

## **PICEAS – Pacific Island Cetacean and Ecosystem Assessment Survey**

### **Weekly Report, August 18-25, 2005**

This is the fourth week of the PICEAS-05 cruise. Last week I left you with the following teaser: “I cannot help but mention that the marine mammal situation has improved dramatically today.” Now I must explain.

As soon as our acoustic team (Julie Oswald and Shannon Rankin) had the array in the water, they started to hear loud, low-frequency whistles. They immediately declared that they were hearing “blackfish.” This is a generic term applied to all large, dark-colored dolphins. Because of their bass profundo squeaks, our acoustics team knew that they were either pilot whales or false killer whales. By the time the visual team went on effort a few minutes later the blackfish were already behind us and out of their search field. Acoustics took control of the ship and guided us to the source of their whistles. “False killer whales at 55 degrees right!” We immediately launched the small boat, and found this large group to be quite cooperative, giving up a total 6 biopsies to our intrepid marksman, Juan Carlos Salinas. False killer whales are one of the main species motivating our study; we want to evaluate whether their bycatch in the Hawaii-based longline fishery is sustainable. In regard to this, one of the biggest questions is whether the false killer whales around Hawaii are unique or are part of a larger pelagic population. With these samples, we will be able to tell if these whales are more closely related to false killer whales around Hawaii or are more closely allied with whales in the eastern tropical Pacific (ETP) which will help answer a pressing management question.

The rest of this week continued to be a series of exceptional days. We found that both the weather and the marine mammals were better in the southeastern corner of our study area. We had an average of almost eight sightings per day (compared to two per day for our first week). The species composition of our sightings were what we expected for equatorial waters ... striped dolphins, spotted and spinner dolphins (sometimes in mixed schools), pilot whales, rough-toothed dolphins, and Bryde’s whales. We also had another encounter with false killer whales (another acoustic detection followed by a sighting), a sighting of killer whales, and a sighting of a large group of the relatively rare Fraser’s dolphin. Fraser’s dolphins have an exclusively pelagic, tropical distribution and consequently were not even known to science until the 1950s. None of the pelagic animals we encountered this week were in the least bit friendly. All of them ran from us. Despite frequent launches of the small boat, we managed to get only one sample from a Bryde’s whale and two samples from pilot whales. The Bryde’s whales were especially abundant in the North Equatorial Current, and we saw several instances of surface lunge-feeding on relatively large fishes (possible juvenile mahi mahi).

This week we circumnavigated two tiny atolls ... Kingman Reef and Palmyra Atoll. At both locations, we found dolphins to be much more cooperative for our biopsy hunters. We managed to get ID-photographs and biopsies of four bottlenose dolphins and two sperm whales around Kingman. Some of the bottlenose dolphins appeared to have unusual color patterns and some appeared to be dwarfs. These genetic samples will certainly be interesting when they are analyzed and compared to our samples from

Hawaii and the ETP. At Palmyra, we also got biopsy samples of all the species we saw there ... melon-headed whales (11), bottlenose dolphins (7), and spinner dolphins (3). Again, these genetic samples contain a gold mine of information, and will help us address the question of whether these species form insular endemic populations or are part of a broader pelagic population. Based on the differences in their behavior near islands, the former hypothesis certainly seems the most likely.

We finished our circumnavigation of Palmyra early enough to allow scientists and crew to go ashore for a brief walk on land or a swim. The entire atoll is a complex of islets surrounding a central lagoon and is part of a U.S. Fish and Wildlife Service (FWS) refuge. Cooper, the largest islet of Palmyra, is owned and protected by the Nature Conservancy which maintains a staff of four people there. We were greeted by Matt Lange, the island manager, and by Alex Wegmann who is the FWS representative on the island. Palmyra turned out to be a tropical paradise, at least for naturalists. There was something for almost everyone there (sorry Julie, no shopping). There was a nesting colony of sooty terns with their nearly fledged young-uns. There was a swimming hole with a rope swing. There were friendly sharks. There were shady jungle trails. There were friendly manta rays. There were coconuts ripe for the picking. There were friendly people ... some of whom were from home (San Diego).

A Scripps Institution of Oceanography expedition studying coral reef communities was working from a charter vessel, the *White Holly*, that was anchored in the middle of the lagoon. We met up with their chief scientist, Enric Sala, as well as other SIO scientists, including Jeremy Jackson and Stuart Sandin. They are looking at how the reef's fish community varies along the Line Islands, from the relatively pristine islands in the northwest (Kingman and Palmyra), to the more human-impacted sites in the southeast (Fanning and Christmas Islands). They said that the number of large fish at Palmyra was just amazing.

We had hoped to deploy a long-term acoustic recording package on the seafloor near Palmyra on Wednesday, but we had trouble finding a suitable site between 300 and 1000 meters depth that was not an absolute cliff face. These High-frequency Acoustic Recording Packages (HARPs for short) were developed by Sean Wiggins and John Hildebrand at Scripps. They sit on the seafloor and record all frequencies of dolphin and whale vocalizations (and any other ocean sounds) continuously for up to four months. It would then (according to plans) be picked up by another ship. When ashore on Palmyra, I found that the research station had a recent high-resolution seafloor map of the atoll that gave me some idea of where to look for a launch site. Maybe tomorrow ....

A special thank-you this week is given to the deck crew who ran countless shuttles from the ship to Palmyra. This was deeply appreciated by the all the scientists.

### Marine Mammal Sighting Summary

081805	0653	N06:23.23	W163:59.28	74.0 nmi	4.0
	1839	N05:18.67	W164:44.12		
081905	0649	N04:39.77	W163:58.27	50.4 nmi	3.7
	1850	N05:35.99	W163:20.94		
082005	0643	N06:04.16	W162:22.16	35.3 nmi	3.2
	1242	N06:29.34	W162:23.91		
082105	0647	N05:33.61	W162:43.95	58.7 nmi	3.7
	1857	N04:26.07	W163:32.59		
082205	0648	N03:08.67	W163:49.19	44.0 nmi	4.0
	1815	N03:50.36	W163:14.97		
082305	0653	N03:44.41	W162:47.73	65.9 nmi	3.2
	1740	N04:53.01	W161:59.10		
082405	0653	N05:51.04	W162:08.08	17.8 nmi	4.0
	1042	N05:51.64	W162:05.00		

CODE	SPECIES	TOT#
002	<i>Stenella attenuata</i> (offshore)	5
003	<i>Stenella longirostris</i> (unid. subsp.)	4
013	<i>Stenella coeruleoalba</i>	3
015	<i>Steno bredanensis</i>	3
018	<i>Tursiops truncatus</i>	6
026	<i>Lagenodelphis hosei</i>	1
031	<i>Peponocephala electra</i>	1
033	<i>Pseudorca crassidens</i>	2
036	<i>Globicephala macrorhynchus</i>	10
037	<i>Orcinus orca</i>	1
046	<i>Physeter macrocephalus</i>	1
072	<i>Balaenoptera edeni</i>	5
077	unid. dolphin	5
099	<i>Balaenoptera borealis/edeni</i>	6
102	<i>Stenella longirostris longirostris</i>	2
	TOTAL	55

### Acoustics Squeakly Report (Shanon Rankin & Julie Oswald)

"Julie can't graduate: we've got too much work for her to do!"

In the past week we have recorded nearly the entire diversity of marine mammals that we expected to get for the entire cruise; I guess you could say it was a busy week! Thursday started bright and early with an acoustic chase for false killer whales, and throughout the week we recorded spotted, spinner, and striped dolphins, pilot whales and melon-headed whales, rough-toothed and bottlenose dolphins, more false killer whales, and even Fraser's dolphins. Neither of the false killer whale sightings this week would have been found without the acoustic team (score two for the ice camp). Julie's species ID program, ROCCA, is up and running, and with the addition of whistles from this week alone, we hope to increase its accuracy. Stephanie Grassia has been a godsend, finding whistles in

our recorded data for Julie to incorporate into her program. The group of sperm whales off of Kingman Reef entertained us with codas for hours (and hours and hours!). Codas are the repeated patterns of clicks which prove that sperm whales have rhythm. Needless to say, there was little we didn't hear (killer whales, one group of pilot whales, and a few random unidentified dolphins).

Our love/hate relationship with sonobuoys was evident this week, as we had several encounters with scattered groups of feeding Bryde's whales. After 6 hours of sonobuoy madness, we managed 40 minutes of recordings (with calls!) before the sonobuoy was out of range. Two days later, our luck improved and the second buoy proved functional (miracles happen!), and we were able to record all kinds of odd sounds throughout the evening station (including what we have decided is a previously undescribed species of "marine pelagic frog"). Little is known of Bryde's whale vocalizations, but there appears to be geographic variation in their calls. We hope to compare these sounds with those obtained from seafloor mounted hydrophones to better understand the population dynamics of this species of whale.

**Birder Blurp** (Michael Force & Sophie Webb)

Shearwaters made the news this week, stealing the lead story normally reserved for Pterodromas. A couple of Flesh-footed Shearwaters, a gorgeous Buller's, and several Newell's Shearwaters in a large feeding aggregation boosted this week's species total to 22, about average for the past few weeks. However, if quantity is what counts, then we came out on top this week. A huge, mind-boggling feeding aggregation in the vicinity of an oceanographic front defied our attempts to obtain an accurate count. Here, the ocean and sky in all directions was awash in Sooty Terns and dark morph Wedge-tailed Shearwaters (and little else). At least 25,000 birds, all taking advantage of what must have been a rich and concentrated food source (the Bryde's Whales certainly were). There was a small black and white shearwater here that was possibly a Little Shearwater, but we just couldn't get enough on it to be sure. This frenzy was recorded as a feeding flock. Unfortunately, our data acquisition program doesn't have the capacity to record species totals in the tens of thousands. This is NOT the ETP! We did have visitors from the ETP though, a couple of Galapagos Storm-Petrels, somewhat surprising, but not unprecedented, this far west. Several Leach's Storm-Petrels were the first we've seen since our second day out of San Francisco. A short visit to Palmyra Atoll was the jewel in the crown this week. Here we found our first Lesser Frigatebirds of the cruise, as well as more Bristle-thighed Curlews (one flew past the ship while we were off Kingman Reef). And, of course, more Sooty Terns!

Cruise leader bird report: I don't remember seeing any.

<b>Biopsy Weekly Report</b>	<b>Weekly Total</b>	<b>Cruise Total</b>
Bryde's whales	1	1
Pilot whales	2	2

Humpback whales	0	3
Melon-headed whales	11	30
Sperm whales	2	2
False killer whales	6	18
Spotted dolphins	2	2
Spinner dolphins	3	3
Rough-toothed dolphins	0	2
Bottlenose dolphins	11	11

<b>Photo-ID Weekly Report</b>	<b>Weekly Total</b>	<b>Cruise Total</b>
Humpback whale fluke IDs	0	4
Melon-headed whale (# groups)	0	1
False killer whales (# groups)	0	1
Pilot whales (# groups)	3	3
Striped dolphins (# groups)	1	1
Spotted dolphins (# groups)	1	1

### **Oceanographic Data Collections (Mindy Kelly and Lacey O’Neal)**

This had been a colorful week full of painted lines on the oceans surface and bright specks spotted on the screen of our echo-sounder computer. Monday was a very special day as the flying bridge radioed for an oceanographer. As I climbed the steps to the flying bridge I began to notice the distinct line on the ocean’s surface that seemed to stretch forever into the distance. We were riding along a very distinct frontal zone between the North Equatorial Current and the Equatorial Countercurrent. At the same time the backscatter screen was glowing with color in the upper 100 meters of the water column while the observers began a slew of marine mammal sightings. Looking back at temperature and salinity, one can see the slight changes in these values throughout the day as we navigated next to and near the frontal zone; very neat.

All operations have been running exceptionally well this week. Our net tow samples have beefed-up and now deliver to us a variety of fun friends (most of whom we pickle). We are also happy to report that after our third run of salt samples, the new Niskin bottles continue to prove they are doing their job.

<b>DATE RANGE</b>	<b>DAY</b>	<b>CTD</b>	<b>XBT</b>	<b>Bongo</b>	<b>Manta</b>
<b>PICEAS05</b> <b>Leg 2</b> <b>Week 2</b>  <b>8/19</b> <b>to</b> <b>8/25</b>	Thursday	2	3	0	0
	Friday	2	3	1	1
	Saturday	2	3	1	1
	Sunday	2	2	1	1
	Monday	2	3	1	1
	Tuesday	2	3	1	1
	Wednesday	1	1	0	0
	<b>Totals</b>	13	18	5	5

## **The *Weakly* Flying Fish Report ( Jim Cotton)**

The evening dipping stations produced only moderate results this week in terms of flying fish netted. Our best night was the station along the edge of the Equatorial Countercurrent where four species of flying fish were caught along with a juvenile-to-adult series of short-wing fliers. Perhaps as interesting as the species diversity along this Equatorial front was the abundance of juvenile dolphin fish, mahi-mahi. Much to our amazement, and dismay, thousands of these trout-sized mahi mahi were swirling beneath the flood lights, chasing and eating our potential samples. Juan Carlos, in a dipping frenzy, got even by scooping up enough mahi for breakfast and proving that he is the top predator.

Unfortunately, dipping was not permitted at Palmyra Atoll but Red-footed Bobbies, roosting on the ship overnight were kind enough to regurgitate samples of short- and two-winged flying fish for the collection.

Dipping for flying fish is not enough; we have now taken to photographing them from the bow during our daytime vigil. So far, several species that have not been collected at night have now been captured digitally.

Additions to the aquarium this week are Fred, the voracious puffer-fish, and a small remora that had attached itself to the acoustical array.

Squid were present nightly in small numbers and Halobates were only seen/collected at half the stations.

For our efforts we ended the week with the following samples:

- 5-four-wing flying fish
- 18- two-wing flying fish
- 33- short-wing flying fish
- 22- lantern fish (myctophids)