



Memorandum

TO: Brian D. Hopper (NMFS PR1), Mandy Migura (NMFS AK)

CC: Sheyna Wisdom, Lindsey Saxon Kendall (Fairweather Science); Kate Lomac-MacNair (SAExploration)

FROM: John Hendrix, Lisa Parker,  Marta Czarnezki (Apache Alaska Corporation)

RE: Monthly Report: June 1 – 30, 2012

1.0 INTRODUCTION

The National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries Service (NMFS) issued Apache Alaska Corporation (APACHE) an Incidental Harassment Authorization (IHA) under the authority of section 101(a)(5)(D) of the Marine Mammal Protection Act (16 U.S.C. 1361 *et seq.*) to harass small numbers of marine mammals, by Level B harassment, incidental to three-dimensional (3D) seismic surveys in Cook Inlet (hereafter *Cook Inlet 3D Seismic Program*) from April 2012 through April 2013.

This monthly report presents information requested in the IHA and Incidental Take Statement (ITS) for this reporting time period of **June 1– 30, 2012** and includes information on the seismic operations, marine mammal monitoring and mitigation measures implemented. Protected Species Observer (PSO) daily reports which include details on the required information are not included in the monthly report because they were attached to the weekly reports previously sent to NMFS.

SUMMARY OF SIGHTINGS

Table 1. Summary of the number of observations, shut downs and takes.

Marine Mammal Species	No. of Observations ¹	No. of Shut Downs	No. of Takes	No. of Cumulative Takes
Beluga Whale (<i>Delphinapterus leucas</i>)	57	1	0	0
Killer Whale (<i>Orcinus orca</i>)	0	0	0	0
Harbor Porpoise (<i>Phoca vitulina</i>)	47	6	0	0
Gray Whale (<i>Eschrichtius robustus</i>)	3	2	0	0
Steller Sea Lion (<i>Eumatopia jubatus</i>)	0	0	0	0
Harbor Seal (<i>Phocoena phocoena</i>)	177	32	1	6
California Sea Lion (<i>Zalophus californianus</i>)	1	0	0	0
Unidentified Large Cetacean	3	0	0	0
Unidentified Pinniped	3	1	0	0

¹ Number of observations include animals visually observed (vessel, land, aerial) and acoustically detected

2.0 SUMMARY OF OPERATIONS

The following table summarizes the seismic operations over this reporting period. More details are found in the following text.

Table 2. Total number of slack tides and hours per airgun.

Source	No. of Slack Tides	No. of Hours
10 cui mitigation	NA	57.9
440 cui ultra-shallow (<i>M/V Peregrine Falcon</i>)	0	0
2400 cui (<i>M/V Arctic Wolf</i>)	78	127.9
2400 cui (<i>M/V Peregrine Falcon</i>)	78	151.6

Operations moved offshore during the week of June 6-12; however, remained in the general area of Trading Bay on the west side of Cook Inlet (Figure 1). The two source vessels include the *M/V Arctic Wolf* and the *M/V Peregrine Falcon*. During seismic activity, the vessels traveled at speeds between 4-5 knots. As identified in the IHA application, marine seismic data are only acquired during low and high slack tides (approximately 2-3 hours over the tide). There are approximately 4 slack tides in a 24-hour period. Over the course of this reporting period, airguns operated for a total of approximately 279.5 hours. The 2400 cui airgun array operated from *Arctic Wolf* during 78 slack tides, for a total of approximately 127.9 hours. The *Peregrine Falcon* operated the 2400 cui airgun array during 78 slack tides for a total of approximately 151.6 hours. The mitigation gun was used on 20 different nights for a total of approximately 57.9 hours. During this month, operations were delayed due to mitigation measures for a total of 35.8 hours, with a cumulative time of 38.9 hours for the duration of the project. The mitigation vessel, the *M/V Dreamcatcher*, was generally stationed to the north of the northern end of the patch for acoustic and visual monitoring during all periods of seismic operations.

The monitoring team consisted of two PSOs on the *Arctic Wolf*, two PSOs on the *Peregrine Falcon*, two PSOs on the *Dreamcatcher*, two PSOs at a land-based station (Shirleyville, Tyonek Dock or Bluff Site #1) and aerial overflights with one PSO. All PSOs operate on a 4-hour shift to avoid fatigue and only during daytime operations.

A radio-telemetered passive acoustic monitoring (PAM) buoy has not been redeployed. The PAM buoy remains in Anchorage for maintenance and re-evaluation. Thus, an over-the-side (OTS) hydrophone was deployed from the *Dreamcatcher* during all nighttime operations (at minimum) with the engines off (but generators still on) for passive acoustic monitoring. The *Dreamcatcher* is positioned to the north of the seismic acquisition patch. Two acoustic technicians monitored for acoustic detections of marine mammals during all nighttime operations in 4-hour shifts. The reported detection range of small vessels on this hydrophone with the engines off was approximately 3 km.

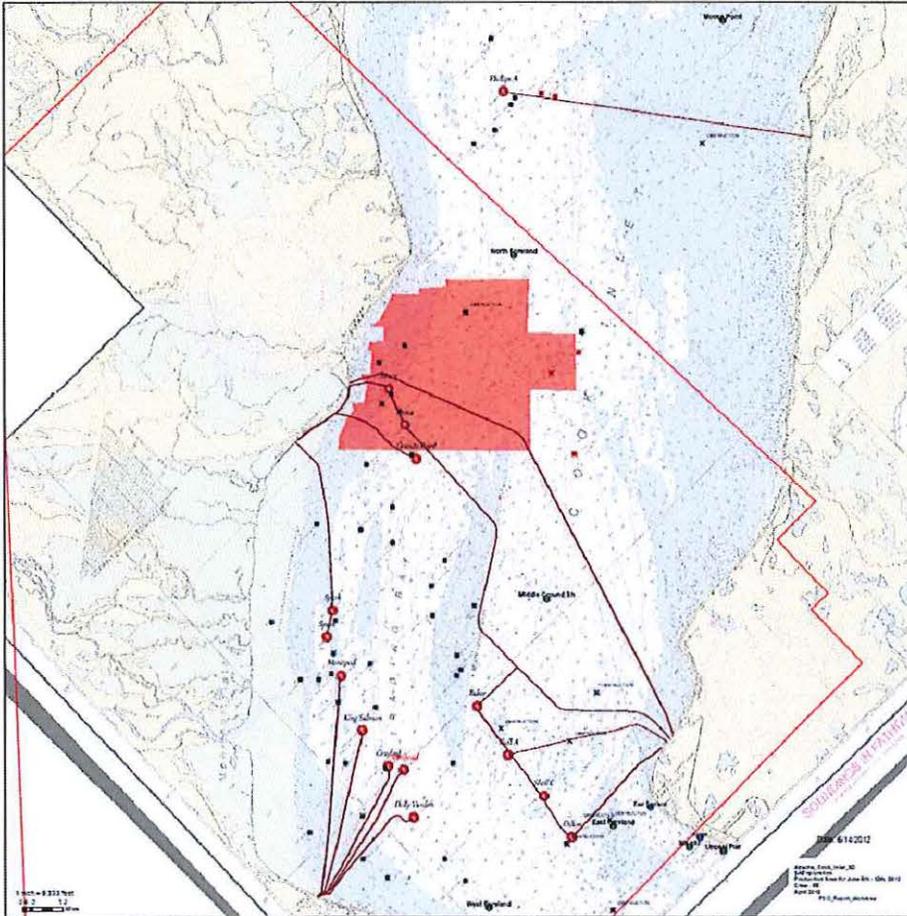


Figure 1. Operations occurred in the general area of Trading Bay on the west side of Cook Inlet (red polygon).

3.0 MONITORING EFFORT

A total of 1,658.4 hours of monitoring effort took place from June 1 – 30, 2012 including visual vessel- and land-based (861.1 and 281.3 hours, respectively), passive acoustic monitoring (497.9 hours) and aerial surveys (18.1 hours; Table 3). The PSOs watched for marine mammals prior to and during seismic activity to monitor the 160 dB zone (9.5km). Opportunistic observations took place when applicable from the mitigation vessel and days when seismic activity did not take place.

Table 3. Total number of hours of monitoring per method.

Monitoring Method	Total No. of Hours
Visual Vessel-based	861.1
Visual Land-based	281.3
Passive Acoustic Monitoring	497.9
Aerial Survey	18.1
Total	1,658.4

3.1 Environmental Conditions

In general, the environmental conditions were conducive to appropriately monitor marine mammals during seismic operations. The sea state ranged from 0 to 4 with an occasional 5 or 6 on the Beaufort Sea State scale.

3.2 Marine Mammal Observations

A total of 291 marine mammal observations and 3,353 estimated individual animals were observed from June 1-30, 2012 using visual vessel- and land-based, acoustic and aerial survey methods. Details on the species sightings are described below and found in the PSO Daily Reports.

Visual Vessel- and Land-based Observations

Five marine mammal species were visually observed from vessel- or land-based stations during this month's monitoring effort including the beluga whale, harbor porpoise, gray whale, harbor seal and California sea lion (Table 4). In addition to those species, there were three sightings of an unidentified large cetacean and two sightings of unidentified pinnipeds.

Table 4. Total of individuals and sighting per species from vessel- and land-based stations

Species	Estimated No. of Individuals Observed	No. of Sightings
Beluga Whale	113	13
Harbor Porpoise	57	39
Gray Whale	3	3
Harbor Seal	148	143
California Sea Lion	2	1
Unidentified Large Cetacean	3	3
Unidentified Pinniped	4	2
Total	330	204

Beluga Whale

A total of 113 beluga whales were observed on 13 occasions. Beluga whales were observed traveling, diving and milling.

Harbor Porpoise

A total of 57 harbor porpoise were observed on 39 occasions. Harbor porpoise were observed traveling, swimming, milling and foraging.

Gray Whale

On June 1, there were three sightings of one gray whale at 11:00, 15:13 and 16:23. The gray whale was observed blowing, swimming and diving. Two shut downs occurred and there was no seismic activity taking place during the third sighting.

Harbor Seal

Harbor seals were observed on 169 different occasions. Harbor seals were observed traveling, swimming, diving, milling, bottlenosing, sinking, looking toward the vessel and resting.

California Sea Lion

Two California sea lions were observed traveling on June 23 at 20:22.

Acoustic Observations

Three species of marine mammals were acoustically detected during this month's monitoring effort including the beluga whale (1 detection), harbor porpoise (7 detections) and harbor seal (5 detections; Table 5). At this time it is not possible to estimate the total number of individuals acoustically because it is not possible to localize with the current hydrophone configuration.

Table 5. Number of acoustic detections per species

Species	No. of Detections
Beluga Whale	1
Harbor Porpoise	7
Harbor Seal	5
Total	13

Aerial Observations

Three species of marine mammals were observed during aerial surveys including the beluga whale, harbor porpoise and harbor seal (Table 6). In addition to those species, was one sighting of an unidentified pinniped.

Table 6. Total of individuals and sighting per species from aerial surveys

Species	Estimated No. of Individuals Observed	No. of Sightings
Beluga Whale	547	43
Harbor Porpoise	1	1
Harbor Seal	2,474	29
Unidentified Pinniped	1	1

Beluga Whale

A total of approximately 547 individual beluga whales were observed on 43 different occasions during aerial surveys. Many of these individuals were likely resighted on several occasions. Beluga whales were observed traveling, swimming, milling, diving and foraging near the McArthur, Beluga, Theodore, Lewis, Ivan and Big Susitna Rivers. Belugas were also observed near Tyonek Creek.

Harbor Porpoise

On June 3, one harbor porpoise was observed during the aerial survey traveling toward central Cook Inlet.

Harbor Seal

A total of approximately 2,474 individual harbor seals were observed on 29 different occasions during aerial surveys. Harbor seals were observed hauled out, swimming, traveling, resting and foraging near the McArthur, Beluga, Theodore and Lewis Rivers.

3.3 Marine Mammal Takes

During the month of June, there was one harbor seal take (Table 7). The take occurred on June 9 at 4:35 (Table 8). No other marine mammal species were taken during this time period.

Table 7. Number of marine mammal takes

Species	No. of Takes	Cumulative Level of Takes
Beluga whale	0	0
Killer whale	0	0
Harbor porpoise	0	0
Steller sea lion	0	0
Harbor seal	1	6

Table 8. Harbor seal take

Date	Time	Behavior	Comments
June 9	4:35	Swimming	Seismic activity was taking place on both the <i>Arctic Wolf</i> and the <i>Peregrine Falcon</i> (2400 cui airgun). A shut down initially occurred, and then seismic activity resumed.

No cetaceans or pinnipeds were exposed to 180 or 190 dB, respectively.

3.4 Implementation of Mitigation Measures

Mitigation measures that were implemented during the month of June include delay clearing safety zone (62), shut down (42) and power down procedures (16; Table 9). Ramp up procedures also took place when initiating operations. Marine mammal monitoring (visual, acoustic and aerial) of the safety radii (monitoring zone extends 9.5 km) was ongoing throughout the month. Passive acoustic monitoring using an “over-the-side” hydrophone occurred at minimum at night during seismic operations. NMFS’s vessel operation and marine mammal viewing guidelines to minimize vessel and aircraft impacts are continually implemented. Airguns were discharged at depths greater than 2 m (~6.6 ft). Details on the implemented mitigation measures are described in the PSO Daily Reports.

Table 9. Number of implemented mitigation measure per species.

Species	Delay Clearing Safety Zone	Shut Down	Power Down	None	Total
Beluga Whale	9	1	0	47	57
Killer Whale	0	0	0	0	0
Harbor Porpoise	16	6	3	22	47
Steller Sea Lion	0	0	0	0	0
Harbor Seal	38	32	13	94	177
Gray Whale	1	2	0	0	3
California Sea Lion	1	0	0	0	1
Unidentified Large Cetacean	3	0	0	0	3
Unidentified Pinniped	0	1	0	2	3
Total	68	42	16	165	291

Aerial Survey

Aerial surveys continued to occur during the month of June. The surveys extended to the southern end of the Big Susitna River to the McArthur River, approximately 25 km to the north and 20 km to the south of the operations area. The surveys stayed within approximately 1.6 km (1 mi) offshore due to safety restrictions (Figure 2). The aerial survey distance insured adequate coverage of the measured 160 dB monitoring zone in areas where high concentrations of marine mammals were expected.



Figure 2. Aerial survey route extends from Big Susitna River south to McArthur River and approximately 1.6 km (1 mi) offshore (yellow polygon).

Extended Shut Down

When a cetacean was observed within in the area, operations ceased for 30 minutes or until the animal cleared the safety zone. In the case of the gray whale, the marine mammal monitoring team used a one hour clearing time to account for the long dive time of this animal.

3.5 Implementation of Conservation Recommendations

The conservation recommendations described in the Biological Opinion issued by NMFS were not stated as a condition, but rather designed to minimize adverse effects to the Cook Inlet beluga whale from in-water noise generated by the airguns during the *Cook Inlet 3D Seismic Program*. At this time APACHE has not implemented any of the conservation recommendations suggested by NMFS. If any of the conservation recommendations are implemented, NMFS will be notified and the effectiveness of the recommendation will be reported.