NOAA's MONTEREY BAY NATIONAL MARINE SANCTUARY LOST FISHING GEAR REMOVAL PROJECT

2011 CRUISE REPORT

Research Vessel *FULMAR*
October 24 - November 2, 2011

Wolf eel surrounded by anemones and monofilament line at Portuguese Ledge (10/31/11). Note snipping tool (left), which was attached to the ROV for cutting lost fishing gear such as thick lines.

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Acknowledgements

Key contributors to the Lost Fishing Gear Removal Project were:

California Department of Fish and Wildlife (CDFW)
California State University Monterey Bay (CSUMB)
Cordell Bank National Marine Sanctuary (CBNMS)
Fishing Vessel *Donna Kathleen*
Marine Applied Research and Exploration (MARe)
Monterey Peninsula College's Marine Advanced Technology Education Center (MATE)
National Marine Fisheries Service (NMFS)
California Academy of Sciences

Objectives

Monterey Bay National Marine Sanctuary (MBNMS) staff and partners conducted a ten-day research mission to survey the deepwater habitats of MBNMS and to remove lost fishing gear from the seafloor using a Phantom HD2 remotely operated vehicle (ROV). The ROV was used to find, document and retrieve lost fishing gear on the Point Sur Platform, on the edges of Soquel Canyon, in Monterey Bay and South of Portuguese Ledge State Marine Conservation Area (SMCA). The cruise was conducted aboard the Research Vessel (R/V) Fulmar. This report describes the findings and results for the third and final year of the project.

The objectives of the mission were to:

- Reduce benthic hazards to marine organisms posed by fishing gear lost in deepwater.
- Conduct video surveys of selected areas of the MBNMS to document and increase knowledge of the degree to which lost fishing gear is impacting deepwater habitats and living marine resources.
- Continue to refine and test methods developed during the 2009 and 2010 research cruises to successfully retrieve lost fishing gear in deepwater (50 to 300 meters), with an emphasis on retrieving recently lost gear in currently fished areas. Recently lost gear is more likely than older, legacy gear to create entanglement hazards for marine life and active fishing gear. In addition, recently lost fishing gear is also more likely to ghost fish because the gear tends to be less damaged and may still contain bait.
- Provide high definition images and video for education and outreach purposes.
- Provide opportunities to study and collect benthic specimens that encrust on fishing gear.
- Provide MBNMS staff with technical experience using ROVs for application to future projects.

Background

The Monterey Bay National Marine Sanctuary (MBNMS) worked with partners to design and implement a three-year project to remove lost fishing gear from the MBNMS. Lost fishing gear is identified as fishing nets, lines, pots, traps, and other commercial and recreational fishing gear that sits on the seafloor, gets caught on rocky reefs, or floats in the water column. Gear can create long-term entrapment mechanisms that continuously kill mobile fauna for many years. Net materials are constructed to be strong and resilient, thus preventing escape of entangled wildlife and persisting in the environment for decades. Their pliable form combined with water movement from storms and currents make lost nets active entrapment systems. Lost cage traps continue to catch prey on a continuing cycle as predators enter the traps to feed on dead and dying entrapped organisms. Nets and traps can physically scrape organisms off of hard reef habitat or sweep immobile invertebrates from sandy areas. Nets and traps have been documented to entangle bottom feeding whales and other marine mammals, becoming ensnared on flukes and fins, causing stress and loss of energy that leads to exhaustion and death. Lost fishing gear can also cause hazards to fishermen. For example, lost traps may snag additional traps being set nearby.

This cruise was made possible by a number of key partners including California Department of Fish and Wildlife (CDFW), California State University Monterey Bay (CSUMB), Cordell Bank National Marine Sanctuary (CBNMS), Marine Advanced Technology Education Center (MATE), Marine Applied Research and Exploration (MARE), Monterey Bay National Marine Sanctuary (MBNMS), National Marine Fisheries Service (NMFS), and fishing partners. The project was funded through a federal settlement that focuses on mitigating impacts to benthic habitats.

A web page containing photos and a description of the project can be found at: http://montereybay.noaa.gov/resourcepro/resmanissues/lostgear.html

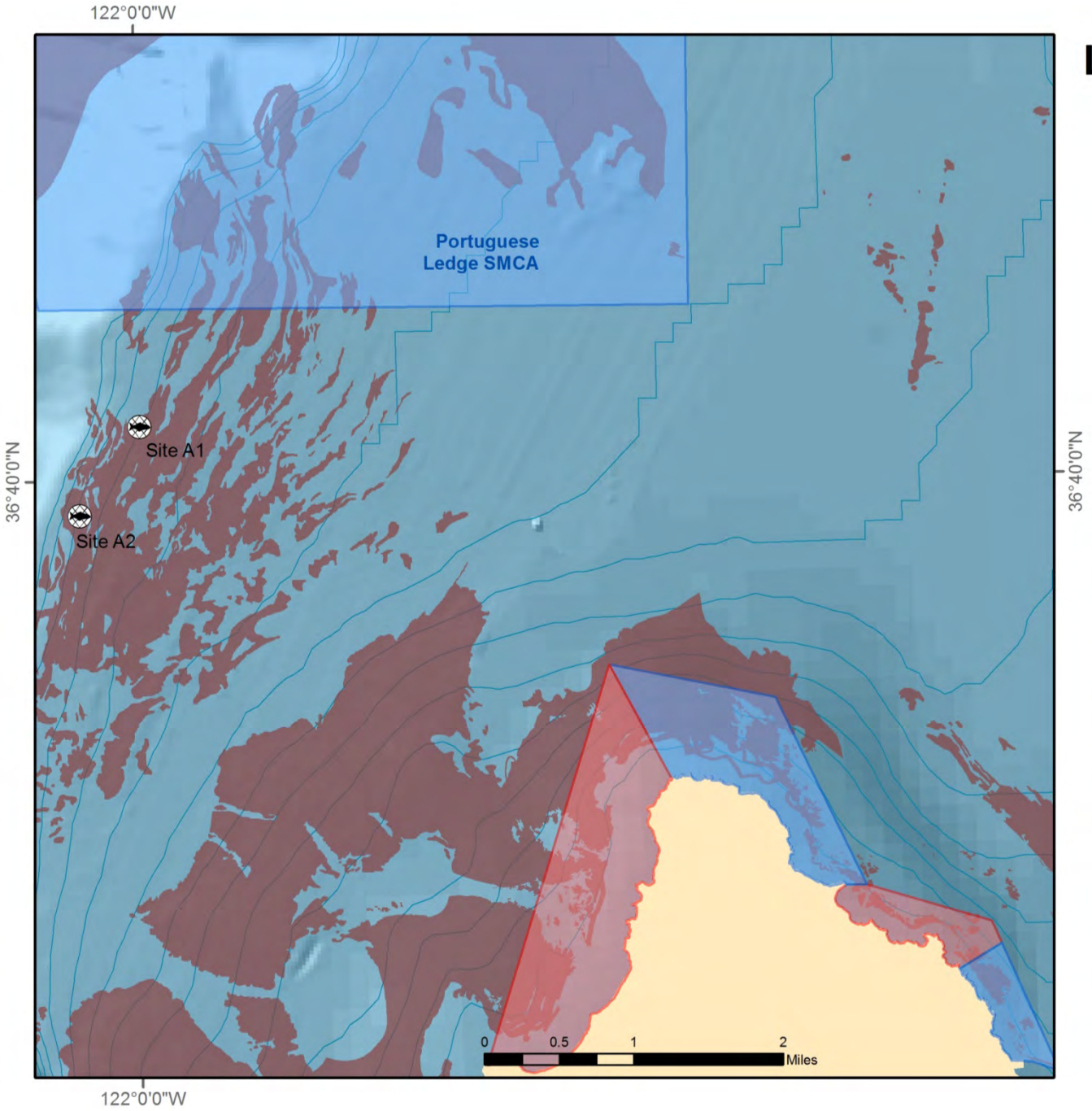
Study Sites

Reviewing past research data and using local knowledge from fishermen allowed for strategically identified dive locations where the lost fishing gear was the densest. In 2011 we focused on a new area, Point Sur Platform, not surveyed during the 2009 or 2010 Lost Fishing Gear Removal cruises. Point Sur Platform was host to six specific survey sites where lost fishing gear had been noted by 2003, 3004, 2007 and 2008 National Marine Fisheries Service (NMFS) Delta Submarine dives, a 2006 camera sled cruise and fishermen noted locations (See Figure 1). The targeted gear included fishing line, gill nets, and other nets at depths ranging from 48 to 183 meters. Lost fishing gear targets of traps in and just Southwest of Soquel Canyon State Marine Conservation Area (SMCA) had been identified by 2007, 2008 and 2009 by NMFS Delta Submarine dives (See Figure 2). The traps close to Soquel Canyon were located between 155 and 306 meters, which was much deeper than sites at the Point Sur Platform. There was also an opportunity to re-survey the

large, intact trawl net located on Portuguese Ledge at 91 m. Two targets, a net and a trap, were identified by 2004 NMFS Delta dives in depths of 127m and 115 m respectively just South-South-West (SSW) of Portuguese Ledge SMCA (See Figure 3). In addition, approximate locations reported from fisherman for crab pots and abalone traps lost in 2008, 2009 and 2010 inside Monterey Bay at depths between 65 and 75 m were surveyed (See Figure 4). See Figure 5 for an overview of all five study sites.

Figure 1. Pre-cruise target sites at Point Sur platform.

Figure 2. Pre-cruise Soquel Canyon and Cabrillo Canyon Sites



Lost Fishing Gear 2011 Targets Extra

Site A1: Trap
Dive 6274
8/15/2004
36.671918
-121.999738
Depth= 115 m

Site A2: Net
Dive 6259
36.66332
-122.007057
Depth= 127 m

Figure 3. Trap and Net targets SSW of Portuguese Ledge SMCA.

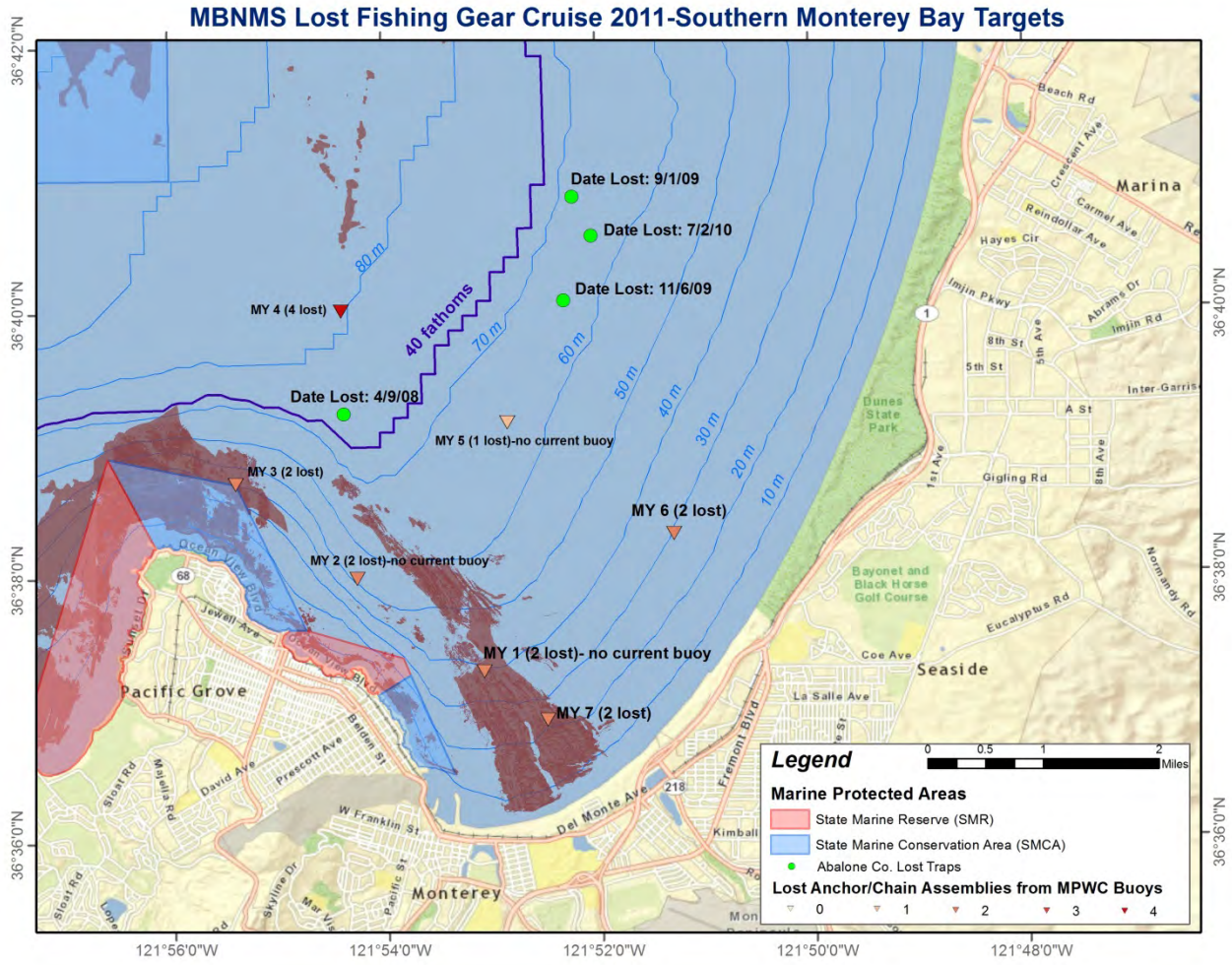


Figure 4. Locations of lost anchor and chain assemblies from MBNMS Motorized Personal Watercraft zones and lost Pleurobrachaea californica traps, in addition to the 40 fathom line on which the traps were originally set.

Figure 5.Post 2011 Lost Fishing Gear Removal cruise targets showing where surveys were completed and where gear was found and recovered

Role Descriptions and Schedule

- Captain - Dave Minard (Monterey Bay National Marine Sanctuary (MBNMS)): was responsible for oversight of overall operation; ensured safe working conditions; operated vessel.
- Cruise Leader- Karen Grimmer (MBNMS): was responsible for oversight of cruise preparation and for decision-making in the field (location, methods, etc.), led communications to science party and crew, and assisted the team as needed (switching out tapes, daily progress summaries, navigating, etc.).
- Chief Technician - Michael Carver (Cordell Bank National Marine Sanctuary (CBNMS)): was responsible for ROV & equipment prep, mobilization and served as back up pilot, backup navigator, and deck support.
- Chief ROV Pilot - Andy Lauermann (Marine Applied Research and Exploration (MARE)): was responsible for piloting the ROV and supervising ROV operations.
- Navigator- Sophie De Beukelaer (MBNMS) and Michael Carver (CBNMS): was responsible for navigation including communications with the captain and deck crew; trouble shooting; managed digital and spatial data.
- Data Manager - Sophie De Beukelaer (MBNMS): was responsible for managing and mapping all sources of data, recorded notes on transect starting and ending coordinates, special conditions, target locations, etc.
- Deck Supervisor - Hans Bruning (MBNMS): was responsible for supervision of deck operations; operated winch and crane.
- Deck Manager– Steve Holtz (MARE): was responsible for deployment and recovery of ROV, including management of tether and clump weight; was responsible for monitoring weather and sea conditions.
- Tether Handler – Thom Smith (Marine Advanced Technology Education Center (MATE Center)) and Beth Pardieck (California State University Monterey Bay (CSUMB): Assisted with handling tether during ROV deployment and recovery.
- Videographer/Photographer- Steve Ellzey (Access Monterey Peninsula (AMP)): was responsible for recording topside cruise operations, in particular, ROV and retrieval operations for public relations.
- Observers/Passengers: Sam Farr (Congress) and Kristin Bor (Sea Grant Fellow); Environmental Protection Agency (EPA) Administrator; Access Monterey Peninsula (AMP) Video crew; CSUMB Intern
- HD Camera (Dry Lab) - Karen Grimmer: was responsible for oversight of HD camera operations in the Dry Lab.
- Specimen collections - Christina Piotrowski and Pamela Montbach (California Academy of Sciences and Steinhart Aquarium): collected, identified and catalogued deepwater inverts present on retrieved fishing gear.

Table 1. Personnel aboard during the 2011 cruise.

Day	Weekday	Date	Study Location	Karen Grimmer	Sophie De Beukelaer	Michael Carver	Beth Pardieck	Thom Smith	Steve Ellzey	Sam Farr and Sea Grant Fellow	California Academy of Sciences/ Steinhart Aquarium	Other (CSUMB Intern, EPA, AMP Staff)	Total (with 4 daily personnel*)
1	Sunday	10/23	Mobilization in Monterey	X	X	X		X					**8**
2	Monday	10/24	Mobilization in Monterey	X	X	X		X					**8**
3	Tuesday	10/25	Point Sur	X	X	X	X	X					**9**
4	Wednesday	10/26	Soquel Canyon	X		X		X					**7**
5	Thursday	10/27	Point Sur	X		X		X					**7**
6	Friday	10/28	Point Sur	X		X	X	X					**8**
7	Saturday	10/29	South of Portuguese Ledge/ Southern Monterey Bay	X	X		X	X					**8**
8	Sunday	10/30	OFF										
9	Monday	10/31	South of Portuguese Ledge and Portuguese Ledge	X	X			X	X	X		X	11
10	Tuesday	11/1	Soquel Canyon/ Southern Monterey Bay	X	X			X				X	8
11	Wednesday	11/2	Point Sur	X				X			X	X	10
12	Thursday	11/3	Demob in Monterey	X	X		X	X					8

***R/V Fulmar crew (Dave Minard and Hans Bruning) and MARE ROV crew (Andy Lauermann and Steve Holtz) onboard every day**

Safety and Communication

Safety of the vessel crew and science party was of the utmost importance. The captain and cruise leader conducted safety briefings daily. Operational procedures were reviewed prior to launch and recovery, as conditions and crew composition varied.

Excellent communication among the crewmembers was essential to the success and safety of the mission. The cruise leader ensured that constant communication was maintained among scientists and the crew in the ROV control area, the bridge and the deck during ROV operations. Communications protocols were reviewed during the daily safety briefings held at the end of the day. The cruise leader ensured that all team members were properly informed and understood the objectives of each dive.

ROV Operations

The Phantom HD2 ROV was retooled for a diversity of deepwater habitats to locate, document and retrieve lost fishing gear. Additional thruster power lights, an HD video camera, a hooking and cutting manipulator, and a spool with resilient Spectra line had been added to enhance the ROV's fishing gear recovery capacity.

Developing and maintaining an equipment list well in advance of the cruise helped prevent delays and reduced days at sea. As in 2009 and 2010, critical equipment was loaned from California Department of Fish and Wildlife (CDFW), California State University Monterey Bay (CSUMB) and from Cordell Bank National Marine Sanctuary (CBNMS). Loaned equipment included a backup tether and clump weight; hydrophone pole and mount; heading sensors, GPS and antennae setup; and Trackpoint II.

Recommendations to improve and enhance ROV operations and performance were identified during the 2009 and 2010 cruises while working aboard the Fishing Vessel (F/V) Donna Kathleen. F/V Donna Kathleen's crew, consisting of Captain Tim Maricich, his wife, Donna, and their son, Tyler, were instrumental in developing methods that worked on the Phantom ROV. We were able to address some of these recommendations including improved carabineer control, modified retrieving spool, providing higher resolution screens for the ROV pilot and adding a high-definition camera.

The skilled ROV pilot and back deck manager, both from MARE, monitored sea conditions to ensure the safety of ROV operations. The ROV pilot also needed to be highly skilled to maneuver an ROV around lines and nets and he continued to demonstrate a high level of competency throughout all Lost Fishing Gear Removal cruises. The pilot provided "on the fly training" to sanctuary staff and interns on 11/1/11 and 11/2/11.

Figure 6. Karen Grimmer (foreground), cruise leader, piloting the ROV under the direction of Andy Lauermann (background) as Steve Holtz (left) looks on.

Upon arrival at station, the R/V Fulmar would stop and remain in neutral to assess local drift and to determine the optimal transect start point and orientation based on available target coordinates. The deck manager, pilot and navigator would go through the pre-dive checklist to ensure that the ROV was ready to be deployed.

The ROV was launched along with a clump weight from the A-frame and winch. The vessel will set up to drift with the wind and current towards the general target area. The ROV was lifted by the A-frame, lowered into the water, released from the winch line, and motored out 40 meters from the vessel prior to launching a 300-lb. clump weight that was be attached to the winch cable and lowered into the water a few meters. At this point, the ROV tether was secured to the clump weight down line (winch line), and thereafter every 3 meters until the clump weight reached 5 to 10 meters from the bottom (more in high relief areas) to prevent contact with the seafloor. Simultaneous with the lowering of the clump weight, the ROV dove to the bottom, with the pilot and navigator monitoring its depth and altitude.

Depending on visibility, the ROV operated 0.5 to 2 meters from the seafloor at speeds ranging from .5 to 1.5 knots. The ROV proceeded along a determined transect or search pattern, but altered its course depending on the bottom relief and presence of lost fishing gear. Observations of gear and potential targets were recorded both digitally in Hypack and manually in the cruise log.

The science team identified gear to be removed as surveys were being conducted. The science team decided whether or not to retrieve fishing gear based on the

following criteria: Impacts to animals and habitat with a high priority given to endangered or protected species and sensitive habitats; threats to fishing operations; impacts to habitat as a result of removal; and feasibility of removal.

One of two retrieval methods was used based on a survey of the area, the sea and benthic conditions, and the type of debris:

1. A carabineer (metal hook) clipped onto the net or trap with the grabbing arm, and as the ROV was retrieved, the spool line paid out to the surface. The spool line was then transferred to a dedicated hydraulic winch (borrowed from CDFW) and the gear was hauled up to the surface.
2. The lost fishing gear was brought up with the ROV. The ROV's grabbing arm on the ROV grasped the net fragment after the snipping device was used to cut any lines that were wrapped around boulders or the carabineer was hooked on a trap and pulled it to the surface.

At the completion of the dive, the deck supervisor, in concert with the captain and ROV pilot, directed the recovery of the ROV. The vessel was set up to drift with the wind. The ROV began its ascent while the winch raises the clump weight with assistance from the tether handler, and another scientist or deck hand managed the umbilical. Once recovered, the crane boomed in to place the clump weight on the deck. It boomed back out for ROV recovery. The ROV flew along the surface into the recovery position and the tether handler attached a recovery carabineer to the ROV via a boat hook, while the pilot kept the ROV away from the vessel's hull. The winch was taken in, and the A-frame was raised to deposit the ROV on the deck with the assistance of the tether handler (See Figure 7). While the tether handler recovered the ROV, a scientist or deck hand managed the tending and coiling of the umbilical. The First Mate operated the A-frame and dedicated winch, and provided oversight of deck operations.

Figure 7. Recovering the ROV. Note the clumpweight has already been recovered and the tether is still being handled.

Data Recording and Management

Data collected included a detailed written log for every dive, HD video and photographs, regular video and navigation data for the ROV and the support vessel. The written log included information on the ROV transect file and description, removal criteria that was applied, recovery descriptions, animals collected, photos taken and also comments in addition to the data, time, transect start and end locations, depth and habitat type (See Appendix A). The HD video and HD stills were recorded from a front-facing camera. This data was recorded on a hard-drive in the camera that was on the ROV and it was downloaded after each dive onto another hard-drive. The HD stills were collected using a touch-screen application on a Toughbook that was wired to the camera on the ROV so that the user of the Toughbook could decide when to capture images. The regular video was recorded on mini digital videotapes. This video has time, date and depth stamp embedded in it and has a wider field of view than the HD video. The date and time will be used to cross-reference the video and navigational data. The position of the ROV was monitored and recorded in Hypack. The navigation feed from the ROV was provided by a Trackpoint II system. Hypack integrates the ROV navigation data and the ship's location via GPS with appropriate offsets to determine the exact location of the ROV. Geo-referenced event annotations were entered into Hypack and stored on an external hard-drive with the navigation data, which were recorded both as

logged files and shared memory files with specific attributes (See Figure 8 for setup of navigation station and ROV piloting station).

Figure 8. Navigation and ROV station on the R/V Fulmar.

Specimen Collection and Disposal of Gear

Due to the number of encrusting organisms found during the 2009 and 2010 cruises, we developed a sampling plan for the 2011 cruise with staff from the California Academy of Sciences. This project provided a unique opportunity to characterize invertebrate communities associated with lost fishing gear. For example, during the 2009 cruise, an interesting light pink coral, *Lophelia pertusa,* was collected by our team and identified by Monterey Bay Aquarium Research Institute (MBARI) and the Smithsonian Institute as a deepwater forming scleractinian that is common on the East coast.

During this cruise, California Academy of Sciences collected and identified 24 invertebrate specimens to the Family level, which were then added to their Invertebrate Zoology Collection (CASIZ Database) with specific GPS location data (See Appendix B. CASIZ database information for specimens collected during the 2011 Lost Fishing Gear Removal Cruise.Appendix B). Steinhart Aquarium staff collected and kept the cylindrical trap and associated invertebrates that had been collected the day before and kept in an ice chest with cooled water.

Figure 9. California Academy of Sciences and Steinhart Aquarium staff collecting specimens from retrieved gear at the dock.

Best effort was made to repatriate lost gear. Monterey Institute of International Studies (MIIS) students used the net and line in a display educating participants of TEDx in Monterey on April 13, 2012 on marine debris issues (See Figure 10 and Figure 11). The net and a trap were provided to the California Academy of Sciences for educational purposes in a new exhibit they are planning. Remaining gear was properly disposed.

Figure 10. HD image of crab trap found on 10/29/11 and recovered on 10/31/11.

Figure 11. Crab trap shown in Fig.10 as part of the display on marine debris at TEDx in Monterey on April 13, 2012.

Daily Cruise Log

Day 1
Sunday, October 23: Mobilization in Monterey

8:00 am: Begin mobilization at the Wharf 2 public hoist.
5:30 pm: End operations for the day.

Science Personnel:
1. Michael Carver
2. Karen Grimmer
3. Sophie De Beukelaer
4. Thom Smith

Day 2
Monday, October 24: Continue mobilization in Monterey and test ROV deployment and retrieval off Monterey Harbor.

8:00 am: Continue mobilization at the NOAA floating dock
4 pm: Test dive of ROV in 68 m in South Monterey Bay near the Harbor. ROV video was ok but no HD video or stills were taken.
5:30 pm: End operations for the day.

Science Personnel:
1. Michael Carver
2. Karen Grimmer
3. Sophie De Beukelaer
4. Thom Smith

Day 3
Tuesday, October 25: Begin survey and gear retrieval at Point Sur. Complete Survey Site #1 (unknown fishing line and small net at 120m noted by 2003 and 2004 NMFS dives); Begin Survey Site #2 within Point Sur SMCA

6:50 am: Science crew aboard R/V FULMAR
6:55 am: Cruise leader and captain review and modify plan of the day as necessary.
7:00 am: Depart for Site 1 at Point Sur near the Sur Canyon head.
9:00 am: Arrive at Site 1 and begin survey. A longline connected to an old fragmented fishnet was found and a target was marked in Hypack but no gear was recovered. HD video and stills were taken. The dive was conducted over a habitat that contained rocky boulders in about 104 m. We completed a U shaped survey transect that lasted about 20 minutes.
12:00 pm: Arrive at Site 2 within Point Sur SMCA. This site was indicated by DFW as an area of interest. The area, about 56 m in depth and rocky, was

surveyed for several hours but no gear was found. HD video was not recording but the regular ROV video did record numerous gorgonians that were in the survey area.

3:00 pm: Retrieve ROV and return to port. Cruise leader and captain debrief en route.

5:00 pm: Arrive at Monterey harbor.

Science Personnel:

1. Karen Grimmer, Cruise Leader
2. Michael Carver
3. Sophie De Beukelaer
4. Beth Pardieck
5. Thom Smith

Day 4

Wednesday, October 26: Begin survey and gear retrieval of traps at Soquel Canyon Sites A, B, D and E.

6:50 am: Science crew aboard R/V FULMAR

6:55 am: Cruise leader and captain review and modify plan of the day as necessary.

7:00 am: Depart for Site A within Soquel Canyon SMCA at the Northern edge of Soquel Canyon.

10:00 am: Arrive at site and begin survey at Site A and search area for partially buried trap in mud noted on a 2007 Delta Dive in 195 m. The ROV then transited along the steep canyon wall West to Site B but no gear was found or retrieved. No HD stills were captured due to a communication issue with the computer but HD video was captured.

11:48 am: Surveyed Site D at 184 m in soft sediments for a buried rectangular trap noted during a 2009 Delta dive. No gear was found or retrieved. Only HD video was captured and no images were collected due to the continued lack of communication with the computer.

12:18 pm: Began survey at Site E in 160 m in muddy habitat with boulders (See Figure 12).

Figure 12. Rectangular Trap (top left) found by the Delta Submersible in 2008 at 159.309 m at the edge of Soquel Canyon (Image by National Marine Fisheries Service).

A cable was sighted first and then a trap was found. The trap was hooked with the carabineer and as the trap was pulled up, a line that was attached to the trap broke free from the rock. The grabbing manipulator arm on the ROV was used to secure the carabineer and the trap was hauled up along with the ROV onto the deck. Specimens removed from trap included crinoids, brittle stars, bat star, sea stars, a decorator crab, a whelk and small sponges. The trap was identified as a lobster trap that might have been used for spot prawns. Video and images of the trap and associated organisms was captured. HD video is available for this dive but no stills were taken. Trackpoint settings were altered mid survey when filtering and smoothing were turned on.

3:00 pm: Return to port. Cruise leader and captain debrief en route.
5:00 pm: Arrive at Monterey harbor.

Science Personnel:

1. Karen Grimmer, Cruise Leader
2. Michael Carver
3. Thom Smith

Day 5

Thursday, October 27: Continue survey and gear retrieval at Point Sur at Site 7 and 4. Begin and complete Survey Site #7: Mike Ricketts had noted that there were rockfish gill nets along the 100-fathom line (183 m).

6:50 am: Science crew aboard R/V FULMAR
6:55 am: Cruise leader and captain review and modify plan of the day as necessary.
7:00 am: Depart for Site 7 at Point Sur.
9:50 am: Begin survey of Site 7 in 195-230 m in soft sediment. Strong bottom current made ROV transect very slow. Transect planned to go to a point NW of the 100 fathom line and then back to the line but due to lack of rocky substrate (therefore, lack of snagging potential), the dive was halted after a short time along the first transect to the point. A rubber mat with two *Metridium* on it was noted but not retrieved and no lost fishing gear was noted. HD video is available for this dive and deck photos were captured during the deployment of the ROV.

12:12 pm: Begin survey of Site 4 where the 2006 camera sled cruise noted a large net in 127 m (See Figure 13). The ROV was deployed about 600 m from the net location. This area was rocky with mud and many large rockfish were noted in addition to a wolf eel, many glass sponges, vase sponges and brachiopods. Large fiber optic cable remnants were noted (and later identified by Naval Postgraduate School staff as Navy cable) but not recovered since lost fishing gear was not attached to the cable. The cables were followed and the survey was captured on HD video. A rockfish hotspot was noted in Hypack.

Figure 13. Net at Site 4. Image taken during 2006 Camera Sled Cruise.

2:40 pm: Retrieve ROV and return to port. Cruise leader and captain debrief en route.
5:00 pm: Arrive at Monterey harbor.

Science Personnel:
1. Karen Grimmer, Cruise Leader
2. Michael Carver
3. Thom Smith

Passenger:
4. Mike Ricketts –Fisherman

Day 6
Friday, October 28: Continue survey and gear retrieval at Point Sur. Begin and complete Survey Site #5: gill net found w/Delta Sub at 71.5 m; continue survey at Site 2.

6:50 am: Science crew aboard R/V FULMAR
6:55 am: Cruise leader and captain review and modify plan of the day as necessary.
7:00 am: Depart for Site 5 at Point Sur
9:55 am: Arrive at site 5 and begin survey in this rocky area at 70 m. Deck photos were taken of the ROV deployment and recovery. Surveyed the area for over an hour but did not locate lost fishing gear. This area had lots of young of the year and HD video captured the whole survey. No explicit transects of a search pattern were followed.
12:15 pm: No evidence of lost fishing gear was identified during this 2.5 hour dive in 45-50.5 m of water. The survey was conducted along the edge of the rocky and sandy interface and followed the feature east for 600 meters and then turned NNE for 575 m. HD images and video were captured in addition to topside images.
3:00 pm: Retrieve ROV and return to port. Cruise leader and captain debrief en route.
5:00 pm: Arrive at Monterey harbor.

Science Personnel:
1. Karen Grimmer, Cruise Leader
2. Michael Carver
3. Thom Smith
4. Beth Pardieck

Day 7
Saturday, October 29: Survey area SSW of Portuguese Ledge SMCA for trap and net; survey of Southern Monterey Bay for lost scientific *Pleurobranchaea californica* trap sets.

6:50 am: Science crew aboard R/V FULMAR

6:55 am: Cruise leader and captain review and modify plan of the day as necessary.
7:00 am: Depart for trap target SSW of Portuguese Ledge SMCA
8:00 am: Arrive at site and begin survey in 122 m of rocky/mud bottom. Found trap in 18 minutes at (36^{0}40'18.79 N, 121^{0}59'59.1968W at 120 m). It was a round crab trap with lots of tangled attached line. The area was surveyed and we planned to remove the trap on 10/31/11. Both HD video and stills were captured.
9:00 am: Arrive at net target SSW of Portuguese Ledge SMCA and south of the crab trap. The survey started in 130 m in rocky habitat and six minutes into the transect a fishing line was found. We followed it and arrived at a net, which we surveyed and measured at approximately 25 meters. Net was flattened along the bottom and did not have many attached organisms (See Figure 14). In order to reduce the chances of snagging the ROV on the net, the position of the snipper arm on the ROV needed to be adjusted and all the clamps needed to be taped so we decided to recover the ROV and that we would recover the net during the follow-up dive. Topside video of the ROV recovery was captured in addition to HD video and ROV video.
12:00 pm: Recovery of net was planned and when relocated (36^{0}39.7935 N, 122^{0}00.4157W at 133m), we hooked as much of the net as possible with the carabineer and released the carabineer. The ROV and the net were recovered separately. Removal criteria were considered. There was no navigation threat and only a low/medium impact to the flora/fauna to remove the net. The net draped over one rock but was primarily over muddy bottom. The recovered rockfish gillnet measured to about 75 by 25 feet. Animals associated with the net were an octopus, brittle stars, a slug, worms and rocks/fossils. HD video and stills captured the benthic survey and topside images were taken of the net and associated fauna (See Figure 15).

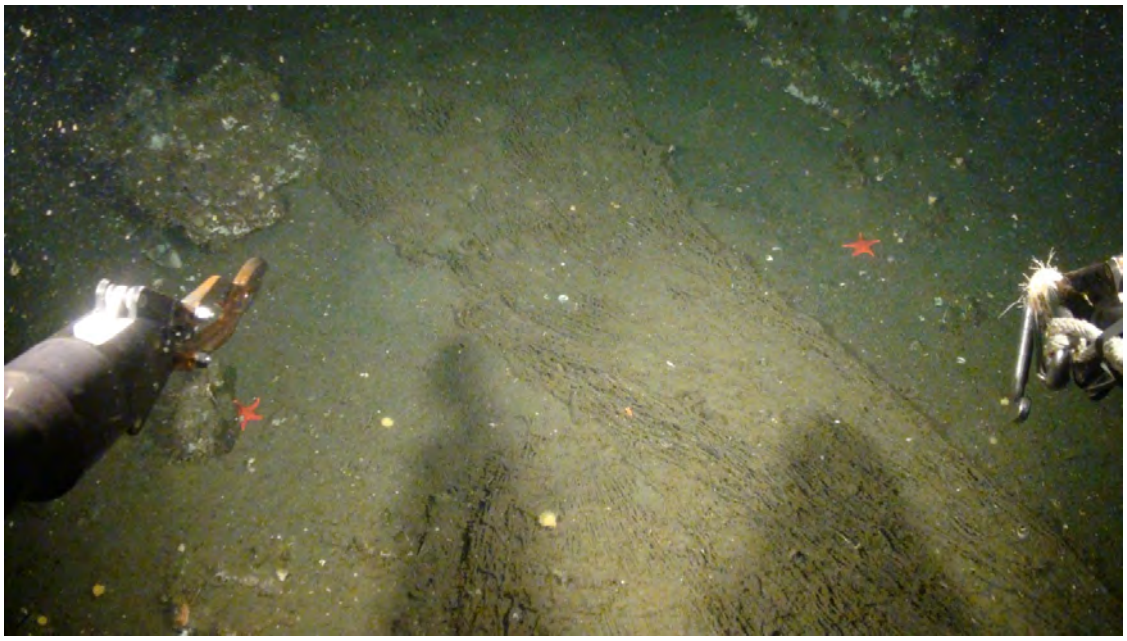


Figure 14. HD image of net removed 10/29/11 SSW of Portuguese Ledge SMCA -133 m.

Figure 15. Science and boat crew sorting organisms from the recovered net on the back deck of the RV Fulmar.

2:05 pm: Start survey for scientific *Pleurobranchaea californica* traps at 73 m in muddy habitat in Southern Monterey Bay. Trevor Fay from the Monterey

Abalone Co. provided the positions and these traps look similar to crab traps but are lined with a small mesh plastic liner. Four traps are set about 300 feet apart. We completed a 600 m transect to the SE from the location of Set 1 to Set 2 but did not find any lost fishing gear. HD video and images of *Pleurobranchaea californica* and octopi were captured.

3:00 pm: Retrieve ROV and return to port. Cruise leader and captain debrief en route.

5:00 pm: Arrive at Monterey harbor.

Science Personnel:

1. Karen Grimmer, Cruise Leader
2. Sophie De Beukelaer
3. Thom Smith
4. Beth Pardieck

Day 8

Sunday, October 30: Rest day – no operations

Day 9

Monday, October 31: Media Day; Congressman- Sam Farr, Sea Grant Fellow and AMP film crew aboard; Survey and retrieve trap SSW of Portuguese Ledge SMCA and re-visit large trawl net found by MBNMS at Portuguese Ledge in 2010

6:50 am: Science crew, Congressman, staffer and AMP film crew aboard R/V FULMAR

9:45 am: Arrive at site and begin survey and retrieval operations of trap.

10:15am: Tracking was jumpy but re-found the trap from 10/29/11 in 30 minutes. Located trap at $36^{0}40.3219$ N, $121^{0}59.9847$ W at 119.8 m (See Figure 16). Checked the line and tried to hook trap but we could not see the starboard arm of the ROV that had the carabineer so we hooked on to the stainless steel wire. ROV and trap back at the surface at 10:43 with the trap. It was a very old round crab trap with about 40 feet of line. There were decorator crabs, worms, sea stars, tunicates, shark egg cases, sponges and one glass sponge associated with the trap. HD images and video were collected.

Figure 16. HD close-up image of round crab trap recovered from an area SSW of Portuguese Ledge SMCA in 119.8 m.

12:11 pm: ROV was put in the water and the objective was to determine if there had been any change in the large intact trawl net and the doors since we found the net in 91 m at the edge of the SE portion of Portuguese Ledge. The trawl net was located at 12:35 pm (See Figure 17). There were lots of *Metridium spp* living on top of the net that was floating in the water column.

Figure 17. Large intact trawl net at 91 m SE of Portuguese Ledge.

At 12:51 pm we maneuvered over to the top of Portuguese Ledge to record the rich habitat (See Figure 18) and showcase it to the passengers aboard. HD imagery was captured and included gorgeous images of a wolf eel and decorator crab.

Figure 18. HD image of rich fauna on top of the rocky reef called Portuguese Ledge.

1:30 pm: Retrieve ROV and return to port. Cruise leader and captain debrief en route.
3:00 pm: Arrive at Monterey harbor.

Science Personnel:
1. Karen Grimmer, Cruise Leader
2. Sophie De Beukelaer
3. Thom Smith

Passengers:
4. Sam Farr –Congressman
5. Kristen Bor – Sea Grant Fellow
6. Steve Ellzey, plus videographer

Day 10
Tuesday, November 1: Continue HD survey and gear retrieval West of Soquel Canyon SMCA at Sites G and H. Continue survey for lost *Pleurobranchaea californica* traps in Southern Monterey Bay.

6:50 am: Science crew aboard R/V FULMAR

6:55 am: Cruise leader and captain review and modify plan of the day as necessary.
7:00 am: Depart for Soquel Canyon
9:00 am: Arrive at site G. Delta dive 7102 T4 in 2008 noted a round mesh cylindrical trap at 243 m on the audio part of the tape. We searched on the edge of Cabrillo Canyon head but the survey was challenged by the steepness of the canyon edge. At 9:35 am we found a line and followed it around a boulder. At 9:43 we found a cylindrical trap at 247 m at $36^0$48.3138 N, $122^0$4.7534 W (See Figure 19). We determined that the traps removal would have a low impact to the habitat but the trap was quite overgrown with biology. We hooked the trap with the carabineer (See Figure 20) and pulled it up with the ROV to the surface. The 2.5-foot cylindrical trap had lots of growth and we stored it in a cooler without the removal of fauna. Bait appeared to still be inside the trap but the trap did not seem to be ghost fishing. There were brittle stars, cup corals, sponges and tunicates associated with the trap. HD video and images, including one of an electric ray, were captured. Topside video of the ROV coming on board with the trap was captured.

Figure 19. HD image of cylindrical trap at 247 m on the edge of Cabrillo Canyon.

Figure 20. HD image of the ROV hooking the cylindrical trap with the carabineer.

10:30 am: Arrive at site H and begin survey. Delta dive 7151 T3 from 2008 noted a trap in 301 m on the audio part of the tape. At 11:17 AM we found the trap at 306.4 m. However, the ROV was pulled off station before we could hook the trap. These was lots of loose sediment that kept dispersing as the ROV made contact or came close to the bottom and impeded visibility. We could not relocate the trap and aborted the dive at 1:05 pm. HD video and images were captured.

3:12 pm: ROV on bottom at 77m in Southern Monterey Bay to survey for and recover lost traps by the Abalone Company. The ROV travelled 400 m at 33 degrees along the 40-fathom depth contour line. At 3:32 pm we found a tire tube with nudibranch eggs at 77 m and we pinched the inner tube with snippers and tried to bring it to the surface. However, we lost the inner tube at the surface so we returned to the bottom to finish the line. Several soda cans were noted but no traps were found. Since we were in a sandy area and maneuvering along one line, the main pilot was able to provide the opportunity for both science and boat crew to pilot the ROV. HD imagery and video were collected.

4:36 pm: Retrieve ROV and return to port. Cruise leader and captain debrief en route.

5:30 pm: Arrive at Monterey harbor.

Science Personnel:

1. Karen Grimmer, Cruise Leader
2. Sophie De Beukelaer
3. Thom Smith

Passenger:
4. Carolyn Roosevelt- CSUMB Intern

Day 11
Wednesday, November 2: Continue HD survey and gear retrieval at Point Sur platform. Survey and retrieval at Sites 6, 4 and 3
6:50 am: Science crew aboard R/V FULMAR
6:55 am: Cruise leader and captain review and modify plan of the day as necessary.
7:00 am: Depart for Point Sur
9:10 am: Arrive at Site 6 and begin survey and retrieval operations. Descended at the target gill net, which was noted in 2007 during Delta dive 6838 at 47 m. Found a line and followed it to a small net fragment that was wedged in a rock. Because the net was wedged in the rock and it did not pose a hazard, it was not removed. HD images and video were recorded during the first part of the dive but then it stopped functioning.
11:15 am: Arrive at Site 4 and surveyed the Navy cable fragments at 130 m thoroughly with the HD camera since the HD camera was not functioning when this site was surveyed on 10/27/11. Many good HD images of the cable (See Figure 21), fish and rockfish were captured.

Figure 21. HD image of crinoids on cable.

Transited over a rockfish hotspot (See Figure 22) but did not find any lost fishing gear.

Figure 22. HD image of rockfish on Point Sur platform.

The 2006 Camera Sled cruise did find a large net at 127 m. The intern, Thom Smith, was able to pilot the ROV with direction from the principal ROV pilot.

1:50 pm: Arrive at Site 3 where Delta dives in 2003 and 2004 indicated unknown fishing line and cable at 90 m. Dropped down on the target coordinates and moved to the east then went NW and found a piece of long line between two rocks over a sandy bottom.

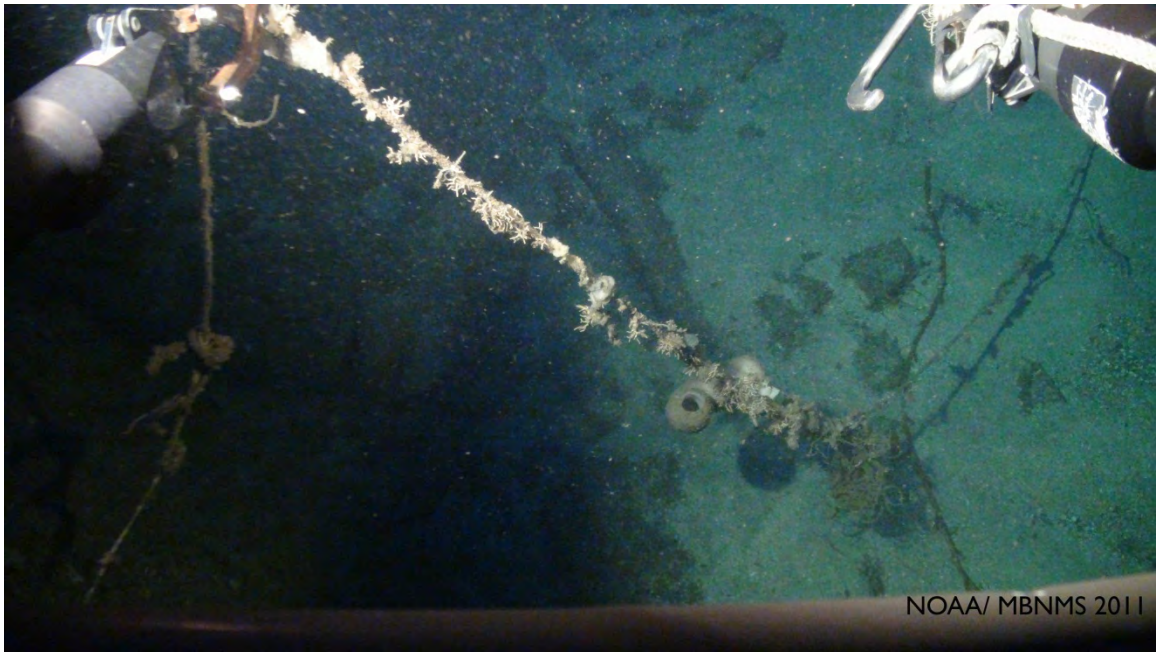


Figure 23. Snipping overgrown longline with ROV.

Snipped long line (See Figure 23) and attempted to recover it using the spool and winch. However, line was lost as ROV was landed so no gear was recovered. HD images and video were captured including several of a ronquil, genus *Rathbunella, (See* Figure 24*)* at 85 m. Robert Lea confirmed the genus and acknowledged that it would be challenging to identify this fish down to the species due to the microscopic differences between the two likely species of that genus.

Figure 24. HD image of a ronquil, Rathbunella sp., in sponge.

3:30 pm: Retrieve ROV and return to port. Cruise leader and captain debrief en route.
5:00 pm: Arrive at Monterey harbor.

Science Personnel:
1. Karen Grimmer, Cruise Leader
2. Thom Smith

Passengers:
3. Jared Blumenseld – EPA Regional Administrator
4. Jared Blumenseld's son
5. Christina Piotrowski- California Academy of Sciences
6. Pamela Montback- Steinhart Aquarium

Day 12
Thursday, November 3: Demobilization in Monterey
8:30 am: Begin demobilization and proceed to Wharf 2 public hoist to offload gear.
5:30 pm: End of cruise.

Science Personnel:
1. Karen Grimmer, Cruise Leader
2. Sophie De Beukelaer
3. Thom Smith
4. Beth Pardieck

Results

During October 24 and November 2, 2011, the team completed 22 ROV dives and removed 3 traps and the associated lines in addition to one rockfish gillnet from the Sanctuary waters. During those 22 dives, we visited 20 sites. Lost fishing gear was found at 10 of those 20 sites and recovered from 4 sites (See Figure 5 and Table 2). Recovered gear was either lightly or heavily encrusted, yet did not appear to be actively fishing. Documented species associated with the recovered gear included brittle stars, octopuses, cup corals, tunicates, cat shark egg cases, sponges including vase and glass sponges, a variety of starfish, a whelk, a red cucumber, decorator crabs and crinoids.

Table 2. Daily tally of found and recovered Lost Fishing Gear during 2011 cruise.

Date	Dive #	Site	Gear Found	Gear Recovered
10/24	1	Test ROV		
10/25	2	Point Sur- Site 1	Line	No
10/25	3	Point Sur- Site 2	None	
10/26	4	Soquel Canyon- Sites A&B	None	
10/26	5	Soquel Canyon- Site D	None	
10/26	6	Soquel Canyon- Site E	Lobster trap	Yes
10/27	7	Point Sur- Site 7	None	
10/27	8	Point Sur- Site 4	Cable	No
10/28	9	Point Sur- Site 5	None	
10/28	10	Point Sur- Site 2	None	
10/29	11	SSW of Portuguese Ledge SMCA	Trap	No
10/29	12	SSW of Portuguese Ledge SMCA	Net	No
10/29	13	SSW of Portuguese Ledge	Net	Yes

Date	Dive #	Site	Gear Found	Gear Recovered
		SMCA		
10/29	14	Southern Monterey Bay	None	
10/30		Day off		
10/31	15	SSW of Portuguese Ledge SMCA	Trap (Found on 10/29)	Yes
10/31	16	SE Portuguese Ledge	Trawl Net	No
11/1	17	Soquel Canyon- Site G	Cylindrical Trap	Yes
11/1	18	Soquel Canyon- Site H	Trap	No
11/1	19	Southern Monterey Bay	None	
11/2	20	Point Sur- Site 6	Line and small net fragment	No
11/2	21	Point Sur- Site 4	None	
11/2	22	Point Sur- Site 3	Long line	No

Figure 25. Net recovered 10/29/11.

HD video and photos were captured as often and as much as possible as they provide amazing outreach and educational benefits due to the quality of the image. We captured HD video during 20 of the 22 dives and HD photos during 12 of the 22 dives (See Table 3). Together the HD video and photos require about 180 GB of storage space. Incredible imagery of both lost fishing gear, its removal and the surrounding fauna and habitat has been incorporated in this report, posted on-line, both on the website and Facebook (see links below), and distributed for outreach and educational purposes.

Table 3. Daily tally of captured HD Video and Photos.

Date	Dive #	Site	HD Video	HD Photos
10/24	1	Test ROV	No	No
10/25	2	Point Sur- Site 1	Yes	Yes
10/25	3	Point Sur- Site 2	No	No
10/26	4	Soquel Canyon- Sites A&B	Yes	No
10/26	5	Soquel Canyon- Site D	Yes	No
10/26	6	Soquel Canyon- Site E	Yes	No
10/27	7	Point Sur- Site 7	Yes	No
10/27	8	Point Sur- Site 4	Yes	No
10/28	9	Point Sur- Site 5	Yes	No
10/28	10	Point Sur- Site 2	Yes	No
10/29	11	SSW of Portuguese Ledge SMCA	Yes	Yes
10/29	12	SSW of Portuguese Ledge SMCA	Yes	No
10/29	13	SSW of Portuguese Ledge SMCA	Yes	Yes
10/29	14	Southern Monterey Bay	Yes	Yes
10/30		Day off		
10/31	15	SSW of Portuguese Ledge SMCA	Yes	Yes
10/31	16	SE Portuguese Ledge	Yes	Yes
11/1	17	Soquel Canyon- Site G	Yes	Yes
11/1	18	Soquel Canyon- Site H	Yes	Yes
11/1	19	Southern Monterey Bay	Yes	Yes
11/2	20	Point Sur- Site 6	Yes (for part of dive)	Yes (for part of dive)
11/2	21	Point Sur- Site 4	Yes	Yes
11/2	22	Point Sur- Site 3	Yes	Yes

The following Education and Outreach products were accomplished:

1. A press release was issued on 11/7/11 to announce the results of the final year of the three-year project. San Jose Mercury followed up on the press release and covered the cruise at: http://www.mercurynews.com/science/ci_19235403

2. A mission log on the MBNMS Facebook page posted daily HD images: https://www.facebook.com/media/set/?set=a.10150377196639916.368861.99323009915&type=3

3. Presentations were provided to MBNMS staff and Sanctuary Advisory Council

4. A webpage was posted on the MBNMS web site at: http://montereybay.noaa.gov/resourcepro/resmanissues/lostgear.html

5. Karen Grimmer, the cruise leader, hosted a segment focused on the Lost Fishing Gear removal project during the Access Monterey Peninsula's "Your Sanctuary" Episode 2 focused on Marine Debris found at http://www.youtube.com/watch?v=30dyhC0yneo&list=PL22D067D179395D12&index=3 (segment starts at 18:28)

6. Invertebrates were entered into the Cal Academy CASIZ database at: http://collections.calacademy.org/iz/

7. The net recovered on 10/29/11 and the trap recovered on 10/31/11 were part of an educational display created by students of the Monterey Institute of International Studies at TEDx in Monterey in April 2012 (See Figure 11).

Appendix A. Logbook entry form used for Lost Fishing Gear Retrieval Cruises

Area:	ROV Pilot:
Site ID:	Co-Pilot/Navigator:
Site Description:	Deck Photographer/videographer:

Target:

Date:	Start		HD camera supervisor:		
(Local)	End:		Sea conditions:		
Time:	Start:				
(Local)	End:				
Location		**Latitude**	**Longitude**	**Depth (m)**	**Habitat Type**
ROV on Bottom	Start:				
ROV off Bottom	End:				

ROV Transect File/Description: *(Include transect pattern)*

Removal Criteria Applied: *(Impacts to animals & habitat, feasibility of removal, threats to fishing/research)*

Recovery description: *(Type of gear recovered, time spent searching vs. time spent retrieving)*

Animals Collected: *(* indicates photos taken)*

Photos/Video Taken: *(Video Labels, Description, # of each, interesting notes)*

ROV:	**HD:**	**Deck:**

Summary and Comments: *(Successes, problems, interesting geology or biology (note time on video))*

Appendix B. CASIZ database information for specimens collected during the 2011 Lost Fishing Gear Removal Cruise.

Cat#	Phylum	Taxon	Family	Name	Locality	Depth	Substratum	Coordinates
184982	ANNELIDA	POLYCHAETA: SEDENTARIA: SABELLIMORPHIDA:	SABELLIDAE	Megalomma splendida (Moore, 1905)	CA: Monterey Bay:	122.00 m	Substratum: rope	36.00° 40.32' " N 122.00° 0.06' " W
184983	ANNELIDA	POLYCHAETA: SEDENTARIA: SABELLIMORPHIDA:	SABELLIDAE	Sabella crassicornis Sars, 1851	CA: Monterey Bay:	122.00 m	Substratum: rope	36.00° 40.32' " N 122.00° 0.06' " W
184984	ANNELIDA	POLYCHAETA: SEDENTARIA: SPIONOMORPHIDA:	CHAETOPTERIDAE	Spiochaetopterus costarum (Claparede, 1870)	CA: Monterey Bay:	122.00 m	Substratum: rope	36.00° 40.32' " N 122.00° 0.06' " W
184986	ANNELIDA	POLYCHAETA: SEDENTARIA: SABELLIMORPHIDA:	SABELLIDAE	Pseudopotamilla	CA: Monterey Bay:	122.00 m	Substratum: rope	36.00° 40.32' " N 122.00° 0.06' " W
184987	ANNELIDA	POLYCHAETA: SEDENTARIA: SABELLIMORPHIDA:	SABELLIDAE		CA: Monterey Bay:	122.00 m	Substratum: rope	36.00° 40.32' " N 122.00° 0.06' " W
184988	ANNELIDA	POLYCHAETA: SEDENTARIA: SPIONOMORPHIDA:	SPIONIDAE		CA: Monterey Bay:	122.00 m	Substratum: rope	36.00° 40.32' " N 122.00° 0.06' " W
184989	ANNELIDA	POLYCHAETA: ERRANTIA: APHRODITOIDA:	POLYNOIDAE		CA: Monterey Bay:	122.00 m	Substratum: rope	36.00° 40.32' " N 122.00° 0.06' " W
184990	ANNELIDA	POLYCHAETA: ERRANTIA: EUNICIMORPHIDA:	DORVILLEIDAE	Ophryotrocha	CA: Monterey Bay:	122.00 m	Substratum: rope	36.00° 40.32' " N 122.00° 0.06' " W
184991	ANNELIDA	POLYCHAETA: ERRANTIA: PHYLLODOCIMORPHIDA:	PHYLLODOCIDAE	Phyllodoce hartmanae Blake & Walton, 1977	CA: Monterey Bay:	122.00 m	Substratum: rope	36.00° 40.32' " N 122.00° 0.06' " W
184992	ANNELIDA	POLYCHAETA: ERRANTIA: APHRODITOIDA:	POLYNOIDAE	Lepidonotus spiculus (Treadwell, 1906)	CA: Monterey Bay:	264.00 m	Substratum: wire trap	36.00° 48.33' " N 122.00° 4.77' " W

Cat#	Phylum	Taxon	Family	Name	Locality	Depth	Substratum	Coordinates
184993	ANNELIDA	POLYCHAETA: ERRANTIA: EUNICIMORPHIDA:	EUNICIDAE	Eunice multipectinata Moore, 1911	CA: Monterey Bay:	122.00 m	Substratum: rope	36.00° 40.32' " N 122.00° 0.06' " W
184994	ANNELIDA	POLYCHAETA: ERRANTIA: PHYLLODOCIMORPHIDA:	NEREIDIDAE	Nereis neonigripes Hartman, 1936	CA: Monterey Bay:	122.00 m	Substratum: rope	36.00° 40.32' " N 122.00° 0.06' " W
184995	CHORDATA	UROCHORDATA: ASCIDIACEA: PLEUROGONA:	STYELIDAE	Styela montereyensis (Dall, 1872)	CA: Monterey Bay:	122.00 m	Substratum: rope	36.00° 40.32' " N 122.00° 0.06' " W
184996	CHORDATA	UROCHORDATA: ASCIDIACEA: ENTEROGONA:	POLYCITORIDAE	Cystodytes	CA: Monterey Bay:	122.00 m	Substratum: rope	36.00° 40.32' " N 122.00° 0.06' " W
184997	ECHINODERMATA	OPHIUROIDEA: OPHIURIDA: GNATHOPHIURINA:	OPHIOTRICHIDAE	Ophiothrix spiculata LeConte, 1851	CA: Monterey Bay:	122.00 m	Substratum: rope	36.00° 40.32' " N 122.00° 0.06' " W
184998	CHORDATA	UROCHORDATA: ASCIDIACEA: PLEUROGONA:	PYURIDAE	Halocynthia igaboja Oka, 1906	CA: Monterey Bay:	122.00 m	Substratum: rope	36.00° 40.32' " N 122.00° 0.06' " W
184999	BRACHIOPODA	ARTICULATA: TEREBRATULIDA:	PLATIDIIDAE	Platidia hornii (Gabb, 1831)	CA: Monterey Bay:	122.00 m	Substratum: rope	36.00° 40.32' " N 122.00° 0.06' " W
185000	SIPUNCULA	PHASCOLOSOMIDA: PHASCOLOSOMAFORMES:	PHASCOLOSOMATIDAE	Phascolosoma agassizii Keferstein, 1866	CA: Monterey Bay:	122.00 m	Substratum: rope	36.00° 40.32' " N 122.00° 0.06' " W
185001	ARTHROPODA	ISOPODA: ASELLOTA:	JANIRIDAE	Janiralata occidentalis Walker, 1898)	CA: Monterey Bay:	122.00 m	Substratum: rope	36.00° 40.32' " N 122.00° 0.06' " W
185002	MOLLUSCA	BIVALVIA: HETERODONTA: MYOIDA:	HIATELLIDAE	Hiatella arctica (Linnaeus, 1767)	CA: Monterey Bay:	122.00 m	Substratum: rope	36.00° 40.32' " N 122.00° 0.06' " W
185003	ECTOPROCTA	GYMNOLAEMATA: CHEILOSTOMATA: ASCOPHORINA:	PHYLACTELLIDAE	Lagenicella punctulata (Gabb & Horn, 1862)	CA: Monterey Bay:	122.00 m	Substratum: rope	36.00° 40.32' " N 122.00° 0.06' " W
185004	ECHINODERMATA	OPHIUROIDEA: OPHIURIDA: LAEMOPHIURINA:	OPHIACANTHIDAE	Ophiacantha diplasia H.L. Clark, 1911	CA: Monterey Bay:	264.00 m	Substratum: wire trap	36.00° 48.33' " N 122.00° 4.77' " W

Cat#	Phylum	Taxon	Family	Name	Locality	Depth	Substratum	Coordinates
185005	BRACHIOPODA	ARTICULATA: TEREBRATULIDA:	TEREBRATULIDAE	Terebratulina unguicula (Carpenter, 1864)	CA: Monterey Bay:	122.00 m	Substratum: rope	36.00° 40.32' " N 122.00° 0.06' " W
185006	ARTHROPODA	AMPHIPODA:			CA: Monterey Bay:	122.00 m	Substratum: rope	36.00° 40.32' " N 122.00° 0.06' " W
185007	NEMERTEA				CA: Monterey Bay:	122.00 m	Substratum: rope	36.00° 40.32' " N 122.00° 0.06' " W
185008	PORIFERA				CA: Monterey Bay:	122.00 m	Substratum: rope	36.00° 40.32' " N 122.00° 0.06' " W
185009	PORIFERA				CA: Monterey Bay:	122.00 m	Substratum: rope	36.00° 40.32' " N 122.00° 0.06' " W