UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NOAA Marine and Aviation Operations
Marine Operations Center
439 W. York Street
Norfolk, VA 23510-1114

JUN 20 2013

MEMORANDUM FOR: Commander Kurt Zegowitz, NOAA
Commanding Officer, NOAA Ship *Henry B. Bigelow*

FROM: Captain Anita L. Lopez, NOAA
Commanding Officer, NOAA Marine Operations Center-Atlantic

SUBJECT: Project Instruction for HB-13-03
Atlantic Marine Assessment Program for Protected Species (AMAPPS) – Cetacean and Turtle Abundance Survey

Attached is the final Project Instruction for HB-13-03, AMAPPS – Cetacean and Turtle Abundance Survey, which is scheduled aboard NOAA Ship *Henry B. Bigelow* during the period of 01 July – 19 August, 2013. Of the 45 DAS scheduled for this project, 45 DAS are base funded by OMAO in support of NMFS and 0 DAS are program funded. This project is estimated to exhibit a Medium Operational Tempo. Acknowledge receipt of these instructions via e-mail to **OpsMgr.MOA@noaa.gov** at Marine Operations Center-Atlantic.

Attachment

cc:
MOA1

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Northeast Fisheries Science Center
166 Water Street
Woods Hole, MA 02543-1026

Final Project Instructions

Date Submitted: 14 June, 2013

Platform: NOAA Ship *Henry B. Bigelow*

Cruise Number: HB 13-03, Parts I and II

Project Title: AMAPPS – Cetacean and Turtle Abundance Survey

Cruise Dates: Part I: 1-23 July, Part II: 29 July – 19 August 2013

Approved by: William Karp Date: 14 JUNE 13
William A. Karp, Ph.D.
Science and Research Director
Northeast Fisheries Science Center

Approved by: CAPT/NOAA Date: 19 JUN 13
Captain Anita L. Lopez, NOAA
Commanding Officer
Marine Operations Center – Atlantic

COMMANDING OFFICER
NOAA Ship *Henry B. Bigelow*

PROJECT INSTRUCTION: HB 13-03 (I-II), AMAPPS – Cetacean and Turtle Abundance Survey

Project Dates: Part 1: 1 – 23 July 2013; Part 2: 29 July – 19 August 2013

Area of Operation: Parts 1 and 2: The survey will be conducted on the continental shelf, shelf break and in deeper water, where the area is between 36°N and 42°N latitude and between 76°W and 64°W (Figure 1).

Objectives: The objectives of both parts are to: 1) determine the distribution and abundance of cetaceans, sea turtles and sea birds within the study area; 2) collect vocalizations of cetaceans using passive acoustic arrays; 3) determine the distribution and relative abundance of plankton using bongo nets with CTDs, the MOCNESS, visual plankton recorder and EK-60 , 4) collect hydrographic and meteorological data, and 5) when possible, collect biopsy samples and photo-identification pictures of cetaceans.

Planned Itinerary: The cruise will consist of two parts, with a port call between the parts.

Part I 1 – 23 July 2013:

1 July: Load scientific gear, embark scientific personnel and depart Newport, RI

2 - 22 July: Conduct the survey per Operational Plans

23 July: Return to Newport, RI, disembark and/or exchange scientists.

Part II 29 July – 19 August 2013:

29 July: Embark scientific personnel and depart Newport, RI

30 July – 18 August: Conduct the survey per Operational Plans

19 August: Return to Newport, RI, disembark and/or exchange scientists and unload scientific gear.

Operational Plans:

Distance Training/Testing

Prior to beginning operations (or within the first couple of days of each Part, depending upon the weather) perform training and testing of observers' ability to estimate sighting distances. This could be accomplished by having NOAA ship *Henry B. Bigelow* stay in precisely the same position and point the bow towards a clear view of the horizon. Visual observers using

binoculars and naked eye will estimate the distance to a black buoy that is deployed from a small boat which has been deployed from NOAA ship *Henry B. Bigelow*. The GPS location of the small boat will be compared to the GPS location of the two sighting platforms to determine the true distance between the sighting platform and the buoy which can then be compared to the estimated distances made by the observers. The buoy will be placed at various positions around NOAA ship *Henry B. Bigelow* from meters in front of the ship to 5 nautical miles in front of the ship. Training of observers will be done by having the true distance reported to the observers immediately after they make their estimate the distance. Testing will be done by withholding the true distance information until after a series of estimated distances have been made.

Visual Marine Mammal-Sea Turtle Sighting Team

A visual line-transect survey will be conducted during daylight hours (approximately 0600-1800 local time with a 1 hour break at lunchtime) using the two independent team procedure. Each team has 4 people (of which 1 is off-effort). Surveying will be conducted during good weather conditions (Beaufort sea state 4 and below) while traveling at about 11 knots as measured over the ground. Survey activity will be conducted along transects whose starting point and direction may be a modification of pre-determined track lines depending on daily weather conditions, satellite imagery, and sea conditions. Thus, the exact track lines to be covered during a day will be determined no later than 19:30 the night before.

Scientific personnel will form two visual marine mammal-sea turtle sighting teams; one on the flying bridge and the other on the anti-roll tank platform. Both teams will use two 25x150 powered binoculars to detect animal groups. Observers on each team will rotate positions within a team every 30 minutes. Observers will not rotate between teams during each leg. Sightings and effort data will be entered by the scientists using a hand held data entry system.

The visual teams, acoustic team, and bridge personnel will be in radio contact with each other and data entered by the visual teams will be displayed for the acoustic team to see (who will be located in the dry lab) using the ship's intranet system.

Bridge officers are requested to give a couple minutes notice before the ship will be starting and ending each transect line.

At times when it is not possible to positively identify a species, surveying will go off-effort and the ship will head in a manner to intercept the animals in question. When the species identification is confirmed and the group's vocalizations are recorded, the ship shall proceed back to the point the ship departed from the track line. When the ship gets back on the original track line, the bridge will inform the survey teams that they are approaching the track line and then the survey teams will go back on-effort.

In addition there will be a fifth big eye binocular stand mounted on the flying bridge that is independent of the two four-person visual sighting teams. Two people (one from the visual team and one from the acoustic team) will search for animals using this fifth set of binoculars. When they detect a group of animals every surfacing will be recorded, as far as is feasible. This team will record surfacing as long as the group can be detected. This information will be used by the acoustic team to enhance the ability to determine duplicate sightings that were seen by both the

visual and acoustic teams. In addition the surfacing patterns will be used to explore the availability bias of the visual sightings.

Seabird Sighting Team

When the visual marine mammal-sea turtle sighting teams are on-effort and whenever feasible, the seabird team will also be visually searching for seabirds. This team will be located on the flying bridge. The two people on this team will switch off every two hours so that at any time there is at least one seabird observer on-effort. This observer will search for seabirds using the naked eye, and use hand held binoculars to confirm the species identification and group size. The seabird team members will follow standard 300m strip-transect protocols for seabirds. Seabird sightings and effort data will be entered by the scientists using a hand held, at sea, data entry system.

There will be times, particularly in Beaufort sea state 5 conditions when the ship is transiting on a track line and the seabird team will be on-effort collecting data even though the visual marine mammal-turtle team will not be on-effort.

Cetacean Biopsy and Photograph Collection

At the discretion of the Chief Scientist, the ship will break effort from the track line and travel to investigate groups of cetaceans. At this time, and perhaps at other times, several scientists will be responsible to photograph the animals to confirm the species identification. Most photographs will be taken from the bow of the ship. Photographs will be collected using a 6.3 digital SLR camera (Canon EOS D10) equipped with a 100-300 mm zoom lens. A 500 mm 4.5 power lens will also be available for taking pictures. Time stamped JPEG images will be saved onto the cameras' compact flash cards and downloaded onto a desktop computer at the end of each day. All images will be kept in the NEFSC Protected Species Branch digital archives. Copies of all humpback whale fluke and dorsal fin images will be sent to the North Atlantic Humpback Whale Catalogue at College of the Atlantic, Bar Harbor, ME, and to the Center for Coastal Studies in Provincetown, MA.

At the discretion of the Chief Scientist, when the ship breaks to investigate a group of cetaceans, biopsy samples may be collected from the bow of the NOAA ship *Henry B. Bigelow*. Biopsy samples will be collected using crossbows. The bolts have hollow stainless steel tips with tines inside to retain the samples. The tips themselves are 5mm in diameter and 25-40m in length. Molded foam near the bolts' tip is used to keep the tip floating so they can be retrieved after the shot made from the RHIB. A "Game Tracker" line dispensing system will be used to retrieve bolts when sampling from the bow of the NOAA ship *Henry B. Bigelow*.

Biopsy samples will be processed in the ship's wet lab at the end of each day. Each sample will be placed in a vial containing dimethyl sulfoxide (DMSO). The samples will be sent to Dr. Patricia Rosel of the Southeast Fisheries Science Center for genetic analysis.

Acoustic Detection Team

This team will be responsible for recording vocalizations of cetaceans using passive acoustics and for recording active acoustic data from some or all of the following sensors: EK60, ME70 and ADCP. These sensors will be activated on an alternating day-on, day-off schedule, so as to

collect passive acoustic data both with and without the active acoustic signals.

DAYTIME OPERATIONS

When the visual marine mammal-sea turtle sighting team is on-effort, the acoustic detection team will also be on-effort. The array will also be deployed at nighttime as discussed in more detail below. The latter will depend on the focus of the passive acoustics and plankton teams. This is done because it is valuable to test the passive acoustic system in conditions when the visual team is not able to work.

The acoustic team will be stationed inside the ship, with the most likely location being in the dry lab, where it was located previously. From this location, the acoustic team will maintain contact with the visual team to be notified of each new cetacean group. This information will be transmitted to the visual team's data stream using the ship's intranet system and perhaps via radio that is held by the visual team members.

Additionally, a protocol will be established between the acoustic and visual teams to facilitate data collection when the ship breaks survey track to investigate a group of animals. This protocol will include the following: a) before the ship breaks from the track line, notify the acoustic team when the ship will break track (so that the recording equipment settings can be adjusted to compensate for the increase in noise experienced during maneuvering); b) and once the visual team is satisfied with species identification and collection of photographs, etc., the ship may be asked to maintain a straight-line transit for five minutes to facilitate the collection of high quality acoustic recordings.

Recordings of acoustic detections will be made onto several desk top computers, utilizing the ship's computers if possible. The main passive acoustic hydrophone array consists of a 400m cable with 5 hydrophone elements. The array should be mounted onto the starboard side net reel, and will be deployed off the stern with the assistance of several members of the deck crew and the acoustic team. The wooden casing for this reel built in 2007 and used again in 2009 and 2011 should be mounted on the reel to accommodate the towed array. Ideally, the array could be suspended through a block mounted at the stern of the ship or suspended in such a way as to limit the side-to-side movement of the array so that it does not bend at a sharp angle and thus break the array. A removable deck cable will connect between the hydrophone array cable and the computers in the lab. A second towed array will be brought on board as a backup.

NIGHTTIME OPERATIONS

In conjunction with the oceanography work, the passive acoustics team will also deploy the towed hydrophone array to collect nighttime acoustic data. When possible, the array will be deployed after the evening CTD cast, so that data may be collected both in transit to the oceanography site and on site. However, if the target site is sufficiently far that the vessel needs to transit at greater than 10 kts, the hydrophone array deployment will be delayed until the vessel arrives on site. The oceanography and passive acoustics team will consult nightly to make this decision.

For each of the sampling protocols detailed below, the hydrophone array will be deployed for the first transect, when oceanography data are being collected via ADCP and EK60. At the end of

the first transect, the array will be recovered and will not be redeployed again until the start of marine mammal ops in the morning. The ship will be requested to slow to 2-3 kts for the deployment and recovery of the array, which takes approximately 5-10 minutes.

MARU Recovery Plan – Passive Acoustic Team

Five Marine Autonomous Recording Units (MARUs) were deployed off the *NOAA ship Gordon Gunter* during 30 April – 4 May 2013, in areas concurrent with the tracklines for the HB13-03 survey. These units can be recovered in either Leg 1 or Leg 2 of the HB13-03 survey. Recovery can be during either leg, as weather and survey progress allows. See Table 1 for positions.

The general recovery procedure at each site is as follows:

1. Prior to arriving on site, the ship's crew will notify the acoustic team to prepare for the buoy recovery.
2. Once on site, the ship will need to maintain station as much as possible. The acoustic team will lower an acoustic transducer and hydrophone over the side of the ship to communicate with the MARU. Once communication has been successfully achieved, the acoustic team will transmit a signal to release the MARU from its anchor. The MARU is positively buoyant, and will float to the surface.
3. Once the release signal has been transmitted, the acoustic team will ask that any available science or ship's crew assist in watching for the MARU at the surface. If the ship has drifted more than several hundred meters from the recovery site, the acoustic team will request that the ship be repositioned, so that sighting the unit will not be hindered by distance. MARUs are equipped with VHF radio transmitters, so they may be detected acoustically once at the surface. They are also equipped with strobe lights to facilitate evening or early morning recoveries.
4. When the buoy is sighted, the ship will need to maneuver to recover it. The buoy weighs approximately 80 lbs in air. Crew from the *NOAA ship Bigelow* has previously recovered the units using a boat hook to grapple the harness that is attached to the outside of the unit (See Figure 2). However, the crew is advised to avoid grabbing the black power lines or the burn cable.

Recovery is anticipated to take approximately 30 minutes at each site, and can be done when convenient for the survey schedule. Communication between the acoustic team and the ship's officers will be important throughout the recovery process. In particular, the acoustic team will need to know the distance between the ship and the recovery site while communicating with the MARU and waiting for it to surface.

Contingencies:

1. If communication cannot be established with the MARU when the ship arrives on site, the acoustic team may ask the ship to reposition. The ship's active acoustic system may also be useful to look for the unit on the seafloor in the event that it does not respond acoustically. This may help determine if the unit is missing (for example, if it had been

trawled up and moved). In this case, the acoustic team may ask for assistance with the echosounders from the survey technician or officer on deck.

2. "Emergency burn" dates and times have been programmed as a fail-safe in the event that a normal recovery is unsuccessful. At the programmed time, each unit will surface automatically if it has not already been recovered. These dates/times were chosen at the end of Leg 2 to try to minimize the impact on the survey schedule.

Hydrographic and plankton data collection

Position, date, time, ship's speed and course, water depth, surface temperature, salinity, and chlorophyll, weather characteristics, along with other variables will be obtained from the ship's sensors and logged into the Science Computer System (SCS), as is normally done for all surveys. In addition, a subset of these data (Table 2) will be routinely collected and recorded at least once a second during survey operations and will be logged into a specially created file that will be used by the cetacean scientists on a daily basis. At the end of the visual survey day (after 1800) the data in the specially created file will be made available to the Chief Scientist.

There may also be special zooplankton collections of salps and euphausiids for scientists of the Woods Hole Oceanographic Institution (WHOI) in Woods Hole, MA. Timing of this special sampling will depend on the plankton species seen in Bongo and Video Plankton Recorder samples. These samples will be collected using a $1m^2$ neuston net equipped with a 980 μm mesh net with the CTD mounted on the wire 1.5m above the net. The net will be towed targeting layers of zooplankton seen by the 120 kHz and 200 kHz sensors of the ship's EK60 echo sounder. Upon retrieval the samples will be washed from the net using seawater and preserved. Samples will then be transported to WHOI or the Narragansett, RI, NMFS lab for future processing.

DAYTIME SAMPLING

EK60 data will be collected continuously during the day on every second day.

The daytime plan includes sampling with a Bongo net instrumented with the Seabird 19+ CTD. The VPR can be attached to the Bongo for additional collection of plankton images. A 61cm Bongo plankton net equipped with one 333 μm and one 505 μm mesh net with the CTD mounted on the wire 1m above the nets will be deployed at least three times a day: once before the day's surveying started (about 05:00-05:30), at lunch time (about 12:00 when the ship stopped surveying), and again after surveying was completed for the day (approximately 18:00, depending upon weather and the time of sunset). Additional stations where the Bongo could be deployed is discussed in detail below in the nighttime sampling section. The bongo will be towed in a double oblique profile using standard MARMAP protocols. The ship's speed through the water will be approximately 1.5 knots. Wire out speed will be 50m/min and wire in speed will be 20m/min. Tows will be to within 5 m of the bottom or 200 m if the bottom depth exceeds 205 m. Upon retrieval, samples will be rinsed from the nets using seawater and preserved in 5% formaldehyde and seawater. At the end of each Part samples will be transported to the NMFS lab at Narragansett, RI for future processing.

XBT's may be deployed during the survey daytime periods, in between the CTD deployments, during at least some of the track lines, in particular those transiting across warm/cold core rings and the shelf break.

It might be possible to do some water column sampling during daytime on days when the sighting conditions are unfavorable. The oceanography team will be off-watch and so it likely will not be possible to do intensive operations like net tows. EK60 and ADCP data, and potentially some CTD casts, might be possible. These could target the transect types described above for each region type.

NIGHTTIME SAMPLING

During night when the visual cetacean and turtle survey teams are off-effort, physical and biological sampling of the water column will be conducted employing a combination of underway (ADCP, EK60, XBTs, possibly towed VPR) and station-based sampling (CTD, MOCNESS, IKMT). The amount of time available each night for sampling and the target site will be determined by the vessel's position at the end of each day's visual surveying and the desired start location the following day. Over the course of the two 21-day legs, the goal will be to sample on successive nights four site types: shelfbreak canyons, shelfbreak regions away from canyons, slope waters, and shelf regions. Some sampling may also be possible during daytime.

Of the about 40 nights available during the cruise, we hope that perhaps 20 of those will be spent near the shelfbreak. The first priority is to sample canyons, and within canyons the priority is the Z-type cross-canyon survey type. We therefore target spending about 14 nights sampling canyons and 6 shelfbreak sites away from canyons. The goal is to conduct about 10 Z-type cross-canyon surveys and 4 U-type along-canyon surveys, with a first priority being cross-canyon surveys in more than one canyon for comparison.

Any of the named canyons on the NOAA charts are of interest, and prior to the cruise we will generate a list of these and tentative survey tracks for each. Of particular interest are Baltimore, Hudson, Atlantis, and Oceanographer (or Lydonia) Canyons as these have been sampled previously and cover a range of bathymetric types as well as a SW-NE along-shelfbreak gradient.

In conjunction with the oceanography work, the passive acoustics team will also deploy the towed hydrophone array to collect nighttime acoustic data. When possible, the array will be deployed after the evening CTD cast, so that data may be collected both in transit to the oceanography site and on site. However, if the target site is sufficiently far that the vessel needs to transit at greater than 10 kts, the hydrophone array deployment will be delayed until the vessel arrives on site. The oceanography and passive acoustics team will consult nightly to make this decision.

For each of the sampling protocols detailed below, the hydrophone array will be deployed for the first transect, when oceanography data are being collected via ADCP and EK60. At the end of the first transect, the array will be recovered and will not be redeployed again until the start of marine mammal ops in the morning. The ship will be requested to slow to 2-3 kts for the deployment and recovery of the array, which takes approximately 5-10 minutes.

Survey speeds for passive acoustic and oceanography data collection will be 10kts or less.

Canyons

Cross-canyon (Z-type) surveys

Repeat passes of two cross-canyon transects will be conducted. One transect will be positioned approximately half-way up the canyon and the other near the canyon head (Figure 3). Total distance to be covered will be about 30 nmi. The first pass of each transect will be for ADCP and EK60 data collection. During this pass, the passive acoustic towed hydrophone array will also be deployed. On the return pass a series of 5 CTD casts (Seabird 19+) will be made to near-bottom (one cast on the rim on each side, one about half way down each side to the max depth axis, and one in the axis); the VPR could be attached to the CTD for these casts. Following these transects and pending available remaining time, MOCNESS tows will be conducted targeting acoustic features of high scattering and interesting frequency response (eg characteristic of krill, small zooplankton, mesopelagic fishes). Ideally, and likely over the course of successive nights, it would be interesting to do net tows along both the eastern and western flanks of canyons as well as along the max depth axis. It will also be interesting to keep in touch with the visual survey team and to do net tows in regions of especially high cetacean abundance. Over the course of the cruise it will be important to sample occasionally with the nets in regions of lower acoustic scattering for comparison. The VPR could also be attached to the MOCNESS for concurrent data collection. Irrespective of the mode of deployment, the VPR will be used to provide real-time data on zooplankton.

Along-canyon (U-type) surveys

Two along-canyon transects will be surveyed from ca. the 1000m to the 100-150m isobaths (Figure 4). Total distance to be covered will be about 30 nmi. ADCP and EK60 data will be collected continuously along these transects, along with towed hydrophone passive acoustic data. XBTs will be deployed at regular intervals; CTD casts could potentially be made along one of the transects too. MOCNESS sampling will be conducted targeting acoustic features of interest; this could target the canyon head in particular and be done between the two transects or following completion of both transects (depending on whether the survey starts at the head or mouth). Any layers of high scattering consistent with mesopelagic fish (likely to be near the canyon mouth) could be sampled with the IKMT and again regions of especially high cetacean abundance might be of particular interest.

Shelfbreak (Non-canyon)

Two passes will be conducted along a transect running across the shelfbreak from about the 1000 m to 100 or 150 m isobaths. ADCP, EK60, and towed hydrophone data will be conducted continuously during the first pass and then regularly spaced CTD casts made along the second pass. Following the transects, or perhaps during the second pass, and pending available time, net sampling with the MOCNESS or IKMT will be conducted targeting zooplankton- or fish-like scattering features, respectively.

Slope

Starting at the end-point of that day's visual survey, two passes will be conducted of a transect running along-isobath. If any warm-core rings are present the transect will aim to cross the ring edge. ADCP, EK60, and towed hydrophone data will be conducted continuously during the outgoing pass and then regularly spaced CTD casts made along the return pass. Following the transects, or perhaps during the second pass, and pending available time, net sampling with the

IKMT will be conducted targeting acoustic features of interest.

Shelf

The HB13-03 planned cruise track includes some sampling in shelf regions of interest to BOEM, including off MD/VA/NC and along Nantucket Shoals. During nights spent in the region off MD, ECOMON bongo/CTD stations will be picked up as these southern areas will not be covered during the upcoming ECOMON cruise. During nights spent on Nantucket Shoals, sampling can be flexible, e.g., targeting acoustic features and/or regions of particular interest to the protected species branch. Shelf CTD casts will be conducted to sample the cold-pool. Further information on the cold pool will be available from the concurrent scallop survey on the Sharp. The towed hydrophone array is typically not deployed in these regions, due to shallow water depths.

Other operations: At the discretion of the Chief Scientist, survey lines may be temporarily broken to conduct other operations, such as, but not limited to, additional CTD casts or plankton tows, photographing species of interest, testing of the acoustic gear and additional distance training.

Vessel Sensor and Logging Requirements: The ship's Scientific Computer System (SCS) will be required for logging data on a routine basis and data requirements will be coordinated with the Commanding Officer and Electronics Technician at the beginning of the cruise. It is requested that the sensors be operational, calibrated and that logging capabilities be enabled.

In addition, a subset of these data (Table 2) will be routinely collected and recorded at least once a second during survey operations and will be logged into a specially created file that will be used by the cetacean scientists on a daily basis. At the end of the visual survey day (after 18:00) the data in the specially created file will be made available to the Chief Scientist.

CTD Support: CTD operators will be trained and certified by the Center's Oceanography Branch. CTD operator training requires two hours and must be completed prior to the beginning of the cruise unless a trainer is included in the scientific complement. In the event that CTD difficulties are encountered during the cruise, shore based support is available. Requests for support should be forwarded NEFSC.CTDHelp@noaa.gov which is monitored daily. Once contact has been established via email, to assure continuous support, the CTD help address above should be copied on ***all*** email communications.

The approach to Protected Species and biopsy sampling are permitted under the US ESA/MMPA permit number 775-1874-02 and the Canadian SARA permit license number 330996. The Chief Scientist will have the original licenses in his/her possession and will also provide a copy of these licenses to the Commanding Officer prior to the survey.

Special Consideration: To conduct the distance training, we require the use of one of the small boats owned by NOAA Ship *Henry B. Bigelow*, along with 2 crew members, one to be the driver and the other to deploy buoys.

During daylight hours when the visual line-transect surveys are being conducted, we require that the jack-staff be lowered so that the observers have a clear view of the waters in front of the ship.

The big eye stands for both the upper bridge and anti-roll tank platforms should be mounted to the deck and inspected to ensure they work properly.

We request assistance from the ship's ET and survey techs so that we can load ship's SCS data directly into the data collection computers on the two visual sighting platforms and also into the acoustic team's computer.

The wooden casing for the net reel that was built in 2007 or a newer version of it should be mounted on the reel to accommodate the towed array.

In addition to the acoustic data collected by the towed array, the acoustic team will need the assistance of the ship's personnel in collecting and archiving the data recorded by the EK60 and ME70.

If possible the acoustic team would like the use of one or two of the ship's computers, like we did in previous years.

To deploy the passive acoustic array we require assistance from the ship's personnel. The acoustic detection team members will be available to assign in the deployment and retrieval of the array.

To deploy the CTD, bongo, VPR, MOCNESS, and IKMT we request the use of the two hydro winches on the starboard 02 deck with the ship's standard terminations and two deck personnel (one to run the winch and one to help with deployment). At night, in addition to the two deck personnel we need one of the ship's survey techs.

Protected Resources:

North Atlantic right whale protection: The vessel is requested to adhere to right whale protection regulations. Information on Seasonal Management Area (SMA) and Dynamic Management Area (DMA) regulations and information for protecting right whales from collisions with vessels are provided through the NOAA Protected Resources website (http://www.nmfs.noaa.gov/pr/shipstrike/), Right Whale Sighting Advisory System (SAS) website (http://www.nefsc.noaa.gov/psb/surveys/), the U.S. Coast Guard's "Notices To Mariners" and NOAA weather radio.

Mariners are urged to use caution and proceed at safe speeds in areas where right whales occur. U.S. Law (50 CFR 224.105) prohibits operating vessels 65 feet (19.8 meters) or greater in excess of 10 knots in Seasonal Management Areas (SMAs) along the U.S. east coast. Mariners are also requested to route around voluntary speed restriction zones, Dynamic Management Areas (DMAs) or transit through them at 10 knots or less. Approaching within 500 yards of right whales is prohibited, unless the Chief Scientist is in possession of an ESA/MMPA permit allowing such approaches.

Whale sightings: Sightings of right whales, or dead or entangled whales of any species, are extremely valuable and reports are urgently requested. Please report all right whale sightings north of the Virginia – North Carolina border to 978-585-8473; right whale sightings south of that border should be reported to 904-237-4220. Right whale sightings in any location may be reported to the U.S. Coast Guard via VHF channel 16. Protocols for reporting sightings are described in the Guide to Reporting Whale Sightings placard. The placard is available online (http://www.nero.noaa.gov/whaletrp/plan/disent/Guide%20to%20reporting%20Whale%20Sightings%20FINAL%20complete_8.7.07.pdf) and laminated copies will be provided by the Protected Species Branch. It is requested that this placard be kept on the bridge for quick reference and to facilitate rapid reporting (via satellite phone if necessary). Opportunistic sightings of other marine mammal species that are live and well may be reported using the Platforms of Opportunity (POP) forms and protocols.

Endangered Species Act and Marine Mammal Protection Act reporting requirements: This reporting is required and is in addition to the reports in the above two sections. If the ship has an interaction with a whale, dolphin, porpoise, marine turtle, or seal (e.g., collision with a whale or bycatch of a sea turtle), the NMFS Northeast Regional Office must be notified within 24 hours of the interaction. If an interaction with any of those species occurs or if the vessel's company notices an animal that is entangled, injured, in distress, or dead, they should contact the Northeast Regional Office's 24-hour hotline at **978-281-9351** to report the incident and receive further instructions.

Stellwagen Bank: Any artifacts brought aboard the vessel due to fishing in the Stellwagen Bank National Marine Sanctuary must be immediately returned, as near as possible, to the location of interception. An artifact is defined as anything of man-made origin with the exception of modern fishing gear. Stations located within Stellwagen Bank will be identified prior to the cruise and reported to the chief scientist.

IT Security: Any computer that will be hooked into the ship's network must comply with the *NMAO Fleet IT Security Policy* prior to establishing a direct connection to the NOAA WAN. Requirements include, but are not limited to:

(1) Installation of the latest virus definition (.DAT) file on all systems and performance of a virus scan on each system.
(2) Installation of the latest critical operating system security patches.
(3) No external public Internet Service Provider (ISP) connections.

Completion of these requirements prior to boarding the ship is required.
Non-NOAA personnel using the ship's computers or connecting their own computers to the ship's network must complete NOAA's IT Security Awareness Course within 3 days of embarking.

Data Management: Cetacean data will be collected and quality controlled as specified in the Operational Plans. All station and biological data will be electronically recorded. At the completion of the cruise, all data will be electronically transmitted to the NEFSC data management system based in Woods Hole, MA. Samples and data collected for specific

individuals, agencies or organizations will be processed by same. Plankton samples will be processed through the NEFSC laboratory in Narragansett, RI. Data from the CTD will be processed at the NEFSC Woods Hole Laboratory.

ROSCOP 3 forms (IOC SC-90/WS-23) will be completed and forward to NODC, Washington, D.C. A Cruise Report will be completed will be completed and submitted by the Chief Scientist to the NEFSC Vessel Coordinator within 20 days following the completion of the cruise.

Foreign National Access and Deemed Export Controls:
All foreign national access to the vessel shall be in accordance with NAO 207-12 and RADM De Bow's March 16, 2006 memo (http://deemedexports.noaa.gov). The foreign national's sponsor is responsible for obtaining clearances and export licenses required and for providing for required escorts by the NAO. Programs sponsoring foreign nationals should consult with their designated line office personnel to assist with the process (http://deemedexports.noaa.gov/contacts.html).

The following are basic requirements. Full compliance with NAO 207-12 is required.

Responsibilities of the Chief Scientist:

1. Provide the Commanding Officer with the e-mail generated by the FRNS granting approval for the foreign national guest's visit. This e-mail will identify the guest's DSN and will serve as evidence that the requirements of NAO 207-12 have been complied with.
2. Escorts – The Chief Scientist is responsible to provide escorts to comply with NAO 207-12 Section 5.10, or as required by the vessel's DOC/OSY Regional Security Officer.
3. Ensure all non-foreign national members of the scientific party receive the briefing on Espionage Indicators (NAO 207-12 Appendix A) at least annually or as required by the servicing Regional Security Officer.
4. Export Control - *The NEFSC currently neither possesses nor utilizes technologies that are subject to Export Administration Regulations (EAR).*

The Commanding Officer and the Chief Scientist will work together to implement any access controls necessary to ensure no unlicensed export occurs of any controlled technology onboard regardless of ownership.

Responsibilities of the Commanding Officer:

1. Ensure only those foreign nationals with DOC/OSY clearance are granted access.
2. Deny access to OMAO platforms and facilities by foreign nationals from countries controlled for anti-terrorism (AT) reasons and individuals from Cuba or Iran without written NMAO approval and compliance with export and sanction regulations.
3. Ensure foreign national access is permitted only if unlicensed deemed export is not likely to occur.
4. Ensure receipt from the Chief Scientist of the NOAA Foreign National List spreadsheet for each foreign national in the scientific party.
5. Ensure Foreign Port Officials, e.g., Pilots, immigration officials, receive escorted access in accordance with maritime custom to facilitate the vessel's visit to foreign ports.

6. Export Control - 8 weeks in advance of the cruise, provide the Chief Scientist with a current inventory of OMAO controlled technology onboard the vessel and a copy of the vessel Technology Access Control Plan (TACP). Also notify the Chief Scientist of any OMAO-sponsored foreign nationals that will be onboard while program equipment is aboard so that the Chief Scientist can take steps to prevent unlicensed export of Program controlled technology. The Commanding Officer and the Chief Scientist will work together to implement any access controls necessary to ensure no unlicensed export occurs of any controlled technology onboard regardless of ownership.
7. Ensure all OMAO personnel onboard receive the briefing on Espionage Indicators (NAO 207-12 Appendix A) at least annually or as required by the servicing Regional Security Officer.

Responsibilities of the Foreign National Sponsor:

1. Export Control - The foreign national's sponsor is responsible for obtaining any required export licenses and complying with any conditions of those licenses prior to the foreign national being provided access to the controlled technology onboard regardless of the technology's ownership.
2. The Departmental Sponsor/NOAA of the foreign national shall assign an on-board Program individual, who will be responsible for the foreign national while on board. The identified individual must be a U.S. citizen, NOAA (or DOC) employee. According to DOC/OSY, this requirement cannot be altered.
3. Ensure completion and submission of Appendix C (Certification of Conditions and Responsibilities for a Foreign National Guest) as required by NAO 207-12 Section 5.03.h.

Communications: Routine communications will be conducted between *Henry B. Bigelow* and Woods Hole via email. Satellite based voice communication is available; the Command shall accommodate the Chief Scientist when requested. The ship's primary means of communication with the Marine Operations Center is the Very Small Aperture Terminal (VSAT) link. Standard VSAT bandwidth at 128kbs is shared by all vessels staff and the science team at no charge. Increased bandwidth in 30 day increments is available on the VSAT systems at increased cost to the scientific party. If increased bandwidth is being considered, program accounting is required it must be arranged at least 30 days in advance.

Hazardous Material: The Chief Scientist is responsible for complying with MOCDOC 15, Fleet Environmental Compliance #07, Hazardous Material and Hazardous Waste Management Requirements for Visiting Scientists, released July 2002. Details regarding those requirements will be provided by the Chief of Operations, Marine Operations Center – Atlantic upon request and may be reached at 757-441-6716.

By Federal regulations and NOAA Marine and Aviation Operations policy, the ship may not sail without a complete inventory of all hazardous materials by name and the anticipated quantity brought aboard, MSDS and appropriate neutralizing agents, buffers, and/or absorbents in amounts adequate to address spills of a size equal to the amount of chemical brought aboard and a chemical hygiene plan. The amount of hazardous material arriving and leaving the vessel shall be accounted for by the Chief Scientist.

Hazardous Materials Inventory

The following chemicals will be placed aboard *Henry B. Bigelow* prior to departure:

ITEM	QUANTITY	FURNISHED BY
90% Ethyl alcohol (ethanol)	3 gal	NMFS, NEFSC, Woods Hole, MA
37% formaldehyde	5 gal	NMFS, NEFSC, Woods Hole, MA
dimethyl sulfoxide (DMSO)	1 gal	NMFS, NEFSC, Woods Hole, MA

Radioactive Isotopes: N/A

Medical Clearances: NOAA Fleet Medical Policy requires all personnel embarking on NOAA vessels to furnish a completed copy of the NOAA Health Services Questionnaire (NHSQ) to the Health Services Office of the Marine Operations Center. This form should be submitted 30 days in advance of sailing, but no later than 7 days in advance of sailing. The Chief Scientist is responsible for the timely submission of NHSQs for scientific personnel to the Health Services Office.

Accident/Illness Reporting: Mishaps, injuries and near misses must be reported to the vessel's Executive Officer and Medical Person in Charge so that appropriate reporting can be made through the OMAO chain of command. In addition, all work-related mishaps involving scientific staff that result in an employee injury or illness, or any work related mishap or near miss, including those that do not require first aid or medical attention, must be reported within 24 hours of occurrence to the NOAA Fisheries Deputy Assistant Administrator for Operations. The reporting will be accomplished using a Mishap Reporting Form, via email, originating from the Chief Scientist, through the OMI Facility Operations and Safety (FOS) Branch (Jack.Emberg@noaa.gov with copies sent to Linda.Arlen@noaa.gov and Joseph.Finnegan@noaa.gov

Email Contact: The following should be included as recipients of the daily e-mail message:

Michael.Simpkins@noaa.gov	{Protected Species Branch Chief}
Fred.Serchuk@noaa.gov	{Acting READ Chief}
Bill.Karp@noaa.gov	{Science and Research Director}
Russell.Brown@noaa.gov	{Deputy Science and Research Director}
Nathan.Keith@noaa.gov	{NEFSC Vessel Coordinator}
Jon.Hare@noaa.gov	{Oceanography Branch Chief}
Tamara.Holzwarth-Davis@noaa.gov	{Oceanography Branch}
Paul.Rago@noaa.gov	{Population Dynamics Branch Chief}
Richard.McBride@noaa.gov	{Population Biology Branch Chief}
CO.Henry.Bigelow@noaa.gov	{Commanding Officer – *Henry B. Bigelow*}
Michael.S.Abbott@noaa.gov	{NEFSC Port Captain}
OPS.Henry.Bigelow@noaa.gov	{Operations Officer – *Henry B Bigelow*}

Watches: Abundance transect operations will be restricted to daylight hours (generally from 06:00 to 18:00). Passive acoustic operations will mainly be restricted to daylight hours; however they will also be conducted during some nighttime hours. Plankton collections will primarily be conducted before and after the abundance transect operations and so could be conducted anytime during the 24 hours of a day. Each scientific personnel will be on duty for 12 hour watches each day (12 hours on and 12 hours off).

Meals and Berthing: Meals and berthing are required for up to 17 scientists. Meals will be served 3 times daily beginning one hour before scheduled departure, extending throughout the cruise, and ending two hours after the termination of the cruise. Berthing requirements, including number and gender of the science crew, will be provided to the ship by the Chief Scientist. The Chief Scientist and Commanding Officer will work together on a detailed berthing plan to accommodate the gender mix of the scientific party taking into consideration the current make-up of the ship's complement.

Since the watch schedule is split between day and night, the night watch may often miss daytime meals and will require adequate food and beverages (for example a variety of sandwich items, cheeses, fruit, milk, juices) during what are not typically meal hours. Special dietary requirements for scientific participants will be made available to the ship's command at least two weeks prior to the survey.

All NOAA Scientists will have proper travel orders when assigned to a NOAA ship. The Chief Scientist will ensure that all non-NOAA and/or non-Federal employee scientists aboard will also have proper orders or the means to support themselves in the event that the ship becomes uninhabitable and/or the galley is closed during a port call during any part of the scheduled project.

Pre-Cruise Meeting: Prior to departure the Chief Scientist will conduct a meeting of the scientific party to train them in sample collection and inform them of cruise objectives. Some vessel protocols, e.g., meals, watches, etiquette, etc., will be presented by the ship's Operations Officer.

Post Cruise Reporting Requirements: Upon completion of each cruise leg, a post-cruise meeting will be held (unless prior alternate arrangements are made) and attended by the ship's officers, the Chief Scientist, members of the scientific party, the Vessel Coordinator and the Port Captain to review the cruise. Concerns regarding safety, efficiency, and suggestions for improvements for future cruises should be discussed. Minutes of the post-cruise meeting will be distributed to all participants via email and to the CO.MOC.Atlantic@noaa.gov and ChiefOps.MOA@noaa.gov. The Port Captain, if attending, is responsible for the recording and distributing the minutes. In his/her absence, the Operations Officer shall be responsible for the minutes.

Within 20 days of the completion of each cruise leg, a Ship Operation Evaluation form is to be completed by the Chief Scientist and submitted to NOAA's Office of Marine and Aviation Operations. The Chief Scientist will also provide a Cruise Report to the NEFSC vessel coordinator.

Personnel List (Scientific):

Part I: 1 – 23 July 2013

Name	Title	Organization
Gordon Waring	Chief Scientist	NMFS, NEFSC, Woods Hole, MA
Elizabeth Broughton	Oceanography team	NMFS, NEFSC, Woods Hole, MA
Joshua Hatch	Visual team	Integrated Statistics, Inc.
Suzanne Yin	Visual team	Integrated Statistics, Inc.
Rachel Hardee	Visual team	Integrated Statistics, Inc.
Richard Holt	Visual team	Integrated Statistics, Inc.
Betty Lentell	Visual team	Integrated Statistics, Inc.
Kelly Slivka	Visual team	Integrated Statistics, Inc.
Todd Pusser	Visual team	Integrated Statistics, Inc.
Danielle Cholewiak	Acoustic team	Integrated Statistics, Inc.
Robert Valtierra	Acoustic team	Integrated Statistics, Inc.
Samara Haver	Acoustic team	Integrated Statistics, Inc.
Michael Force[1]	Seabird team	Integrated Statistics, Inc.
Nicolas Metheny	Seabird team	Integrated Statistics, Inc.
Michael Lowe	Oceanography team	Integrated Statistics, Inc
Ensign Erick Gomez	Oceanography team	NOAA Corp.
Desray Reeb	Visual team	Bureau of Ocean Energy Management

Part II: 29 July – 19 August 2013

Name	Title	Organization
Debra Palka	Chief Scientist	NMFS, NEFSC, Woods Hole, MA
Peter Duley	Visual team	NMFS, NEFSC, Woods Hole, MA
Elizabeth Broughton	Oceanography team	NMFS, NEFSC, Woods Hole, MA
Douglas Sigourney	Visual team	Integrated Statistics, Inc
Suzanne Yin	Visual team	Integrated Statistics, Inc
Rachel Hardee	Visual team	Integrated Statistics, Inc
Richard Holt	Visual team	Integrated Statistics, Inc
Joy Stanistreet	Visual team	Integrated Statistics, Inc
Gary Friedrichsen	Visual team	Integrated Statistics, Inc
Todd Pusser	Visual team	Integrated Statistics, Inc
Eric Matzen	Visual team	Integrated Statistics, Inc
Genevieve Davis	Acoustic team	Integrated Statistics, Inc.
Samara Haver	Acoustic team	Integrated Statistics, Inc.
Michael Force[1]	Seabird team	Integrated Statistics, Inc.
Nicolas Metheny	Seabird team	Integrated Statistics, Inc.
Ensign Erick Gomez	Oceanography team	NOAA Corp.

[1]Foreign National

Equipment and Supply List: The following sampling and scientific equipment will be placed aboard NOAA Ship *Henry B. Bigelow* prior to departure:

ITEM	QUANTITY	FURNISHED BY
1. Passive acoustic data collection equip	ample	NMFS, NEFSC, Woods Hole, MA
2. Portable computers	3	"
3. Desk top computer	1	"
4. Pelorus for measuring sighting angles (mounted at each sighting station)	4	"
5. Hand held binoculars	4	"
6. 25x150 binoculars and yokes	4	"
7. Data logs, computerized and paper	ample	"
8. Photographic equipment	ample	"
9. Plywood floating replica of porpoise	1	"
10. Desks and chairs for sighting stations	3	"
11. Bongo equipment and supplies	ample	"
12. Passive acoustic array	2-3	"
13. CTD	2	"
14. Bongo plankton net equipment	1	"
15. Video Plankton Recorder	1	"
16. 1 m^2 MOCNESS	1	"
17. 20% Dimethyl sulfoxide (DMSO) (Dispensed in capped vials)	1.1 liters	"
18. Formalin (37% formaldehyde)	5 gallons	"
19. XBT's	ample	"
20. IKMT (Isaacs-kid mid-water trawl)	1	"
21. Scientific Computer System		NOAA Ship *Henry B. Bigelow*
22. Flow-through and meteorology sensors		"
23. Deck equipment to deploy CTD & bongo		"
24. Deck equipment to deploy VPR, MOCNESS, and IKMT		"
25. Stands to support big eye binoculars	5	"
26. Wooden casing for net reel to hold acoustic array	1	"
27. Simard EK60 Scientific Sounder	1	"
28. ME70	1	"
29. Hydro winches on starboard 02 deck to deploy the CTD, bongo and VPR	2	"
30. XBT launcher and software	1	"
31. Movable platforms at the bow to allow a photographer or biopsier to see over the ship's bow	2	"
32. Small boat for distance training	1	"

Figure 1. Planned area of operations and track lines for NOAA Ship *Henry B. Bigelow*, Cruise 11-03 Cetacean, sea turtle and seabird abundance survey, during 1 July – 19 August 2013.

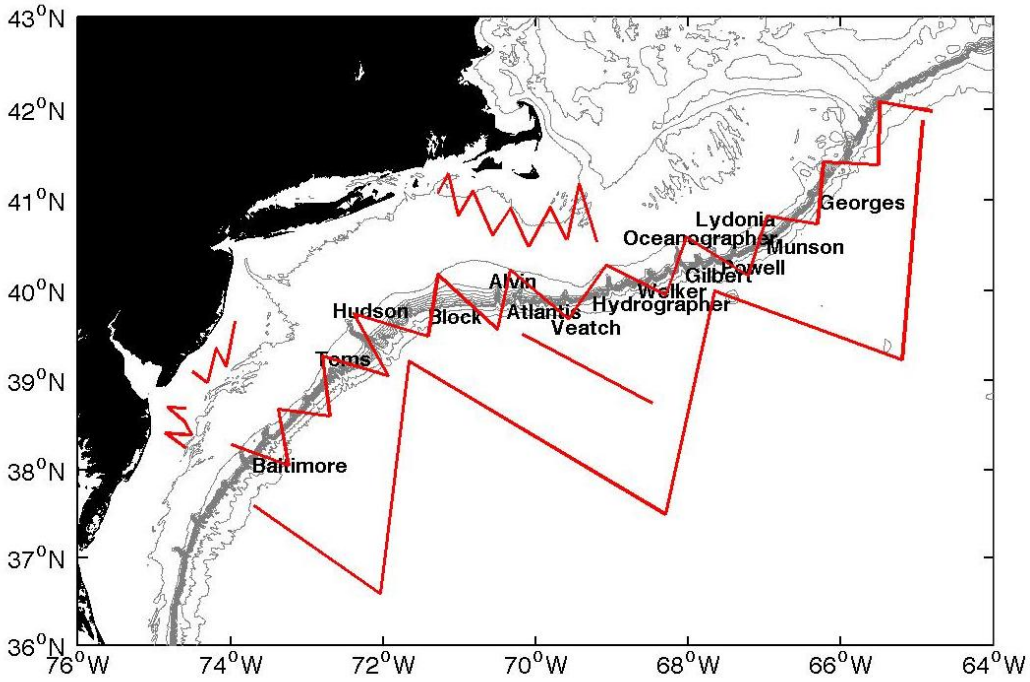

Figure 2.
a) Photo of MARU. The yellow harness lines and white float are good points for grappling with the boat hook. The black power lines and the white burn connector (on the right side of the picture) should be avoided.

b) Map showing the tracklines for the AMAPPS survey (yellow) and the locations of the five MARUs to be recovered (purple dots).

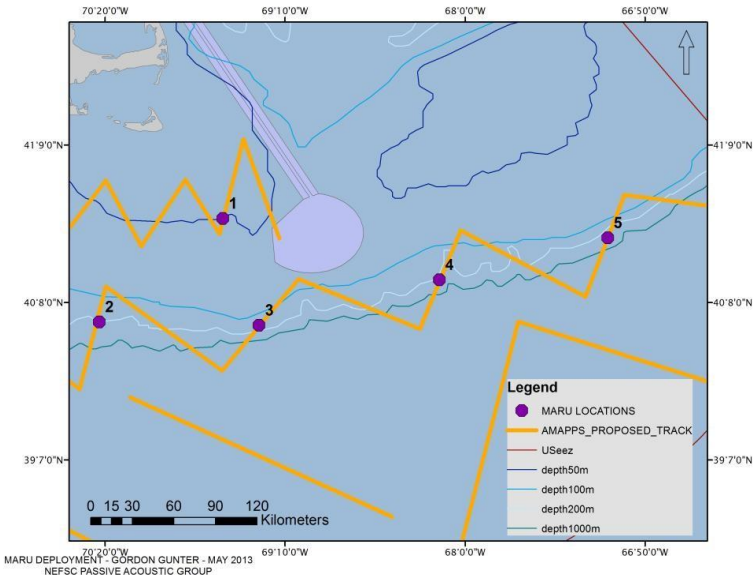

Figure 3. Example of cross-canyon Z-type tracklines

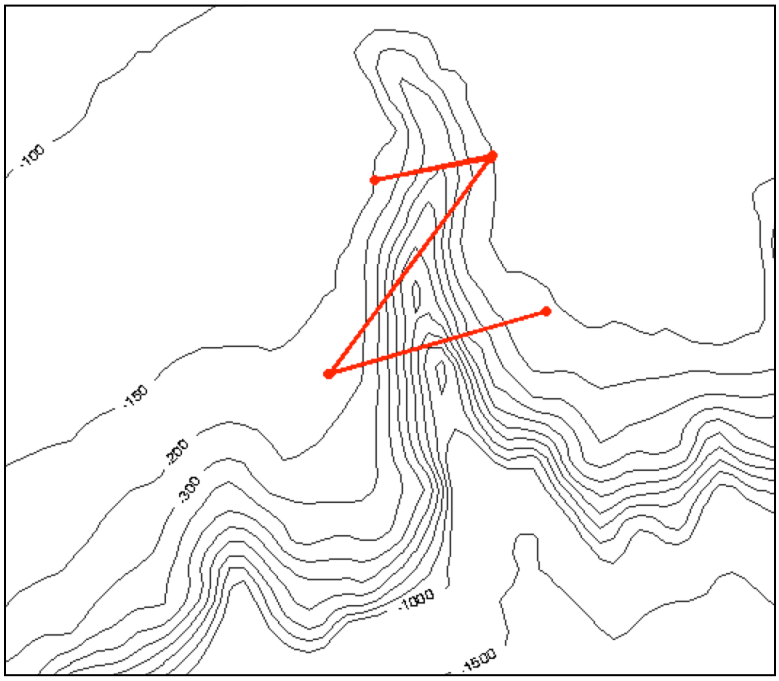

Figure 4. Example of along-canyon U-type tracklines

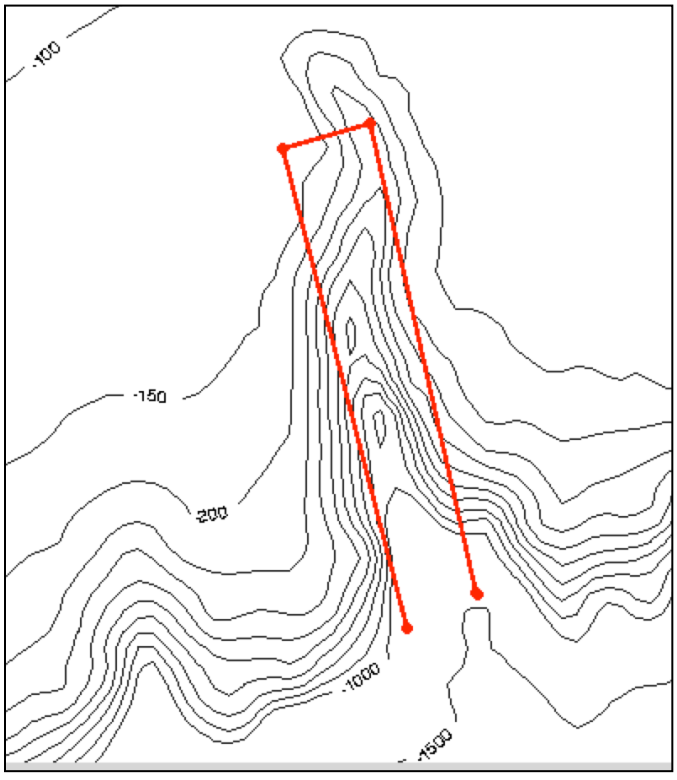

Table 1. Site information for each of the MARUs to be recovered during this survey.

SITE #	Unit #	Date Deployed	Lat	Long	Depth (m)	Radio Freq (MHz)	Emerg Burn Date	Emerg Burn Time (GMT)
1	229	20130430	40.648	-69.57490	49.0	151.88	20130818	19:00
2	143	20130504	38.98355	-70.43906	322.0	151.88	20130818	13:00
3	74	20130504	39.92849	-69.36956	350.0	151.94	20130818	07:00
4	103	20130503	40.22487	-68.21907	340.0	151.88	20130817	23:59
5	199	20130503	40.55465	-67.06516	310.0	151.88	20130817	16:00

Table 2. Scientific Computer Sensors, and logging rates of those sensors, required during HB- 13-03, AMAPPS Cetacean and Turtle Abundance Survey, scheduled to be conducted during 1 July – 19 August 2013. Additional sensors may be requested.

Sensor Name	**Units**	**Log Rate (secs)**
ADCP-Depth	(Meters)	1
ADCP-F/A-GroundSpeed	(Knots)	1
ADCP-F/A-WaterSpeed	(Knots)	1
ADCP-P/S-GroundSpeed	(Knots)	1
ADCP-P/S-WaterSpeed	(Knots)	1
Air-Temp	(Degrees C)	1
Baro-Press	(Millibars)	1
CenterBoardPos-Value	(Position)	1
Date	(Date)	1
Doppler-Depth	(Meters)	1
Doppler-KeelOffset	(Meters)	1
Doppler-P/S-BottomSpeed	(Knots)	1
Doppler-P/S-WaterSpeed	(Knots)	1
EK60-18kHz-Depth	(Meters)	1
EK60-38kHz-Depth	(Meters)	1
ES60-200hz-Depth	(Meters)	1
ES60-50hz-Depth	(Meters)	1
GYRO	(Degrees)	1
ME70-Depth	(Meters)	1
Mid-SeaTemp-C	(Degrees C)	1
MX420-COG	(Degrees)	1
MX420-Lat	(DEGMIN)	1
MX420-Lon	(DEGMIN)	1
MX420-SOG	(Knots)	1
MX420-Time	(Time)	1

Sensor Name	**Units**	**Log Rate (secs)**
POSMV-COG	(Degrees)	1
POSMV-Elevation	(Value)	1
POSMV-hdops	(Value)	1
POSMV-Heading	(Degrees)	1
POSMV-Lat	(DEGMIN)	1
POSMV-Lon	(DEGMIN)	1
POSMV-Quality	(Value)	1
POSMV-Sats	(Value)	1
POSMV-SOG	(Knots)	1
POSMV-Time	(Time)	1
SAMOS-AirTemp-Value	(Degrees C)	1
SAMOS-TRUE-WIND-DIR-Value	(Degrees)	1
SAMOS-TRUE-WIND-Spd-Value	(Knots)	1
YOUNG-TWIND-Speed	(Knots)	1
Fluorometer data		