



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 Czarnecki (Apache Alaska Corporation)

RE: Monthly Report – July 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 **July 1– 31, 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>)	32	1	0	0
Killer Whale (<i>Orcinus orca</i>)	0	0	0	0
Harbor Porpoise (<i>Phoca vitulina</i>)	27	7	0	0
Gray Whale (<i>Eschrichtius robustus</i>)	3	1	0	0
Steller Sea Lion (<i>Eumatopia jubatus</i>)	0	0	0	0
Harbor Seal (<i>Phocoena phocoena</i>)	95	13	1	7
Unidentified Large Cetacean	1	0	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 and vessel.

Source	No. of Slack Tides	No. of Hours
10 cui mitigation (<i>M/V Arctic Wolf</i>)	NA	59.4
10 cui mitigation (<i>M/V Peregrine Falcon</i>)	NA	60.4
440 cui ultra-shallow (<i>M/V Peregrine Falcon</i>)	0	0
2400 cui (<i>M/V Arctic Wolf</i>)	88	140.1
2400 cui (<i>M/V Peregrine Falcon</i>)	82	125.2

Operations occurred offshore from July 1-31, 2012; however, remained in the general area of Trading Bay on the west side of Cook Inlet (Figure 1). Nine vessels operated for the *Cook Inlet 3D Seismic Program* during the month of July including *M/V Arctic Wolf*, *M/V Peregrine Falcon*, *M/V Westward Wind*, *M/V Miss Diane*, *M/V Mark Stevens*, *M/V Maxime*, *M/V Dreamcatcher*, *M/V Norseman I* and *M/V Side Winder* (Table 3). The *M/V Westward Wind* operated on the project from July 1-21 and the *M/V Norseman I* arrived on July 29. Vessel based PSOs were stationed on the *M/V Arctic Wolf*, *M/V Peregrine Falcon* (source vessels) and *M/V Dreamcatcher* (mitigation vessel). 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 265.3 hours. The 2400 cui airgun array operated from *Arctic Wolf* during 88 slack tides, for a total of approximately 140.1 hours. The *Peregrine Falcon* operated the 2400 cui airgun array during 82 slack tides for a total of approximately 125.2 hours. The mitigation gun was used on 25 different nights. The *Arctic Wolf* and the *Peregrine Falcon* operated the mitigation gun for approximately 59.4 and 60.4 hours, respectively. During July, operations were delayed due to mitigation measures for a total of 20.78 hours, with a cumulative time of 59.37 hours for the duration of the project. The mitigation vessel, the *Dreamcatcher*, was generally stationed to the north or south of the project area (opposite of the land-based observation station) for acoustic and visual monitoring for near-shore marine mammal movement during all periods of seismic operations. On July 22, the *Dreamcatcher* moved to the west side of Cook Inlet and was positioned to the north of the OSK dock near Boulder Point to assist in monitoring the west side of the project area.

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

During July 1-16, land-based observations took place on the west side of Cook Inlet from the Shirleyville, Tyonek Dock or Bluff Site #1 observation stations. On July 16, land-based observations moved to the

OSK Bluff Site near the OSK dock in Nikiski on the east side of Cook Inlet. The land-based station moved to improve monitoring efforts as the vessels continue to work offshore. Observations continued to take place at the OSK Bluff Site from July 17-31.

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 or south of the seismic acquisition patch (opposite of the land-based observation station). 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.

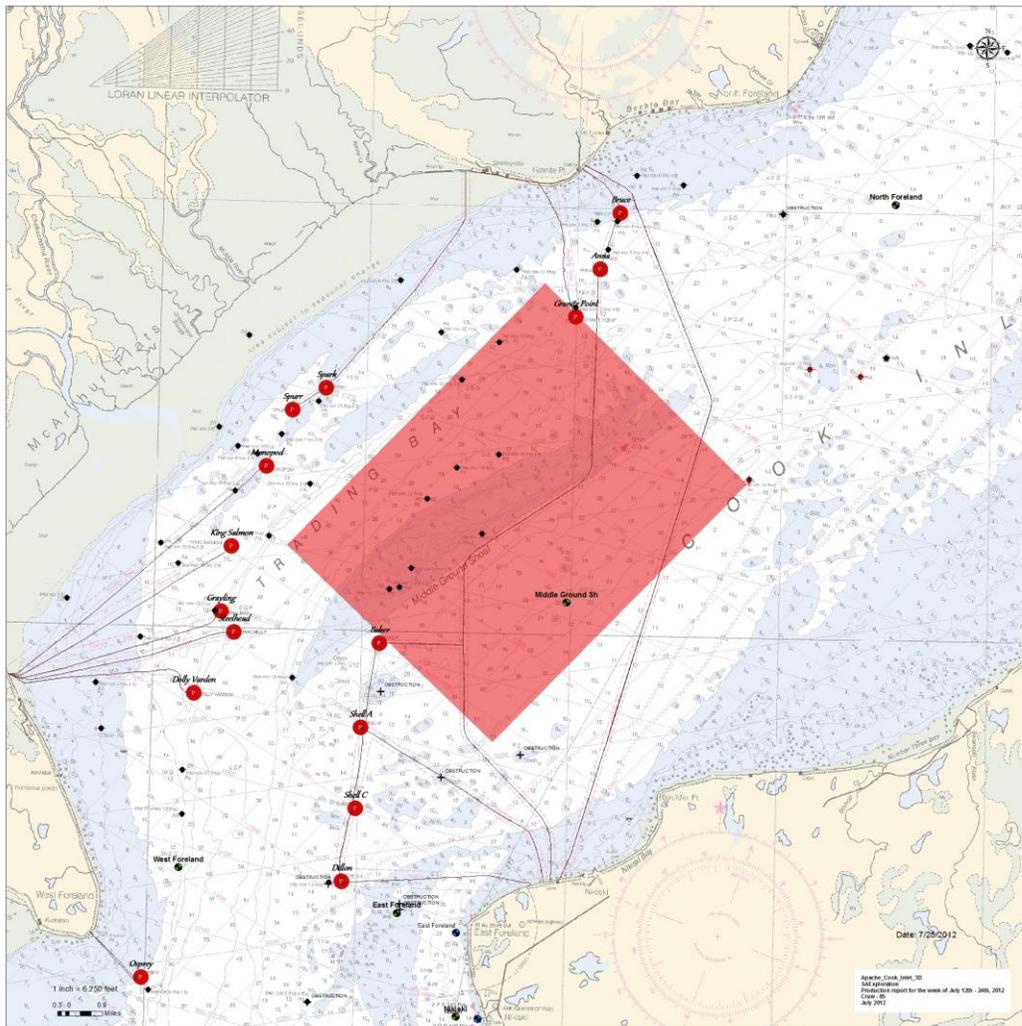


Figure 1. Operations occurred offshore near Trading Bay, Cook Inlet (red polygon).

Table 3. Vessels operating for the Cook Inlet 3D Seismic Program.

Vessel	Vessel Purpose	Size	Documentation No.	Call Sign	Gross Tonnage
<i>M/V Arctic Wolf</i>	Source vessel	41 m x 9 m (135 ft x 30 ft)	687450	-	251
<i>M/V Peregrine Falcon</i>	Source vessel	26 m x 6 m (85 ft x 24 ft)	950245	WCZ6285	131
<i>M/V Westward Wind</i> ¹	Node vessel	-	-	-	-
<i>M/V Miss Diane</i>	Node vessel	26 m x 6 m (85 ft x 20 ft)	1210779	WAV0779	53
<i>M/V Mark Stevens</i>	Node vessel	26 m x 6.7 m (85 ft x 22 ft)	1238385	WCZ-7941	81
<i>M/V Maxime</i>	Transfer vessel	21 m x 4.9 m (70 ft x 16 ft)	1196716	WAV6716	48
<i>M/V Dreamcatcher</i>	Mitigation vessel	26 m x 7.1 m (85 ft x 23 ft)	963070	WBN5411	100
<i>M/V Norseman I</i> ²	Housing Management	33 m x 8.5 m (108 ft x 28 ft)	553713	WDC-6817	197
<i>M/V Side Winder</i>	Side scan sonar	11 m x 4 m (36.8 ft x 14 ft)	1091516	WCZ-6262	16

¹Westward Wind operated on the project July 1-21.

²Norseman I arrived and began operating on the project July 29.

3.0 MONITORING EFFORT

A total of 1,355.1 hours of monitoring effort took place from July 1-31, 2012 including visual vessel- and land-based (746.1 and 158.6 hours, respectively), passive acoustic monitoring (432.5 hours) and aerial surveys (17.9 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	746.1
Visual Land-based	158.6
Passive Acoustic Monitoring	432.5
Aerial Survey	17.9
Total	1,355.1

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. However, operations did not occur on four days during July due to weather conditions (July 5, 11, 12 and 13).

3.2 Marine Mammal Observations

A total of 158 marine mammal observations and 507 estimated individual animals were observed from July 1-31, 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

Four 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 and harbor seal (Table 4). In addition to those species, one unidentified large cetacean was observed.

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	171	16
Harbor Porpoise	37	27
Gray Whale	3	3
Harbor Seal	103	91
Unidentified Large Cetacean	1	1
Total	315	138

Beluga Whale

A total of 171 beluga whales were observed on 16 different occasions. Beluga whales were observed at the surface, blowing, swimming, traveling, diving and milling.

Harbor Porpoise

A total of 37 harbor porpoise were observed on 27 different occasions. Harbor porpoise were observed at the surface, porpoising, swimming, traveling, diving and milling.

Gray Whale

Individual gray whales were observed on three different occasions. On July 2 at 6:35, a gray whale was observed at the surface, blowing and fluking. A shut down occurred at this time. On July 28 at 19:47 and 20:07, a gray whale was observed blowing and swimming and there were two delays clearing the safety zone.

Harbor Seal

A total of 103 harbor seals were observed on 91 different occasions. Harbor seals were observed traveling, swimming, diving, sinking, looking toward the vessel, resting, foraging and hauled out.

Unidentified Large Cetacean

On July 25 at 21:14, a large cetacean was observed blowing and followed by a dive. The species was not identified.

Acoustic Observations

Two species of marine mammals were acoustically detected during this month's monitoring effort including the beluga whale (1 detection) and the harbor seal (1 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 Seal	1
Total	2

Aerial Observations

Two species of marine mammals were observed during aerial surveys including the beluga whale and the harbor seal (Table 6).

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

Species	Estimated No. of Individuals Observed	No. of Sightings
Beluga Whale	186	15
Harbor Seal	6	3
Total	18	192

Beluga Whale

A total of approximately 186 individual beluga whales were observed on 15 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, Chuitna, Beluga and Theodore Rivers. Belugas were also observed near Granite Point and the Tyonek Dock.

Harbor Seal

A total of approximately six individual harbor seals were observed on three different occasions during aerial surveys. Harbor seals were observed either hauled out or swimming near the McArthur River. One harbor seal was observed hauled out on the Middle Ground Shoal, a sandbar located directly east of the town Shirleyville in the center of Cook Inlet.

3.3 Marine Mammal Takes

During the month of July, there was one Level B take of a harbor seal (Table 7). The take occurred on July 19 at 8:32 (Table 8). The harbor seal was observed surfacing and traveling. Seismic activity was taking place on both the *Arctic Wolf* and the *Peregrine Falcon* (2400 cui airgun). The harbor seal's distance from the *Arctic Wolf* and the *Peregrine Falcon* was estimated to be 9.4 km and 8.9 km, respectively. A shut down initially occurred; however, seismic activity resumed. 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	7

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 July include delay clearing safety zone (15), shut down (22), shut down followed by a power down (24) and power down procedures (2; 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 OTS hydrophone occurred at minimum at night during seismic operations. NMFS's vessel operation and marine mammal viewing guidelines to minimize vessel and aircraft impacts were 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 measures per species.

Species	Delay Clearing Safety Zone	Shut Down	Shut Down/Power Down	Power Down	None	Total
Beluga Whale	2	1	3	2	24	32
Killer Whale	0	0	0	0	0	0
Harbor Porpoise	4	7	7	0	9	27
Steller Sea Lion	0	0	0	0	0	0
Harbor Seal	6	13	14	0	62	95
Gray Whale	2	1	0	0	0	3
Unidentified Large Cetacean	1	0	0	0	0	1
Total	15	22	24	2	95	158

Aerial Survey

Aerial surveys continued to occur daily during the month of July. From July 1-16, aerial surveys were conducted from a Bell 407 helicopter. The surveys extended to the southern end of the Big Susitna River to the McArthur River and approximately 1.6 km (1 mi) offshore due to safety restrictions (Figure 2; yellow polygon). From July 17-31, aerial surveys were conducted with *Rediske Air* from a twin-engine Islander fixed-wing aircraft in Nikiski. The flight route typically departed from Nikiski, traveled across the inlet to the Beluga River, south to the McArthur River, with 2-4 transects spaced approximately 2 km apart over the project area and then returned to Nikiski (Figure 2; red polygon).

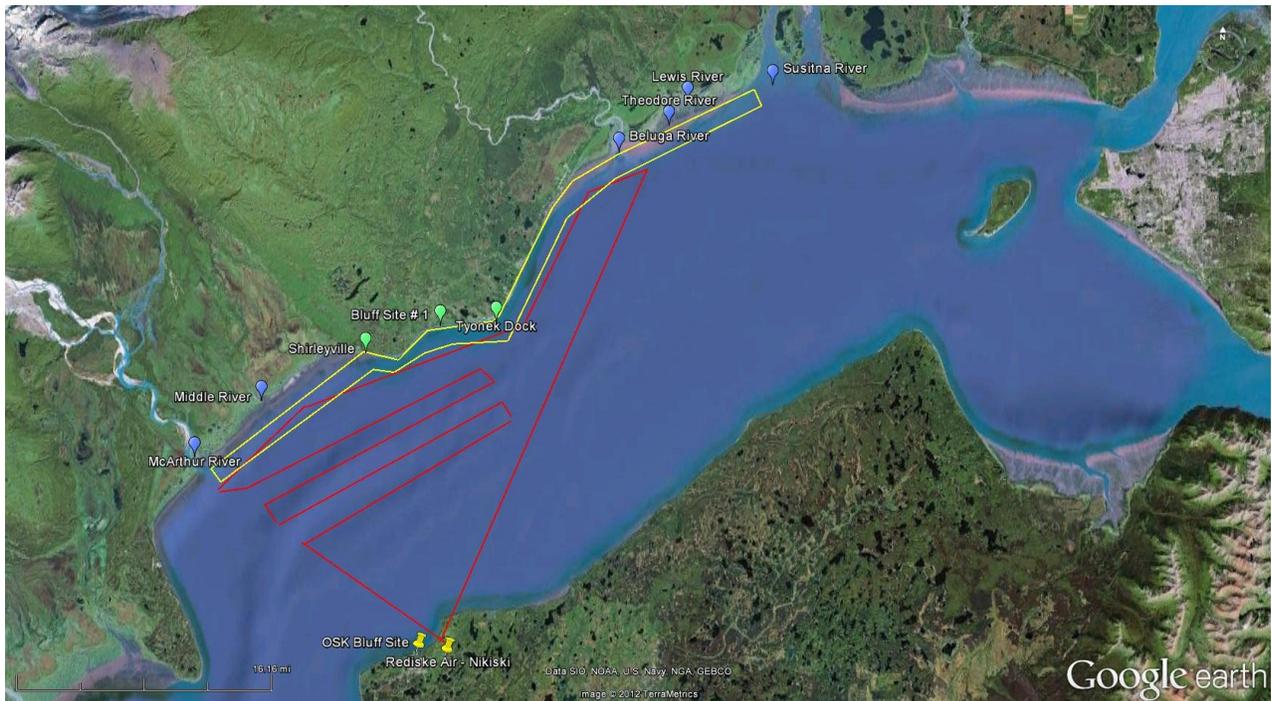


Figure 2. Aerial surveys from July 1-16 took place from the Big Susitna River to McArthur River (yellow polygon). From July 17-31, aerial surveys departed from Nikiski, traveled across the inlet to the Beluga River, south to the McArthur River and over the project area before returning to Nikiski (red polygon). Land-based observation platforms included Shirleyville, Tyonek Dock, Bluff Site # 1 and OSK Bluff Site.

Extended Shut Down

When a cetacean was observed within in the area operations ceased for 30 minutes or until the animal was observed leaving the safety zone. In the case of gray whale sightings, the marine mammal monitoring team used a 45-60 minute 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.