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

MEMORANDUM FOR: Commander G. Mark Miller, NOAA
Commanding Officer, NOAA Ship *Henry B. Bieglow*

FROM: Captain Anne K. Lynch, NOAA
Commanding Officer, NOAA Marine Operations Center-Atlantic

SUBJECT: Project Instruction for HB-14-03
AMAPPS Cetacean and Turtle Abundance Spring Survey

Due to staffing and mechanical delays, the schedule for HB-14-03 AMAPPS Cetacean and Turtle Abundance Spring Survey aboard NOAA Ship *Henry B. Bigelow* has been amended to the following:

DEP: 7/24/2014	Thu	Newport, RI	HB-14-03
ARR:7/30/2014	Wed	Newport, RI	AMAPPS

Of the 7 DAS currently scheduled for this project, 7 days are funded by a Line Office Allocation. This project is estimated to exhibit a High Operational Tempo. Acknowledge receipt of these instructions via e-mail to **OpsMgr.MOA@noaa.gov** at Marine Operations Center-Atlantic.

Attachment
cc:
MOA1

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MEMORANDUM FOR: Commander G. Mark Miller, NOAA
Commanding Officer, NOAA Ship *Henry B. Bigelow*

Anne K Lynch CAPT/NOAA

FROM: Captain Anne K. Lynch, NOAA
Commanding Officer, NOAA Marine Operations Center-Atlantic

SUBJECT: Project Instruction for HB-14-03
AMAPPS Cetacean and Turtle Abundance Spring Survey

Attached is the final Project Instruction for HB-14-03, AMAPPS Cetacean and Turtle Abundance Spring Survey, which is scheduled aboard NOAA Ship *Henry B. Bigelow* during the period of 8 July to 24 July 2014. Of the 17 DAS scheduled for this project, 17 days are funded by a Line Office Allocation. 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: June 27, 2014

Platform: NOAA Ship *Henry B. Bigelow*

Project Number: HB-14-~~04~~ 03 BK

Project Title: AMAPPS – Cetacean and Turtle Abundance Survey Spring

Project Dates: 8- 24 July 2014

Approved by: Russell W. Brown for Dated: 6-26-2014
William A. Karp, Ph.D.
Science and Research Director
Northeast Fisheries Science Center

Approved by: Anne K. Lynch Dated: 7/23/2014
Captain Anne K. Lynch, NOAA
Commanding Officer
Marine Operations Center – Atlantic

I. Overview

A. Brief Summary and Project Period

B. Days at Sea (DAS)

Of the 17 DAS scheduled for this project, 0 DAS are funded by an OMAO allocation, 17 DAS are funded by a Line Office Allocation, 0 DAS are Program Funded, and 0 DAS are Other Agency funded. This project is estimated to exhibit a Medium Operational Tempo.

C. Operating Area (include optional map/figure showing op area)

The survey will be conducted on the continental shelf, shelf break and in deeper water, primarily in the area is between 39°N and 42°N latitude and between 68°W and 64°W (Figure 1; Table 1).

D. Summary of Objectives

The overall goal of the survey is to document the relationship between the distribution and abundance of cetaceans, sea turtles and sea birds within the study area relative to their physical and biological environment. This study will primarily focus on beaked whale species, with the following objectives: 1) Develop a better understanding of beaked whale habitat use and site fidelity for abundance and monitoring of critical areas, 2) Quantify efficacy of passive acoustic monitoring for detection and abundance of these species, through controlled methodological tests and in comparison to a bottom-mounted recorders (AMAR), 3) Determine the distribution and relative abundance of plankton and prey species, 4) When possible, collect identification photographs and biopsy samples.

E. Participating Institutions

Northeast Fisheries Science Center, Woods Hole, Protected Species Branch
Northeast Fisheries Science Center, Woods Hole, Oceanography Branch
Northeast Fisheries Science Center, Woods Hole, Ecosystem Survey Branch
Integrated Statistics, Inc., Woods Hole, MA

F. Personnel/Science Party: name, title, gender, affiliation, and nationality

In the following table are the personnel that will participate in the survey. The shipboard Foreign National Sponsor will be Dr. Debra Palka.

	Name (Last, First)	**Title**	**Date Aboard**	**Date Disembark**	**Gender**	**Affiliation[1,2]**	**Nationality**
1	Cholewiak, Danielle	Chief Scientist	7 July	24 July	Female	IS, Inc[1]	USA
2	Aschettino, Jessica	Visual team	7 July	24 July	Female	IS, Inc	USA
3	Duley, Pete	Visual team	8 July	24 July	Male	NEFSC[1]	USA
4	Hardee, Rachel	Visual team	7 July	24 July	Female	IS, Inc	USA
5	Moors-Murphy, Hilary	Visual team	7 July	24 July	Female	DFO	Canada
6	Orphaniides, Chris	Visual team	8 July	24 July	Male	NEFSC[1]	USA
7	Palka, Debra	Visual team	7 July	24 July	Female	NEFSC[1]	USA
8	Pusser, Todd	Visual team	7 July	24 July	Male	IS, Inc	USA
9	Yin, Suzanne	Visual team	7 July	24 July	Female	IS, Inc	USA
10	Haver, Samara	Acoustic team	8 July	24 July	Female	IS, Inc[1]	USA
11	Izzi, Annamaria	Acoustic team	8 July	24 July	Female	IS, Inc	USA
12	Stanistreet, Joy	Acoustic team	8 July	24 July	Female	IS, Inc	USA
13	Coates, Shannon	Acoustic team	7 July	24 July	Female	IS, Inc	USA
14	Force, Michael	Bird team	7 July	24 July	Male	IS, Inc	Canada
15	Metheny, Nick	Bird team	7 July	24 July	Male	IS, Inc	USA
16	Jech, Mike	Survey	8 July	24 July	Male	NEFSC[1]	USA
17	Broughton, Betsy	Oceanography	8 July	24 July	Female	NEFSC[1]	USA
18*	Godlewski, Joseph	Survey	8 July	8 July	Male	NEFSC[1]	USA
19*	Ryan, Michael Cranston	Survey	8 July	8 July	Male	IS, Inc	USA

[1]Has a CAC card
*Will depart after acoustic calibration

NEFSC= Northeast Fisheries Science Center, Woods Hole, MA
IS, Inc= Integrated Statistics, Inc.
DFO = Department of Fisheries and Oceans

G. **Administrative**

1. **Points of Contacts:**

Chief Scientist: Dr. Danielle Cholewiak; NEFSC, 166 Water St., Woods Hole, MA 02543; 508-495-2387; danielle.cholewiak@noaa.gov

Protected Species Branch Chief: Dr. Peter Corkeron, Acting Branch Chief; NEFSC, 166 Water St., Woods Hole, MA 02543; 508-495-2358; peter.corkeron@noaa.gov

Oceanography Branch Chief: Dr. Jon Hare; NEFSC, 28 Tarzwell Dr., Narragansett, RI 02882; 401-871-4705; jon.hare@noaa.gov

Vessel Operations Coordinator: Nathan J. Keith; NEFSC, 166 Water St, Woods Hole, MA 02543; 508-495-2224; Nathan.Keith@noaa.gov

Ops Officer Henry Bigelow: LT Jeffrey Pereira; In Port: 774-487-7585;At Sea:301-713-7770; OPS.Henry.Bigelow@noaa.gov

2. **Diplomatic Clearances**

This project could involve Marine Scientific Research in waters under the jurisdiction of Canada. Diplomatic clearance has been requested by NEFSC.

3. **Licenses and Permits**

This project will be conducted under the

Marine Mammal Protected Species Permit Number 17355 (U.S.);

Foreign Fishing Vessel License Number 000005 (Canada) {applied for};

Species at Risk Act permit (Canada) issued by _____ (Canada) on _____ (date) to Debra Palka {applied for}

II. Operations

The Chief Scientist is responsible for ensuring the scientific staff are trained in planned operations and are knowledgeable of project objectives and priorities. The Commanding Officer is responsible for ensuring all operations conform to the ship's accepted practices and procedures.

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

3 &7 July	Load scientific gear. .
8 July	Depart Newport, RI, 10:00h.
8- 23 July	Conduct the survey per Operational Plans
24 July	Return to Newport, RI, disembark, unload scientific gear

B. Staging and Destaging: Newport, RI. See Project Itinerary for details.

C. Operations to be conducted:

Visual Marine Mammal-Sea Turtle Sighting Teams

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 10 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 data entry computers will be connected with the ship's SCS system to record latitude, longitude, depth and sea surface temperature into the scientist's data entry computers. Thus, power will be needed at the bridge station, on the flying bridge and on the bridge wings.

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 or if they need to make minor diversions from the track line to, for example, go around fishing boats.

Surveying effort will change and dedicated operations (photo-ID, biopsy, acoustic recording) will be conducted in two types of situations:

1) In areas where aggregations (eg multiple groups) of beaked whales are found, the Chief Scientist and visual observation team will decide on specific data collection priorities, which will be communicated to the bridge by the Chief Scientist. The ship will likely be requested to transit through the area on the trackline at 10kts, and then return along the trackline at 5 kts. The passive acoustic array may then be recovered and the ship may be requested to approach specific groups for photo-ID/biopsy data collection. Alternatively, the array may continue to be deployed, and the ship may be requested to pass through an aggregation where there are species of interest to record. These data collection efforts are expected to take place regularly in areas of high beaked whale density.

2) 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 is near the original departure point, the bridge will notify the observers and when the ship is back on the original track line and up to survey speed then the survey teams will go back on-effort.

Additional tracklines may be added adaptively in areas where aggregations of target species (beaked whales) are encountered (e.g., Figure 2).

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 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 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 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 or other authorized genetic laboratories.

Acoustic Detection Team

General Operations

The passive acoustic team will be on-effort 24 hours. During daylight hours, when the visual sighting team is on-effort, the acoustic detection team will work in coordination with them. The acoustic team will maintain contact with the visual team to be notified of each cetacean sighting; this information may be transmitted via the visual team's data stream using the ship's intranet system and also via handheld walkie-talkie. In prior surveys, a protocol has been 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 to facilitate the collection of high quality acoustic recordings.

In areas of high beaked whale density, standard survey protocol will change to facilitate the collection of dedicated acoustic and visual data. These changes will be communicated to the bridge by the Chief Scientist. On multiple occasions, the ship will be requested to transit through the area on the trackline at 10 kts, and then return along the trackline at 5 kts. This will allow for systematic testing of acoustic detection probability based on ship speed and array depth. Additionally, the ship may be requested to deviate from the trackline to pass near species of interest, specifically for the collection of acoustic recordings and identification photographs.

At night, the ship will be requested to re-run portions of the same tracklines that were covered during the day. The passive acoustic team will continue to collect data, with the goal of systematically comparing acoustic activity between day and night in the same areas.

The acoustic team will be stationed inside the dry lab. Recordings of acoustic detections will be made onto several desktop computers, utilizing two ship's computers if possible. The acoustic team will require 3-4 GPS feeds from the ship. The main passive acoustic hydrophone array consists of a 400m cable with 8 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. A wooden casing was built to accommodate the array in 2007, and was used until 2011, after which time it was replaced by steel pipes. A removable deck cable will connect the hydrophone tow cable to the computers in the lab. A second towed array will be brought on board as a back-up.

When deploying and recovering the array, the ship will be requested to slow to 2-3kts. While the array is in the water, the ship will be requested not to make turns greater than 60°, so as to minimize strain on the electrical wires inside the array. Therefore, maneuvers at the end of the tracklines or to follow animals will require a broad turn radius. In addition, when the ship is operating in waters less than 100m depth, maneuvering may be restricted while the array is in the water. In these situations, the visual team and the bridge should communicate with the acoustics team to determine whether the array should be retrieved before the ship breaks track.

Deployment of deep-water mooring (AMAR)

One deep-water acoustic mooring (Table 2; Figures 3,4) will be deployed during the survey, at

approximately 40º 5'N 68ºW, at a water depth of approximately 800m. At the discretion of the Chief Scientist, additional tracklines may be added to survey the area near the AMAR deployment site. Deployment guidelines will be provided separately.

Seabird Sighting Team

This team will be responsible for recording sea bird data using standard single team strip transect procedures.

When the visual marine mammal-sea turtle sighting teams are on-effort and whenever else feasible, the seabird team will 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. This computer needs to be hooked up to the ship's intranet via a serial port.

There will be times, particularly in Beaufort sea state 5 or worst 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.

Oceanography Team

Oceanographic operations will be conducted to collect hydrographic, plankton, and mesopelagic data during four types of operations: continuous, fixed-time, night-time, and fixed-location. However, prior to the collection of these data, the ship's EK60 will be calibrated on the day of departure.

EK60 Calibrations

The multi-frequency EK60 will be calibrated on the day of departure in the Newport naval anchorage in Narragansett Bay across the channel from the Newport Navy base. Calibrations are required for each survey to ensure data quality and verify that the instrumentation is operating properly. The EK60 is calibrated by suspending standard calibration spheres of known target strength under each transducer from three monofilament lines. The calibration sphere is centered in the far field of the transducer and moved throughout the acoustical beams beneath the vessel using remotely controlled downriggers. Given mild weather and tidal conditions, centering the sphere and mapping the beam patterns requires about 2-4 hours for all frequencies. The 70-, 38-, 120-, and 200-kHz split-beam transducers require 15 m or greater water depth, and the 18-kHz split-beam transducer requires about 25 m or greater water depth.

We will require an additional two personnel to assist with calibrations (Joe Godlewski and Michael Ryan), who will only be on board for the calibration and will depart the vessel at the conclusion of the calibrations. Transport of these personnel can be via small boat back to the Navy pier or other means as determined by the vessel command.

Continuous Operations

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 (e.g., see Table 4).

EK60 data will be collected continuously during the day, likely on every day. At times, the EK60 may be disabled for specific passive acoustic recording requirements.

Fixed-Time Operations

CTD and plankton sampling may be conducted up to three times daily: at 5:00am, at noon and 18:00h. A 61cm Bongo plankton net, equipped with two333 µm mesh nets and a CTD mounted on the wire 1m above the nets will be used. The bongo will be towed in a double oblique profile using standard ECOMON protocols. The ship's speed through the water will be approximately 1.5 knots. Wire out speed will be a maximum of 50m/min and wire in speed will be a maximum of 20m/min, both of which depend on water depth. Tows will be a minimum of 5 minutes in duration. 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 the cruise samples will be transported to the NMFS lab at Narragansett, RI for future processing. A Laser In-Situ Scattering Transmissometer (LISST) may be mounted alongside the CTD to collect particle size distribution and abundance data in the water column. 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.

Night-Time Operations

Systematic and opportunistic night-time sampling of small prey layers will be conducted using an Isaacs-Kidd Mid-water trawl (IKMT) and a small mid-water trawl. Both nets will be used for sampling during approximately 6 nights, with the goal of sampling three areas where beaked whales are present and three where they are not. The Chief Scientist and Oceanography team will make decisions jointly as to which nights to sample prey.

The net may be towed targeting layers of zooplankton seen by the 120 kHz and 200 kHz sensors of the ship's EK60 echo sounder. A bongo/CTD cast as described in the fixed-time operations will be conducted in conjunction with the trawling operations to collect complimentary hydrographic and plankton data. Casts will be to a maximum of 200 m. On nights when prey sampling is being conducted, the passive acoustic array will not be deployed until prey sampling operations have finished.

One survey technician from the vessel will be required to assist oceanography staff during each watch.

Isaacs-Kidd mid-water trawl description

The 10-ft IKMT will be deployed to target depth-specific layers that were observed at the lower frequencies of the EK60 and so are consistent with mesopelagic fish and euphausiids. The 10-ft IKMT will be deployed off the stern using the ships stern A-frame and the oceanographic winch. The net will be fished to a maximum of 500 m. Acoustic net sensors may be attached to the net's tow bar to monitor the depth of the net in realtime. To maximize the sampling depth in relation to tow duration, the IKMT can be lowered below its target depth with the ship maintaining minimal speed without sacrificing steerage. The ship can increase speed to 2 – 3 kts (speed over the ground, SOG)when the net reaches maximum tow depth. As the IKMT rises through the water with the increased SOG, the IKMT trawl depth should be maintained in the target depth-specific layer by adjusting the amount of wire out. After the target layer is sampled, the net will be retrieved as fast as safely possible. Upon retrieval, samples will be rinsed from the nets using seawater and preserved in 5% formaldehyde and seawater. Samples will be transported to the NMFS lab at Narragansett, RI for future processing.

A 6-ft IKMT will be used if stern operations using the 10-ft IKMT are unsuccessful. The 6-ft IKMT will be deployed from the port side A-frame using the hydrographic winch. A CTD will be mounted on the top tow bar of the trawl to monitor real-time depth. Deployment, towing, retrieval, and sample preservation would be the same as described for the 10-ft IKMT with the exception that on the Bigelow the wire angle becomes too steep, causing the wire to rub on the aft block. As a result, tow speed should be lowered.

Pelagic Trawl Description

A shallow-water mid-water trawl (Fig. 5) will be used as the primary mid-water trawl and a polytron mid-water rope trawl (Fig. 6) will be brought as a backup to collect biological samples and verify species composition of acoustic backscatter. The shallow-water mid-water trawl will use 1.8 m superkrub doors and 100-lb tom weights, whereas the polytron trawl will use 3.5-m superkrub and 600-lb tom weights. The trawls will be rigged similarly (Fig. 7). The midwater trawls are designed to be fished at speeds of about 4 knots. The midwater trawls will be deployed during survey operations, and targeted on acoustic backscatter to a maximum depth of about 500 m. The duration and depth of the trawls are not standardized, thus it is incumbent upon the Chief Scientist or Watch Chief to communicate with the bridge officers the haul duration and depths.

Simrad FS70 Trawl Monitoring and Third-wire Winch System

The trawl will be monitored using at least the FS70 and possibly the Scanmar systems. The Simrad FS70 trawl monitoring system is required for pelagic trawling. It is a third-wire device that provides real-time trawl performance information through its sonar images of the trawl opening. The Scanmar wireless trawl sensors provide point measurements of the trawl depth, horizontal and vertical opening, and door spread. The scientific party will record measurements at specified intervals during each deployment.

The Simrad FS70 will be deployed with every haul. Typically, the trawl will be fished obliquely. Officers will record the time, date, navigational, and station data in FSCS, while the scientists will record the catch data for each station deployment. Catch data will be recorded using the FSCS on-board entry system.

Trawl Catch Processing

Trawl catch will processed at a sorting table on the back deck. The sorting table will be located where the fish "hopper" is currently. Fish will be sorted by species and weighed en masse. Fish length will be measured for up to 150 individuals of each species. The complete fish handling system will not be used. We will use only the "watch chief" station to process the fish. The bottom-trawl SCS event will be used and completed by the bridge officer during the trawl

Fixed-Location Operations

The HB14-04 planned cruise track includes some sampling in shelf regions of interest to the NEFSC Oceanography Branch. Several standard fixed station locations from the ECOMON program will be targeted for sampling during the survey (Figure 1, Table 3). A 911 CTD / Rosette will be deployed for more detailed oceanographic data collection and for the collection of water samples. The rosette will deployed from the port side A-frame. Wire out/in during casts will not exceed 50 m/min and the winch will be stopped at various predetermined depths on the upcast to collect water samples. The CTD operator will communicate with the winch operator to coordinate these stops. Casts will be made to a

maximum of 500 m. Once back on deck, water samples will be collected and preserved by the oceanography team while the ship is underway to the next station. A bongo/CTD cast as described in the fixed-time operations will be conducted in conjunction with the rosette operations to collect complimentary plankton data. Bongo/CTD casts will be to a maximum of 200 m.

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 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 to 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 permitnumber 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:

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. Also, a tarp or canvas should be mounted on the flying bridge to shade the observers.

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 steel pipes should be mounted on the reel to accommodate the towed array. To deploy the passive acoustic array we require assistance from the ship's personnel. The array is not to be deployed without the presence of at least one of the passive acoustic team members.

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

To deploy the CTD, bongo, VPR, 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.

D. **Dive Plan**

All dives are to be conducted in accordance with the requirements and regulations of the NOAA Diving Program (http://www.ndc.noaa.gov/dr.html) and require the approval of the ship's Commanding Officer.

Dives arenot planned for this project.

E. Applicable Restrictions

Conditions which preclude normal operations:

In most cases, the marine mammal visual observation teams will survey when the Beaufort sea state is under six (6). The seabird visual observation team, passive acoustic team, and oceanography team may continue surveying even when the Beaufort sea state is 6 and above.

The oceanographic sampling during the day or night may have to be altered if there are fixed gear and multiple vessels in the region of the sampling station.

III. Equipment

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

	ITEM	QUANTITY	SUPPLIED BY
1	Passive acoustic data collection equipment	ample	NMFS, NEFSC, Woods Hole, MA
2	Portable computers	3	
3	Pelorus for measuring sighting angles (mounted at each sighting station)	4	
4	Hand held binoculars	4	
5	25x150 binoculars and yokes	4	
6	Data logs, computerized and paper	ample	
7	Photographic equipment	ample	
8	Desks and chairs for sighting stations	3	
9	Bongo equipment and supplies	ample	
10	Passive acoustic arrays	2	
11	CTDs	2	
12	Bongo plankton net equipment	2	
13	Video Plankton Recorder	1	
14	10-ft Isaacs-Kidd mid-water trawl	1	
15	6-ft Isaacs-Kidd mid-water trawl	1	
16	20% Dimethyl sulfoxide (DMSO, dispensed in capped vials)	1.1 liters	
17	Formalin (37% formaldehyde)	5 gallons	
18	XBT's	ample	
19	Scientific Computer System		NOAA Ship *Henry Bigelow*
20	Flow-through and meteorology sensors		
21	Deck equipment to deploy CTD & bongo		
22	Deck equipment to deploy VPR, IKMT		
23	Stands to support big eye binoculars	5	
24	Steel pipes for acoustic array		
25	Simard EK60 Scientific Sounder	1	
26	ME70	1	
27	Hydro winches on starboard 02 deck to deploy the CTD, bongo and VPR	2	
28	Oceanographic winch to deploy 10-ft IKMT off the stern	1	
29	XBT launcher and software	1	
30	Movable platforms at the bow to allow a photographer or biopsier to see over the ship's bow	2	
31	FS70 trawl monitor	2	
32	Constant tension winch	1	

IV. Hazardous Materials

A. Policy and Compliance

The Chief Scientist is responsible for complying with FEC 07 Hazardous Materials and Hazardous Waste Management Requirements for Visiting Scientific Parties (or the OMAO procedure that supersedes it). 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 quantity, MSDS, appropriate spill cleanup materials (neutralizing agents, buffers, or absorbents) in amounts adequate to address spills of a size equal to the amount of chemical brought aboard, and chemical safety and spill response procedures. Documentation regarding those requirements will be provided by the Chief of Operations, Marine Operations Center, upon request.

Per OMAO procedure, the scientific party will include with their project instructions and provide to the CO of the respective ship 30 days before departure:

- List of chemicals by name with anticipated quantity
- List of spill response materials, including neutralizing agents, buffers, and absorbents
- Chemical safety and spill response procedures, such as excerpts of the program's Chemical Hygiene Plan or SOPs relevant for shipboard laboratories
- For bulk quantities of chemicals in excess of 50 gallons total or in containers larger than 10 gallons each, notify ship's Operations Officer regarding quantity, packaging and chemical to verify safe stowage is available as soon as chemical quantities are known.

Upon embarkation and prior to loading hazardous materials aboard the vessel, the scientific party will provide to the CO or their designee:

- An inventory list showing actual amount of hazardous material brought aboard
- An MSDS for each material
- Confirmation that neutralizing agents and spill equipment were brought aboard sufficient to contain and cleanup all of the hazardous material brought aboard by the program
- Confirmation that chemical safety and spill response procedures were brought aboard

Upon departure from the ship, scientific parties will provide the CO or their designee an inventory showing that all chemicals were removed from the vessel. The CO's designee will maintain a log to track scientific party hazardous materials. MSDS will be made available to the ship's complement, in compliance with Hazard Communication Laws.

Scientific parties are expected to manage and respond to spills of scientific hazardous materials. Overboard discharge of hazardous materials is not permitted aboard NOAA ships.

B. Inventory

Common Name of Material	Qty	Notes	Trained Individual	Spill control
Ethanol (97%)	1 gal	Flammability	Elisabeth Broughton, Harvey Walsh	
Formaldehyde solution (2%)	1 x 5 gal	Alkalinity	Elisabeth Broughton, Harvey Walsh	F
Formaldehyde solution (37%)	2 x 20 L	Alkalinity, Stored in ship chem. lkr	Elisabeth Broughton, Harvey Walsh	F
Dimethyl sulfoxide (DMSO)	30/ 2oz. tubes	Tubes will be kept sealed in a box under the fume hood	Peter Duley	F
Chlorox bleach	1 gal	Stored under the fume hood	Peter Duley	A

C.Chemical safety and spill response procedures

A: ACID

- Wear appropriate protective equipment and clothing during clean-up. Keep upwind. Keep out of low areas.
- Ventilate closed spaces before entering them.
- Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible.
- **Large Spills**: Dike far ahead of spill for later disposal. Use a non-combustible material like vermiculite, sand or earth to soak up the product and place into a container for later disposal.
- **Small Spills**: Wipe up with absorbent material (e.g. cloth, fleece). Clean surface thoroughly to remove residual contamination.
- Never return spills in original containers for re-use.
- Neutralize spill area and washings with soda ash or lime. Collect in a non-combustible container for prompt disposal.
- J. T. Baker NEUTRASORB® acid neutralizers are recommended for spills of this product.

M: Mercury

- Spills: Pick up and place in a suitable container for reclamation or disposal in a method that does not generate dust. Sprinkle area with sulfur or calcium polysulfide to suppress mercury. Use Mercury Spill Kit if need be.

F: Formalin/Formaldehyde

- Ventilate area of leak or spill. Remove all sources of ignition.
- Wear appropriate personal protective equipment.

- Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Contain and recover liquid when possible.
- Use non-sparking tools and equipment. Collect liquid in an appropriate container or absorb with a formaldehyde neutralizer (sodium metabisulfate or Spill-X-FP) and follow the manufacturer's instructions for disposal.
- Do not use combustible materials, such as saw dust.

Inventory of Spill Kit supplies

Product Name	Amount	Chemicals it is useful against	Amount it can clean up
Spill-X-FP	1.68 kg	Formaldehyde	10 gallons
Mercury Tamer	250 gm	Mercuric Chloride	2 Liters

D. Radioactive Materials

No Radioactive Isotopes are planned for this project.

E. Inventory (itemized) of Radioactive Materials

No Radioactive Isotopes are planned for this project.

V. Additional Projects

A. Supplementary ("Piggyback") Projects

No Supplementary Projects are planned.

B. NOAA Fleet Ancillary Projects

No NOAA Fleet Ancillary Projects are planned.

VI. Disposition of Data and Reports

A. Data Classifications: *Under Development*

a. OMAO Data

Disposition of data gathered aboard NOAA ships will conform to NAO 216-101 *Ocean Data Acquisitions* and NAO 212-15 *Management of Environmental Data and Information.* To guide the implementation of these NAOs, NOAA's Environmental Data Management Committee (EDMC) provides the *NOAA Data Documentation Procedural Directive* (data documentation) and *NOAA Data Management Planning Procedural Directive* (preparation of Data Management Plans). OMAO is developing procedures and allocating resources to manage OMAO data and Programs are encouraged to do the same for their Project data.

b. Program Data

Program Data - At the end of each leg of the cruise the ship will provide the chief scientist with a copy of data from the EK60 transducer, the ADCP unit and the SCS system. A copy of the SCS data should also be provided to DMS personnel in Woods Hole.

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.nefsc.noaa.gov/psb/surveys/documents/20120919_Report_a_Right_Whale.pdf) and laminated copies will be provided by the Protected Species Branch upon request. 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 sturgeon, 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 866-755-6622 to report the incident and receive further instructions.

Marine turtle bycatch: All marine turtles taken incidental to fishing activities must 1) behandled and resuscitated according to established procedures, 2) be clearly photographed(multiple views if possible, including at least one photograph of the head scutes), 3) beidentified to the species level, 4) have width and length (carapace notch to notch, and notchto tip) measured in centimeters, 5) have supporting data recorded including GPS or Lorancoordinates recorded describing the location of the interaction; time of interaction; date ofinteraction; condition of the animal upon retrieval (alive uninjured, alive injured, fresh

dead,decomposed, comatose or unresponsive); the condition of the animal upon return to thewater; GPS or Loran coordinates of the location at which it was released; and a description of the care or handlingprovided. Live animals shall then be returned to the sea. Dead animals shall, if feasible, be frozen and returned to the Woods Hole Laboratory.

Marine mammal bycatch: All marine mammals taken incidental to fishing activities must 1)be clearly photographed (multiple views if possible, including at least one photograph of thehead, 2) be identified to the species level, 3) have body length (snout to tail (seals), beak tothe notch in the fluke/tail (whales, dolphins and porpoises)), measured in centimeters, 4) have supporting data recorded including GPS or Loran coordinates recorded describing thelocation of the interaction; time of interaction; date of interaction; condition of the animalupon retrieval (alive uninjured, alive injured, fresh dead, decomposed, comatose orunresponsive). Live animals shall then be returned to the sea. Dead animals shall, iffeasible, be frozen and returned to the Woods Hole Laboratory.

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.

VII. Meetings, Vessel Familiarization, and Project Evaluations

A. Pre-Project Meeting: The Chief Scientist and Commanding Officer will conduct a meeting of pertinent members of the scientific party and ship's crew to discuss required equipment, planned operations, concerns, and establish mitigation strategies for all concerns. This meeting shall be conducted before the beginning of the project with sufficient time to allow for preparation of the ship and project personnel. The ship's Operations Officer usually is delegated to assist the Chief Scientist in arranging this meeting.

B. Vessel Familiarization Meeting: The Commanding Officer is responsible for ensuring scientific personnel are familiarized with applicable sections of the standing orders and vessel protocols, e.g., meals, watches, etiquette, drills, etc. A vessel familiarization meeting shall be conducted in the first 24 hours of the project's start and is normally presented by the ship's Operations Officer.

C. Post-Project Meeting: The Commanding Officer is responsible for conducted a meeting no earlier than 24 hrs before or 7 days after the completion of a project to discuss the overall success and short comings of the project. Concerns regarding safety, efficiency, and suggestions for future improvements shall be discussed and mitigations for future projects will be documented for future use. This meeting shall be attended by the ship's officers, applicable crew, the Chief Scientist, and members of the scientific party and is normally arranged by the Operations Officer and Chief Scientist.

D. Project Evaluation Report: Within seven days of the completion of the project, a Customer Satisfaction Survey is to be completed by the Chief Scientist. The form is

available at http://www.omao.noaa.gov/fleeteval.html and provides a "Submit" button at the end.

The Customer Satisfaction Survey is one of the primary methods OMAO and Marine Operations (MO) utilize to improve ship customer service. Information submitted through the form is automatically input into a spreadsheet accessible to OMAO and MO management for use in preparing quarterly briefings. Marine Operations Centers (MOC) address concerns and praise with the applicable ship. Following the quarterly briefings the data are briefed to the Deputy Director of OMAO.

VIII. Miscellaneous

A. Meals and Berthing

The ship will provide meals for the scientists listed above. Meals will be served 3 times daily beginning one hour before scheduled departure, extending throughout the project, and ending two hours after the termination of the project. 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 seven days prior to the project.

Berthing requirements, including number and gender of the scientific party, 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. The Chief Scientist is responsible for ensuring the scientific berthing spaces are left in the condition in which they were received; for stripping bedding and linen return; and for the return of any room keys which were issued. The Chief Scientist is also responsible for the cleanliness of the laboratory spaces and the storage areas utilized by the scientific party, both during the project and at its conclusion prior to departing the ship.

All NOAA scientists will have proper travel orders when assigned to any NOAA ship. The Chief Scientist will ensure that all non NOAA or non Federal scientists aboard also have proper orders. It is the responsibility of the Chief Scientist to ensure that the entire scientific party has a mechanism in place to provide lodging and food and to be reimbursed for these costs in the event that the ship becomes uninhabitable and/or the galley is closed during any part of the scheduled project.

All persons boarding NOAA vessels give implied consent to comply with all safety and security policies and regulations which are administered by the Commanding Officer. All spaces and equipment on the vessel are subject to inspection or search at any time. All personnel must comply with OMAO's Drug and Alcohol Policy dated May 17, 2000 which forbids the possession and/or use of illegal drugs and alcohol aboard NOAA Vessels.

B. Medical Forms and Emergency Contacts

The NOAA Health Services Questionnaire (NHSQ, Revised: 02JAN2012) must be completed in advance by each participating scientist. The NHSQ can be obtained from the Chief Scientist or the NOAA website http://www.corporateservices.noaa.gov/~noaaforms/eforms/nf57-10-01.pdf. The completed form should be sent to the Regional Director of Health Services at Marine Operations Center. The participant can mail, fax, or scan and send via secure e-mail the form using the contact information below; participants should take precautions to protect their Personally Identifiable Information (PII) and medical information. The NHSQ should reach the Health Services Office no later than 4 weeks prior to the project to allow time for the participant to obtain and submit additional information that health services might require before clearance to sail can be granted. Please contact MOC Health Services with any questions regarding eligibility or completion of the NHSQ. Be sure to include proof of tuberculosis (TB) testing, sign and date the form, and indicate the ship or ships the participant will be sailing on. The participant will receive an email notice when medically cleared to sail if a legible email address is provided on the NHSQ.

Contact information:

Regional Director of Health Services
Marine Operations Center – Atlantic
439 W. York Street
Norfolk, VA 23510
Telephone 757-441-6320
Fax 757-441-3760
E-mail MOA.Health.Services@noaa.gov

Prior to departure, the Chief Scientist must provide an electronic listing of emergency contacts to the Executive Officer for all members of the scientific party, with the following information: contact name, address, relationship to member, and telephone number.

C. Shipboard Safety

Hard hats are required when working with suspended loads. Work vests are required when working near open railings and during small boat launch and recovery operations. Hard hats and work vests will be provided by the ship when required.

Wearing open-toed footwear or shoes that do not completely enclose the foot (such as sandals or clogs) outside of private berthing areas is not permitted. At the discretion of the ship CO, safetyshoes (i.e. steel or composite toe protection) may be required to participate in any work dealing with suspended loads, including CTD deployment and recovery. The ship does not provide safety-toedshoes/boots. The ship's Operations Officer should be consulted by the Chief Scientist to ensure members of the scientific party report aboard with the proper attire.

D. Communications

A progress report on operations prepared by the Chief Scientist may be relayed to the program office. Sometimes it is necessary for the Chief Scientist to communicate with another vessel, aircraft, or shore facility. Through various means of communications, the ship can usually

accommodate the Chief Scientist. Special radio voice communications requirements should be listed in the project instructions. The ship's primary means of communication with the Marine Operations Center is via e-mail and 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 and it must be arranged at least 30 days in advance.

E. IT Security

Any computer that will be hooked into the ship's network must comply with the *OMAO Fleet IT Security Policy*1.1 (November 4, 2005) 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 the above 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.

F. Foreign National Guests Access to OMAO Facilities and Platforms

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). National Marine Fisheries Service personnel will use the Foreign National Registration System (FNRS) to submit requests for access to NOAA facilities and ships. The Departmental Sponsor/NOAA (DSN) is responsible for obtaining clearances and export licenses and for providing escorts required by the NAO. DSNs should consult with their designated Line Office Deemed Export point of contact to assist with the process.

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 Servicing Security Office granting approval for the foreign national guest's visit. (For NMFS-sponsored guests, this e-mail will be transmitted by FNRS.)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 Security Office.

4. Export Control - Ensure that approved controls are in place for any 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 approval from the Director of the Office of Marine and Aviation Operations 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 or the DSN of the FNRS or Servicing Security Office e-mail granting approval for the foreign national guest's visit.
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 project, 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 Security Office.

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 DSN 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 and a 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

VIII. Appendices : Figures, maps, tables, images, etc.

Table 1. Waypoints for transit and tracklines (see Figure 1).

Trackline	Waypoint_Name	LAT_DDM	LON_DDM	LAT_DD	LON_DD
Transit	Transit A	39° 50.4' N	69° 46.4' W	39.8400	-69.7740
Transit	Transit B	39° 57.8' N	69° 2.8' W	39.9640	-69.0460
1	1 North	40° 6.6' N	68° 49.1' W	40.1103	-68.8183
1	1 South	39° 6.9' N	68° 22.9' W	39.1156	-68.3818
1	1 South Ext	38° 57.4' N	68° 18.8' W	38.9574	-68.3136
2	2 North	40° 7.1' N	68° 35.5' W	40.1177	-68.5920
2	2 South	39° 10.1' N	68° 10.7' W	39.1686	-68.1787
2	2 South Ext	39° 0.7' N	68° 6.7' W	39.0111	-68.1112
3	3 North	40° 10.5' N	68° 23.3' W	40.1757	-68.3880
3	3 South	39° 13.3' N	67° 58.5' W	39.2214	-67.9752
3	3 South Ext	39° 3.9' N	67° 54.5' W	39.0644	-67.9084
4	4 North	40° 17.0' N	68° 12.3' W	40.2838	-68.2058
4	4 South	39° 16.4' N	67° 46.3' W	39.2737	-67.7714
4	4 South Ext	39° 7.0' N	67° 42.3' W	39.1174	-67.7054
5	5 North	40° 18.3' N	67° 59.1' W	40.3058	-67.9857
5	5 South	39° 19.5' N	67° 34.0' W	39.3257	-67.5674
5	5 South Ext	39° 10.2' N	67° 30.1' W	39.1700	-67.5020
6	6 North	40° 20.3' N	67° 46.2' W	40.3386	-67.7703
6	6 South	39° 22.6' N	67° 21.8' W	39.3773	-67.3630
6	6 South Ext	39° 13.3' N	67° 17.9' W	39.2222	-67.2984
7	7 North	40° 23.3' N	67° 33.7' W	40.3875	-67.5617
7	7 South	39° 25.7' N	67° 9.5' W	39.4286	-67.1584
7	7 South Ext	39° 16.4' N	67° 5.7' W	39.2741	-67.0945
8	8 North	40° 29.1' N	67° 22.4' W	40.4853	-67.3738
8	8 South	39° 28.8' N	66° 57.2' W	39.4795	-66.9535
8	8 South Ext	39° 19.5' N	66° 53.4' W	39.3256	-66.8903
9	9 North	40° 32.5' N	67° 10.1' W	40.5421	-67.1682
9	9 South	39° 31.8' N	66° 44.9' W	39.5300	-66.7483
9	9 South Ext	39° 22.6' N	66° 41.1' W	39.3768	-66.6858

Table 2. Approximate site information for deployment of AMAR deep-water recorder.

SITE #	Unit #	Lat	Long	Depth (m)
1	1	40.305157	-67.737434	800

Table 3: Waypoints for fixed- location oceanography (ECOMON) sampling stations

SITE	**EcoMon_Reference**	**LAT_DDM**	**LON_DDM**	**LAT_DD**	**LON_DD**
EcoMon 1	ACID17 SNE	41° 6.3' N	70° 37.3' W	41.1051	-70.6222
EcoMon 2	ACID18 SNE	40° 40.2' N	70° 37.3' W	40.6700	-70.6222
EcoMon 3	ACID19 SNE	40° 2.2' N	70° 36.1' W	40.0371	-70.6011
EcoMon 4	ACID20 SNE	39° 50.0' N	70° 37.3' W	39.8325	-70.6222
EcoMon 5	ACID25 GB	40° 14.7' N	67° 41.4' W	40.2456	-67.6905
EcoMon 6	ACID24 GB	40° 23.0' N	67° 41.4' W	40.3828	-67.6905
EcoMon 7	ACID23 GB	40° 55.7' N	67° 42.5' W	40.9286	-67.7085
EcoMon 8	ACID28 GSCH	40° 54.0' N	69° 9.4' W	40.9000	-69.1574

Table 4. Scientific Computer Sensors, and logging rates of those sensors, required during *Henry Bigelow HB 14-03*, AMAPPS Cetacean and Turtle Abundance Survey. Additional sensors may be requested.

Sensor Name	**Units**	**Log Rate (secs)**	**Sensor Name**	**Units**	**Log Rate (secs)**
ADCP-Depth	(Meters)	1	MX420-COG	(Degrees)	1
ADCP-F/A-GroundSpeed	(Knots)	1	MX420-Lat	(DEGMIN)	1
ADCP-F/A-WaterSpeed	(Knots)	1	POSMV-COG	(Degrees)	1
ADCP-P/S-GroundSpeed	(Knots)	1	POSMV-Elevation	(Value)	1
ADCP-P/S-WaterSpeed	(Knots)	1	POSMV-hdops	(Value)	1
Air-Temp	(Degrees C)	1	POSMV-Heading	(Degrees)	1
Baro-Press	(Millibars)	1	POSMV-Lat	(DEGMIN)	1
CenterBoardPos-Value	(Position)	1	POSMV-Lon	(DEGMIN)	1
Date	(Date)	1	POSMV-Quality	(Value)	1
Doppler-Depth	(Meters)	1	POSMV-Sats	(Value)	1
Doppler-KeelOffset	(Meters)	1	POSMV-SOG	(Knots)	1
Doppler-P/S-BottomSpeed	(Knots)	1	POSMV-Time	(Time)	1
Doppler-P/S-WaterSpeed	(Knots)	1	SAMOS-AirTemp-Value	(Degrees C)	1
EK60-18kHz-Depth	(Meters)	1	SAMOS-TRUE-WIND-DIR-Value	(Degrees)	1
EK60-38kHz-Depth	(Meters)	1	SAMOS-TRUE-WIND-Spd-Value	(Knots)	1
ES60-200hz-Depth	(Meters)	1	YOUNG-TWIND-Speed	(Knots)	1
ES60-50hz-Depth	(Meters)	1	Fluorometer data		
GYRO	(Degrees)	1	MX420-Lon	(DEGMIN)	1
ME70-Depth	(Meters)	1	MX420-SOG	(Knots)	1
Mid-SeaTemp-C	(Degrees C)	1	MX420-Time	(Time)	1

Figure 1. Planned area of operations and track lines for HB 14-03. Tracklines are indicated by black lines. Orange squares indicate fixed oceanographic monitoring stations (EcoMon). EcoMon stations 1-4 will be sampled the day of departure; stations 5-8 may be sampled opportunistically during the survey.

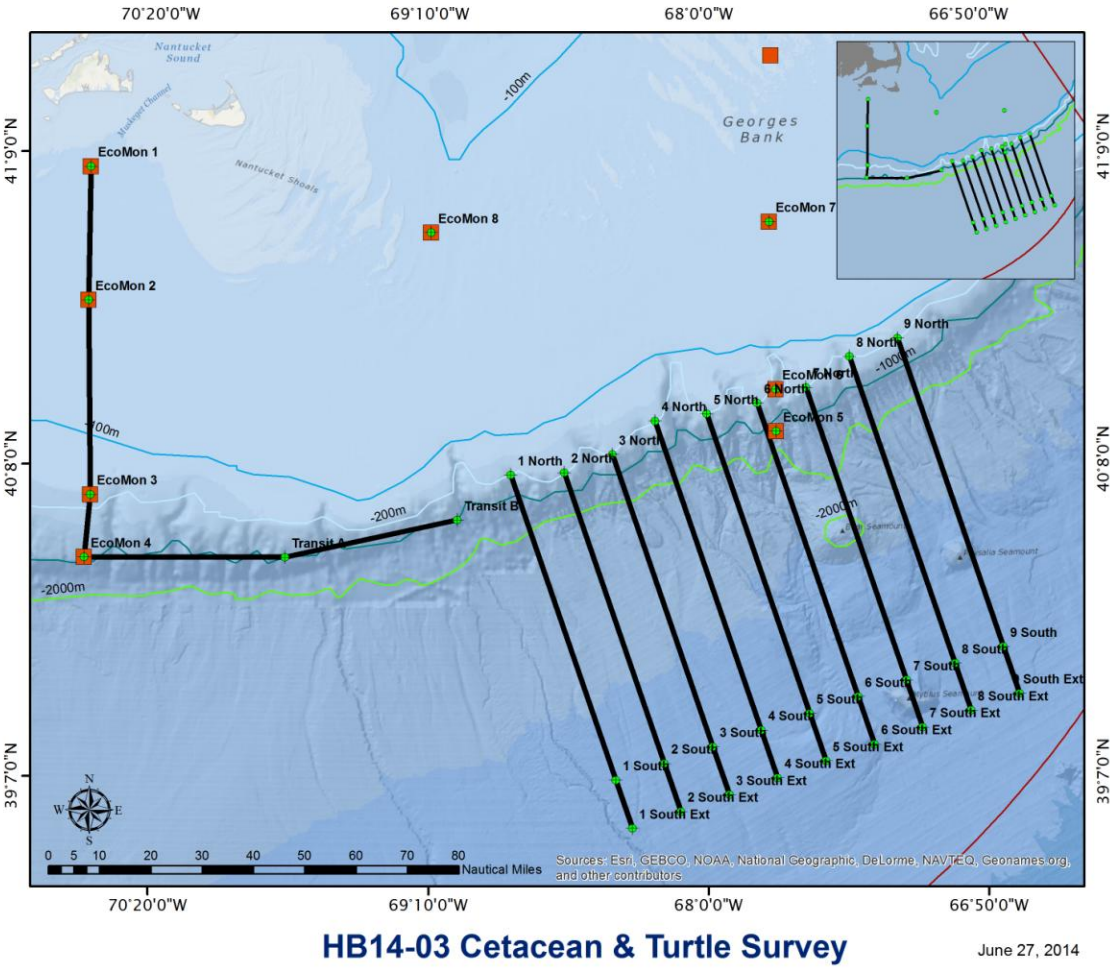


Figure 2. Example "zig-zag" survey lines (in pink) that may be used to more thoroughly sample area in which beaked whale aggregations are encountered. Decisions on adding additional survey lines such as these will be made in conjunction with the bridge.

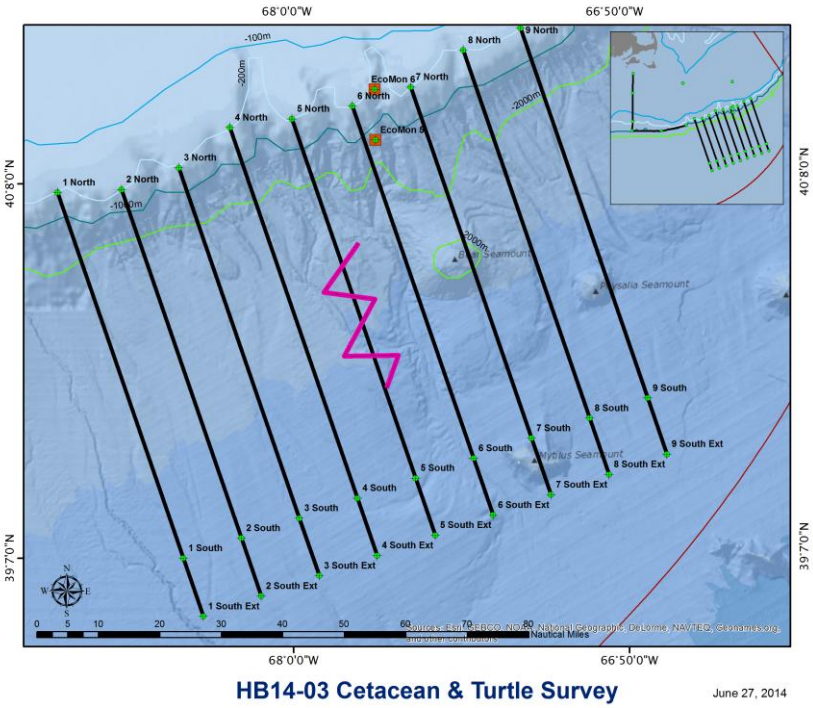


Figure 3. Tentative deployment location for bottom-mounted acoustic recorder (AMAR), shown in the pink triangle. Target depth is approximately 800m. Precise location will be determined based on bathymetry at region of site.

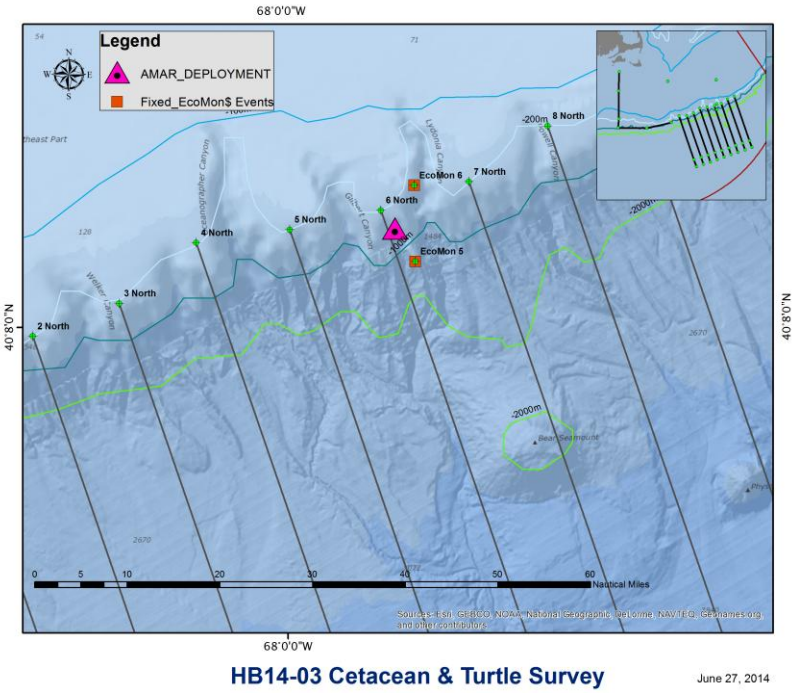
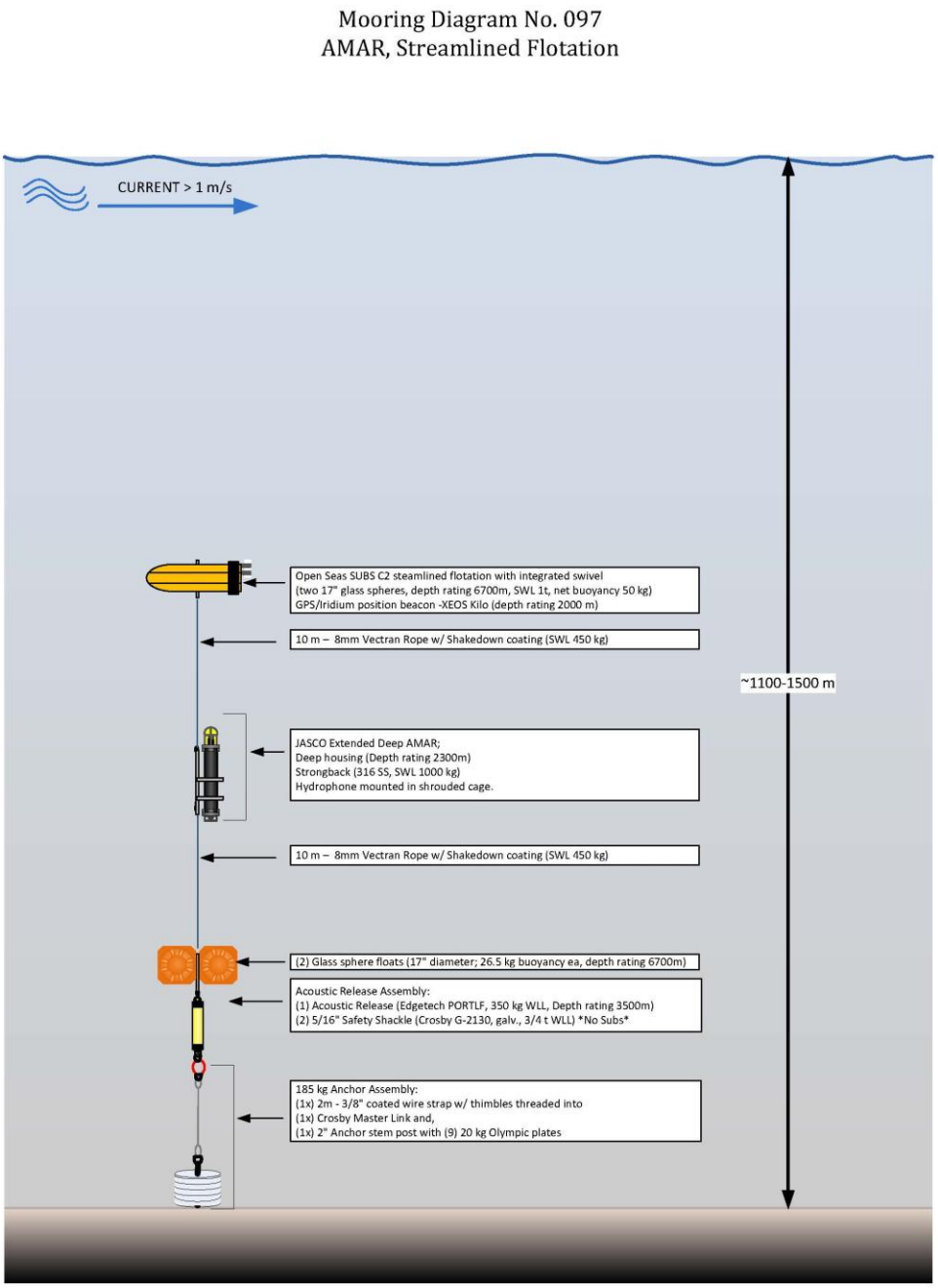


Figure 4. Mooring diagram for AMAR, passive acoustic recorder.



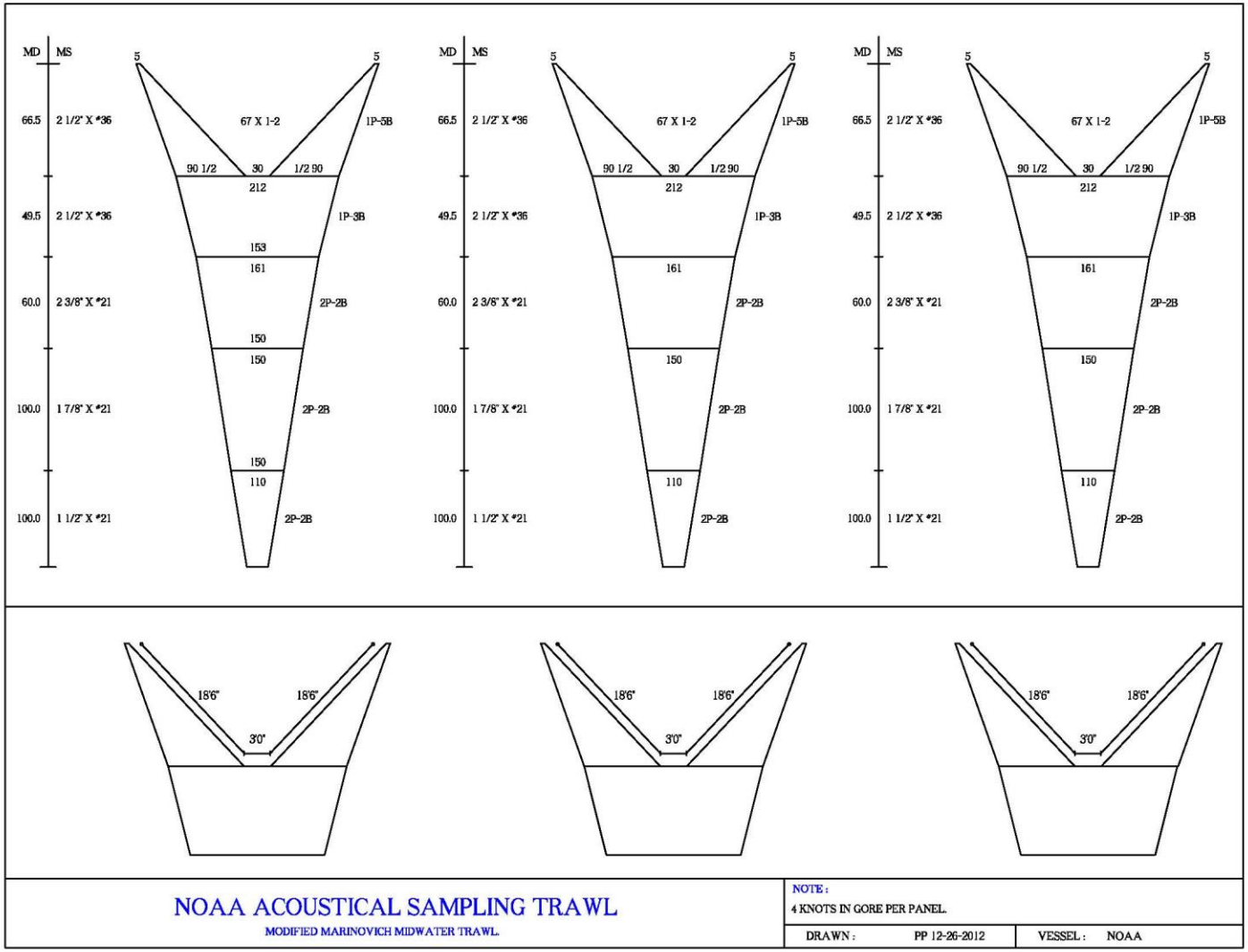


Figure 5. Shallow-water mid-water trawl (Swan Net Gundry)

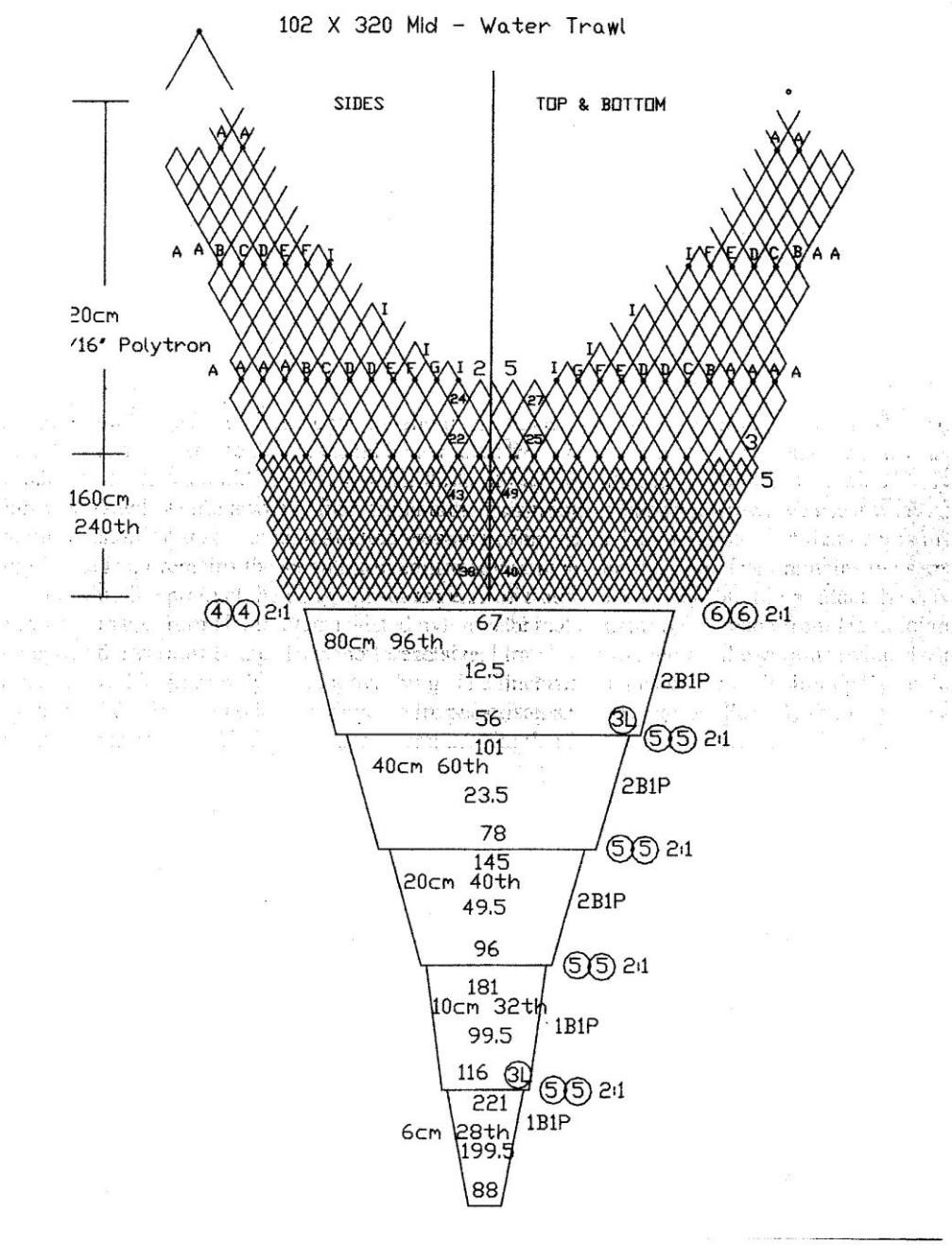


Figure 6. Polytron mid-water rope trawl (Superior Trawl).

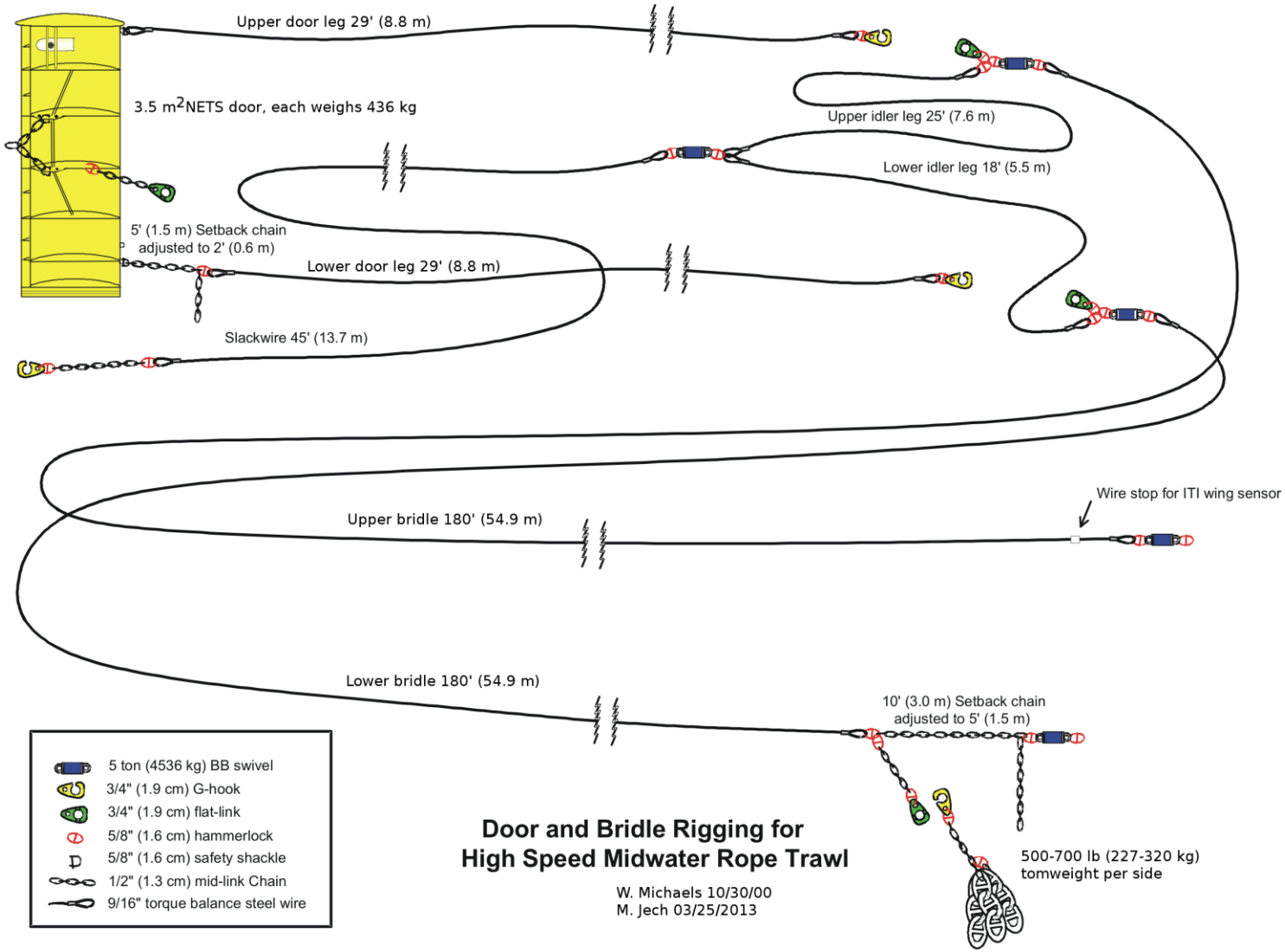


Figure 7. Rigging for the pelagic trawls.