Marine Mammal Observer Observations During US-Canada Extended Continental Shelf Survey

September 6 – October 1
2008

MRAG Americas, Inc.

1810 Shadetree Circle
Anchorage, AK 99502
(907) 677-8772 Phone
(907) 677-6022 Fax
Bryan.Belay@mragamericas.com

JUSTIN J. PUDENZ

MARINE MAMMAL OBSERVER
MRAG AMERICAS
NOAA
HEALY CRUISE 0806

Table of Contents

Table of Contents 2
Introduction 3
Description of Daily Activities 3
  Responsibilities of the MMO 4
  Data Recording 4
    Effort Report Form 4
    Sighting Form 4
    USF&W Sighting Form 5
    Logbook 5
    Data Codes 6
Summary Sightings 7
  September 9, 2008 7
  September 13, 2008 7
  September 15, 2008 7
  September 17, 2008 7
  September 18, 2008 8
  September 29, 2008 8
Conclusion 8
Appendix 1 – EFFORT REPORT FORMS .....
Appendix 2 – SIGHTING FORMS .....
Appendix 3 – LOGBOOK .....
  Section 1 – Daily Notes .....
Appendix 3 – LOGBOOK .....
  Section 2 – Effort Report Log .....
Appendix 3 – LOGBOOK .....
  Section 3 – Marine Mammal Sighting Log .....
Appendix 4 – ANCO DATA .....
Appendix 5 – SEISMIC DATA .....
Appendix 6 – USF&W Sighting Forms .....

[Note: Appendices have been removed from this version of the report for brevity.]

Introduction

The United States and Canada embarked on a joint venture aboard two ships from 6 September-1 October of 2008. The USCGC Healy and the CCGS Louis S. St. Laurent (Louis) collected seismic and bathymetric data on the Extended Continental Shelf that lies offshore both countries. The collection of data focused on the areas beyond the 200 nautical mile Exclusive Economic Zone where utilizing two ice breaking vessels would inhibit a successful cruise. The Healy was the lead vessel breaking ice while conducting multibeam and subprofile surveys. The Louis followed collecting seismic reflection and refraction data. During periods of light ice conditions the vessels were able to separate and double their data collection.

Sounds produced during data collection, particularly by the seismic equipment, had the potential to disrupt the behavior of marine mammals within the area. Certain measures were taken including course alteration and allowance of an approximately one kilometer "safety zone" where marine mammals were observed. Onboard the Healy were two marine mammal observers (MMOs) Justin Pudenz (NOAA), and George Neakok, an Alaska Native Community observer (ANCO) while the Louis housed three MMOs representing the Canadian Hunters and Trappers Community. The MMOs from both vessels were able to communicate in "real time" using VHF radio channel 6 to inform the other vessel when a marine mammal was detected.

Hereinafter this report will document how operations were conducted by the MMOs including specific sightings, methods, format for reporting conditions, and vessel activities during and pertaining to marine mammal observations. A logbook and multiple data forms were completed daily to ensure the accuracy and integrity of the collected data for future reference, interpretation and analysis. Copies of complete data forms from MMOs aboard the Healy are included Appendex 1, 2 and 4. Also, a spreadsheet obtained from the chief scientist aboard the Healy portrays the dates and times of seismic operations onboard the Louis in Appendix 5.

Description of Daily Activities

The Healy MMOs observed from the bridge of the vessel and were allowed unobstructed access to all areas and instruments required for data collection. All operations aboard the Healy were made during daylight hours. Systematic scans or sweeps with binoculars and naked eye were directed forward while the vessel was underway and in all directions during stationary periods. During transit to and from data collection sites, MMOs monitored for marine mammals up to 8 hours within a 24 hour period. Healy MMOs could monitor up to 12 hours a day for a maximum of 4 consecutive hours in a row to avoid fatigue. When both MMOs aboard the Healy were monitoring at the same time, each observed from opposite sides of the bridge. Monitoring aboard the Louis was underway 24 hours a day, each MMO observing 8 hour shifts. Healy observers were able to be contacted by phone or page during off-watch periods. Bridge personnel were willing to monitor for marine mammals during these periods and were supplied with forms to accompany any sightings while MMOs were off-watch.

Responsibilities of the MMO

- Performing monitoring procedures described in the MMO handbook;
- Abiding by the communication plan to be established between the 2 ships at the onset of the cruise;
- Adhering to a logbook of daily operations (activities and results); ensuring data are recorded correctly for data entry and data sheets are copied (and stored separately) for backup purposes;
- Acting as a source of marine mammal information;
- Providing observation schedules and nighttime standby schedules to the *Healy* Chief Scientist
- Abiding by the safety procedures of the vessel and acting in a responsible manner at all times.

Data Recording

Effort Report Form

The data was collected and recorded on two primary forms developed by NMFS and MRAG. The NOAA MMO completed an Effort Report form hourly during daily observations which were preformed while seismic operations were and were not being conducted. The MMO recorded the following information.

- Vessel name;
- Observer names and affiliations;
- Date;
- Time and latitude/longitude when daily visual survey began and ended;
- Environmental conditions during visual survey were recorded hourly; this provides a measure of ability to accurately estimate take from observer data;
    - Wind speed and direction (average sustained);
    - Air and water temperature
    - Sea state (Beaufort sea/wind scale);
    - Swell (height in feet);
    - Weather conditions (e.g. rain, fog, haze, clear skies, cloud cover, ice conditions, etc.);
    - Ice Cover (% of water surface);
    - Overall visibility (based on distance to horizon in kilometers).

Tidal Stage and closest tide were not pertinent in the arctic conditions and were not recorded.

Sighting Form

A Sighting form was completed when a marine mammal was observed and the following information was recorded:

- Date, time, location, vessel activity, seismic state and heading.
- Species, group size and individual characteristics.
- Behavior during initial sighting and post initial sighting or response to vessel encounter.
- Mammal bearing and distance from vessel and behavior pace (e.g. positive, sedate, or moderate).
- Sea state, ice cover, overall visibility (km), sun glare, wind speed (kn) and direction, air (F) and water temperatures (C), depths, and any other environmental parameters notable for individual sightings.

The NOAA MMO on Healy was not able to accurately judge the apparent reaction of the mammals to seismic vessel and closest point of approach due to the distance between the Healy and Louis.

If the same mammal or group of mammals was sighted multiple times, they were assigned the same number in the sight id column on the sighting form. The MMO reset the sighting code each day during the cruise. A comment noting when a mammal was seen multiple times was also included in the comment section of the form. During the debriefing, the sighting codes were ordered sequentially for the entire cruise. On the Sighting form the sight id was changed in red pencil and the database was edited accordingly.

Information necessary to complete the various data forms was available from instruments on the bridge and personal observation. Information regarding seismic, multibeam, and subprofile specifics were provided by the science party.

USF&W Sighting Forms

There were also two unique forms to be completed upon the sighting of polar bears or walruses. MRAG delivered a copy of the Polar Bear/Walrus Sighting forms to the USF&W at the end of the cruise, since these species are managed by them.

Another form was available for off-watch sightings or sightings made by bridge personnel if a MMO could not be located. However, if sightings occurred when the MMOs were off duty, the MMO were paged to the bridge and recorded the sighting. There was not a need to complete the Crew Incidental Sighting forms.

Logbook

The NOAA MMO completed a daily logbook, which is included in Appendix 3 at the end of this report. The logbook was recorded in three sections; Daily Notes, Effort Report Log and Marine Mammal Sighting Log. The MMO recorded the following information in each section:

- Daily activities including hours on watch, coordination efforts with crew and other MMOs, general sighting information and unusual sightings or events were recorded in the Daily Notes.
- Changes in the vessel operations including seismic information, icebreaking, or any other outstanding or pertinent items were recorded in the Daily Notes.
- A detailed summary of all MMO observations including mammal distance from and direction relative to vessel, sighting cues, behavior and any actions implemented in response (e.g. delays, power down, shut down, course alteration, etc.) were recorded in the Marine Mammal sighting log. Ancillary information, such as seal breathing holes and bear tracks were also included in this section.
- Any reasons for compromised or obstructed visibility (e.g. swell height, sea state, wind speed, glare, weather conditions, equipment malfunction, etc.) were recorded in the Effort Report Log.
- Time and location (latitude/longitude) of vessel's seismic activities, operations, and trackline (e.g. pre-ramp-up survey, ramp-up, testing, shooting, shut down, other) were recorded in the Effort Report Log.

Data Codes

OBSERVER
Two letter initials of on-duty obs.

OBSERVER LOCATION

BR	Bridge
FB	Flying Bridge
ST	Stern

DATE/TIME
Two number values (ie. 01, not 1)

WATCH START–END

WS	Watch Start
WE	Watch End

SEISMIC ACTIVITY

LS	Line Shooting
SH	Shooting Betw/Off.Lines
ST	Seismic Testing
SZ	Safety Zone Shut-Down
SD	Shut-Down
PZ	Safety Zone Power-down
PD	Power-down
OT	Oth (comment&describe)

 # GUNS
Enter Number of Operating Airguns,

88	Varying (e.g., ramp-up)
99	Unknown

ARRAY VOLUME
Enter operating volume, or

99	Unknown

ARRAY DEPTH
Depth at which guns are being towed

POSITION
Two digit Degrees
Two digit, two decimal Minutes

WATER DEPTH
In meters

SEA STATE
See Beaufort Scale sheet

VISIBILITY (# KM)
0 – 10 km
Or > < 3.5 if variable

LIGHT OR DARK

L	Light (day)
D	Darkness

GLARE AMOUNT

NO	None
LI	Little
MO	Moderate
SE	Severe

MARINE MAMMAL SPECIES

Baleen Whales

BHW	Bowhead Whale
UMW	Unidentifed Mysticete

Large Toothed Whales

BW	Beluga Whale
KW	Killer Whale
NW	Narwhal

Dolphins

UD	Unidentified Dolphin

Porpoises

UP	Unidentified Porpoise

Pinnipeds

BS	Bearded Seal
HS	Hooded Seal
RS	Ringed Seal
HPS	Harp Seal
US	Unidentified Seal
UP	Unidentified Pinniped
PWA	Pacific Walrus

Bear

PB	Polar Bear

MOVEMENT

PE	Across Bow
ST	Swim Toward
SA	Swim Away
FL	Flee
SP	Swim Parallel
MI	Mill
NO	No movement
DE	Dead
UN	Unknown

INDIVIDUAL BEHAVIOR

MA	Mating
SI	Sink
FD	Front Dive
TH	Thrash Dive
DI	Dive
LO	Look
LG	Logging
SW	Swim
BR	Breach
LT	Lobtail
SH	Spyhop
FS	Flipper Slap
FE	Feeding
FL	Fluking
BL	Blow
BO	Bow Riding
PO	Porpoising
RA	Rafting
WR	Wake Riding
AG	Approaching Guns
RE	Resting
OT	Other (describe)
NO	None (sign seen only)
UN	Unknown

GROUP BEHAVIOR (BEHAVIORAL STATES)

TR	Travel
SA	Surface Active
ST	Surface Active-Travel
MI	Milling
FG	Feeding
RE	Resting
OT	Other (describe)
UN	Unknown

BEHAVIOR PACE

PO	Positive
SE	Sedate
MO	Moderate

 # RETICLES or ESTIMATE

(of Initial Distance, etc.; Indicate Big eyes or Fujinons in comments)

0 to 16	Number of reticles
E	Estimate, by eye

CLOSEST POINT OF APPROACH (CPA)
Nearest distance of individ/group (m)

SIGHTING CUE

BO	Body
HE	Head
SP	Splash
FL	Flukes
DO	Dorsal Fin
BL	Blow
BI	Birds

IDENTIFICATION RELIABILITY

MA	Maybe
PR	Probably
POI	Positive

Summary Sightings

The following is an overview of individual sightings made by Justin Pudenz (NOAA) onboard the Healy. If the same sighting was recorded by the other MMO onboard the Healy, George Neakok, (ANCO), it was noted following the sighting description so as not to be confused with "multiple or double" sightings of the same animal. A copy of the ANCO data is also included and species names are recorded in the native dialect. Translations for the three species observed are as followed, polar bear (nanuq), ringed seal (natchiq), and bearded seal (ugruk). For a more detailed description of individual sightings, it is essential to refer to the completed forms and logbook.

September 9, 2008

An unidentified seal was observed three consecutive times from 1947 (Alaska Standard Time) to 1953 at 80 02.5° N and 147 21.9° W. The flipper of this seal was all that was observed, it would semi-surface, dive, and swim ahead of the vessel and then resurface further ahead. The Healy had not yet made contact with the Louis so no seismic activity was underway.

September 13, 2008

A polar bear and cub were observed at 1723 at 79 58.5° N and 132 47.8° W, approximately 2000m on the port side of the vessel. The bears were lying down or resting initially, and then they would casually move a short distance and lay down again as the vessels passed. Observation conditions were favorable and the bears did not appear to alter their behavior during the presence of the two vessels and seismic activity. Also observed on the ice in the vicinity of the bears was a seal breathing hole surrounded by blood, possibly from the bears' latest meal. This sighting was also recorded by the ANCO on board the Healy and the MMOs on board the Louis.

September 15, 2008

Three ringed seals were observed today at 1246 (79 39.4° N, 145 21.7° W), 1703 (79 35.9° N, 146 39.2° W), and 1830 (79 36.1° N, 146 49.7° W). All were observed swimming at <500m from the Healy with the final sighting made while the vessel was stationary. The proximity of the vessel did not appear to affect the animal's behavior. Seismic activity was underway on the Louis, and the first two sightings were observed by the ANCO.

September 17, 2008

An adult ringed seal was observed at 2236 at 79 13.4° N, 133 36.7° W, approximately 400m from the Healy. This seal was in a small body of open water and would surface head only, and then lunge upwards exposing up to half of its body, as to attain a better view. It was sighted several times and appeared to act relatively curious as opposed to startled upon our encounter. This behavior was typical of the observations noted thus far. Seismic activity was underway during this observation.

September 18, 2008

While on board the Louis an adult polar bear was observed at 1330 and 79 00.9° N, 129 56.6° W. The bear was 2500m-3000m directly port side, swiftly walking the opposite direction of the vessel. The Healy was 2km behind the Louis and no seismic activity was underway due to repairs. Viewing conditions were good and this sighting was also recorded by the ANCO.

September 29, 2008

Three polar bear sightings were recorded today with a total of four animals. First, at 1050 a lone cub was observed on a large ice floe port side of the Healy approximately 1000m and 72 09.6° N, 141 03.1° W. This bear responded to the vessel with a "fleeing" behavior partially concealing itself behind a small ice structure on the far side of the flow.

At 1441 and 71 30.3° N, 140 59.4° W, a sow and cub polar bears were observed on an ice floe approximately 1000m starboard side of the Healy. Their reaction to our presence was to move to the far edge of the floe, then jump into the water and swim 90° away from the vessel towards another floe. The sow swam under the thin ice and broke through with her head to make an area for the cub to surface and breathe. The bears had to swim about 200m to get to the next sizable floe that would sustain their weight.

The final sighting of the day was an adult polar bear at 1510 (71 26.0° N, 140 58.2° W) observed at ±1000m on a small ice floe port side of the Healy. As we passed by the bear jumped and swam from floe to floe while distancing itself from the vessel.

All of the bears observed today appeared to be in good health. During every encounter all bears moved in a direction away from the vessel. No seismic activity was underway as the Healy and Louis parted ways on the 27th in opposite directions to their final destinations. These sightings were all recorded by the ANCO as well.

Conclusion

During the duration of this cruise everyone aboard both vessels were very willing, helpful, and responsive when marine mammals were encountered. The communication between the MMOs, scientists, and Coast Guard personnel along with vessel to vessel contact was excellent and undoubtedly resulted in a pleasant achievement of individual goals and expectations for all parties involved. For future marine mammal observation programs I believe data collection protocols between all MMOs from the different organizations involved should be standardized so the information collected can be interpreted in the same manner under a common goal.

(Appendices have been removed from this report. J. Childs)