

# **Acoustic and Visual Survey of Cetaceans at Palmyra Atoll**

**Trip report 05/2011**

**Palmyra, April 29 – May 9, 2011**

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## Summary

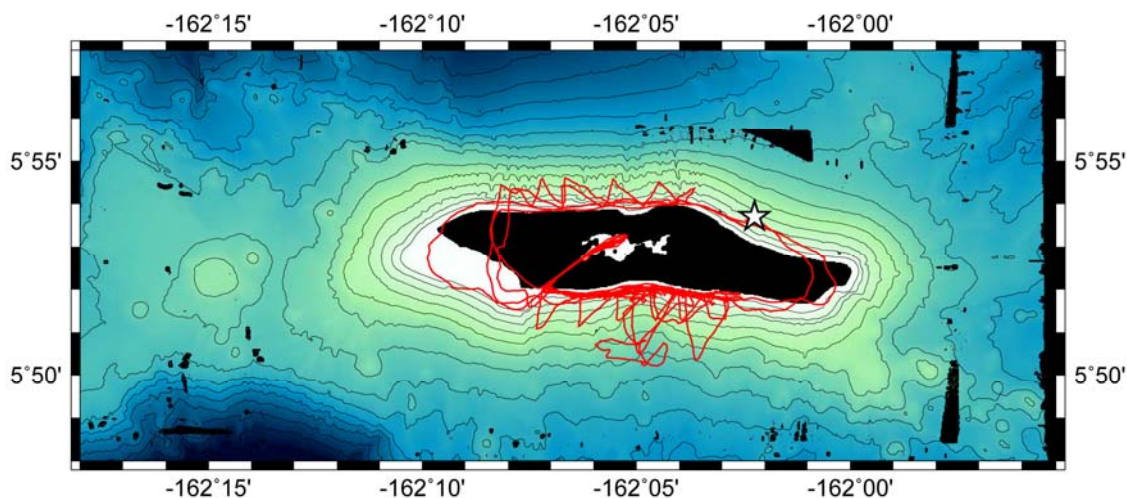
### 1. HARP Recovery

The high-frequency acoustic recording package (HARP), which had been deployed off the northeast shore of the atoll, was recovered on 30 April 2011. This instrument started recording on 25 August 2010, located at position 05° 53.705' N 162° 02.240' W in 700 m of water. This trip marked the closing of the project in Palmyra and therefore the HARP was not re-deployed but rather brought back to Hawaii aboard the plane. All equipment had been removed earlier from the atoll aboard the yearly barge.

### 2. Cetacean Survey

In addition to recovering the HARP, visual surveys were conducted to obtain species identification and abundance. Photographs, biopsy samples, and acoustic recordings were taken for certain species when conditions allowed. The focus of the survey effort was on the unidentified beaked whale (*Mesoplodon sp.*) known to frequent the nearshore waters.

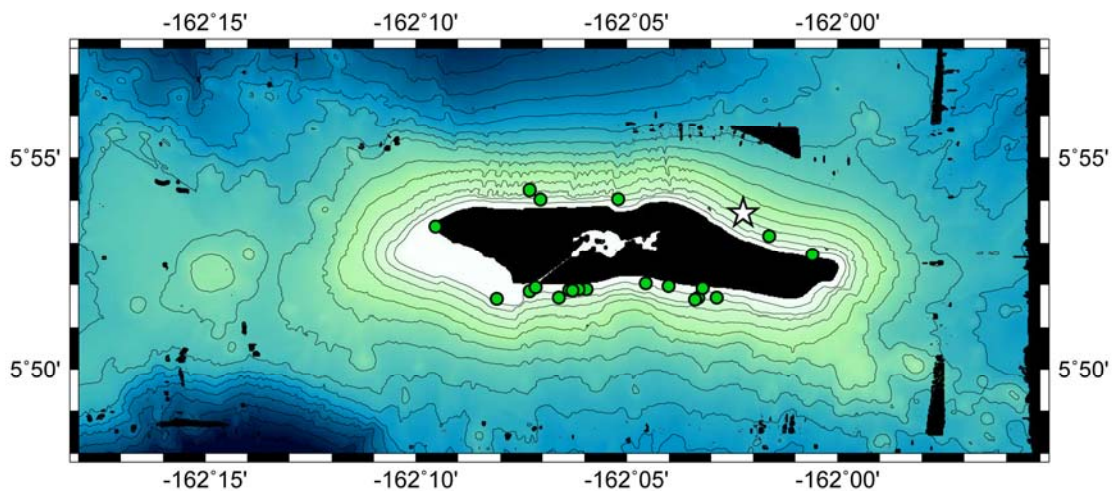
During the two weeks on the atoll, a total of 30 hours of boat time was logged on the *R/V Zenobia* of which 15 hours were on effort (trackline map Figure 1). Sea surface state ranged from Beaufort 3 to 5 with most of the effort at Beaufort 4. Several days of survey effort were lost due to high winds and/or swell. During past survey trips, the prevalent wind direction was from the southwest which often created a lee on the north side of the atoll where the majority of beaked whale sightings have occurred. On this trip however, the primarily easterly wind direction prevented a lee off both the north and south side of the atoll. Whitecaps were frequently seen up to the shallow reef edge.



**Figure 1. Surveyed tracklines (red) for all 15 hours of effort and HARP location (white star). Bathymetry lines every 200 m. Black indicates areas with no depth data.**

A total of 23 cetacean sightings were made (Table 1). The species and number of sightings included 20 bottlenose dolphin (*Tursiops truncatus*) groups, one melon-headed whale (*Peponocephala electra*), one spinner dolphin (*Stenella longirostris*), and one unidentified medium delphinid. No beaked whales were sighted which was not surprising given the sea state conditions.

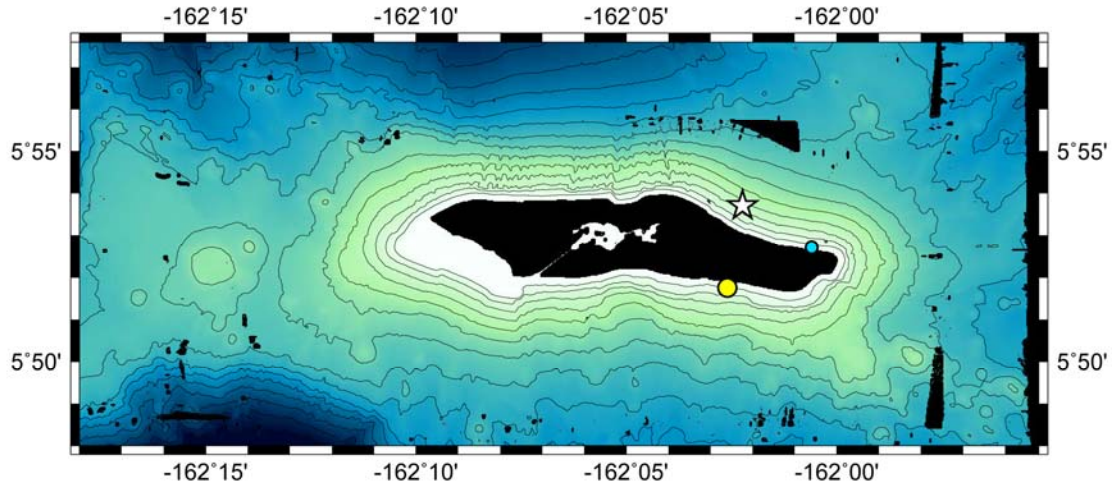
The group size for the 23 bottlenose dolphin encounters ranged from one to 20 animals and averaged five animals. These groups were sighted around the atoll (map of sightings figure 2). Because of the tendency of bottlenose dolphins to approach the vessel and because of the small study area, it is certain that some of the sightings are actually re-sightings of the same individuals. While no biopsies were attempted for this species, photos were taken (170) when conditions allowed.



**Figure 2. Sighting location of bottlenose dolphins (green dots) and HARP location (white star). Bathymetry lines every 200 m. Black indicates areas with no depth data.**

Melon-headed whales were sighted only once this trip (map of sightings figure 3). This occurred during the only period (approximately two hours) when there was a lee on the south side of the atoll. The group size was estimated to be approximately 280 animals. It should be noted that no encounters were recorded during the fall 2009 trip. Photos were taken (1,313) to compare individuals seen on previous trips and six biopsies were collected. In addition, underwater photos and video clips were taken by the captain with a pole camera.

Spinner dolphins were encountered once, ENE of Barren Island at the west end of the atoll (map of sightings figure 3). The group size was estimated to be 40 dolphins. Because of the large swell usually present over the ends of the reefs, no photos or biopsies were attempted.



**Figure 3. Sighting locations of melon-headed whales (yellow dot), spinner dolphins (blue dot), and HARP location (white star). Bathymetry lines every 200 m. Black indicates areas with no depth data.**

Overall, strong winds and their direction hampered survey effort this trip. A lee was encountered only once over a two hour period during which the melon-headed whales were seen. This trip ended field work at Palmyra Atoll. Acoustic and survey data have been collected spanning 10 trips over 6 years. All equipment has been removed from the research station and water.

**Table 1. Date, location, species, and group size estimates for all sightings.**

| <b>Date</b> | <b>Species</b>         | <b>Latitude</b> | <b>Longitude</b> | <b>Min<br/>Count</b> | <b>Best<br/>Count</b> | <b>Max<br/>Count</b> |
|-------------|------------------------|-----------------|------------------|----------------------|-----------------------|----------------------|
| 04/30/2011  | Bottlenose dolphin     | 5.8615934       | -162.110073      | 2                    | 2                     | 2                    |
| 04/30/2011  | Bottlenose dolphin     | 5.8861035       | -162.027056      | 2                    | 2                     | 2                    |
| 04/30/2011  | Bottlenose dolphin     | 5.9006851       | -162.086651      | 5                    | 5                     | 5                    |
| 05/02/2011  | Bottlenose dolphin     | 5.8614623       | -162.047836      | 1                    | 1                     | 1                    |
| 05/02/2011  | Bottlenose dolphin     | 5.8610751       | -162.134724      | 1                    | 1                     | 1                    |
| 05/02/2011  | Bottlenose dolphin     | 5.8899464       | -162.158993      | 2                    | 2                     | 2                    |
| 05/02/2011  | Bottlenose dolphin     | 5.9005352       | -162.117494      | 2                    | 2                     | 2                    |
| 05/03/2011  | Unid. medium delphinid | 5.8691687       | -162.116811      | 2                    | 3                     | 3                    |
| 05/03/2011  | Bottlenose dolphin     | 5.8615415       | -162.055034      | 1                    | 1                     | 1                    |
| 05/03/2011  | Melon-headed whale     | 5.8626097       | -162.043414      | 250                  | 280                   | 300                  |
| 05/04/2011  | Spinner dolphin        | 5.8785603       | -162.009904      | 30                   | 40                    | 50                   |
| 05/04/2011  | Bottlenose dolphin     | 5.8785603       | -162.009904      | 15                   | 20                    | 25                   |
| 05/04/2011  | Bottlenose dolphin     | 5.9040927       | -162.121746      | 7                    | 8                     | 9                    |
| 05/04/2011  | Bottlenose dolphin     | 5.8641188       | -162.121719      | 2                    | 2                     | 2                    |
| 05/05/2011  | Bottlenose dolphin     | 5.8657024       | -162.119339      | 4                    | 4                     | 4                    |
| 05/05/2011  | Bottlenose dolphin     | 5.8648178       | -162.099292      | 8                    | 8                     | 10                   |
| 05/05/2011  | Bottlenose dolphin     | 5.867194        | -162.075794      | 3                    | 3                     | 3                    |
| 05/05/2011  | Bottlenose dolphin     | 5.8644913       | -162.106055      | 2                    | 2                     | 2                    |
| 05/07/2011  | Bottlenose dolphin     | 5.8647551       | -162.102444      | 6                    | 6                     | 6                    |
| 05/07/2011  | Bottlenose dolphin     | 5.8662282       | -162.066793      | 4                    | 4                     | 4                    |
| 05/07/2011  | Bottlenose dolphin     | 5.8653395       | -162.053339      | 10                   | 14                    | 16                   |
| 05/07/2011  | Bottlenose dolphin     | 5.8608179       | -162.0564        | 4                    | 4                     | 4                    |
| 05/07/2011  | Bottlenose dolphin     | 5.8642779       | -162.104775      | 5                    | 6                     | 7                    |