



**U.S. DEPARTMENT OF COMMERCE**  
**National Oceanic and Atmospheric Administration**  
**NATIONAL MARINE FISHERIES SERVICE/NOAA FISHERIES**  
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## CRUISE REPORT<sup>1</sup>

**VESSEL:** *Oscar Elton Sette*, Cruise SE-11-06 (SE-89)

**CRUISE PERIOD:** 28 August–11 September 2011

**AREA OF OPERATION:** Main Hawaiian Islands, Kohala-Kona Coast of Big Island (Fig. 1)

**TYPE OF OPERATION:** The NOAA Ship *Oscar Elton Sette* was engaged as support for a Fisheries Monitoring and Research Division (FMRD) Pacific Islands Fisheries Science Center (PIFSC), National Marine Fisheries Service (NMFS) fisheries research program. The two primary missions involved the collection of eteline snappers and groupers for age, growth and maturity studies and the collection of billfish eggs and larvae in waters off the coastlines of Hawai'i and Penguin Banks (Fig. 1). Daytime operations included surface net tows using a 1.8-m Isaacs-Kidd (IK) trawl and small boat operations including handline bottomfishing and dip-netting in surface slicks. Night operations consisted of Cobb midwater trawl for epipelagic and pelagic juvenile reef and bottomfish species and conductivity-temperature-depth (CTD) casts at predetermined locations.

### ITINERARY:

28 August Embarked scientific personnel: Chief Scientist Robert Humphreys; PIFSC scientists James Barlow, Kurt Kawamoto, and Matthew Vandersande; JIMAR scientists Meagan Sundberg and Karen Underkoffler; Taiwan (FRI) scientist Wei Chuan Chiang (“Riyar”); and Monterey Bay Aquarium staff members Wyatt Patry and Chris Paine. Departed Pearl Harbor, Oahu at 1400; began transit to Kohala and Kona Coast, Big Island of Hawai'i.

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<sup>1</sup> PIFSC Cruise Report CR-11-009  
Issued 14 December 2011



- 29 August Daily operations for Kawaihae, Hawai`i consisted of a 0700 Isaacs-Kidd (IK) trawl survey (Table 1), followed at 0800 with a Small Boats safety meeting and deployment of one SAFEboat at 0815 for handline fishing within Hawai`i State waters at Kawaihae location (Table 2). Handline fishing for juvenile snappers and groupers from small boats was conducted at depths of 35-70 fm until approximately 1530. Continued IK trawl operations that consisted of a series of seven nets deployed for 60-min tows concluding at 1630. Cobb trawl operations (Table 3) began at 1830; concluded trawling operations at 2130. All daily operations were concluded at 2200.
- 30 August Daily operations commenced with first IK at 0700; followed at 0815 with safety meeting and deployment of two small boats for handline fishing off of Kawaihae. Resumed IK operations at 0910, commenced a series of three IK surface tows (for billfish larvae) and 4 IK midwater tows (for eteline snapper larvae). Concluded IK handline fishing operations at 1610. Final IK of daily operations concluded at 1734. At 1840, arrived at Cobb trawl location; the tow was at three 40-min duration (depth levels 45-52 m, 37-40 m, and 19-23 m). At the conclusion of Cobb trawl, conducted night light operations for jellies and fish. All daily operations concluded at 2200.
- 31 August Arrived Keahole Pt., Hawai`i. Daily operations commenced at 0530 with a 1-hr survey of the 100-fathom contour for bottomfish grounds. At 0700, the first IK trawl was deployed. At 0815, concluded safety meeting and deployed two SAFEboats for handline fishing. Resumed IK operations at 0830, consisting of a series of five IK surface tows (for billfish larvae) and 2 IK midwater tows (for eteline snapper larvae). Retrieved small boats at 1557; concluded IK operations at 1718. Arrived at Cobb trawl location at 1755, concluded trawling operations at 2122. A single CTD (Table 4) was conducted and appeared to work successfully at 2240. Night light operations were conducted following CTD operations.
- 1 September Daily operations commenced at 0530 and a Keahole Pt. bottomfish grounds survey was conducted. At 0700, the first IK trawl was deployed. At 0815, concluded meeting then deployed two SAFEboats for handline fishing. Resumed IK operations at 0830; commenced a series of five IK surface tows (for billfish larvae) and 2 IK midwater

tows (for eteline snapper larvae). Retrieved small boats at 1550; concluded IK operations at 1718. Arrived at Cobb trawl location at 1818; concluded trawling operations at 2122. At 2312, a series of CTD casts along transect 19 42.5N latitude commenced. Night light operations were conducted following CTD operations. All daily operations concluded at 2200.

2 September

Daily operations commenced at 0530 and a Keahole Pt. bottomfish grounds survey was conducted. At 0700, the first IK trawl was deployed. At 0750, concluded meeting then deployed two SAFEboats for handline fishing (Station 46-47). Resumed IK operations at 0838; commenced a series of both IK surface and midwater tows. In the mid-afternoon, Matthew Vandersande was disembarked from the cruise by small boat at the fuel pier in Honokohau Harbor, then concluded IK and handline fishing operations at 1507. Two CTD casts along transect 19 32.5N latitude were completed at 1738. Arrived at Cobb trawl location at 1753, targeting depths at 120-127 m (350 m wire out) and 19-23 m (100 m wire out); concluded trawling operations at 2119. A short night-light session afterwards produced no catch of fish of interest. All daily operations were concluded at 2200.

3 September

Daily operations commenced at 0530 and a bottomfish grounds survey was conducted. At 0700, the first IK trawl was deployed. At 0815, concluded meeting then deployed two SAFEboats for handline fishing. Resumed IK operations at 0917; commenced a series of five IK surface tows (for billfish larvae) and one IK midwater tows (for eteline snapper larvae). In the mid-afternoon, Andrew West embarked on the cruise by small boat at the fuel pier in Honokohau Harbor, then concluded IK and handline fishing operations at 1556. Remaining two CTD casts along transect 19 32.5N latitude were completed at 1849. Arrived at Cobb trawl location at 1906, targeting depths at 100 m depth and 20 m (each depth for 1 hour); concluded trawling and all daily operations at 2147.

4 September

Daily operations commenced at 0530 and a bottomfish grounds survey was conducted. At 0706, deployed the first IK trawl in Kailua-Kona and Keahou coastline. At 0815, concluded safety meeting then deployed two SAFEboats for handline fishing. Resumed IK operations at 0835; commenced a series of seven IK surface tows (for billfish

larvae). In the mid-afternoon, Kurt Kawamoto was disembarked from the cruise by small boat at the fuel pier in Honokohau Harbor, then concluded IK and handline fishing operations at 1643. Arrived at Cobb trawl location at 1839, targeting depths at 100 m depth and 20 m (each depth for 1 hour); concluded trawling and all daily operations at 2122.

- 5 September Daily operations commenced at 0530 and a Keahou bottomfish grounds survey was conducted. At 0706, the first IK trawl was deployed. At 0815, concluded meeting then deployed two SAFEboats for handline fishing. Resumed IK operations at 0840; commenced a series of five IK surface tows (for billfish larvae). Concluded IK and handline fishing operations at 1623. Arrived at Cobb trawl location at 1843, targeting depth of 100 m depth (for 2 hours); concluded trawling operations at 2113. A short night-light session afterwards produced no catch of fish of interest. All daily operations concluded at 2200.
- 6 September Daily operations commenced at 0530 and a bottomfish grounds survey was conducted. At 0702, commenced first IK trawl. At 0817, performed safety meeting then deployed two SAFEboats for handline fishing. Resumed IK operations at 0854; commenced a series of four IK surface tows (for billfish larvae). In the early evening, Andrew West disembarked and Lynne Nakamura and Ryan Nichols embarked the cruise by small boat at the Kailua-Kona Fishing Pier. No evening operations were scheduled.
- 7 September Daily operations commenced at 0530 and a Keahole bottomfish grounds survey was conducted. At 0815, concluded safety meeting then deployed two SAFEboats for handline fishing. At 0900, the first IK trawl was deployed; commenced a series of five IK surface tows (for billfish larvae). Concluded IK and handline fishing operations at 1648. Arrived at Cobb trawl location at 1834; concluded trawling operations at 2115. No CTD casts were completed; vessel made way for South Pt. of Hawaii.
- 8 September At 0530, conducted a South Pt. bottomfish grounds survey. At 0815, completed safety meeting then deployed two SAFEboats for handline fishing. Resumed IK operations at 0856; commenced a series of four IK midwater tows. Concluded IK and handline fishing operations at 1641. Arrived at Cobb trawl location at 1916, targeting depths at

100 m depth and 20m (each depth for 1 hour); concluded trawling operations at 2152. All scheduled daily operations concluded at 2200. Vessel made way for Keahole Pt.

9 September Daily operations commenced at 0530 and a Keahole Pt. bottomfish grounds survey was conducted. At 0648, the first IK trawl was deployed. At 0745, concluded safety meeting then deployed two SAFEboats for handline fishing. Resumed IK operations at 0818; commenced a series of five IK surface tows (for billfish larvae). Concluded IK and handline fishing operations at 1634. Arrived at Cobb trawl location at 1836, targeting depths at 100 m depth and 20 m (each depth for 1 hour); concluded trawling operations at 2114. This concluded the fishing operations around the island of Hawaii, and vessel steamed for Penguin Banks.

10 September Daily operations commenced at 0530 and a bottomfish grounds survey on second finger of Penguin banks was conducted; completed Small Boats safety meeting and deployed one SAFEboat at 0800. Commenced bottomfishing from *Sette* at 1000 . Concluded fishing operations and retrieved SAFEboat at 1700. At 1916, arrived on site for Cobb trawl, targeting depths at 100 m depth and 20 m (each depth for 1 hour). Concluded all scheduled fishing operations for SE-11-06. Vessel made way for Pearl Harbor fueling pier at 2201.

11 September Arrived at Pearl Harbor fueling pier at 0800; disembarked all remaining scientific staff.

## **MISSIONS AND RESULTS:**

- A. Conduct bottom handline operations (Fig. 1) and dip-netting from small boats and the ship to obtain adult specimens of eteline snapper species for maturity estimates from sites along portions of the Kohala, Kona and Kau Coasts. For handline fishing, four Henry Ching electric reels were spooled with 200-lb test Dacron backing and 180-lb test Power-pro® mainline. Terminal gear consisted of a 3-m long dropper with 6 branch lines of 50-lb monofilament test attached to 2-5 lb lead weight. Four to six circle hooks ranging in sizes from 14 to 22 were baited with strips of squid.
1. A total of 40 bottomfish handline operations (Table 1) took place during this cruise. Operations focused primarily along depth contours ranging from 50 to 140 fathoms all within the proximity of the starting locations. The average number of drifts per station was 14, and drift time varied

from 7 to 18 min for a total of 53.6 line hours between the two small boats.

2. A total of 164 adult fish were caught during handline operations (Table 4). Approximately 76% were targeted eteline snapper/grouper species, 69 (42%) opakapaka, *Pristopomoides filamentosus*; 19 (12%) kalekale, *Pristopomoides seiboldii*; 15 (9%) ehu, *Etelis carbunculus*; 10 (6%) gindai, *Pristopomoides zonatus*; 6 (4%) lehi, *Aphareus rutilans*; 4 (5%) uku, *Aprion virescens*; and 3 (2%) Hawaiian grouper, *Hyporthodus quernus*. The 38 individuals comprising the remaining 24% of the handline catch appear in Table 4.
  3. All permitted eteline/grouper species fork/total lengths were taken and gonads removed and immediately stored in 10% histological grade Formalin. Heads were also removed and frozen for later extraction on otoliths.
  4. A total of 19 Kahala (17 *Seriola dumerili* and 2 *Seriola rivoliana*) were tagged and released as part of the DAR Ulua tagging project.
- B. Conduct daytime surface net tows targeting billfish larvae in surface waters along portions of the Kohala and Kona Coasts (Fig. 1.).

A total of 68 Isaacs-Kidd (IK) plankton tows were conducted during daylight hours. The IK net dimensions consisted of a net mouth width of 1.8 m and total length of 10 m. The mouth opening to the back (8 m long) consisted of 5 mm webbing while the posterior 2 m of net consisted of 0.5 mm Nytex netting. All tows were approximately 1-h duration and were operated from the mid-ship port side J-frame. PVC outflow deflectors were placed over the air-conditioning outflows forward of the towing station in order to deflect the outflow downward rather than across the water. This measure was employed to mitigate possible flight response of surface larvae forward of the net mouth.

Fifty-five daylight surface IK tows were conducted during the cruise off of the island of Hawaii. These tows were conducted to target surface-dwelling billfish larvae. The effective depth of the net mouth was adjusted during surface tows to sample the 0-1 m depth range; this provided the ability to sample the neuston layer as well. These tows yielded a total of 13 billfish larvae which occurred in only 8 of the 55 surface IK tows. The billfish larvae consisted of 8 blue marlin (*Makaira nigricans*), 3 shortbill spearfish (*Tetrapterus angustirostris*), and 2 swordfish (*Xiphias gladius*).

Thirteen daylight subsurface IK tows were also conducted off the Island of Hawaii targeting pelagic stage lutjanid larvae. Of these tows, only 1 *Lutjanus* sp. larva was collected from a tow conducted at 41-45 m depth.

- C. Conduct Cobb midwater trawls offshore of the Kohala and Kona coastline targeting the pelagic stage lutjanid snappers (Fig. 1).
1. Twelve nocturnal midwater Cobb trawls were conducted during this cruise. Eleven trawl hauls were conducted off leeward Hawaii Island and one offshore of the southern flank of Penguin Banks. All leeward Hawaii Island trawl hauls were conducted at least 15-20 nm offshore. Since little previous information was available regarding the depth of previous captures of pelagic stage lutjanids, the first six Cobb trawls targeted a combination of depths between 20 and 120 m depths. After each tow, the entire catch was placed in a large metal bucket and sorted indoors in the Wet Lab. All reef, bottomfish, and epipelagic fish larvae and juveniles were removed from each trawl haul and preserved in 95% ethanol. The remainder of the catch (primarily mesopelagic fishes, crustaceans, and squid) was discarded.
  2. A total of 45 eteline and 7 *Lutjanus* pelagic stage individuals were collected from 5 of the 12 Cobb trawl hauls. Thirty-five etelines and 7 *Lutjanus* were captured off leeward Hawaii Island in 4 trawl hauls and 10 etelines collected in a single trawl haul off Penguin Banks. All of the leeward Hawaii Island captures occurred offshore of Keahole Point. Virtually all of captured pelagic stages were captured during trawl hauls that targeted depths of 100-120 m and 20-25 m during each trawl; haul times were 1 h for each depth range. Shallow trawl hauls that towed at depths no greater than 90 m did not capture eteline pelagic stage individuals.
  3. Among the catch of the midwater Cobb trawl were 3 live specimens of the cookie cutter shark (*Isistius brasiliensis*) and one specimen of the pygmy shark (*Euprotomicrus bispinatus*). Cooperating scientists from the Monterey Bay Aquarium applied various husbandry techniques on these specimens to assess the feasibility of maintaining these wild caught specimens alive in captivity.
- D. Conduct shipboard CTDs in the vicinity of juvenile bottomfish nursery grounds along the Kohala and Kona coastline (Fig. 1).

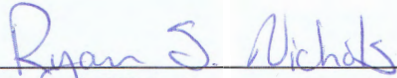
A total of 7 CTD stations were performed during the cruise to obtain information on salinity, temperature and dissolved oxygen. The CTD casts were performed along previously established Fishery Biology and Stock Assessment Division larval billfish sites. The lower two CTD transect stations were not conducted since operations for bottomfish were deemed a higher priority and the latter two CTD transects were too distant from suitable adult bottomfish grounds.

E. Conduct night light operations for Monterey Bay Aquarium collections.

A total of 4 night light operations were conducted in an effort to secure specimens for Monterey Bay Aquarium. All night lighting occurred after primary mission objectives were completed and lasted for until midnight.

**SCIENTIFIC  
PERSONNEL:**

Ryan Nichols, Co-Chief Scientist, Pacific Islands Fisheries Science Center (PIFSC),  
National Marine Fisheries Service (NMFS)  
Robert Humphreys, Co-Chief Scientist, PIFSC, NMFS  
Meagan Sundburg, Fisheries Associate, Joint Institute for Marine and Atmospheric  
Research (JIMAR), University of Hawaii (UH)  
Karen Underkoffler, Fisheries Associate, JIMAR, UH  
James Barlow, Cooperating Scientist, PIFSC, NMFS  
Kurt Kawamoto, Fishery Biologist, PIFSC, NMFS  
Matthew Vandersande, Cooperating Scientist, PIFSC, NMFS  
Chris Paine, Cooperating Scientist, Monterey Bay Aquarium (MBA)  
Whyatt Patry, Cooperating Scientist, MBA,  
Lynne Nakamura, Research Assistant, PIFSC, NMFS  
Andrew West, Cooperating Scientist, University of Nations, Kailua-Kona, HI  
Wei Chuan Chiang, Cooperating Scientist, Fisheries Research Institute, Taiwan

Submitted by:   
Ryan S. Nichols  
Chief Scientist

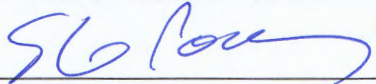
Approved by:   
Samuel G. Pooley  
Science Director  
Pacific Islands Fisheries Science Center



Table 1.—Isaacs-Kidd trawl stations conducted on *Oscar Elton Sette* Cruise SE-11-06. Positions are in decimal degrees. Dash indicates when surface slick was targeted.

| Station # | Date       | Latitude °N | Longitude °W | Soak time | Depth of tow (m) | Targeted slick |
|-----------|------------|-------------|--------------|-----------|------------------|----------------|
| 1         | 08/29/2011 | 20° 01.77   | 155° 51.4    | 40min     | 0-1              | NO             |
| 3         | 08/29/2011 | 20° 04.44   | 155° 52.96   | 62min     | 0-1              | NO             |
| 4         | 08/29/2011 | 20° 04.65   | 155° 56.76   | 60min     | 0-1              | NO             |
| 5         | 08/29/2011 | 20° 04.74   | 156° 00.339  | 64min     | 0-1              | ?              |
| 6         | 08/29/2011 | 20° 04.425  | 155° 55.684  | 60min     | 0-1              | ?              |
| 7         | 08/29/2011 | 20° 04.196  | 155° 52.571  | 63min     | 0-1              | NO             |
| 8         | 08/29/2011 | 20° 00.646  | 155° 51.751  | 61min     | 0-1              | NO             |
| 11        | 08/30/2011 | 20° 07.54   | 155° 55.13   | 62min     | 0-1              | NO             |
| 14        | 08/30/2011 | 20° 10.99   | 156° 01.35   | 60min     | 39-41            | NO             |
| 15        | 08/30/2011 | 20° 08.61   | 155° 59.83   | 63min     | 41-45            | NO             |
| 16        | 08/30/2011 | 20° 07.25   | 156° 03.09   | 61min     | 74-82            | NO             |
| 17        | 08/30/2011 | 20° 08.37   | 155° 59.43   | 61min     | 0-1              | YES            |
| 18        | 08/30/2011 | 20° 10.04   | 155° 58.72   | 62min     | 0-1              | NO             |
| 19        | 08/30/2011 | 20° 08.57   | 155° 55.56   | 63min     | 68-75            | NO             |
| 22        | 08/31/2011 | 19° 46.59   | 156° 06.23   | 63min     | 0-1              | NO             |
| 25        | 08/31/2011 | 19° 42.96   | 156° 06.56   | 60min     | 0-1              | NO             |
| 26        | 08/31/2011 | 19° 41.26   | 156° 09.80   | 62min     | 0-1              | YES            |
| 27        | 08/31/2011 | 19° 38.79   | 156° 11.01   | 59min     | 0-1              | YES            |
| 28        | 08/31/2011 | 19° 41.68   | 156° 09.62   | 62min     | 0-1              | YES            |
| 29        | 08/31/2011 | 19° 42.43   | 156° 11.22   | 60min     | 17-20            | NO             |
| 30        | 08/31/2011 | 19° 45.95   | 156° 06.58   | 60min     | 16-20            | NO             |
| 34        | 09/01/2011 | 19° 46.82   | 156° 06.92   | 62min     | 0-1              | YES            |
| 35        | 09/01/2011 | 19° 46.58   | 156° 07.88   | 60min     | 0-1              | YES            |
| 36        | 09/01/2011 | 19° 42.28   | 156° 08.41   | 62min     | 0-1              | YES            |
| 37        | 09/01/2011 | 19° 38.16   | 156° 09.11   | 60min     | 0-1              | YES            |
| 38        | 09/01/2011 | 19° 34.37   | 156° 08.52   | 62min     | 0-1              | YES            |
| 39        | 09/01/2011 | 19° 38.56   | 156° 07.92   | 60min     | 89-100           | NO             |
| 45        | 09/02/2011 | 19° 43.67   | 156° 08.29   | 47min     | 11-14            | NO             |
| 48        | 09/02/2011 | 19° 42.53   | 156° 05.77   | 62min     | 0-1              | YES            |
| 49        | 09/02/2011 | 19° 37.95   | 156° 05.08   | 63min     | 0-1              | YES            |
| 50        | 09/02/2011 | 19° 34.12   | 156° 04.12   | 61min     | 0-1              | YES            |
| 51        | 09/02/2011 | 19° 39.12   | 156° 04.53   | 62min     | 0-1              | YES            |
| 56        | 09/03/2011 | 19° 49.11   | 156° 07.94   | 64min     | 3-4              | NO             |
| 59        | 09/03/2011 | 19° 46.03   | 156° 06.31   | 62min     | 0-1              | YES            |
| 60        | 09/03/2011 | 19° 43.26   | 156° 06.89   | 63min     | 0-1              | YES            |
| 61        | 09/03/2011 | 19° 39.55   | 156° 05.76   | 63min     | 0-1              | YES            |
| 62        | 09/03/2011 | 19° 36.58   | 156° 03.71   | 61min     | 0-1              | YES            |
| 63        | 09/03/2011 | 19° 41.75   | 156° 06.91   | 12min     | 0-1              | NO             |
| 67        | 09/03/2011 | 19° 32.83   | 156° 02.22   | 63min     | 0-1              | YES            |
| 70        | 09/04/2011 | 19° 37.29   | 156° 04.95   | 61min     | 0-1              | NO             |
| 71        | 09/04/2011 | 19° 36.72   | 156° 09.76   | 62min     | 0-1              | YES            |
| 72        | 09/04/2011 | 19° 32.09   | 156° 09.80   | 62min     | 0-1              | YES            |
| 73        | 09/04/2011 | 19° 27.67   | 156° 10.59   | 62min     | 0-1              | YES            |
| 74        | 09/04/2011 | 19° 26.17   | 156° 08.84   | 61min     | 0-1              | NO             |
| 75        | 09/04/2011 | 19° 30.19   | 156° 01.64   | 62min     | 0-1              | NO             |
| 77        | 09/05/2011 | 19° 33.08   | 156° 03.16   | 63min     | 0-1              | NO             |

|     |            |            |             |       |            |     |
|-----|------------|------------|-------------|-------|------------|-----|
| 80  | 09/05/2011 | 19° 29.8   | 156° 00.5   | 60min | 0-1        | NO  |
| 81  | 09/05/2011 | 19° 29.880 | 156° 04.064 | 60min | 0-1        | YES |
| 82  | 09/05/2011 | 19° 23.12  | 156° 03.84  | 60min | 0-1        | YES |
| 83  | 09/05/2011 | 19° 31.92  | 156° 00.93  | 61min | 0-1        | NO  |
| 86  | 09/05/2011 | 19° 48.08  | 156° 10.00  | 64min | 0-1        | NO  |
| 89  | 09/06/2011 | 19° 47.22  | 156° 07.34  | 64min | 0-1        | YES |
| 90  | 09/06/2011 | 19° 42.82  | 156° 08.02  | 60min | 0-1        | YES |
| 91  | 09/06/2011 | 19° 37.70  | 156° 06.33  | 64min | 0-1        | YES |
| 92  | 09/06/2011 | 19° 33.41  | 156° 06.41  | 62min | 0-1        | YES |
| 95  | 09/06/2011 | 19° 47.55  | 156° 06.14  | 62min | 0-1        | YES |
| 96  | 09/07/2011 | 19° 43.42  | 156° 07.33  | 62min | 0-1        | NO  |
| 97  | 09/07/2011 | 19° 38.23  | 156° 12.68  | 62min | 0-1        | NO  |
| 98  | 09/07/2011 | 19° 38.80  | 156° 08.41  | 62min | 0-1        | NO  |
| 99  | 09/07/2011 | 19° 38.23  | 156° 12.68  | 23min | 0-1        | NO  |
| 103 | 09/07/2011 | 18° 54.56  | 155° 35.89  | 62min | 100-120    | NO  |
| 104 | 09/08/2011 | 18° 54.50  | 155° 35.10  | 60min | subsurface | NO  |
| 105 | 09/08/2011 | 18° 54.15  | 155° 35.01  | 58min | subsurface | NO  |
| 106 | 09/08/2011 | 18° 54.09  | 155° 34.87  | 61min | subsurface | NO  |
| 108 | 09/09/2011 | 19° 48.14  | 156° 09.62  | 61min | 0-1        | NO  |
| 111 | 09/09/2011 | 19° 46.77  | 156° 07.69  | 62min | 0-1        | YES |
| 112 | 09/09/2011 | 19° 45.37  | 156° 06.95  | 60min | 0-1        | YES |
| 113 | 09/09/2011 | 19° 50.04  | 156° 10.33  | 60min | 0-1        | YES |
| 114 | 09/09/2011 | 19° 47.31  | 156° 09.66  | 62min | 0-1        | YES |
| 115 | 09/09/2011 | 19° 45.24  | 156° 07.74  | 63min | 0-1        | NO  |

Table 2.—Handline fishing stations conducted on *Oscar Elton Sette* Cruise SE-11-06. Positions are in decimal degrees. Double dash indicates disabled depth finder.

| Station # | Date       | Latitude °N | Longitude °W | No. drifts | Median drift (min) | Depth range (fm) |
|-----------|------------|-------------|--------------|------------|--------------------|------------------|
| 2         | 08/29/2011 | 20° 02.491  | 155° 51.358  | 17         | 8                  | 66 - 105         |
| 12        | 08/30/2011 | 20° 02.379  | 155° 55.237  | 13         | 11                 | 72 - 132         |
| 13        | 08/30/2011 | 20° 11.841  | 156° 56.489  | 13         | 16                 | 50 - 140         |
| 23        | 08/31/2011 | 19° 46.447  | 156° 05.894  | 16         | 11                 | 71 - 106         |
| 24        | 08/31/2011 | 19° 46.297  | 156° 05.878  | 16         | 17                 | 71 - 120         |
| 35        | 09/01/2011 | 19° 46.294  | 156° 06.277  | 17         | 13                 | 76 - 118         |
| 36        | 09/01/2011 | 19° 46.481  | 156° 05.940  | 16         | 15                 | 75 - 130         |
| 46        | 09/02/2011 | 19° 46.414  | 156° 03.582  | 19         | 8                  | 75 - 117         |
| 47        | 09/02/2011 | 18° 44.657  | 155° 06.494  | 15         | 12                 | 70 - 115         |
| 57        | 09/03/2011 | 18° 48.061  | 155° 06.080  | 19         | 10                 | 72 - 90          |
| 58        | 09/03/2011 | 19° 46.314  | 156° 06.287  | -          | -                  | Dip Netting      |
| 68        | 09/04/2011 | 19° 31.014  | 156° 59.021  | 11         | 18                 | 75- 110          |
| 69        | 09/04/2011 | 19° 31.094  | 156° 59.135  | 13         | 15                 | 74 - 130         |
| 78        | 09/05/2011 | 19° 31.036  | 155° 59.198  | 11         | 16                 | 83 - 135         |
| 79        | 09/05/2011 | 19° 31.051  | 155° 59.201  | 12         | 14                 | 70 - 130         |
| 87        | 09/06/2011 | 19° 47.457  | 156° 06.033  | 11         | 14                 | 78 - 120         |
| 88        | 09/06/2011 | 19° 47.301  | 156° 07.299  | -          | -                  | Dip Netting      |
| 93        | 09/07/2011 | 19° 45.802  | 156° 05.436  | 16         | 9                  | 84 - 127         |
| 94        | 09/07/2011 | 18° 45.783  | 156° 05.432  | 15         | 12                 | 75 - 115         |
| 101       | 09/08/2011 | 18° 56.539  | 155° 36.384  | 10         | 18                 | 82 - 118         |
| 102       | 09/08/2011 | 18° 56.474  | 155° 36.360  | 31         | 7                  | 69 - 115         |
| 109       | 09/09/2011 | 19° 45.773  | 156° 05.288  | 17         | 8                  | 76 - 129         |
| 110       | 09/09/2011 | 19° 45.617  | 156° 05.276  | 22         | 12                 | 70 - 110         |
| 116       | 09/10/2011 | 20° 59.449  | 157° 26.240  | 15         | 16                 | 65 - 118         |
| 117-132   | 09/10/2011 | 20° 00.357  | 157° 24.531  | 21         | 11                 | 61 - 110         |

Table 3.--Cobb midwater trawl stations conducted during *Oscar Elton Sette* Cruise SE-11-06. Positions are in decimal degrees.

| Station # | Date       | Latitude °N | Longitude °W | Target depths (m) | TDR depth (m)       | Wire out (m)  | Time at Depth (min) | Total Time (min) |
|-----------|------------|-------------|--------------|-------------------|---------------------|---------------|---------------------|------------------|
| 9         | 08/29/2011 | 20° 02.616' | 156° 05.449' | 60, 40, 20        | 60-65, 51-56, 27-29 | 180, 120, 60  | 40, 40, 40          | 145              |
| 20        | 08/30/2011 | 20° 07.804' | 155° 59.733' | 60, 40, 20        | 45-52, 37-40, 19-23 | 180, 150, 100 | 40, 40, 40          | 146              |
| 31        | 08/31/2011 | 19° 42.56'  | 156° 10.81'  | 60, 40, 20        | 59-62, 42-47, 25-27 | 200, 150, 100 | 41, 40, 40          | 150              |
| 44        | 09/01/2011 | 19° 41.96'  | 156° 17.16'  | 20, 10            | 20-23, 5-7          | 100, 50       | 60, 60              | 137              |
| 54        | 09/02/2011 | 19° 32.42'  | 156° 05.75'  | 100, 25           | 120-127, 19-23      | 350, 100      | 60, 60              | 148              |
| 66        | 09/03/2011 | 19° 31.326' | 156° 13.823' | 100, 25           | 94-108, 26-29       | 350, 100      | 61, 60              | 148              |
| 76        | 09/04/2011 | 19° 37.69'  | 156° 19.73'  | 100, 25           | 100-105, 18-21      | 350, 100      | 60, 60              | 147              |
| 84        | 09/05/2011 | 19° 41.32'  | 156° 21.92'  | 25                | 20-23               | 100           | 120                 | 130              |
| 100       | 09/07/2011 | 19° 38.02'  | 156° 18.97'  | 100, 25           | TDR failed          | 350, 100      | 60, 60              | 145              |
| 107       | 09/08/2011 | 19° 01.907' | 156° 08.052' | 100, 25           | 99-114, 18-21       | 350, 100      | 60, 60              | 144              |
| 116       | 09/09/2011 | 19° 38.96'  | 156° 20.71'  | 100, 25           | 96-116, 17-21       | 350, 100      | 60, 60              | 145              |
| 133       | 09/10/2011 | 20° 46.07'  | 157° 28.43'  | 100, 25           | 101-111, 21-28      | 350, 100      | 60, 60              | 149              |

Table 4.--Fish species captured during handline fishing stations. Double dash lines indicate fish that were released or lost overboard without a length taken.

| Species                            | Count | Percentage of catch (%) | Size range (cm) | Mean size (cm) |
|------------------------------------|-------|-------------------------|-----------------|----------------|
| <i>Pristipomoides filamentosus</i> | 69    | 42.10                   | 32.0 – 59.0     | 42.3           |
| <i>Pristipomoides sieboldii</i>    | 19    | 11.58                   | 26.0 – 41.2     | 34.8           |
| <i>Seriola dumerili</i>            | 17    | 10.36                   | 53.2 – 105.0    | 68.7           |
| <i>Etelis carbunculus</i>          | 15    | 9.14                    | 32.4 – 50.4     | 41.3           |
| <i>Pristipomoides zonatus</i>      | 10    | 6.09                    | 24.4 – 43.5     | 34.8           |
| <i>Aphareus rutilans</i>           | 6     | 3.65                    | 52.2 – 79.2     | 66.4           |
| <i>Bodianus albotaeeniatus</i>     | 5     | 3.05                    | 37.0 – 40.0     | 38.5           |
| <i>Aprion virescens</i>            | 4     | 2.44                    | 60.4 – 73.2     | 64.4           |
| <i>Lutjanus kasmira</i>            | 3     | 1.83                    | 28.5 – 30.5     | 29.0           |
| <i>Hyporthodus quernus</i>         | 3     | 1.83                    | 50.6 – 90.3     | 68.3           |
| <i>Pontinus macrocephalus</i>      | 3     | 1.83                    | 29.0 – 50.3     | 44.5           |
| <i>Seriola rivolaiiana</i>         | 2     | 1.22                    | 54.6 – 59.5     | 57.5           |
| <i>Erythrocles scintillans</i>     | 2     | 1.22                    | 31.2 - 37.1     | 34.1           |
| <i>Mulloidichthys vanicolensis</i> | 2     | 1.22                    | 42.5 – 50.0     | 46.2           |
| <i>Carangoides orthogrammus</i>    | 1     | 0.61                    | 82.5            | 82.5           |
| <i>Gymnothorax eurostus</i>        | 1     | 0.61                    | --              | --             |
| <i>Pseudocaranx cheillio</i>       | 1     | 0.61                    | --              | --             |
| <i>Triaenodon obesus</i>           | 1     | 0.61                    | --              | --             |

OES-11-06 Bottomfish Cruise, Big Island, HI  
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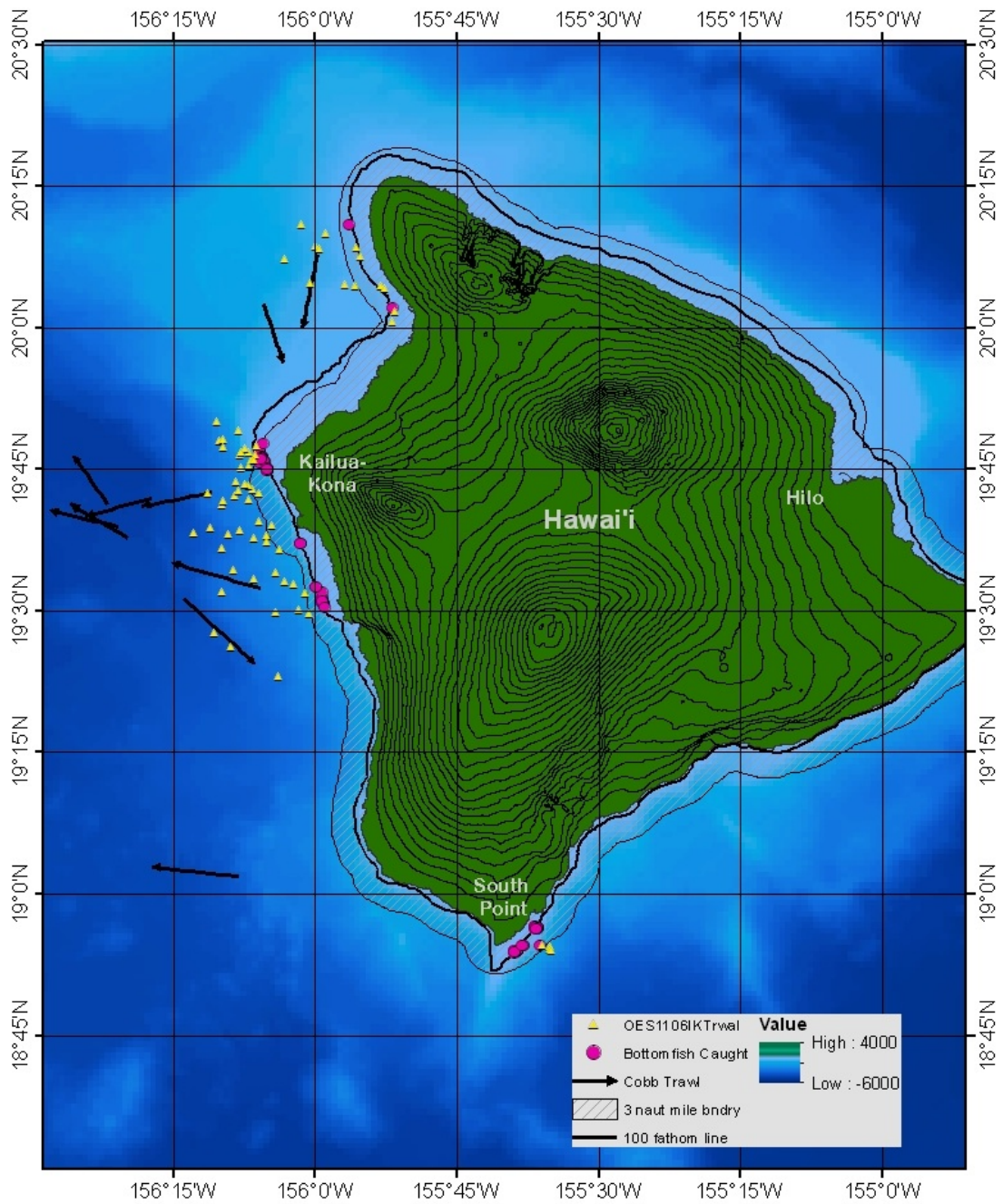


Figure 1.--Marine operation locations for *Oscar Elton Sette* Cruise SE-11-06 along the coastline of the Big Island of Hawai'i.