STAR-LITE 2007: NOAA Ship *David Starr Jordan*
Weekly Science Report

Lisa T. Ballance, Cruise Leader
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Science Summary: 7-13 October 2007

This week was spent almost entirely in port – our second of three scheduled port calls, all in Manzanillo, for STAR-LITE. Port call means R&R for most of the scientists (traveling, surfing the internet, sampling Mexican fish, tortillas, and beer) and work for most of the officers and crew (re-provisioning, refueling, repairing, maintaining, and standing watch) with a little R&R thrown in on the side. Among the significant accomplishments this inport was repair of the J-frame from which we deploy our bongo and manta nets, problematic last leg (and working beautifully during our first nightly net deployments of Leg 3).

On Friday, as planned, we cleared customs and departed from the harbor mid-morning to begin Leg 3. The day-long transit to the study area was spent in welcome aboard meetings, drills, settling back onto the ship, and enjoying the Beaufort 1 weather. This leg we are hosting three new visiting scientists: Annette Henry (our brilliant Survey Coordinator, who seamlessly runs all cruise logistics from the shore and has come to sea to see the field side of things – we hope nothing breaks down on shore while she's out here!), Nick Kellar (soon to be Dr. Kellar, who has developed new and amazing methods to determine pregnancy state of a dolphin from a tiny skin sample obtained with a biopsy dart), and Dr. Megan Ferguson (a quantitative expert who, among other things, uses our ecosystem and dolphin data together to build mathematical models that predict dolphin density in areas where we have not sampled). We also have Robert Pitman with us, who was to be our fourth visiting scientist, but is instead taking the place of James Cotton as a marine mammal observer this leg (Jim left the ship unexpectedly due to family health issues). James – we miss you and send our best. Bob is doing his utmost to fill your shoes (but you took them with you).

Although this report includes only a single day in the study area, there were a number of notable events. 1) The *first* mahi of the trip, pulled in on Art's line by Pitman in the middle of a fire drill (Art caught a

Frolicking spinner dolphins, *Stenella longirostris orientalis*, Photo Adam Ü

second fish shortly thereafter, and after the drills); 2) Our first killer whale sighting of the leg – and (of course) sighted on a passing mode day when turning the ship to approach animals is not an option (for the eastern tropical Pacific novice, killer whales out here are few and far between and every single sighting counts toward learning a great deal more about these animals, especially when biopsy samples or photographs can be obtained; additionally, we have two marine mammal observers that are positively obsessed with this species so these passing mode sightings are particularly difficult to accept); 3) Two gifts from crew to scientists: brackets specially designed and fabricated by the Chief Boatswain to fix a broken doughnut for the flying bridge big eyes, and *ruby red* Crock knock-offs donated to Bob by the Senior Survey Tech so that he can comply with the ship's close-toed shoe policy without having to wear hiking boots. (The red completes the color spectrum of Crock and Crock-like shoes sported by the scientists and crew out here: pink, turquoise, orange, blue, green, and brown, with no two persons displaying the same color, an observation noted by soon-to-be Dr. Kellar).

Marine Mammals: Effort and Sightings (Richard Rowlett, Juan Carlos Salinas, Suzanne Yin, Ernesto Vázquez, Adam Ü, and Robert L. Pitman)

Date	Start/ Stop Time	Position	Total nm	Average Beaufort	Mode of Operations
100707	In port, Manzanillo, Mexico				
100807	In port, Manzanillo, Mexico				
100907	In port, Manzanillo, Mexico				
101007	In port, Manzanillo, Mexico				
101107	In port, Manzanillo, Mexico				
101207	In transit to study area				
101307	0921	N16:05.61 W106:15.17	92.4	4.7	Passing
	1900	N14:42.75 W107:11.05			

Code	Species	Number of Sightings
037	*Orcinus orca*	1
177	Unid. small delphinid	5
Total		6

Plots at the end of this report depict locations of Orcinus orca and unidentified small delphinid sightings.

Photography (Adam Ü, Suzanne Yin and Nick Kellar)

As most of this week has been spent in port there has been no photographic effort to report on. However, Nick Kellar is now on board to explain what "laser dot images" are, so I will hand it over to him. Nick, take it away!

Bowriding: is this risky behavior just a practice of the nation's reckless youth or is everyone doing it? Dolphin scientists want to know.

In attempts to answer this question we are, in Orwellian fashion, shooting lasers at bowriding dolphins while capturing their images on film. Two beams are projected onto target animals; the beams are parallel with a known distance between. The end result is a size standard plastered to each successfully photographed dolphin from which we extrapolate morphometric measurements (e.g., total length). These measurements are used to generate length distributions of bowriding dolphins that can then be compared to length distributions for each population as a whole (as derived from aerial photogrammetry or bycatch observer data). These comparisons will help us elucidate whether certain age classes (length used as a proxy for age) are more or less likely to come ride the bow; important to know when interpreting data from skin biopsy samples of bowriding animals and assessing how well they represent the entire population that is being sampled.

Also important if you want to know what your teenaged dolphin does after school.

Wish us luck!

Species	**Common Name**	**Weekly photographs**		**Total photographs**	
		Individuals	**Schools**	**Individuals**	**Schools**
Stenella attenuata	Pantropical spotted			10	226
Stenella longirostris	Eastern spinner dolphin			2	38
Stenella coeruleoalba	Striped dolphin			2	20
Tursiops truncates	Bottlenose dolphin			2	74
Grampus griseus	Risso's dolphin			1	42
Feresa attenuate	Pygmy killer whale			5	304
Pseudorca crassidens	False killer whale			1	26
Total		0	0	23	730

Biopsy (Juan Carlos Salinas, Ernesto Vásquez, and Suzanne Yin)

Species	**Common Name**	**Weekly**		**Total**	
		Samples	**Takes**	**Samples**	**Takes**
Pseudorca crassidens	False killer whale	0	0	1	4
Stenella attenuata	Pantropical spotted dolphin	0	0	2	10
Tursiops truncatus	Bottlenose dolphin	0	0	2	8
Total		0	0	5	22

Acoustic Squeakly (*Megan Ferguson with assistance from Suzanne Yin and Sophie Webb)*

With the closing of Leg 2, we completed the acoustics effort that we had originally planned for STAR-LITE. We still have the full complement of acoustics equipment onboard the ship, and we have a few brave souls who are willing to interact with the hydrophone array (that has proven to be somewhat temperamental in the past) so we will continue with a scaled-down version of our acoustics project during

Legs 3 and 4. During this leg, Megan Ferguson, Suzanne Yin, and Sophie Webb will deploy and retrieve the hydrophone array on the days that the visual observers are surveying in passing mode. The computers will continuously record what the array is hearing and where the ship has sailed, but nobody will listen to or analyze the data until after the cruise ends. Saturday, October 13th, was the first day of acoustics operations on Leg 3, and the operation went off without a hitch, relatively speaking. With luck, the acoustics trio will keep the beast happy for the rest of the leg!

Seabird Report (Michael Force and Sophie Webb)

We're back, and so are the boobies. Entering the study area greeted by our familiar gaggle of Brown, Red-footed and Masked boobies was like running into old friends. The kind of old friends that show up unannounced, make a mess, and never leave. You know the type. However, they provide hours of entertainment as they scrap for a squat spot on the ship's jackstaff. And we all have front row seats. The 13 species we found on the single day of effort covered by this report includes most of what we expect to find in the next three weeks including the headliners Juan Fernandez Petrel and Wedge-tailed Shearwater, and a lesser cast of characters such as Tahiti Petrel, Leach's and Galapagos storm-petrel, various jaegers and Cattle Egret.

Plots at the end of this report depict location of seabird feeding flocks. Species identifications associated with flock locations, reported in previous reports, have been omitted from this leg's plots to provide a depiction focused on density of flocks as a whole.

Oceanographic Operations (Candice Hall and Ryan Driscoll with assistance from Annette Henry, Nick Kellar, and Megan Ferguson)

Welcome to our new leg 3 oceanographers. We are very spoilt to have three such willing participants for the third installment of STAR-LITE 2007.

After surveying between way point 1 and 2, we are able to report that the 20 °C isotherm has remained at a depth of approximately 65m, consistent with the previous two legs. During the first two XBT drops of transect 1, the mixed layer was found to end at a deeper depth than before, probably reflecting yesterday's Beaufort 4 sea state.

Last night's net tows again proved our competence in all ecosystem aspects as we captured another flyingfish in the Manta tow. I believe that is four to us, many thousand to the flyingfish teams.

Date	CTD	XBT	Bongo tow	Manta tow
100707	In port, Manzanillo, Mexico			
100807	In port, Manzanillo, Mexico			
100907	In port, Manzanillo, Mexico			
101007	In port, Manzanillo, Mexico			
101107	In port, Manzanillo, Mexico			
101207	In transit to study area			

Date	CTD	XBT	Bongo tow	Manta tow
101307	2	4	4	1
Total	2	4	4	1

Dipnet Report (Juan Carlos Salinas, Ernesto Vázquez, Adam Ü, Ryan Driscoll, and Robert L. Pitman)

This is the beginning of the second half of the cruise, unfortunately for this Leg our Master collector (Jim Cotton) is not going to be with us, but instead we have the pleasure to count with the "Sensei" of the flyingfish, R. L. Pitman.

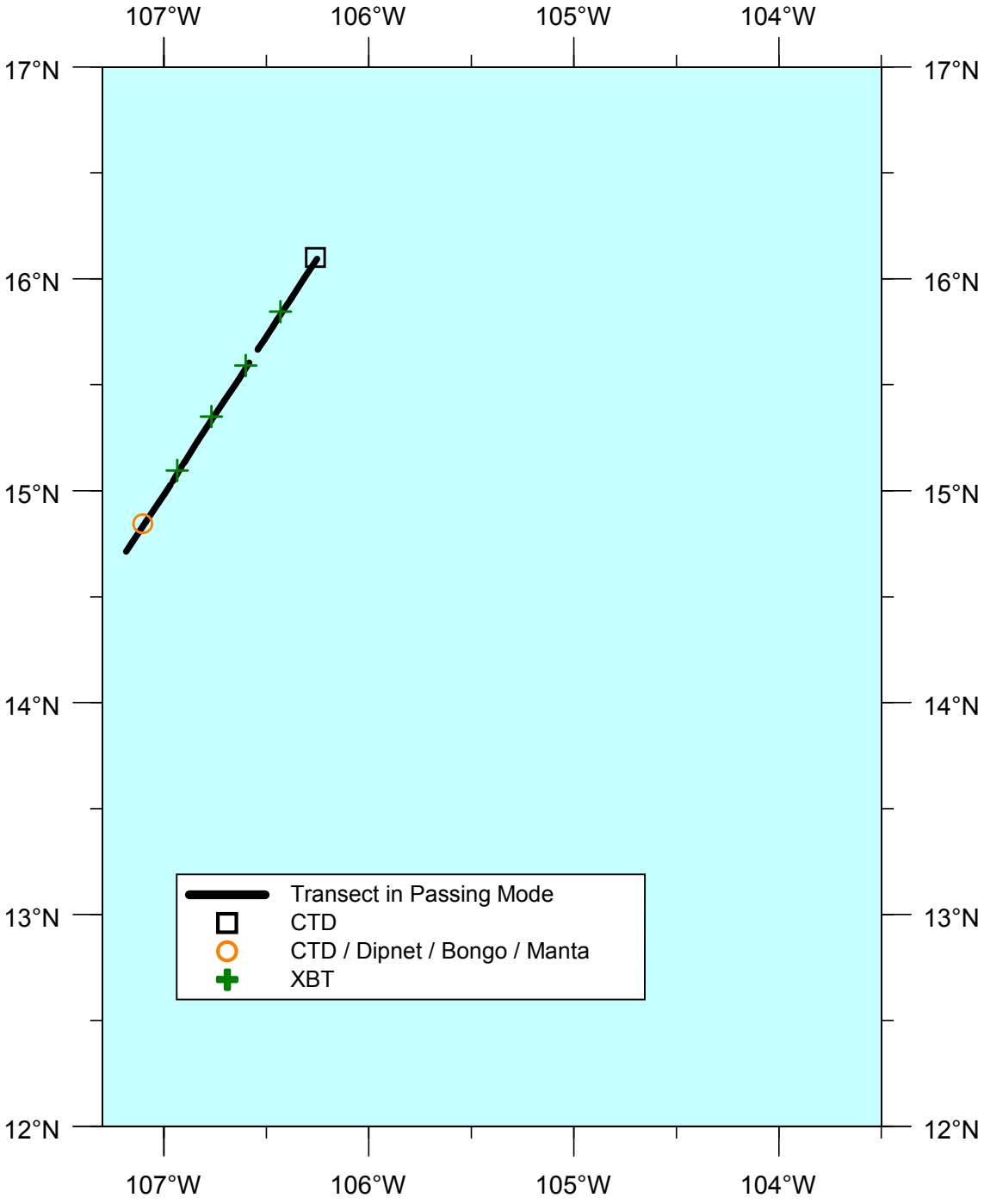
For this weekly we only have one station to report and despite the B 5 we were able to collect four specimens to increase our collection in the freezer. The short-winged flyingfish (*Oxyporhamphus*), were abundant and only a few two-winged flyingfish (*Exocoetus* sp.) were present during the station.

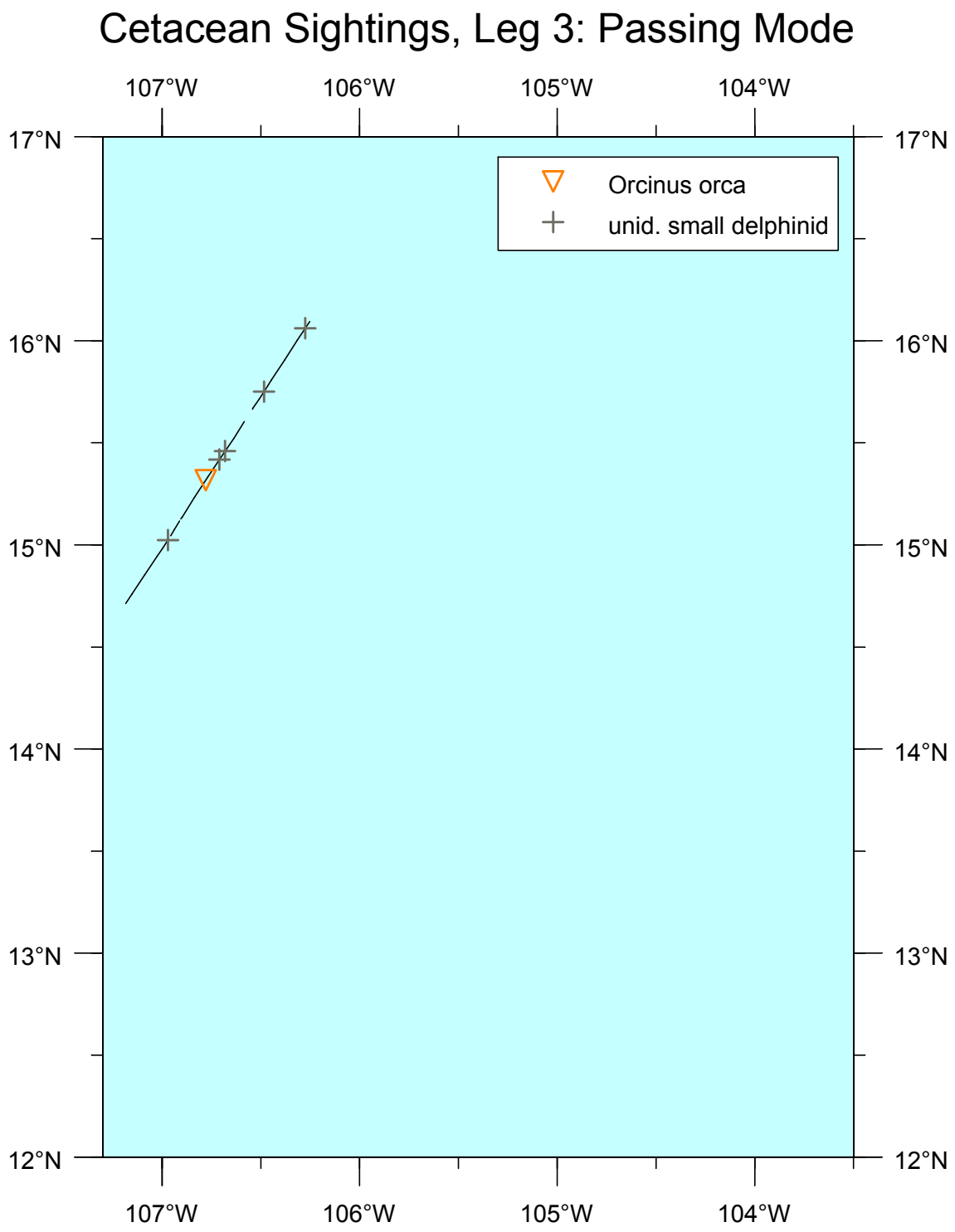
Under the suggestion of our "Sensei" we started to collect stomach samples from the short-winged flyingfish (*Oxyporhamphus*) which are present in almost all the stations and it will be interesting to compare with the other species.

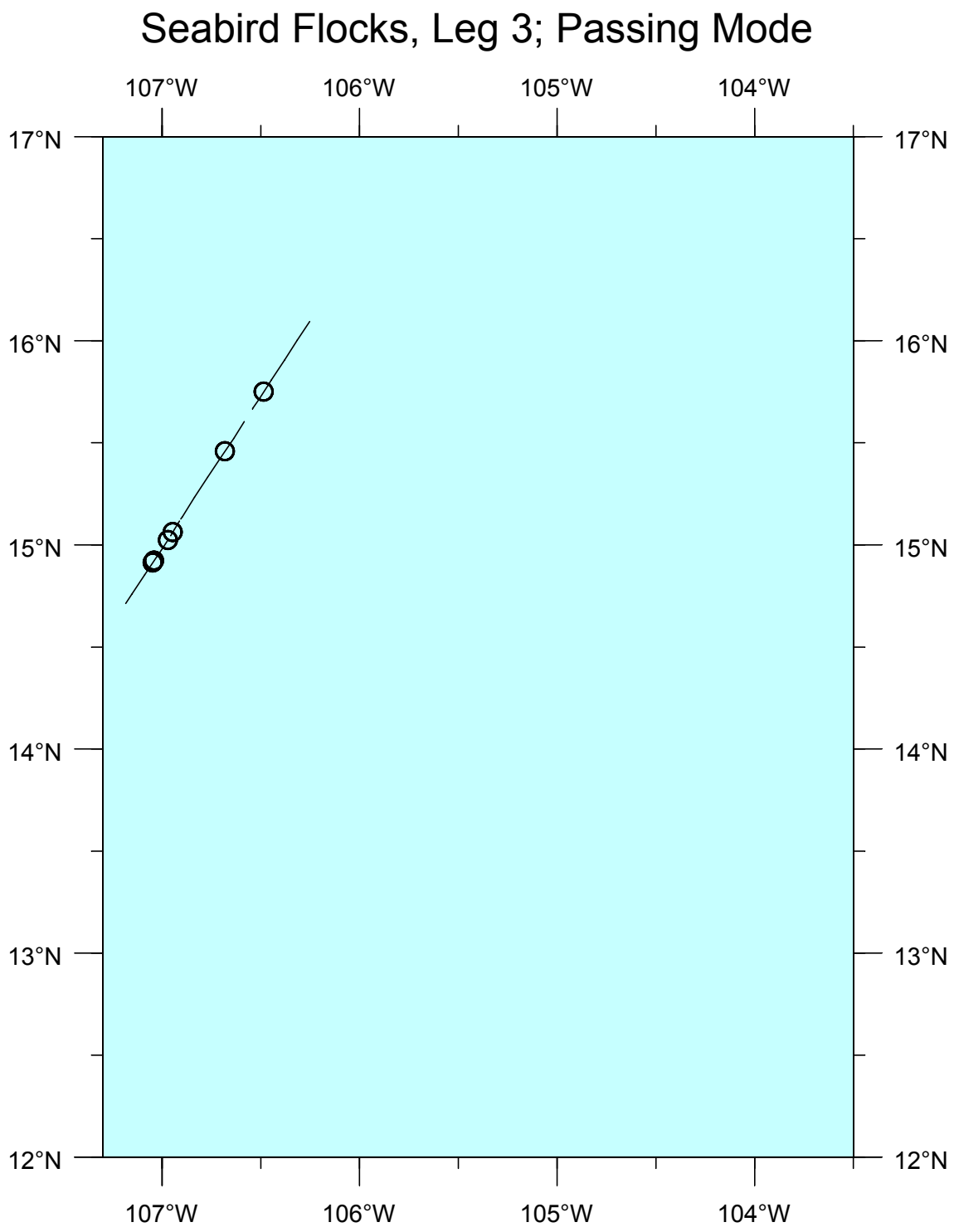
Fish collected	Weekly total	Grand total
Two-winged flyingfish (*Exocoetus* sp.)	1	162
Four-winged flyingfish (*Cheilopogon, Hirundichthys, Prognichthys*)		88
Short-winged flyingfish (*Oxyporhamphus*)	3	77
Lantern fish (Myctophidae)		7
Unidentified fish		3
Total	4	337

Stomach samples collected	Weekly total	Grand total
Two-winged flyingfish (*Exocoetus* sp.)	1	113
Four-winged flyingfish (*Cheilopogon, Hirundichthys, Prognichthys*)		56
Short-winged flyingfish (*Oxyporhamphus*)	3	1
Total	4	174

Ecosystem Sampling Stations, Leg 3; Passing Mode




Cetacean Sightings, Leg 3: Passing Mode
107°W
106°W
105°W
104°W
17°N
16°N
15°N
14°N
13°N
12°N
Orcinus orca
unid. small delphinid


Seabird Flocks, Leg 3; Passing Mode
107°W
106°W
105°W
104°W
17°N
16°N
15°N
14°N
13°N
12°N