Report for Protected Species Observation
Geophysical Cruise
Conducted by US Geological Survey in the
Gulf of Mexico
2 May 2003 – 14 May 2003

Submitted to:

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Summary

The United States Geological Services (USGS) conducted seismic surveys from May 2 through May 14, 2003 off the R/V Gyre. The purpose of these surveys was to locate hydrates beneath sea floor of the Gulf of Mexico. Much of this surveying occurred within waters greater than 200m. Under regulations set forth by the Minerals Management Services (MMS) in 30 CFR 250. 103, visual observation for marine mammals, the implementation of ramp up procedures and the maintenance of an exclusion zone is required for any seismic activities that occur in water greater than 200m throughout the Gulf of Mexico.

The use of seismic airguns may have an adverse effect on marine mammals. All marine mammals are protected under the Marine Mammal Protection Act (MMPA) and several, including the sperm whale, *Physter macrocephalis*, are protected under the Endangered Species Act (ESA). Under the current guidelines, visual observers are required to monitor the water for 30 minutes prior to initiating airgun ramp-up procedures and during any seismic activity. The purpose of the ramp up procedures is to "warn "animals of seismic activity and allow them time to move out of range and to reduce the potential for an animal to be situated directly beneath an airgun when it begins firing at full power. Seismic vessels operating in the Gulf of Mexico in waters greater than 200m are required to utilize visual observers during the ramp up protocols and gun operations to maintain an exclusion zone of 500m surrounding the vessel and to provide warning as to any animals entering the area of seismic activity. For this survey, the National Marine Fisheries Service (NMFS) required the exclusion zone be set at 250m from the source.

Observers were present on the R/V Gyre during all daylight seismic activities. No sperm whales were spotted; however, 3 species of dolphin were seen and one basking shark was observed. At no point were operations ceased due

to marine mammal activity. Crew and research team members all followed compliance protocols and kept the observers informed of their activities during the seismic surveys.

Methods

Two visual observers monitored the exclusion zone during all seismic operations conducted on the R/V Gyre. Each observer was equipped with appropriate clothing, binoculars, range finders, data sheets, polarized sunglasses, and hand held VHF radios. Visual observers maintained a continual watch every day beginning at sunrise, (approximately 0630 AM), and ending at sunset, (approximately 1930 PM). Throughout the day observers were allowed to alternate short breaks of approximately 30 minutes to hour every 4 hours. This allowed the observers to alleviate fatigue and maintain a high level of confidence during the watch. Observers were positioned on the rear quarterdeck located approximately 7 meters from the sea surface. This location allowed the observers a wide area of view as well as an unobstructed view of the airgun activity. This observation location was maintained from May 3 through May 8. On May 9 the observers began using the bridge roof as the observation location. This position allowed the observers a greater field of view however they were only able to utilize it after the seas had calmed. It is important to note here that these positions were the same used on the R/V Gyre during the SWSS cruise in which sperm whales were located and tagged for research studying the effects of seismic surveys on the species. Visual observation began at 0630 on May 2. Seismic operations began at 1500 with the initiation of a chirper, a hull-mounted seismic source with an output of at least 160dB. After the chirper began firing it was to be a continuous sound source that would allow operations to continue during darkness. Observers recorded all observations and environmental conditions on and hourly basis or when circumstances merited.

Results

Seismic surveys were conducted continuously from May 2 to May 13, 2003. Results from the watch program are described in Figure 1. A complete set of observation results can be found in Appendix A. As can be seen in Figure 1 no sperm whales were sighted during any seismic operations. There were several sightings of dolphins in waters deeper than 200m involving two species, the pantropical spotted dolphin, S*tenella attenuata*, and the rough-toothed dolphin, *Steno bredanensis*. In each sighting the dolphins were seen to approach the vessel and bow ride for a short time before leaving the area. In each situation the dolphins were within 100 meters of the main airgun and within 30 meters of the chirper. During none of these encounters did the animals appear affected by the seismic activity. Figure 2 shows the daily position of the vessel and environmental conditions that were observed.

Discussion

Weather was the only inhibiting factor for the watch program. Conditions during seismic operations were highly variable. Conditions from May 1 through May 3 were very conducive to visual monitoring. Sea state was between Beaufort 1 and 2 with seas up to 1 m and both visibility and clarity were good. From May 4 through May 9 the sea state was ranged from 3 to 4 with seas up to 1½ m and very choppy with visibility reduced and clarity slightly reduced. On May 9, the sea state began to subside and maintained for the remainder of the operations with both visibility and clarity becoming excellent.

At no point during seismic activity were sperm whales sighted. This allowed for the uninterrupted surveying of all ranges. There are several possible reasons why this may have occurred. Despite the fact that sperm whales are known to be located in the area of the Atwater / Mississippi Canyon region, our survey areas were quite small and our survey routes were repetitive in that we traversed the same lines repeatedly. So while our survey time was long, our actual survey area was so small that there was a reduced chance of encountering a sperm whale. During the cruise, we contacted one of the scientists from the SWSS tagging cruise and he stated that the nearest satellite-tagged sperm whale was approximately 60 miles northwest of our survey location. Additionally, the constant sound from the air guns in such a localized area may have kept deep diving animals out of the area.

The operations were all conducted within regulatory guidelines and all crewmembers and research team members were aware of the compliance issues. All cooperated fully during the project and provided any information that was required for our surveys and recording needs. .