Project Instructions

Date Submitted:	August 16, 2013
Platform:	NOAA Ship *Bell M Shimada*
Project Number:	SH-13-06 (OMAO), BS1301 (SWFSC)
Project Title:	Juvenile Salmon Ocean Ecology
Project Dates:	September 9, 2013 to September 30, 2013

Prepared by: Jeff Harding (SIH for) Dated: 8/23/13
Jeff Harding, Chief Scientist
SWFSC, FED

Approved by: _____ Dated: 8/20/13
Sean Hayes, Program Director
SWFSC, FED

Approved by: _____ Dated: 8/23/13
Steve Lindley, Lab Director
SWFSC, FED

Approved by: _____ Dated: 8/22/13
Kristen Koch, Deputy Director
SWFSC

Approved by: _____ Dated: 8/22/13
Mark Strom, Deputy Director
NWFSC

Approved by: Wade J Blake Digitally signed by BLAKE.WADE.JAMES.1025936538 DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=NOAA, cn=BLAKE.WADE.JAMES.1025936538 Date: 2013.08.29 10:25:35 -07'00' Dated: _____
Captain Wade J. Blake, NOAA
Commanding Officer
Marine Operations Center – Pacific

I. Overview

A. Brief Summary and Project Period

The Juvenile Salmon Ocean Ecology project annually assesses the ecological and physiological status of juvenile salmonids and their habitat in the coastal waters of the central and northern California Current. This year, the project will have a fall cruise to be conducted from September 9-30, 2013.

B. Service Level Agreements

All 20 DAS scheduled for this project are funded by OMAO. This project is estimated to exhibit a Medium Operational Tempo.

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

The operating area for this project is the coastal ocean from shore to around 20 nautical miles offshore, between Pillar Point, California (37°30' N) and La Push, Washington (47°55' N)

Leg 1 covers the southern portion, from Pillar Point, CA (37°30' N) to Newport, OR (44°40' N)
Leg 2 covers the northern portion, from Newport, OR (44°40' N) to La Push, WA (47°55' N)

Map of operating area: see section VIII. Appendix, Figure 1A (Leg 1) and Figure 1B (Leg 2)

D. Summary of Objectives

Working closely with our partners in the NMFS Northwest Fisheries Science Center, our annual survey is part of a collaborative and ongoing coast-wide (California to Washington) study of juvenile salmonids and their ocean habitat. Our primary objectives are to:

1. Determine the interannual and seasonal variability of growth, feeding, energy status, and spatial distribution of juvenile salmonids in the coastal ocean off northern California and southern Oregon; determine the migration pathways and spatial distribution of genetically distinct stocks (ESUs) of salmonids during their early ocean residence.

2. Characterize prominent biological and physical oceanographic features associated with juvenile salmon ocean habitat from shore to the continental shelf break; identify potential links between coastal geography, oceanographic features, and salmon distribution patterns, energy status, and diet; quantify and describe the coastal pelagic fish and invertebrate community associated with juvenile salmon.

3. Quantify seabird distribution, abundance, and foraging activity in the vicinity of salmon and other pelagic fish and invertebrates.

E. Participating Institutions

NOAA Fisheries, SWFSC
NOAA Fisheries, NWFSC
University of California Santa Cruz (UCSC)
Oregon State University (OSU)
Washington Department of Fish & Wildlife (WDFW)

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

Name (Last, First)	Title	Leg	Date Aboard	Date Disembark	Sex	Affiliation	Nationality
Hayes, Sean	PI	1	12 SEP 2013	19 SEP 2013	M	NOAA	USA
Harding, Jeff	CS	1	09 SEP 2013	19 SEP 2013	M	NOAA	USA
Lehman, Brendan	Biologist	1	09 SEP 2013	19 SEP 2013	M	NOAA	USA
Michel, Cyril	Biologist	1	09 SEP 2013	19 SEP 2013	M	NOAA	USA
Notch, Jeremy	Biologist	1	09 SEP 2013	19 SEP 2013	M	NOAA	USA
Hassrick, Jason	Biologist	1	09 SEP 2013	19 SEP 2013	M	NOAA	USA
Dolan, Tara	volunteer	1	09 SEP 2013	19 SEP 2013	F	NOAA	USA
Haukebo, Sepp	volunteer	1	09 SEP 2013	19 SEP 2013	M	NOAA	USA
Bentley, Paul	CS	2	21 SEP 2013	30 SEP 2013	M	NOAA	USA
Fresh, Kurt	PI	2	21 SEP 2013	30 SEP 2013	M	NOAA	USA
Zimmerman, Mara	Biologist	2	21 SEP 2013	30 SEP 2013	F	WDFW	USA
Weitkamp, Laurie	Biologist	2	21 SEP 2013	30 SEP 2013	F	NOAA	USA
Burke, Brian	Biologist	2	21 SEP 2013	30 SEP 2013	M	NOAA	USA

G. Administrative

1. Points of Contacts:

FIRST LEG

Principal Investigator: Sean Hayes, NOAA Fisheries
110 Shaffer Rd., Santa Cruz, CA 95060
(831) 420-3937
Sean.Hayes@noaa.gov

Chief Scientist: Jeff Harding, NOAA Fisheries
110 Shaffer Rd., Santa Cruz, CA 95060
(831) 420-3938
Jeff.Harding@noaa.gov

Operations Officer: LT Patrick Sweeney, NOAA
NOAA Ship Bell M. Shimada
2002 SE Marine Science Drive
Newport, OR 97365
At Sea: 301-713-7788
In Port: 206-427-2374

SECOND LEG

Principal Investigator: Kurt Fresh, NOAA Fisheries
2725 MONTLAKE BLVD EAST
SEATTLE WA 98112-2097
206-860-6793
Kurt.Fresh@noaa.gov

Chief Scientist: Paul Bentley, NOAA Fisheries
520 Heceta Place, P.O. Box 155
Hammond, OR 97121
503-861-1818 ext 16
Paul.Bentley@noaa.gov

2. Diplomatic Clearances: N/A

3. Licenses and Permits:
This project will be conducted under the Scientific Research Permit (U.S.)
#1112M2 issued by NOAA on 12-MAR-2013 to Sean Hayes
#APPS 1410-7A issued by NOAA on 01-APR-2009 to Robert Emmett
#APPS 18021 issued by NOAA on 16-MAY-2013 to Robert Emmett
#SRP-1 01-2013 issued by NOAA on 20 June 2013 to Doug Dey
#13-129 issued by WDFW on 1 May 2013 to Robert Emmett

#18021 issued by ODFW on 29-APR-2013 to Robert Emmett
CDFG-NOAA MOU issued by NOAA on 11-FEB-1986 to Sean Hayes

II. Operations

A. Project Itinerary

September 9	Mobilize (load and assemble sampling equipment) in Newport, OR
September 9-19	Leg 1 – at sea (11 DAS) and return to Newport, OR
September 19-22	In-port in Newport, OR. Scientific crew exchange.
September 22-30	Leg 2 – at sea (9 DAS) and return to Newport, OR
September 30	Demobilize in Newport, OR

A daily station plan for each leg of the project showing station coordinates and depth is provided in Section VIII (appendices), Tables 1 and 2.

B. Staging and Destaging

On September 9, 2013, scientists and ship's crew will set up sampling gear for deployment (e.g. install MMED in trawl, put trawl on net reel, hang trawl doors and assemble trawl rigging, assemble bongo nets and 0.5m plankton net, set up flow-through water sampling apparatus and chlorophyll filtration area, etc.). With assistance from the ship's engineers, scientists will set up computer work stations and verify that communication with acoustic sounders, GPS, and other shipboard instruments is functioning. On September 30, 2013, scientists and ship's crew will disassemble nets and other sampling gear and depart the vessel.

C. Operations to be Conducted

1. Sequence and Timing of Operations

During daylight hours, we will use a surface trawl (264 Nordic rope trawl) to collect juvenile salmon and other epipelagic fish and invertebrates. We will also make CTD casts, collect seawater and chlorophyll samples, and collect zooplankton using a vertical net. At selected stations, we may also deploy a bongo net for zooplankton samples.

The order of sampling activities will normally be trawling first, followed by CTD, vertical net, and (possibly) bongo net. Together these operations require about 90-100 minutes per station, not including transit time between stations. This sequence, in which trawling is conducted first upon arrival at a station, attempts to minimize potential interactions with marine mammals in accordance with proposed guidelines developed by the SWFSC. Under normal conditions, we hope to complete four or five stations per day, starting with the inshore and ending with the offshore station.

Leg 2
The order of sampling activities during Leg 2 will be CTD, vertical net, and then trawl. We have found it important to have additional time observing for marine mammals and also a need to work up adult salmon and other large fish quickly so their survival after capture is high.

At night we transit to the next proposed transect line, arriving at the nearshore station by sunrise. Whenever possible, sampling at the first station shall commence no later than 0800 hours each day, to allow time to complete all 5 stations before sunset. The ship's path traveled at night will, if time and sea state allow, involve sailing in a zigzag pattern in order to increase the spatial coverage of the oceanographic data (temperature, salinity, chlorophyll, and acoustics) collected while underway at night.

Leg 2
During Leg 2, the ship shall be at the inshore station no later than 0630, with first operations (i.e., CTD cast) commencing at 0645.

The operational plans can be considered only a guide as to how the Chief Scientist expects the surveys to progress without being able to predict the weather, operational and scheduling problems, and equipment failures. The Chief Scientist has the authority to revise or alter the technical portion of the instructions as work progresses, provided that, after consultation with the Captain, it is determined that the proposed changes will not: (1) jeopardize the safety of personnel or the ship, (2) exceed the overall time allotted for the project, (3) result in undue additional expenses, and (4) alter the general intent of the project instructions.

2. Operations: Methods of Gear Deployment

Surface Trawl: We will use a 264 Nordic Rope Trawl (264 NRT) and $3m^2$ foam-filled pelagic doors to collect juvenile salmon and their associated fish and invertebrate community. Six large polyform floats (size A5) will be attached to the net (two on the headrope kite and two on each wingtip) during each layout to insure that the net fishes at the surface continuously. Typical footrope depth during tows is 18-23m, and a few meters deeper during layout and haulback. Depth recorders will be attached to the headrope and footrope to verify deployment depth and measure vertical spread. A mechanical flowmeter will be lowered into the water at the start of each tow and retrieved at the end, to measure total distance traveled through water during the tow.

For optimal deployment of the surface trawl, the following vessel speeds (SOG) should be observed: 1.5-2.0 kts. during initial layout of net (from codend in water to weight chains in water); 2.5-3.0 kts. during layout of bridles (from weights in water to completion of door transfer); 4.0-4.6 kts. during layout of warps. Because we occasionally trawl in shallow (30m depth) water over hard substrates, **vessel speed must be sufficient to maintain the net and doors at or very close to the surface during layout and retrieval of warps.** Speed will be maintained at 3.0-3.3 knots (SOG) while trawling, with 137 meters (75 fm) of warp out. While setting and towing, the Chief Scientist will communicate with the Captain to achieve the best possible net and door position to maintain the net at the surface and maximize net spread. Sets

will be 30 minutes in duration, except when jellyfish are very abundant, in which case tow time may be reduced according to jellyfish density. At stations where jellyfish are suspected to be abundant, trawling may be eliminated or "test tows" with the codend open may be conducted to assess jellyfish density. Jellyfish density may also be assessed by conducting the plankton tows before trawling at selected stations (for example, in the Gulf of the Farallones).

Wind and seas permitting, trawl tows should follow the depth contour and intersect the station coordinates roughly at the midpoint of the tow. Thus, tows usually run parallel to shore, toward the south or southeast with the prevailing wind and seas. The position of nearshore tows may be modified slightly if soundings indicate bottom hazards, or if crab pots or other boats are too numerous to safely navigate while towing.

Fish (other than juvenile salmon) and invertebrates will be identified, counted, measured, and returned to the water alive whenever possible. Juvenile and subadult salmon (<30 cm fork length) will be frozen and saved for laboratory analyses. Other species may also be kept for scientific purposes upon request from collaborating institutions.

CTD: We will use the ship's CTD for hydrographic sampling. The winch operator will lower the CTD to 10 meters depth and hold for 2 minutes, then raise it to just below the surface and again lower the unit at a constant rate of 60 m/min for the downcast to a depth about 5 meters above the bottom, or to a maximum depth of 200 meters at stations deeper than 200 m. The operator will hold the unit at max depth for 3 seconds, then retrieve at a constant rate of 60 m/min for the upcast. Additional sampling instruments, including a PAR sensor, fluorometer, oxygen sensor, and transmissometer, may be attached to the CTD.

Leg 2 – The following CTD protocol will be followed:
•Place CTD 3m under water and hold for 1 ½ to 2 minute
•Bring CTD back up to surface so ~ ½ of cage is coming out of water and hold for ~ 5-10 seconds.
•Descend to 15-20 feet (4-6m) above bottom or 330 ft (200m) max. Get as close to bottom as possible (up to 200m)
•PAUSE FOR 10 SECONDS BEFORE COMING BACK UP!
•Descend and retrieve at 100 ft/ minute (30m/min)
AT NH25, PUT OUT 260m OF WIRE TO ENSURE A READING AT 250m. NOTE NH25 IS AT SLIGTHLY DIFFERENT LATTITUDE THAN THE REST OF TRANSECT.

Water samples: Water samples will be automatically collected during the CTD upcast at 20m, 10m, and 3m depth using the Eco55 water sampler and Niskin bottle rosette attached to the CTD carousel. These samples will be filtered, frozen, and used to measure chlorophyll concentration and to calibrate the fluorometer on the CTD. In addition to these discrete subsurface samples, seawater supplied from an intake in the ship's hull and pumped to the wet lab will be used to make continuous underway measurements of surface chlorophyll for the duration of the project.

Leg 2
Only one water sample will be taken at 3m depth**.**

Vertical net: A 0.5m diameter, 200 micron ring net will be used to collect zooplankton. While the boat is stopped, the weighted net will be lowered vertically to a point about 5 meters above the bottom, or to a maximum depth of 100m at stations deeper than 100m, and held there for 10 seconds. The net will be retrieved at a constant rate of 30m/min. Once on deck, net contents will be rinsed down with a seawater deck hose into the codend and transferred to a storage jar with 5% buffered formalin preservative.

Leg 2
Vertical net tows will only be taken at stations on LaPush, Grays Harbor, Cape Meares, and Newport (NH) lines

Bongo net: At selected stations to be determined while at sea, zooplankton samples may also be collected with a bongo net (a weighted pair of hoops fitted with 300 micron mesh nets and rigid PVC codends) using the standard protocol for CalCOFI oblique plankton tows. The bongo will be lowered at a constant speed of 30m/min to a depth of 30 meters or to within 5m of the bottom at stations shallower than 30m. Wire angle will be measured with an inclinometer attached directly to the tow wire beneath the block. The ship will maintain a slow, steady speed of 1.5-2.0 knots to keep the wire angle at 45^{o} (+/- 5^{o}) throughout the tow, with the Captain standing by to make slight adjustments to speed as needed to maintain the desired angle. After 30 seconds at maximum depth, the bongo will be raised at a constant rate of 30 m/min to the surface and brought on board. A seawater deck hose will be used to rinse down the plankton nets after each tow and samples will be preserved in jars with 5% buffered formalin.

Leg 2 – NO bongo net tows will be taken

Nighttime navigation: Between sunset and sunrise, the ship will transit to the next transect line. The actual path traveled at night will, if possible, involve sailing in a zigzag pattern in order to increase the spatial coverage of the oceanographic data (temperature, salinity, chlorophyll, acoustics) collected while underway at night.

3. Operations: Mitigating measures for protected species interactions

During transit to each station, the Captain, deckhands, and all available scientists will visually scan the sea surface for marine mammals and other protected species (e.g. sea turtles) for a period of at least 30 minutes. If marine mammals or other protected species are sighted in this period, upon arrival at the station, or during CTD, Bongo, or ½-meter plankton tow (Leg 2) ,the Chief Scientist, in consultation with the Captain and other knowledgeable members of the crew and scientific staff, will determine if trawling operations can commence without increased likelihood of interaction between the gear and the animals sighted. This determination will be based on the species and number of animals sighted, their behavior, their position and vector relative to the path of the vessel, the professional judgment of the Chief Scientist and Captain, and other factors. If marine mammals or turtles are observed during this period and are determined to be at increased risk of interaction with gear, then the vessel will move away from the animals to a new location within the same general area but at least 0.5 nautical miles away from the last position at which protected animals were sighted. The visual scan for marine

mammals and turtles will continue during each subsequent move until it is determined that trawling operations can safely commence, or until the station is abandoned.

Trawling will normally be the first activity undertaken upon arrival at a new station (except for Leg 2), in order to reduce the opportunity to attract marine mammals and other protected species to the vessel. During the trawl tow, the Captain and other designated individuals will keep a continuous watch for marine mammals. If animals are sighted while the net is in the water, the Chief Scientist, in consultation with others, will determine the best strategy to avoid potential takes based on the species and number of animals sighted, their behavior, their position and vector relative to the path of the vessel, and other factors. In some situations the decision may be to immediately retrieve the net and move away from the area. In other situations, the decision may be to continue towing until the animal(s) are clear of the area and away from potential contact with the gear during haulback, when the risk of entanglement is believed to be highest. Every effort will be made to deploy and retrieve the trawl net as quickly as possible (following all safety measures) to avoid possible interactions with marine mammals.

In addition to the active avoidance of marine mammals described above, the rope trawl will be equipped with a Marine Mammal Excluder Device (MMED) consisting of a rigid aluminum frame in the intermediate section forward of the codend and designed to expel marine mammals and other large animals (e.g. turtles, sharks) before they are swept to the rear of the net. Finally, two STM Products Dolphin Dissuasive Device (DDD 03) acoustic pingers will be attached to the trawl net whenever it is deployed.

During **Leg 2** the MMED device will NOT be used in the trawl. Research has shown the MMED affects juvenile salmonid catches and all data collected before the MMED would not be comparable to Sept 2013 data. However, IF a marine mammal is captured, all operations will cease until appropriate individuals are contacted and a decision is made regarding project operations. For example, permission may be given to continue the project but only with the MMED installed.

If a marine mammal is inadvertently caught in the trawl net and brought on board, it will be our highest priority to release the animal back into the water as soon as is safely possible. After release the Chief Scientist will be responsible for recording the event in the data books, noting the status of the animal (e.g. healthy and alive, injured slightly, etc.), the species, and if possible other details such as sex and size. Beginning in 2008, if a marine mammal is captured in the trawl, the Chief Scientist will immediately notify a NOAA NMFS SWFSC (or NWFSC and NMFS Regional office) representative on shore via telephone or email and convey all the pertinent information regarding the event.

D. Dive Plan N/A

E. Applicable Restrictions

Conditions which preclude normal operations may include, but are not limited to, the following:

- Wind and sea state: sustained winds in excess of 30 kts.
- Sighting of protected species in the vicinity of the station
- Large numbers of crab pots or fishing vessels in the vicinity of the station
- Large numbers of jellyfish in the vicinity of the station
- Equipment loss, malfunction, or damage

Mitigation strategies for these and other unforeseen events include: moving to another nearby location and re-evaluating conditions; abandoning a station and moving on to the next station on the list; waiting at a station until conditions improve; conducting only a subset of the proposed sampling activities and moving on; or seeking shelter in a protected location and waiting for weather conditions to improve (i.e. weather days).

III. Equipment

A. Equipment and Capabilities provided by the ship (itemized)

port and starboard trawl winches with suitable trawl cable for Nordic rope trawl
net reel to accommodate 264 Nordic rope trawl and 230' bridles
davit or A-frame and winch with at least 250 meters of 1/4" or 5/16" cable for CTD and plankton nets, marked at 5m intervals or fitted with a metering block.
CTD and carousel with bottles for water samples.
GPS and acoustic sounders wired to interface with NMFS-supplied laptop computers
continuously flowing seawater supply to a protected wet-lab area where chlorophyll and temperature sensors can operate continuously.
freezer for salmon and water samples, to accommodate at least 400 lbs. of samples (at least 80 square feet of freezer space)
powerful seawater deck hose to rinse and clear plankton nets
hand-held radios for bridge-to-deck communication
immersion suits for all scientists and crew

B. Equipment and Capabilities provided by the scientists (itemized)

264 Nordic rope trawl with 230' bridles and all necessary rigging
$3m^2$ pelagic trawl doors
webbing, twine, and needles for mending 264 NRT
bongo frame, nets, weights, and codends
0.5m vertical plankton net and associated weights and codends
Inclinometer to measure wire angle during bongo tows
temperature and depth recorders (TDRs)
SBE 19 Seacat profiler (CTD) with attached sensors (as a back-up)
SCUFA fluorometer

TSG (thermosalinograph)
laptop computers
specimen jars and bags
catch baskets and shovels
measuring boards and sorting trays
float coats, work vests, rain gear, hard hats, and deck boots for scientists

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 the anticipated quantity brought aboard, MSDS and appropriate neutralizing agents, buffers, or absorbents in amounts adequate to address spills of a size equal to the amount of chemical brought aboard, and a chemical hygiene plan. Documentation regarding those requirements will be provided by the Chief of Operations, Marine Operations Center, upon request.

Per FEC 07, the scientific party will include with their project instructions and provide to the CO of the respective ship 60 to 90 days before departure:

- A list of hazardous materials by name and anticipated quantity
- Include a chemical spill plan that addresses all of the chemicals the program is bringing aboard. This shall include:
  - Procedures on how the spilled chemicals will be contained and cleaned up.
  - A complete inventory (including volumes/amounts) of the chemical spill supplies and equipment brought aboard by the program. This must be sufficient to clean and neutralize all of the chemicals brought aboard by the program.
  - A list of the trained personnel that will be accompanying the project and the training they've completed.

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.

Upon departure from the ship, scientific parties will provide the CO or their designee an inventory of hazardous material indicating all materials have been used or 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 scientific chemicals is not permitted during projects aboard NOAA ships.

B. Inventory

Common Name of Material	**Qty**	**Notes**	**Trained Individual**	**Spill control**
Formaldehyde solution (37%)	4 liters	Alkalinity, Stored in ship chem. locker	Jeff Harding	See below

Formalin/Formaldehyde spill control plan

- 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 an inert material (e. g., vermiculite, dry sand, earth), and place in a chemical waste container.
- 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**
Formalin Neutralizer Kit	1 kit	Formalin	4 liters

C. Radioactive Isotopes:

N/A. NO RADIOACTIVE MATERIALS WILL BE TAKEN ABOARD THE VESSEL.

V. Additional Projects

A. Supplementary ("Piggyback") Projects: N/A

B. NOAA Fleet Ancillary Projects: N/A

VI. Disposition of Data and Reports

A. Data Responsibilities

All data collected during this project will be maintained by NOAA SWFSC FED or NWFSC, and are the responsibility of the Principal Investigator and Chief Scientist.

B. Pre and Post Project 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 project objectives. Some vessel protocols, e.g., meals, watches, etiquette, etc. will be presented by the ship's Operations Officer.

Post-Project Meeting: Upon completion of the project, a meeting will normally be held at 0830 (unless prior alternate arrangements are made) and attended by the ship's officers, the Chief Scientist and members of the scientific party to review the project. Concerns regarding safety, efficiency, and suggestions for improvements for future projects should be discussed. Minutes of the post-project meeting will be distributed to all participants by email.

C. Ship Operation Evaluation Report

Within seven days of the completion of the project, a Ship Operation Evaluation form is to be completed by the Chief Scientist. The preferred method of transmittal of this form is via email to omao.customer.satisfaction@noaa.gov. If email is not an option, a hard copy may be forwarded to:

Director, NOAA Marine and Aviation Operations
NOAA Office of Marine and Aviation Operations
8403 Colesville Road, Suite 500
Silver Spring, MD 20910

VII. 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 survey.

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: 02 JAN 2012) 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 – Pacific
2002 SE Marine Science Dr.
Newport, OR 97365
Telephone 541-867-8822
Fax 541-867-8856
Email MOP.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

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. Steel-toed shoes are required to participate in any work dealing with suspended loads, including CTD deployments and recovery. The ship does not provide steel-toed boots. Hard hats are also 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.

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 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.

VIII. Appendices

Table 1. Leg 1 Station/Waypoint List (Degrees, Decimal Minutes)
Table 2. Leg 2 Station/Waypoint List (Degrees, Decimal Minutes)
Figure 1. Map of study area for Leg 1 (A) and Leg 2 (B)

Table 1: Station plan for Leg 1: California and southern Oregon (September 9-19, 2013). Order of transect lines is subject to change.

Day	Line	Station	LAT DEG	LAT D-MIN	LONG DEG	LONG D-MIN	CHART DEPTH (m)	Distance Offshore (nm)	Station Spacing (nm)	note
11-Sep	Fort Ross	**FR01**	38	30.00	123	14.80	39	1.2	1.2	no trawl if crab pots
11-Sep	Fort Ross	**FR02**	38	30.00	123	15.60	55	1.8	0.6	
11-Sep	Fort Ross	**FR03**	38	30.00	123	18.50	81	4.1	2.3	
11-Sep	Fort Ross	**FR04**	38	30.00	123	24.90	112	9.1	5.0	
11-Sep	Fort Ross	**FR05**	38	30.00	123	33.80	164	16.1	7.0	
12-Sep	Gulf Farallones	**GF01**	37	50.50	122	41.70	28	6.6	6.6	tow NW; beware of jellies
12-Sep	Gulf Farallones	**GF02**	37	50.50	122	48.00	46	11.6	5.0	tow NW on edge of lane
12-Sep	Gulf Farallones	**GF03**	37	50.50	123	01.50	80	22.2	10.6	beware of jellies
12-Sep	Gulf Farallones	**GF04**	37	50.50	123	11.60	85	30.2	8.0	
12-Sep	Gulf Farallones	**GF05**	37	50.50	123	23.00	190	39.2	9.0	
13-Sep	Albion River	**AR01**	39	15.00	123	48.20	59	0.8	0.8	rocky shallows near
13-Sep	Albion River	**AR02**	39	15.00	123	49.75	92	2.0	1.2	
13-Sep	Albion River	**AR03**	39	15.00	123	53.60	130	5.0	3.0	
13-Sep	Albion River	**AR04**	39	15.00	124	00.00	420	10.0	5.0	
13-Sep	Albion River	**AR05**	39	15.00	124	06.50	720	15.0	5.0	
14-Sep	Big Flat	**BF01**	40	08.00	124	12.90	30	1.1	1.1	beware of crab pots
14-Sep	Big Flat	**BF02**	40	08.00	124	14.00	55	1.9	0.8	
14-Sep	Big Flat	**BF03**	40	08.00	124	15.20	91	2.8	0.9	
14-Sep	Big Flat	**BF04**	40	08.00	124	21.70	400	7.8	5.0	
14-Sep	Big Flat	**BF05**	40	08.00	124	28.25	600	12.8	5.0	
15-Sep	Trinidad Head	**TD01**	41	03.50	124	11.40	32	1.7	1.7	
15-Sep	Trinidad Head	**TD02**	41	03.50	124	14.10	52	3.7	2.0	
15-Sep	Trinidad Head	**TD03**	41	03.50	124	16.70	87	5.7	2.0	
15-Sep	Trinidad Head	**TD04**	41	03.50	124	23.30	260	10.7	5.0	
15-Sep	Trinidad Head	**TD05**	41	03.50	124	29.90	650	15.7	5.0	

Table 1 (continued)

Day	Line	Station	LAT DEG	LAT D-MIN	LONG DEG	LONG D-MIN	CHART DEPTH (m)	Distance Offshore (nm)	Station Spacing (nm)	note
16-Sep	Klamath River	**KR01**	41	35.00	124	09.50	30	2.7	2.7	
16-Sep	Klamath River	**KR02**	41	35.00	124	15.20	51	7.0	4.3	
16-Sep	Klamath River	**KR03**	41	35.00	124	20.60	82	11.0	4.0	
16-Sep	Klamath River	**KR04**	41	35.00	124	26.50	137	15.4	4.4	
16-Sep	Klamath River	**KR05**	41	35.00	124	33.20	647	20.4	5.0	
17-Sep	Rogue River	**RR01**	42	30.00	124	29.50	32	3.0	3.0	tow NNE to avoid rocks
17-Sep	Rogue River	**RR02**	42	30.00	124	32.50	57	5.2	2.2	
17-Sep	Rogue River	**RR03**	42	30.00	124	36.00	82	7.8	2.6	
17-Sep	Rogue River	**RR04**	42	30.00	124	41.80	118	12.1	4.3	
17-Sep	Rogue River	**RR05**	42	30.00	124	48.60	600	17.1	5.0	
18-Sep	Heceta Head	**HH01**	44	00.00	124	10.25	30	1.4	1.4	
18-Sep	Heceta Head	**HH02**	44	00.00	124	12.70	55	3.2	1.8	
18-Sep	Heceta Head	**HH03**	44	00.00	124	16.50	80	5.9	2.7	
18-Sep	Heceta Head	**HH04**	44	00.00	124	23.40	117	10.9	5.0	
18-Sep	Heceta Head	**HH05**	44	00.00	124	30.40	133	15.9	5.0	

Table 2: Station plan for Leg 2: northern Oregon and Washington (September 22-30, 2013). Order of transect lines is subject to change.

Line	Station	LAT DEG	LAT D-MIN	LONG DEG	LONG D-MIN	CHART DEPTH (m)	note
LaPush	**LP04**	47	55.00	124	44.50	35	
LaPush	**LP06**	47	55.00	124	47.50	55	
LaPush	**LP09**	47	55.00	124	52.50	82	
LaPush	**LP12**	47	55.00	124	57.50	110	
LaPush	**LP17**	47	55.00	125	05.00	137	
Queets River	**QR03**	47	32.00	124	25.50	20	NO TRAWL
Queets River	**QR06**	47	32.00	124	30.00	29	
Queets River	**QR10**	47	32.00	124	36.50	55	
Queets River	**QR14**	47	32.00	124	42.00	82	
Queets River	**QR19**	47	32.00	124	48.50	110	
Queets River	**QR24**	47	32.00	124	56.00	172	
Grays Harbor	**GH03**	47	00.00	124	14.80	27	
Grays Harbor	**GH06**	47	00.00	124	19.20	38	
Grays Harbor	**GH10**	47	00.00	124	25.00	55	
Grays Harbor	**GH16**	47	00.00	124	33.50	82	
Grays Harbor	**GH21**	47	00.00	124	41.70	110	
Willapa Bay	**WB05**	46	40.00	124	11.00	29	
Willapa Bay	**WB09**	46	40.00	124	17.50	55	
Willapa Bay	**WB14**	46	40.00	124	24.00	82	
Willapa Bay	**WB19**	46	40.00	124	30.50	110	
Willapa Bay	**WB23**	46	40.00	124	36.50	137	
Columbia River	**CR04**	46	10.00	124	04.60	27	
Columbia River	**CR07**	46	10.00	124	09.50	55	
Columbia River	**CR10**	46	10.00	124	13.10	82	
Columbia River	**CR15**	46	10.00	124	20.00	110	
Columbia River	**CR20**	46	10.00	124	27.10	132	

Table 2 (continued)

Line	Station	LAT DEG	LAT D-MIN	LONG DEG	LONG D-MIN	CHART DEPTH (m)	note
Cape Meares	**CM01**	45	29.00	124	00.40	33	
Cape Meares	**CM03**	45	29.00	124	02.20	55	
Cape Meares	**CM05**	45	29.00	124	05.50	81	
Cape Meares	**CM10**	45	29.00	124	12.50	135	
Cape Meares	**CM15**	45	29.00	124	19.60	179	
Cascade Head	**CH01**	45	03.00	124	02.00	30	
Cascade Head	**CH02**	45	03.00	124	04.50	55	
Cascade Head	**CH05**	45	03.00	124	08.00	86	
Cascade Head	**CH10**	45	03.00	124	14.00	146	
Cascade Head	**CH15**	45	03.00	124	20.50	201	
Newport	**NH03**	44	40.00	124	07.80	46	
Newport	**NH05**	44	40.00	124	10.50	59	
Newport	**NH10**	44	40.00	124	17.20	82	
Newport	**NH15**	44	40.00	124	24.30	91	
Newport	**NH20**	44	40.00	124	31.20	128	
Newport	**NH25**	44	39.10	124	39.00	265	NO TRAWL

Figure 1A. Map of study area for Leg 1, showing transect lines and trawl stations (open symbols)

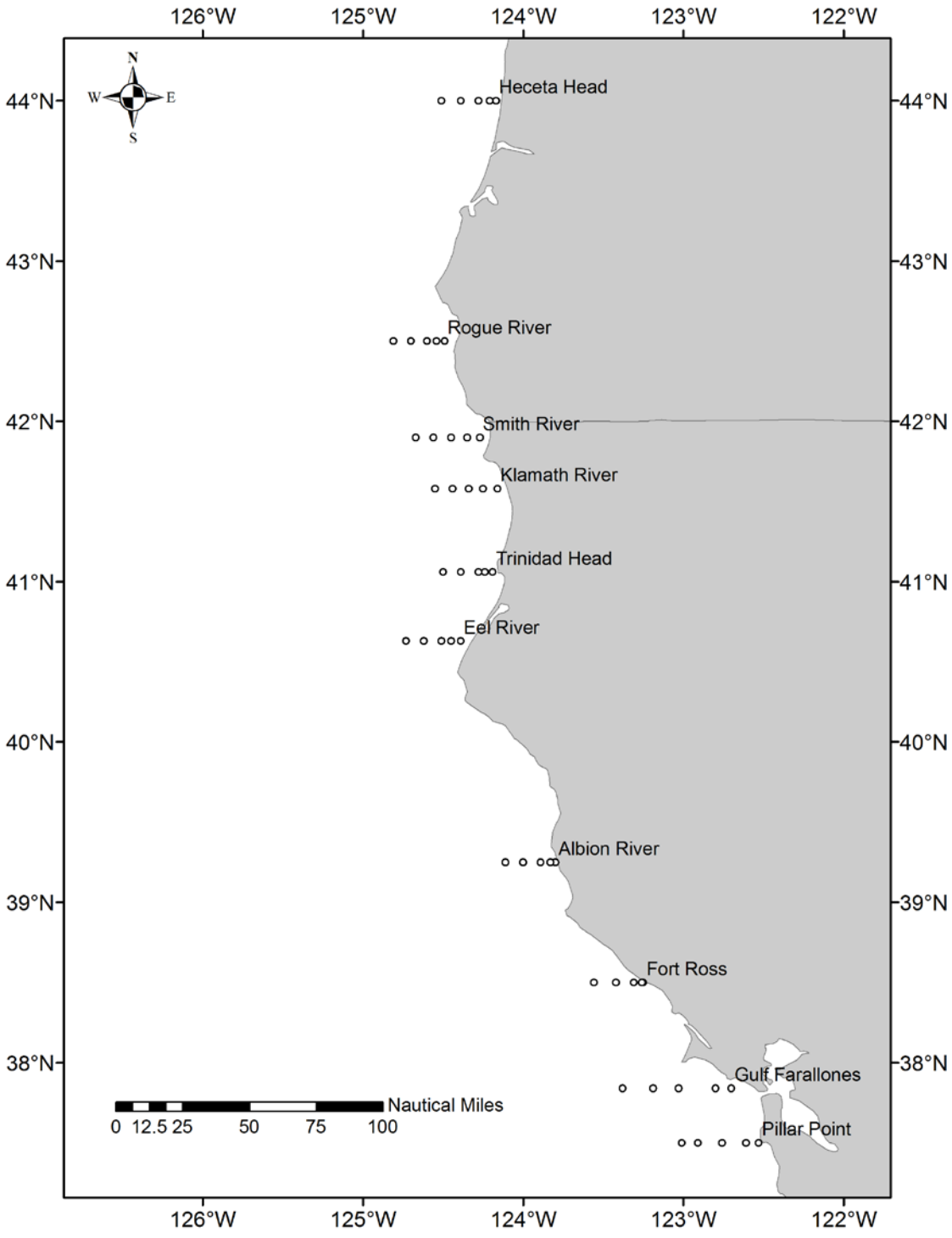

Figure 1B. Map of study area for Leg 2, showing transect lines and stations. Filled circles are trawl stations; open circles (NH25 and QR03) are CTD and plankton only.