cingulifera
 unknown BPBM specimen (as *Triforis cingulifera*)
Triphora coralina (Laseron, 1958)
 2000 NOW-RAMP
Triphora peasi (Jousseume, 1884)
 2000 NOW-RAMP
Triphora cf. *triticea* (Pease, 1861)
 2000 NOW-RAMP
Triphora sp.1
 2000 NOW-RAMP
Triphora sp.2
 2000 NOW-RAMP
Triphora sp.3
 2000 NOW-RAMP
Triphora sp.4
 unknown BPBM specimen
 Family TRIPHORIDAE
 unid. Triphoridae sp.1
 2000 NOW-RAMP
 unid. Triphoridae sp.2
 2000 NOW-RAMP
 unid. Triphoridae sp.3
 2000 NOW-RAMP
 unid. Triphoridae sp.4
 2000 NOW-RAMP
 Family EPITONIIDAE
Parviscala cf. *paumotensis* (Pease, 1867)
 2000 NOW-RAMP
 Family JANTHINIDAE
Janthina janthina (Linnaeus, 1758)
 1923 BPBM specimen (*Tanager Expedition*)

- Family EULIMIDAE
- Balcis brunnimaculata* Kay, 1979
2000 NOW-RAMP
 - Balcis* cf. *inflexa* (Pease, 1868)
2000 NOW-RAMP
 - Balcis* sp.1
2000 NOW-RAMP
 - Balcis* sp.2
2000 NOW-RAMP
 - Balcis* sp.3
2000 NOW-RAMP
 - Melanella rafra*
1923 BPBM specimen (*Tanager Expedition*)
 - Scaleonostoma carinata* Deshayes, 1863
2000 NOW-RAMP
 - Trochostilifer* cf. *hawaiiensis* Waren, Burch & Burch,
2000 NOW-RAMP
- Family SCALIOLIDAE
- Scaliola glareosa* A. Adams, 1862
2000 NOW-RAMP
- Order NEOGASTROPODA
- Family BUCCINIDAE
- Caducifer decapitata* (Reeve, 1844)
1923 BPBM specimen (*Tanager Expedition*)
 - Pisania* sp.1
1923 BPBM specimen (*Tanager Expedition*)
 - Prodotia ignea* (Gmelin, 1791)
1923 BPBM specimen (*Tanager Expedition*)
2000 NOW-RAMP
 - Prodotia iostomus* (Gray in Griffiths and Pidgeon, 1834)
1923 BPBM specimen (*Tanager Expedition*)
- Family COLUMBELLIDAE
- Euplica varians* (Sowerby, 1832)
1923 BPBM specimen (*Tanager Expedition*)
 - Mitrella fusiformis* (Pease, 1868)
1923 BPBM specimen (*Tanager Expedition*)
1990 Kay
2000 NOW-RAMP
 - Seminella peasei* (von Martens & Langkaval 1871)
2000 NOW-RAMP
 - Seminella smithi* (Angas, 1877)
2000 NOW-RAMP
 - Seminella* sp. (juv.)
2000 NOW-RAMP
- Family CORALLIOPHILIDAE
- Coralliophila erosa* (Röding, 1798)
1923 BPBM specimen (*Tanager Expedition*)
2000 NOW-RAMP
 - Coralliophila violacea* (Kiener, 1836)
1923 BPBM specimen (*Tanager Expedition*)
2000 NOW-RAMP
 - Magilopsis lamarckii* (Deshayes, 1863)
2000 NOW-RAMP
 - Quoyula madreporarum* (Sowerby, 1834)
1923 BPBM specimen (*Tanager Expedition*)
- Family FASCIOLARIIDAE
- Latirus nodatus* (Gmelin, 1791)
1923 BPBM specimen (*Tanager Expedition*)
2000 NOW-RAMP
 - Peristernia chlorostoma* (Sowerby, 1825)
1923 BPBM specimen (*Tanager Expedition*)
2000 NOW-RAMP
- Family MURICIDAE
- Aspella producta* (Pease, 1861)
1923 BPBM specimen (*Tanager Expedition*)
2000 NOW-RAMP
 - Muricodrupa funiculus* (Wood, 1828)
1923 BPBM specimen (*Tanager Expedition*)
- Family NASSARIIDAE
- Nassarius gaudiosus* (Hinds, 1844)
1923 BPBM specimen (*Tanager Expedition*)

Nassarius hirtus (Kiener, 1834)
 1923 BPBM specimen (*Tanager Expedition*)

Family THAIDIDAE

Drupa (Drupa) morum Röding, 1798
 1923 BPBM specimen (*Tanager Expedition*)
 2000 NOW-RAMP

Drupa (Drupa) ricina (Linnaeus, 1758)
 1923 BPBM specimen (*Tanager Expedition*)
 2000 NOW-RAMP

Drupa (Drupina) grossularia (Röding, 1798)
 1923 BPBM specimen (*Tanager Expedition*)
 2000 NOW-RAMP

Drupa (Ricinella) rubusidaeus Röding, 1798
 1923 BPBM specimen (*Tanager Expedition*)
 2000 NOW-RAMP

Drupella ochrostoma (Blainville, 1832)
 2000 NOW-RAMP

Maculotriron bracteatus (Hinds, 1844)
 1923 BPBM specimen (*Tanager Expedition*)
 1990 Kay
 2000 NOW-RAMP

Morula dumosa (Conrad, 1837)
 1923 BPBM specimen (*Tanager Expedition*)
 2000 NOW-RAMP

Morula foliacea (Conrad, 1837)
 1923 BPBM specimen (*Tanager Expedition*)

Morula granulata (Duclos, 1832)
 1923 BPBM specimen (*Tanager Expedition*)
 2000 NOW-RAMP

Morula mitosa
 1923 BPBM specimen (*Tanager Expedition*)

Morula spinosa (H. and A. Adams, 1853)
 1923 BPBM specimen (*Tanager Expedition*)

Morula uva (Röding, 1798)
 1923 BPBM specimen (*Tanager Expedition*)
 2000 NOW-RAMP

Nassa sarta (Bruguère, 1789)
 1923 BPBM specimen (*Tanager Expedition*)

Purpura aperta (Blainville, 1832)
 1923 BPBM specimen (*Tanager Expedition*)

Thais armigera (Link, 1807)
 2000 NOW-RAMP

unid. Thaididae
 2000 NOW-RAMP

Family COSTELLARIIDAE

Vexillum (Costellaria) pacificum (Reeve, 1845)
 2000 NOW-RAMP

Vexillum (Pusia) cancellarioides (Anton, 1839)
 1923 BPBM specimen (*Tanager Expedition*) (as *Vexillum cancellarioides*)

Vexillum (Pusia) capricornea (Hedley, 1907)
 2000 NOW-RAMP

Vexillum sp.
 2000 NOW-RAMP

Family MARGINELLIDAE

Cystiscus huna Kay, 1979
 2000 NOW-RAMP

Dentimargo sp.
 2000 NOW-RAMP

Granula sandwicensis (Pease, 1860)
 1923 BPBM specimen (*Tanager Expedition*)
 1990 Kay
 2000 NOW-RAMP

Granula sp.
 2000 NOW-RAMP

Granulina vitrea (Laseron, 1957)
 2000 NOW-RAMP

Volvarina fusiformis (Hinds, 1844)
 2000 NOW-RAMP

Family MITRIDAE (IMBRICARIINAE)

Cancilla (Domiporta) cf. carnicolor (Reeve, 1844)
 2000 NOW-RAMP

Family MITRIDAE (MITRINAE)

Mitra (Mitra) coffea Schubert and Wagner, 1829
1923 BPBM specimen (*Tanager Expedition*) (as *Mitra coffea*)

Mitra (Mitra) stictica (Link, 1807)
1923 BPBM specimen (*Tanager Expedition*) (as *Mitra stictica*)

Mitra (Strigatella) litterata (Lamarck, 1811)
1923 BPBM specimen (*Tanager Expedition*) (as *Mitra literatus*)

Mitra sp.
1923 BPBM specimen (*Tanager Expedition*)

unid. Mitridae
2000 NOW-RAMP

Family OLIVIDAE

Oliva richerti Kay, 1979
2000 NOW-RAMP

Family CONIDAE

Conus abbreviatus Reeve, 1843
1923 BPBM specimen (*Tanager Expedition*)
2000 NOW-RAMP

Conus chaldaeus
1923 BPBM specimen (*Tanager Expedition*)

Conus flavidus Lamarck, 1810
1923 BPBM specimen (*Tanager Expedition*)
2000 NOW-RAMP

Conus lividus Hwass in Bruguière, 1792
1923 BPBM specimen (*Tanager Expedition*)
2000 NOW-RAMP

Conus pulicarius Hwass in Bruguière, 1792
1923 BPBM specimen (*Tanager Expedition*)

Conus rattus Hwass in Bruguière, 1792
2000 NOW-RAMP

Conus sponsalis Hwass in Bruguière, 1792
1923 BPBM specimen (*Tanager Expedition*)
2000 NOW-RAMP

Conus striatus Linnaeus, 1758
1923 BPBM specimen (*Tanager Expedition*)
2000 NOW-RAMP

Conus textile Linnaeus, 1758
1923 BPBM specimen (*Tanager Expedition*)
2000 NOW-RAMP

Conus vexillum Gmelin, 1791
1923 BPBM specimen (*Tanager Expedition*)

Conus sp.
2000 NOW-RAMP

Family TEREBRIDAE

Terebra affinis Gray, 1834
1923 BPBM specimen (*Tanager Expedition*)

Terebra chlorata Lamarck, 1822
1923 BPBM specimen (*Tanager Expedition*)

Terebra columelares Hinds, 1844
1923 BPBM specimen (*Tanager Expedition*)

Terebra crenulata (Linnaeus, 1758)
1923 BPBM specimen (*Tanager Expedition*)
2000 NOW-RAMP

Terebra felina (Dillwyn, 1817)
unknown BPBM specimen

Terebra guttata (Röding, 1798)
1923 BPBM specimen (*Tanager Expedition*)

Terebra sp.
2000 NOW-RAMP

Family TURRIDAE (CLAVININAE)

Carinapex minutissima (Garret, 1873)
2000 NOW-RAMP

Carinapex sp.
2000 NOW-RAMP

Family TURRIDAE (DAPHNELLINAE)

Kermia aniani Kay, 1979
2000 NOW-RAMP

Kermia cf. *bifaciata* (Pease, 1860)
2000 NOW-RAMP

Kermia sp.
2000 NOW-RAMP

Microdaphne trichodes (Dall, 1919)
 2000 NOW-RAMP
 Family TURRIDAE (MANGELIINAE)
Etrema acricula Hedley, 1922
 2000 NOW-RAMP
 unid. Mangeliinae
 2000 NOW-RAMP
 Family TURRIDAE (TURRINAE)
Xenurotarris cerithiformis Powell, 1964
 1923 BPBM specimen (*Tanager* Expedition)
 2000 NOW-RAMP
 Order HETEROSTROPHA
 Family ORBITESTELLIDAE
Orbitestella regina Kay, 1979
 2000 NOW-RAMP
 Family ARCHITECTONICIDAE
Heliacus mighelsi (Philippi, 1853)
 1923 BPBM specimen (*Tanager* Expedition)
 Family RISSOELLIDAE
Rissoella cf. confusa confusa Ponder and Yoo, 1977
 2000 NOW-RAMP
Rissoella longispira Kay, 1979
 2000 NOW-RAMP
Rissoella sp.1
 2000 NOW-RAMP
Rissoella sp.2
 2000 NOW-RAMP
Rissoella sp.3
 2000 NOW-RAMP
 Family OMALOGYRIDAE
Omalogyra japonica (Habe, 1972)
 2000 NOW-RAMP
 Family PYRAMIDELLIDAE
Herviera gliriella (Melvill and Standen, 1896)
 2000 NOW-RAMP
Odostomia cf. stearnsiella Pilsbry, 1918
 2000 NOW-RAMP
 unid. Pyramidellidae
 2000 NOW-RAMP
Turbonilla sp.
 2000 NOW-RAMP
Turbonilla cf. lirata (A. Adams, 1855)
 2000 NOW-RAMP
Turbonilla thaanumi Pilsbry and Vanatta, 1908
 2000 NOW-RAMP
 Subclass OPISTHOBANCHIA
 Order CEPHALASPIDEA
 Family HAMINEIDAE
Alys sea semistriata Pease, 1860
 2000 NOW-RAMP
Alys sea sp.
 2000 NOW-RAMP
Diniatys dentifer (A. Adams, 1850)
 2000 NOW-RAMP
Hamineoa sp.
 2000 NOW-RAMP
 Order ANASPIDEA
 Family APLYSIIDAE (APLYSIINAE)
Aplysia oculifera Adams and Reeve, 1850
 2000 NOW-RAMP
Aplysia parvula Guilding in Mörch, 1863
 2000 NOW-RAMP
Aplysia sp.
 2000 NOW-RAMP
 Family APLYSIIDAE (DOLABELLINAE)
Dolabella auricularia (Lightfoot, 1786)
 2000 NOW-RAMP
 Order NOTASPIDEA
 Family PLEUROBRANCHIDAE
Berthellina citrina (Ruppell and Leuckart, 1831)
 2000 NOW-RAMP

Pleurobranchus sp.
 2000 NOW-RAMP
 Order SACOGLOSSA
 Family JULIIDAE
Julia exquisita Gould, 1862
 2000 NOW-RAMP
 Family PLAKOBRANCHIDAE
Plakobranchus ocellatus van Hasselt, 1824
 2000 NOW-RAMP
 Family ELYSIIDAE
Thuridilla hoffae new HI record
 2000 NOW-RAMP
 Order NUDIBRANCHIA
 Family CHROMODORIDIDAE
Glossodoris atromarginata new HI record
 2000 NOW-RAMP
Risbecia imperialis
 2000 NOW-RAMP
 Family PHYLLIDIIDAE
Phyllidia pustulosa
 2000 NOW-RAMP
 Family DORIDIDAE (HALGERDINAE)
Halgerda terramtuentis
 2000 NOW-RAMP
 Family PTERAEOLIDIDAE
Pteraeolidia ianthina (Angas, 1864)
 2000 NOW-RAMP
 Subclass PULMONATA
 Order BASOMMATOPHORA
 Family SIPHONARIIDAE
Siphonaria sp.
 1923 BPBM specimen (*Tanager Expedition*)
Williamia radiata (Pease, 1861)
 1923 BPBM specimen (*Tanager Expedition*)
 1990 Kay
 2000 NOW-RAMP
 Class BIVALVIA
 Family MYTILIDAE
Brachidontes crebristriatus (Conrad, 1837)
 2000 NOW-RAMP
Dacryduim cf. *zebra* new HI record
 2000 NOW-RAMP
Lithophaga fasciola Dall, Bartsch, and Rehder, 1938
 2000 NOW-RAMP
Musculus aviarius Dall, Bartsch, and Rehder, 1938
 2000 NOW-RAMP
Septifer bryanae (Pilsbry, 1921)
 2000 NOW-RAMP
Septifer sp.1
 2000 NOW-RAMP
Septifer sp.2
 1923 BPBM specimen (*Tanager Expedition*)
 Family PHILOBRYIDAE
Cosa waikikia Dall, Bartsch, & Rehder, 1938
 2000 NOW-RAMP
 Family ARCIDAE (ANADARINAE)
Bentharca sp.
 2000 NOW-RAMP
Bentharca cf. *decorata* Hayami & Kase, 1993
 2000 NOW-RAMP
 Family ARCIDAE (ARCINAE)
Arca ventricosa Lamarck, 1819
 2000 NOW-RAMP
 unknown BPBM specimen
Arca sp.2
 1923 BPBM specimen (*Tanager Expedition*)
Arca sp.
 2000 NOW-RAMP
Barbatia (*Acar*) *plicata* (Dillwyn, 1817)
 1923 BPBM specimen (*Tanager Expedition*)
 1990 Kay

2000 NOW-RAMP
Barbatia divaricata Sowerby, 1833
 2000 NOW-RAMP
Barbatia nuttingi (Dall, Bartsch, and Rehder, 1938)
 2000 NOW-RAMP
Barbatia tenella Reeve, 1844
 2000 NOW-RAMP
Barbatia sp.
 2000 NOW-RAMP
 Family ISOGNOMONIDAE
Isognomon perna (Linnaeus, 1767)
 1923 BPBM specimen (*Tanager Expedition*)
 2000 NOW-RAMP
Isognomon sp.
 1923 BPBM specimen (*Tanager Expedition*)
 2000 NOW-RAMP
Pedalion anomioides
 1923 BPBM specimen (*Tanager Expedition*)
 Family MALLEIDAE
 unid. Malleidae sp.1
 2000 NOW-RAMP
 unid. Malleidae sp.2
 2000 NOW-RAMP
 Family PTERIIDAE
Pinctada cumingi
 1923 BPBM specimen (*Tanager Expedition*)
Pinctada margaritifera (Linnaeus, 1758)
 2000 NOW-RAMP
 Family PINNIDAE
Pinna muricata Linnaeus, 1758
 2000 NOW-RAMP
Streptopinna saccata (Linnaeus, 1758)
 1923 BPBM specimen (*Tanager Expedition*)
 2000 NOW-RAMP
 Family OSTREIDAE
Ostrea sp.1
 2000 NOW-RAMP
Ostrea sp.2
 1923 BPBM specimen (*Tanager Expedition*)
 unid. Ostreidae
 2000 NOW-RAMP
 Family PECTINIDAE
Chlamys coruscan hawaiiensis Dall, Bartsch, & Rehder, 1938
 2000 NOW-RAMP
Chlamys irregularis (Sowerby, 1842)
 1923 BPBM specimen (*Tanager Expedition*)
Laevichlamys irregularis (Sowerby, 1842)
 1923 BPBM specimen (*Tanager Expedition*)
 2000 NOW-RAMP
 Pectinidae (juv.) (cf. *Cryptopecten* sp.)
 2000 NOW-RAMP
 unid. Pectinidae
 2000 NOW-RAMP
 Family PROPEAMUSIIDAE
Chlamydella sp.
 2000 NOW-RAMP
 Family SPONDYLIDAE
Spondylus nicobaricus Schreibers, 1793
 2000 NOW-RAMP
Spondylus violacescens
 1923 BPBM specimen (*Tanager Expedition*)
 2000 NOW-RAMP
 Family ANOMIIDAE
Anomia nobilis Reeve, 1859
 2000 NOW-RAMP
 Family CHAMIDAE
Chama fibula Reeve, 1846
 2000 NOW-RAMP
Chama iostoma Conrad, 1837
 1923 BPBM specimen (*Tanager Expedition*)
 2000 NOW-RAMP

Family LUCINIDAE
 Codakia punctata (Linnaeus, 1758)
 1923 BPBM specimen (*Tanager Expedition*)
 Epicodakia sp.
 2000 NOW-RAMP
 Lucina sp.
 1923 BPBM specimen (*Tanager Expedition*) (as *Diplodonta* sp.)
 Family GASTROCHAENIDAE
 Gastrochaena (Rocellaria) cuneiformis Spengler, 1793
 2000 NOW-RAMP
 Family VENERIDAE
 Lioconcha hieroglyphica (Conrad, 1837)
 1923 BPBM specimen (*Tanager Expedition*)
 Periglypta reticulata (Linnaeus, 1758)
 1923 BPBM specimen (*Tanager Expedition*)
 2000 NOW-RAMP
 Family LASAEIDAE
 Lasaeidae (cf. *Kellia rosea*) Dall, Bartsch, & Rehder, 1938
 2000 NOW-RAMP
 unid. Lasaeidae sp.1
 2000 NOW-RAMP
 unid. Lasaeidae sp.2
 2000 NOW-RAMP
 Nesobornia bartschi Chavan, 1969
 2000 NOW-RAMP
 Family CARDIIDAE
 Fragum mundum (Reeve, 1845)
 2000 NOW-RAMP
 Trachycardium orbita (Sowerby, 1833)
 1923 BPBM specimen (*Tanager Expedition*)
 Family CARDITIDAE
 Cardita excisa Philippi, 1847
 1923 BPBM specimen (*Tanager Expedition*)
 Family CONDYLOCARDIIDAE
 Carditella hawaiiensis Dall, Bartsch, and Rehder, 1938
 1923 BPBM specimen (*Tanager Expedition*)
 1990 Kay
 2000 NOW-RAMP
 Family SEMELIDAE
 Semele australis (Sowerby, 1832)
 1923 BPBM specimen (*Tanager Expedition*)
 Family TELLINIDAE
 Tellina tithonia
 1923 BPBM specimen (*Tanager Expedition*)
 Family MESODESMATIDAE
 Rochefortina sandwichensis Hayami & Kase, 1993
 2000 NOW-RAMP
 Family GLOSSIDAE
 unid. Glossidae sp.1
 2000 NOW-RAMP
 Family TRAPEZIIDAE (MOLLUSCA)
 Trapezium oblongum (Linnaeus, 1758)
 1923 BPBM specimen (*Tanager Expedition*)
 Family NUCULIDAE
 Nucula sp.
 2000 NOW-RAMP
 Class CEPHALOPODA
 Order OCTOPODA
 Family OCTOPODIDAE
 Octopus cyanea Gray, 1849
 2000 NOW-RAMP
 Class POLYPLACOPHORA
 Order CHITONID
 Family ISCHNOCHITONIDAE
 Ischnochiton sp.
 2000 NOW-RAMP
 Phylum ARTHROPODA
 Class PYCNOGONIDA
 Order PANTOPODA
 Family AMMOTHEIDAE
 Achelia nana

2000 NOW-RAMP
 Family PHOXICHILIDIIDAE
 Anoplodactylus marshallensis Child new HI record
 2000 NOW-RAMP
 Family RHYNCHOTHORAXIIDAE
 Rhynchothorax mediterraneus new HI record
 2000 NOW-RAMP
 Class MAXILLOPODA
 Subclass CIRRIPIEDIA
 Order THORACICA
 Family CHTHAMALIDAE
 Nesochthamalus intertetus (Darwin, 1854)
 2000 NOW-RAMP
 Family BALANIDAE
 Balanus reticulatus Utinomi nonindigenous
 2000 NOW-RAMP 2000
 Megabalanus tanagrae (Pilsbry, 1928)
 1923 BPBM-B 202 (*Tanager* Expedition) (as *Balanus tintinnabulum*)
 2000 NOW-RAMP
 Subclass COPEPODA
 Order CALIGOIDA
 Family CALIGOIDA
 Alebion gracilis
 1923 BPBM-S 1320 (*Tanager* Expedition)
 Class MALACOSTRACA
 Subclass HOPLOCARIDA
 Order STOMATOPODA
 Family PSEUDOSQUILLIDAE
 Pseudosquilla oculata (Brulle, 1837)
 1923 BPBM-S 1321 (*Tanager* Expedition) (as *Pseudosquilla oculata*)
 Subclass EUMALACOSTRACA
 Superorder PERACARIDA
 Order AMPHIPODA
 Suborder GAMMARIDEA
 Family AMPELISCIDAE
 Ampelisca sp.1 new HI record
 2000 NOW-RAMP
 Family AMPHILOCHIDAE
 Amphilocheus menhune Barnard, 1970
 2000 NOW-RAMP
 Gitana liliuokalaniae Barnard, 1970
 2000 NOW-RAMP
 Gitanopsis pele Barnard, 1970
 2000 NOW-RAMP
 Family AMPITHOIDAE
 Ampithoe kaneohe Barnard, 1970
 2000 NOW-RAMP
 Ampithoe ramondi Audouin, 1826
 2000 NOW-RAMP
 Ampithoe sp.1 new HI record
 2000 NOW-RAMP
 Ampithoe spp.
 2000 NOW-RAMP
 Ampithoe waialua Barnard, 1970
 2000 NOW-RAMP
 Family ANAMIXIDAE
 Anamixis moana Thomas, 1997
 2000 NOW-RAMP
 Family AORIDAE
 Aoroides columbiae Walker, 1898
 2000 NOW-RAMP
 Aoroides nahili Barnard, 1970
 2000 NOW-RAMP
 Bemlos intermedius Schellenberg, 1938
 2000 NOW-RAMP
 Bemlos macromanus Shoemaker, 1925
 2000 NOW-RAMP
 Bemlos sp.1 new HI record
 2000 NOW-RAMP
 Bemlos sp.2 new HI record
 2000 NOW-RAMP

Bemlos waipio Barnard, 1970
 2000 NOW-RAMP

Globosolembos ovatus (Myers, 1985)
 2000 NOW-RAMP new HI record

Lembos virgus Myers, 1985
 2000 NOW-RAMP new HI record

Family COLOMASTIGIDAE
Colomastix lunalilo Barnard, 1970
 2000 NOW-RAMP

Family COROPHIIDAE
Erichthonius brasiliensis (Dana, 1853)
 2000 NOW-RAMP

Family DEXAMINIDAE
Paradexamine (Waialele) maunaloa Barnard, 1970
 2000 NOW-RAMP

Family EUSIRIDAE
Eursiroides diplonyx Walker, 1904
 2000 NOW-RAMP

Family GAMMARIDAE
Nuuanu amikai Barnard, 1970
 2000 NOW-RAMP

Family ISAEIDAE
Chevalia aviculae Walker, 1904
 2000 NOW-RAMP

Gammaropsis abbotti
 2000 NOW-RAMP new HI record

Gammaropsis afra Stebbing, 1888
 2000 NOW-RAMP

Gammaropsis atlantica Stebbing, 1888
 2000 NOW-RAMP

Gammaropsis sp.1
 2000 NOW-RAMP new HI record

Gammaropsis sp.2
 2000 NOW-RAMP new HI record

Gammaropsis spp.
 2000 NOW-RAMP

Photis hawaiiensis Barnard, 1955
 2000 NOW-RAMP

Family ISCHYROCERIDAE
Leucothoe hyhelia Barnard, 1965
 2000 NOW-RAMP

Leucothoe micronesiae Barnard, 1965
 2000 NOW-RAMP

Leucothoe sp.1
 2000 NOW-RAMP new HI record

Leucothoe sp.2
 2000 NOW-RAMP new HI record

Leucothoe tridens Stebbing, 1888
 2000 NOW-RAMP

Leucothoides pottsi Shoemaker, 1933
 2000 NOW-RAMP new HI record

Notopoma n.sp.
 2000 NOW-RAMP

Ventojassa ventosa Barnard, 1962
 2000 NOW-RAMP

Family LILJEBORGIIDAE
Liljeborgia heeia Barnard, 1970
 2000 NOW-RAMP

Family LYSIANASSIDAE
Lysianassa ewa Barnard, 1970
 2000 NOW-RAMP

Family MELITIDAE
Ceradocus hawaiiensis Barnard, 1955
 2000 NOW-RAMP

Elasmopus diplonyx Schellenberg, 1938
 2000 NOW-RAMP

Elasmopus hawaiiensis Schellenberg, 1938
 2000 NOW-RAMP

Elasmopus hooheno Barnard, 1970
 2000 NOW-RAMP

Elasmopus molokai Barnard, 1970

2000 NOW-RAMP
Elasmopus pocillimanus (Bate, 1862)
 2000 NOW-RAMP
Elasmopus rapax Costa, 1853
 2000 NOW-RAMP
Maera pacifica Schellenberg, 1938
 2000 NOW-RAMP
Maera quadrimana (Dana, 1853)
 2000 NOW-RAMP
Maera sp.1 new HI record
 2000 NOW-RAMP
Maera sp.2 new HI record
 2000 NOW-RAMP
Mallacoota sp. new HI record
 2000 NOW-RAMP
 Family OCHELESIDAE
Ochlesis alii Barnard, 1970
 2000 NOW-RAMP
 Family OEDICEROTODAE
Kanaloa manoa Barnard, 1970
 2000 NOW-RAMP
 Family PHLIANTIDAE
Pereionotus alaniphlias Barnard, 1970 new HI record
 2000 NOW-RAMP
 Family PODOCERIDAE
Podocerus brasiliensis Dana, 1853
 2000 NOW-RAMP
Podocerus hanapepe Barnard, 1970
 2000 NOW-RAMP
 Family STENOTHOIDAE
Stenothoe valida Dana, 1853
 2000 NOW-RAMP
 Order ISOPODA
 Suborder GNATHIIDEA
 Family GNATHIIDAE
Gnathia n.sp.
 2000 NOW-RAMP
 Suborder ANTHURIDEA
 Family ANTHURIDAE
Mesanthura hieroglyphica Miller and Menzies, 1952
 2000 NOW-RAMP
Panathura cf. collaris
 2000 NOW-RAMP
Pendanthura n.sp. new HI record
 2000 NOW-RAMP
 Family EXPANATHURIDAE
Eisothistos n.sp. new HI record
 2000 NOW-RAMP
 Family LEPTANTHURIDAE
Leptanthura n.sp. new HI record
 2000 NOW-RAMP
 Family PARANTHURIDAE
Colanthura n.sp. new HI record
 2000 NOW-RAMP
Paranthura bellicauda Miller and Menzies, 1952
 1979 BPBM-S 10105
 2000 NOW-RAMP
 Suborder ASELOTA
 Family GNATHOSTENETROIDIDAE
Marsiella n.sp. new HI record
 2000 NOW-RAMP
 Family JANIRIDAE
Bagatus algicola Miller, 1941
 2000 NOW-RAMP
 Family JOEROPSIDAE
Joeropsis hawaiiensis Miller, 1941
 2000 NOW-RAMP
 Family MUNNIDAE
Munna acarina Miller, 1941
 2000 NOW-RAMP
Munna n.sp.

2000 NOW-RAMP
 Family SANTIIDAE
 Santia n.sp. new HI record
 2000 NOW-RAMP
 Family STENETRIIDAE
 Stenetrium medipacifica Miller, 1941
 2000 NOW-RAMP

Superorder EUCARIDA
 Order DECAPODA
 Suborder DENDROBRANCHIATA
 Family PENAEIDAE
 Melicertus marginatus (Randall, 1840)
 1923 BPBM-S 1314 (*Tanager* Expedition) (as *Penaeus marginatus*)

Suborder PLEOCYEMATA
 Infraorder STENOPODIDEA
 Family STENOPODIDAE
 Stenopus hispidus (Olivier, 1811)
 2000 NOW-RAMP

Infraorder CARIDEA
 Family STYLODACTYLIDAE
 Neostylodactylus littoralis new HI record
 2000 NOW-RAMP

Family NEMATOCARCINIDAE
 Nematocarcinus gracilis Bate, 1888
 1902 Rathbun, 1906

Family RHYNCHOCINETIDAE
 Rhynchocinetes rathbunae Okuno, 1996
 1902 Rathbun, 1906

Family GNATHOPHYLLIDAE
 Gnathophylloides mineri Schmitt, 1933
 2000 NOW-RAMP
 Gnathophyllum americanum Guerin-Meneville, 1856
 2000 NOW-RAMP
 Levicaris sp.
 1981 BPBM specimen (as *Coralliocaris* sp.)

Family PALAEMONIDAE (PONTONIINAE)
 Conchodytes tridacnae Peters, 1852
 1923 BPBM-S 1313 (*Tanager* Expedition)
 Harpiliopsis depressa (Stimpson, 1860)
 1923 BPBM-S 1319 (*Tanager* Expedition) (as *Harpiliopsis depressus*)
 Harpiliopsis spinigera new HI record
 2000 NOW-RAMP
 Onycocaris quadratophthalma (Balss, 1921)
 2000 NOW-RAMP
 Onycocaris sp. nov. new HI record
 2000 NOW-RAMP
 Palaemonella lata Kemp, 1922
 2000 NOW-RAMP
 Periclimenaeus quadridentatus (Rathbun, 1906)
 2000 NOW-RAMP
 Periclimenaeus sp.
 2000 NOW-RAMP
 Periclimenes cf. *diversipes* new HI record
 2000 NOW-RAMP
 unid. Pontoniinae
 2000 NOW-RAMP

Family ALPHEIDAE
 Alpheus clypeatus Coutiere, 1905
 1923 BPBM-S 1316 (*Tanager* Expedition)
 2000 NOW-RAMP
 Alpheus collumianus Stimpson, 1860
 2000 NOW-RAMP
 Alpheus deuteropus Hilgendorf, 1878
 1923 BPBM-S 1798 (*Tanager* Expedition)
 Alpheus lottini Guerin, 1829
 1923 BPBM-S 1315 (*Tanager* Expedition) (as *Alpheus ventrosa*)
 Metalpheus hawaiiensis (Edmondson, 1925)
 2000 NOW-RAMP
 Metalpheus paragracilis Coutiere, 1897
 1923 BPBM-S 1317 (*Tanager* Expedition) (as *Alpheus paragracilis*)
 2000 NOW-RAMP

Synalpheus paraneomeris Coutiere, 1905
 1923 BPBM-S 1318 (*Tanager Expedition*)
 2000 NOW-RAMP
 Family HIPPOLYTIDAE
Lysmata trisetacea (Heller, 1861)
 1923 BPBM-S 1311 (*Tanager Expedition*) (as *Lysmata paucidens*)
Saron marmoratus (Olivier, 1811)
 1923 BPBM-S 1310 (*Tanager Expedition*)
Thor amboinensis (de Man, 1888)
 2000 NOW-RAMP
Thor sp.
 2000 NOW-RAMP
Thorina maldivensis (Borradaile, 1915)
 2000 NOW-RAMP
 Family PANDALIDAE
Chlorocurtis jactans (Nobili, 1904) new HI record
 2000 NOW-RAMP
Heterocarpus laevigatus Bate, 1888
 1902 Rathbun, 1906
 Suborder REPTANTIA
 Infraorder BRACHYURA
 Family RANINIDAE
Notosceles viaderi Ward, 1942
 1979 BPBM-S 10609
 Family CRYPTOCHIRIDAE
Hapalocarcinus marsupialis Stimpson, 1859
 1981 BPBM-S 10042
 Family GRAPSIDAE
Cyclograpsus henshawi Rathbun, 1902
 1982 BPBM-S 10044
Grapsus tenuicrustatus (Herbst, 1783)
 1981 BPBM-S 10038
Grapsus sp.
 1984 BPBM-S 10583
Pachygrapsus minutus A. Milne Edwards, 1873
 1923 BPBM-S 1279 (*Tanager Expedition*)
 2000 NOW-RAMP
Pachygrapsus planifrons de Man, 1888
 1982 BPBM-S 10043
Percnon abbreviatum (Dana, 1851)
 2000 NOW-RAMP
 Family OCYPODIDAE
Ocypode ceratophthalmus (Pallas, 1772)
 1923 BPBM-S 1278 (*Tanager Expedition*)
Ocypode pallidula Jacquinot,
 1984 BPBM-S 10582
 Family PORTUNIDAE
Portunus granulatus (H. Milne Edwards, 1834)
 2000 NOW-RAMP
Thalamita picta Stimpson, 1858
 1923 BPBM-S 1305 (*Tanager Expedition*)
 2000 NOW-RAMP
Thalamita sp.
 1981 BPBM-S 10039
Thalamita sp. juv.
 2000 NOW-RAMP
 Family CARPILIIDAE
Carpilius convexus (Forskal, 1775)
 1923 BPBM-S 1323 (*Tanager Expedition*)
 Family PILUMNIDAE
Pilumnus acutifrons Rathbun, 1906
 1902 Rathbun, 1906
Pilumnus longicornis Hilgendorf, 1878
 2000 NOW-RAMP
 Family TRAPEZIIDAE
Domecia hispida Eydoux and Souleyet, 1842
 1923 BPBM-S 1299 (*Tanager Expedition*)
 1978 BPBM-S 10659 (as *Domecia glabra*)
Jonesius triunguiculatus (Borradaile, 1902)
 2000 NOW-RAMP
Tetralia sp.

2000 NOW-RAMP
Trapezia ferruginea Latreille, 1825
 2000 NOW-RAMP
Trapezia intermedia Miers, 1886
 1902 Rathbun, 1906 (as *Grapsillus ferrugineus intermedius*)
 1923 BPBM-S 1298 (*Tanager Expedition*)
Trapezia sp.
 1981 BPBM-S 10040
 Family XANTHIDAE
Actaea parvula (Krauss, 1843)
 1923 BPBM-S 1784 (*Tanager Expedition*)
Chlorodiella cytherea Dana, 1852
 1923 BPBM-S 1295 (*Tanager Expedition*) (as *Chlorodiella niger*)
Chlorodiella laevis (Dana, 1852)
 2000 NOW-RAMP
Liocarpilodes integerrimus Dana, 1852
 2000 NOW-RAMP
Liomera bella (Dana, 1852)
 1923 BPBM specimen (*Tanager Expedition*) (as *Carpilodes bellus*)
Liomera n.sp. new HI record
 2000 NOW-RAMP
Liomera rugata (H. Milne Edwards, 1834)
 1923 BPBM specimen (*Tanager Expedition*) (as *Carpilodes rugatus*)
Liomera supernodosa Rathbun, 1906
 1923 BPBM specimen (*Tanager Expedition*) (as *Carpilodes supernodosus*)
Lophozozymus dodone (Herbst, 1801)
 1923 BPBM-S 1290 (*Tanager Expedition*)
Lophozozymus intonsus
 1923 BPBM-S 1291 (*Tanager Expedition*)
Lophozozymus pulchellus A. Milne Edwards, 1867
 1923 BPBM-S 1289 (*Tanager Expedition*)
Lophozozymus sp. possible new HI record
 2000 NOW-RAMP
Lybia edmondsoni Takeda and Miyake, 1970
 1923 BPBM-S 1300 (*Tanager Expedition*) (as *Lybia tessellata*)
Medaeus elegans A. Milne Edwards, 1867
 1923 BPBM-S 1292 (*Tanager Expedition*)
Paractaea rufopunctata Guinot, 1969
 1923 BPBM-S 1285 (*Tanager Expedition*) (as *Actea rufopunctata*)
Paraxanthias notatus (Dana, 1852)
 1923 BPBM-S 1294 (*Tanager Expedition*)
 2000 NOW-RAMP
Paraxanthias sp. possible new HI record
 2000 NOW-RAMP
Phymodius nitidus (Dana, 1852)
 1923 BPBM-S 1296 (*Tanager Expedition*)
 2000 NOW-RAMP
Pilodius areolatus (H. Milne Edwards, 1834)
 1923 BPBM-S 1283 (*Tanager Expedition*) (as *Chlorodopsis areolata*)
 2000 NOW-RAMP
Pilodius flavus Rathbun, 1893
 1902 Rathbun, 1906
 1923 BPBM-S 1287 (*Tanager Expedition*)
 2000 NOW-RAMP
Pilodius sp. possible new HI record
 2000 NOW-RAMP
Platypodia actoeoides (A. Milne Edwards, 1867)
 1923 BPBM-S 1288 (*Tanager Expedition*)
Platypodia n.sp. new HI record
 2000 NOW-RAMP
Pseudoliomera helleri
 2000 NOW-RAMP
Pseudoliomera variolosa (Borradaile, 1902)
 1923 BPBM-S 1286 (*Tanager Expedition*) (as *Actea variolosa*)
 2000 NOW-RAMP
Tweedieia laysani (Rathbun, 1906)
 1923 BPBM specimen (*Tanager Expedition*) (as *Phymodius laysani*)
 2000 NOW-RAMP
Xanthias canaliculatus Rathbun, 1906
 1923 BPBM-S 1293 (*Tanager Expedition*)
Xanthias pachydactylus new HI record

- 2000 NOW-RAMP
 Family DROMIIDAE
Cryptodromiopsis tridens (Lewinsohn, 1984)
 2000 NOW-RAMP
 Family DYNOMENIIDAE
Dynomene hispida Guerin-Meneville, 1832
 2000 NOW-RAMP
 Family MAJIDAE
Achaeus superciliaris Ortman, 1893
 1923 BPBM-S 1284 (*Tanager Expedition*) (as *Actea superciliaris*)
Huenia proteus De Haan, 1839
 1902 Rathbun, 1906
Hyastenus tenuicornis (Pocock, 1895)
 1902 Rathbun, 1906
Micippa parca Alcock, 1895
 1902 Rathbun, 1906
Perinea tumida Dana, 1852
 1923 BPBM-S 1301 (*Tanager Expedition*)
 2000 NOW-RAMP
 unid. Majidae
 2000 NOW-RAMP
 Family PARTHENOPIDAE
Daldorfia dimorpha PARATYPE
 1923 BPBM-S 1302 (*Tanager Expedition*)
 Family AETHRIDAE
Actaeomorpha erosa Miers, 1878
 1981 BPBM-S 12053
 2000 NOW-RAMP
 Family CALAPPIDAE
Calappa gallus (Herbst, 1803)
 1923 BPBM-S 1303 (*Tanager Expedition*)
 1981 BPBM-S 10036
Calappa hepatica (Linnaeus, 1758)
 1981 BPBM-S 10035
 Infraorder THALASSINIDEA
 Family AXIIDAE
Axius (Paraxius) tridens
 1902 Rathbun, 1906
 Infraorder PALINURIDEA
 Family PALINURIDAE
Panulirus marginatus (Quoy & Gaimard, 1825)
 1961 BPBM-S 7811
Panulirus penicillatus (Oliver, 1791)
 2000 NOW-RAMP
 Family SCYLLARIDAE
Paribacus antarcticus (Lund, 1793)
 1948 BPBM-S 6156
 Infraorder ANOMURA
 Family DIOGENIDAE
Calcinus elegans Milne Edwards, 1836
 1923 BPBM-S 1308 (*Tanager Expedition*)
Calcinus guamensis Wooster, 1982
 2000 NOW-RAMP
Calcinus latens (Randall, 1839)
 1923 BPBM-S 1307 (*Tanager Expedition*)
Calcinus laurentae
 2000 NOW-RAMP
Ciliopagurus strigatus
 1923 BPBM-S 1309 (*Tanager Expedition*) (as *Aniculus strigatus*)
Dardanus gemmatus
 2000 NOW-RAMP
Dardanus haani
 1923 BPBM-S 1277 (*Tanager Expedition*) (as *Pagurus haani*)
Dardanus sanguinocarpus
 1923 BPBM-S 1814 (*Tanager Expedition*)
 2000 NOW-RAMP
Dardanus sp.
 1981 BPBM-S 10037
Dardanus sulcatus PARATYPE
 1923 BPBM-S 1815 (*Tanager Expedition*)
 Family PAGURIDAE

Pylopaguropsis keijii McLaughlin & Haig, 1989 PARATYPE
 1923 BPBM-S 1817 (*Tanager Expedition*) (as *Pylopagurus keijii*)
 Family GALATHEIDAE
Galathea spinosorostris Dana, 1852
 1923 BPBM-S 1312 (*Tanager Expedition*)
 2000 NOW-RAMP
 Family PORCELLANIDAE
Pachycheles pisoides (Heller, 1865)
 1923 BPBM-S 1304 (*Tanager Expedition*)
 2000 NOW-RAMP
 Family HIPPIDAE
Hippa pacifica (Dana, 1852)
 1923 BPBM-S 1306 (*Tanager Expedition*)

Phylum ECTOPROCTA

UNID. BRYOZOAN

unid. encrusting A
 2000 NOW-RAMP

unid. encrusting B
 2000 NOW-RAMP

Class GYMNOLEAEMATA

Order CHEILOSTOMATA

Suborder ANASCA

Family BEANIIDAE
Beania discodermiae (Ortmann, 1890)
 2000 NOW-RAMP

Family BUGULIDAE
Bugula philippae? possible new HI record
 2000 NOW-RAMP
Bugula vectifera? possible new HI record
 2000 NOW-RAMP
Bugula sp.
 2000 NOW-RAMP
Holoporella aperta (Hincks, 1882)
 2000 NOW-RAMP
Schismopora cf. spathulata (MacGillivray, 1887)
 2000 NOW-RAMP

Family CHEILOPORINIDAE
Cheiloporina haddoni (Harmer, 1902)
 2000 NOW-RAMP
 unid. cheilostome possible new HI record
 2000 NOW-RAMP

Family CHORIZOPORIDAE
Rhamphostomella argentea (Hincks, 1881)
 2000 NOW-RAMP

Family SCRUPOCELLARIIDAE
Caberia boryi (Audouin, 1826)
 2000 NOW-RAMP
Cleidochasma laterale
 2000 NOW-RAMP
Scrupocellaria maderensis Busk, 1860
 2000 NOW-RAMP

Family HIPPOPODINIDAE
Cosciniopsis fusca Canu and Bassler, 1927
 2000 NOW-RAMP

Family MARGARETTIDAE
Margaretta gracilior? possible new HI record
 2000 NOW-RAMP

Family MICROPORELLIDAE
Microporella orientalis Harmer, 1957
 2000 NOW-RAMP

Family SCHIZOPORELLIDAE
Schizomavella cf. torquata possible new HI record
 2000 NOW-RAMP
Schizoporella cf. errata
 2000 NOW-RAMP
Schizoporella decorata Canu and Bassler, 1927
 2000 NOW-RAMP

Family SERTELLIDAE
Calypotheca cf. suluensis possible new HI record
 2000 NOW-RAMP
Reteporellina denticulata (Busk, 1884)

2000 NOW-RAMP
Rhynchozoon sp.
 2000 NOW-RAMP
 Family SMITTINIDAE
Parasmittina sp.
 2000 NOW-RAMP
 unid. Smittinidae possible new HI record
 2000 NOW-RAMP
 Family TETRAPLARIIDAE
Tetraplaria ventricosa (Haswell, 1880)
 2000 NOW-RAMP
 Family WATERSIPORIDAE
Watersipora edmondsoni Soule and Soule, 1968
 2000 NOW-RAMP
 Family MICROPORIDAE
Caleschara levinseni
 2000 NOW-RAMP
Caleschara sp. possible new HI record
 2000 NOW-RAMP
 Family STEGINOPORELLIDAE
Steginoporella magnilabris (Busk, 1854)
 2000 NOW-RAMP
 Family THALAMOPORELLIDAE
Thalamoporella stapifera (Levinsen, 1909)
 2000 NOW-RAMP
 Family SCRUPARIIDAE
Scruparia sp.? possible new HI record
 2000 NOW-RAMP
 Class STENOLAEMATA
 Order CYCLOSTOMATA
 Suborder ARTICULATA
 Family CRISIIDAE
Crisia sp. possible new HI record
 2000 NOW-RAMP
Crisina radians (Lamarck, 1816)
 2000 NOW-RAMP
Crisina sp.1 possible new HI record
 2000 NOW-RAMP
 Family LICHENOPORIDAE
Disporella sp. possible new HI record
 2000 NOW-RAMP
Disporella violacea (Canu and Bassler, 1927)
 2000 NOW-RAMP
 Family TUBULIPORIDAE
Tubulipora atlantica? possible new HI record
 2000 NOW-RAMP
Tubuliporina sp.? possible new HI record
 2000 NOW-RAMP
 Phylum ECHINODERMATA
 Class ASTEROIDEA
 Order PAXILLOSIDA
 Family ASTROPECTINIDAE
Astropecten polyacanthus Muller and Troschel, 1842
 1923 BPBM specimen (*Tanager Expedition*)
 Order VALVATIDA
 Family ACANTHASTERIDAE
Acanthaster planci Linnaeus, 1758
 2000 NOW-RAMP
 Family MITHRODIIDAE
Mithrodia fisheri Holly, 1932
 1923 BPBM-S 716 (*Tanager Expedition*)
 2000 NOW-RAMP
 Family OREASTERIDAE
Culcita novaeguineae Muller and Troschel, 1842
 2000 NOW-RAMP
 Family OPHIDIASTERIDAE
Leiaster sp.
 2000 NOW-RAMP
Linckia guildingi Gray, 1840
 2000 NOW-RAMP
Linckia multifora (Lamarck, 1816)

Class ECHINOIDEA

Order CIDAROIDA

Family CIDARIDAE

Actinocidaris thomasi (Agassiz and Clark, 1907)
2000 NOW-RAMP

Eucidaris metularia Lamarck, 1816
1923 BPBM-W 294 (*Tanager Expedition*)
2000 NOW-RAMP

Order DIADEMATOIDA

Family DIADEMATIDAE

Diadema paucispinum Agassiz, 1863
1902 Clark, 1949

Echinothrix calamaris (Pallas, 1774)
2000 NOW-RAMP

Echinothrix diadema (Linnaeus, 1758)
2000 NOW-RAMP

Order PHYMOSOMATOIDA

Family ARBACIIDAE

Habrocidaris argentea Agassiz and Clark, 1907
1902 Clark, 1949

Order TEMNOPLEUROIDA

Family TOXOPNEUSTIDAE

Cyrtechinus verruculatus (Lutken, 1864)
1902 Clark, 1949

Pseudoboletia indiana (Michelin, 1862)
1902 Clark, 1949

Tripneustes gratilla (Linnaeus, 1758)
1923 BPBM-W 220 (*Tanager Expedition*)
2000 NOW-RAMP

Order ECHINOIDA

Family ECHINOMETRIDAE

Colobocentrotus atratus (Linnaeus, 1758)
1923 BPBM-W 229 (*Tanager Expedition*)

Echinometra mathaei (Blainville, 1825)
1923 BPBM-W 237 (*Tanager Expedition*)
2000 NOW-RAMP

Echinometra oblonga (Blainville, 1825)
1923 BPBM-W 257 (*Tanager Expedition*)
2000 NOW-RAMP

Echinostrephus aciculatus Agassiz, 1863
1902 Clark, 1949
2000 NOW-RAMP

Heterocentrotus mammillatus (Linnaeus, 1758)
1923 BPBM-W 206 (*Tanager Expedition*)
2000 NOW-RAMP

Family ECHINONEIDAE

Echinoneus cyclostomus Leske, 1778
1923 BPBM-W 254 (*Tanager Expedition*)
2000 NOW-RAMP

Order CLYPEASTEROIDA

Family FIBULARIIDAE

Echinocyamus sp.
1981 BPBM-W 3078

Mortonia australis (Desmoulins, 1837)
1981 BPBM specimen

Order SPATANGOIDA

Family BRISSIDAE

Brissus latecarinatus (Leske, 1778)
1923 BPBM-W 219 (*Tanager Expedition*)
1981 BPBM-W 2999
unknown BPBM-W 502

Class HOLOTHUROIDEA

Order ASPIDOCHIROTIDA

Family HOLOTHURIIDAE

Actinopyga mauritiana (Quoy and Gaimard, 1833)
2000 NOW-RAMP

Actinopyga obesa (Selenka, 1867)
2000 NOW-RAMP

Bohadschia paradoxa (Selenka, 1867)
2000 NOW-RAMP

Holothuria (Halodeima) atra Jaeger, 1833

2000 NOW-RAMP
Holothuria (Mertensiothuria) fuscrobura Theel, 1886
 1902 Clark, 1949 (as *Holothuria fuscrobura*)
Holothuria (Microthele) whitmaei Bell, 1887
 2000 NOW-RAMP
Holothuria (Semperothuria) cinerascens (Brandt, 1835)
 2000 NOW-RAMP
Holothuria (Thymiosycia) hilla Lesson, 1830
 1902 Clark, 1949 (as *Holothuria monacaria*)
 1923 BPBM-W 403 (*Tanager Expedition*) (as *Holothuria hilla*)
 2000 NOW-RAMP
Holothuria (Thymiosycia) impatiens (Forsk., 1775)
 2000 NOW-RAMP
Holothuria sp.1
 1981 BPBM-W 3001
Holothuria sp.2
 2000 NOW-RAMP

possible new HI record

Phylum CHORDATA

Class ASCIDIACEA

Order ENTEROGONA

Suborder APLOUSOBRANCHIA

Family DIDEMNIDAE

beige didemnid #1
 2000 NOW-RAMP
 beige didemnid #2
 2000 NOW-RAMP
 black didemnid #1
 2000 NOW-RAMP
 gray didemnid #1
 2000 NOW-RAMP
 gray didemnid #2
 2000 NOW-RAMP
 gray didemnid #3
 2000 NOW-RAMP
 gray didemnid #4
 2000 NOW-RAMP
 green didemnid
 2000 NOW-RAMP
 purple didemnid #1
 2000 NOW-RAMP
 white didemnid #1
 2000 NOW-RAMP
 white didemnid #2
 2000 NOW-RAMP
 white didemnid #3
 2000 NOW-RAMP
 white didemnid #4
 2000 NOW-RAMP
 white didemnid #5
 2000 NOW-RAMP
 white didemnid #6
 2000 NOW-RAMP

Family POLYCLINIDAE

polyclinid sp.1
 2000 NOW-RAMP
 polyclinid sp.2
 2000 NOW-RAMP
 polyclinid sp.3
 2000 NOW-RAMP
 polyclinid sp.4
 2000 NOW-RAMP

Order PLEUROGONA

Suborder STOLIDOBRANCHIA

Family STYELIDAE

Botryllus sp.
 2000 NOW-RAMP

Family PYURIDAE

Microcosmus exasperatus Heller, 1878
 2000 NOW-RAMP
 pyurid sp.1
 2000 NOW-RAMP
 pyurid sp.2
 2000 NOW-RAMP