Diel Dive Behavior of Fin Whales (*Balaenoptera physalus*) in the Southern California Bight

Supplemental Material

Eric M. Keen, Erin A. Falcone, Russel D. Andrews, and Gregory S. Schorr

Marine Ecology and Telemetry Research, Seabeck, WA 98380, USA
E-mail: eric.k@marecotel.org

Table S1. Proximity of tagged individuals to the nearest boundary of shipping lanes and naval ranges

		Shipping lanes		Naval ranges		
ID		LA	SFO	SOAR	SoCal	Pt. Mugu
BpTag048	%	4	0	15	94	34
(*n* = 4,246)	Min	0	477	0	0	0
	Max	79	649	101	59	85
	Median	31	586	27	0	17
BpTag050	%	0	0	48	100	0
(*n* = 1,004)	Min	41	575	0	0	3
	Max	75	597	16	0	24
	Median	56	587	3	0	14
BpTag058	%	0	0	12	36	87
(*n* = 2,412)	Min	66	533	0	0	0
	Max	95	609	51	14	34
	Median	75	551	29	1	0
BpTag059	%	0	0	56	100	50
(*n* = 714)	Min	44	558	0	0	0
	Max	95	602	14	0	26
	Median	65	575	0	0	0
BpTag060	%	0	0	37	84	65
(*n* = 1,221)	Min	16	487	0	0	0
	Max	82	588	86	38	13
	Median	55	565	8	0	0
BpTag061	%	0	0	99	100	2
(*n* = 634)	Min	66	574	0	0	0
	Max	99	602	1	0	26
	Median	89	593	0	0	17
BpTag063	%	0	0	3	73	37
(*n* = 3,065)	Min	36	455	0	0	0
	Max	254	848	225	114	34
	Median	130	599	54	0	14
BpTag066	%	3	0	24	90	58
(*n* = 2,330)	Min	0	489	0	0	0
	Max	120	702	94	51	12
	Median	63	555	23	0	0
BpTag072	%	0	0	0	10	68
(*n* = 4,446)	Min	29	111	1	0	0
	Max	543	573	769	712	343
	Median	82	487	109	52	0
BpTag073	%	6	0	0	44	36
(*n* = 2,401)	Min	0	475	10	0	0
	Max	82	607	113	61	44
	Median	10	547	51	5	5

Note: *n* = number of position records; % = percent of records within area; Min, Max, and Median = distances (km) from edge of area

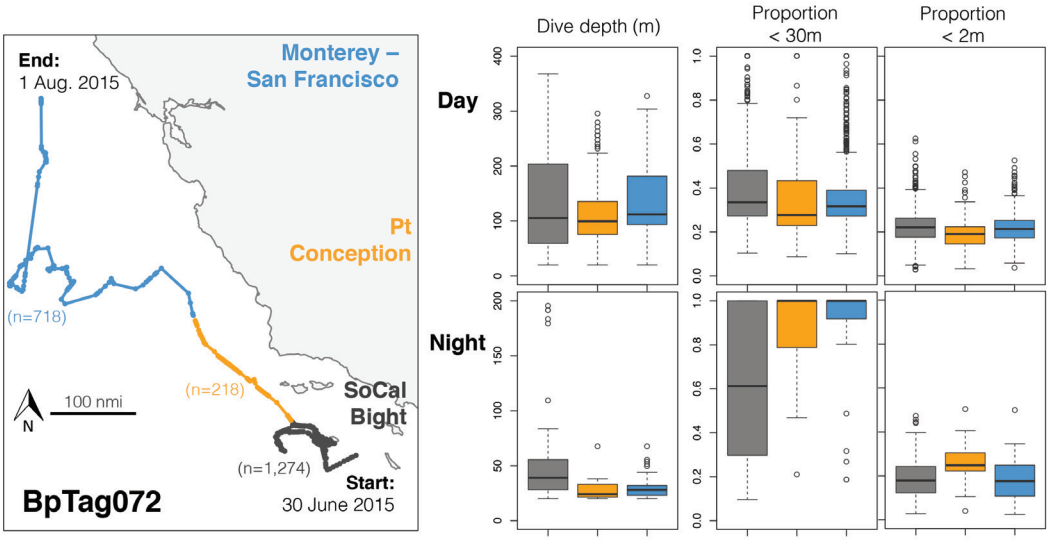

Figure S1. Box plot summaries of dive cycle metrics of BpTag072, delineated by approximate region (Southern California Bight [SCB], Pt. Conception area, and the Monterey–San Francisco area). "Proportion < 30 m" is the proportion of dive cycle spent within 30 m of the surface; "Proportion < 2 m" is the proportion of dive cycle spent within 2 m of the surface. Note the change in scale for dive depth between night and day. Sample sizes are the number of dive cycles within each region.

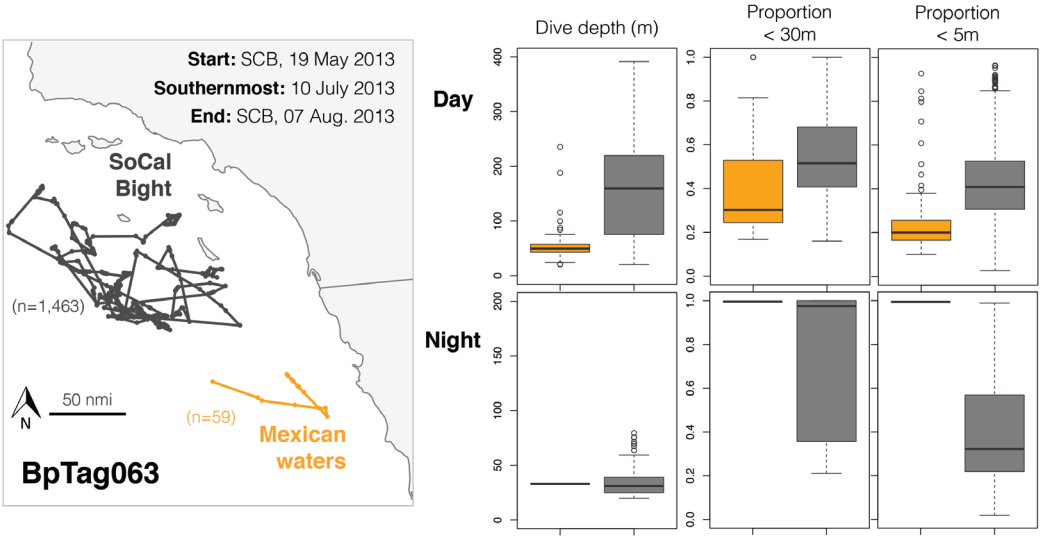

Figure S2. Box plot summaries of dive cycle metrics of BpTag063, delineated by approximate region (SCB and Mexican waters). "Proportion < 30 m" is the proportion of dive cycle spent within 30 m of the surface; "Proportion < 5 m" is the proportion of dive cycle spent within 5 m of the surface. Note the change in scale for dive depth between night and day. Sample sizes are the number of dive cycles within each region.

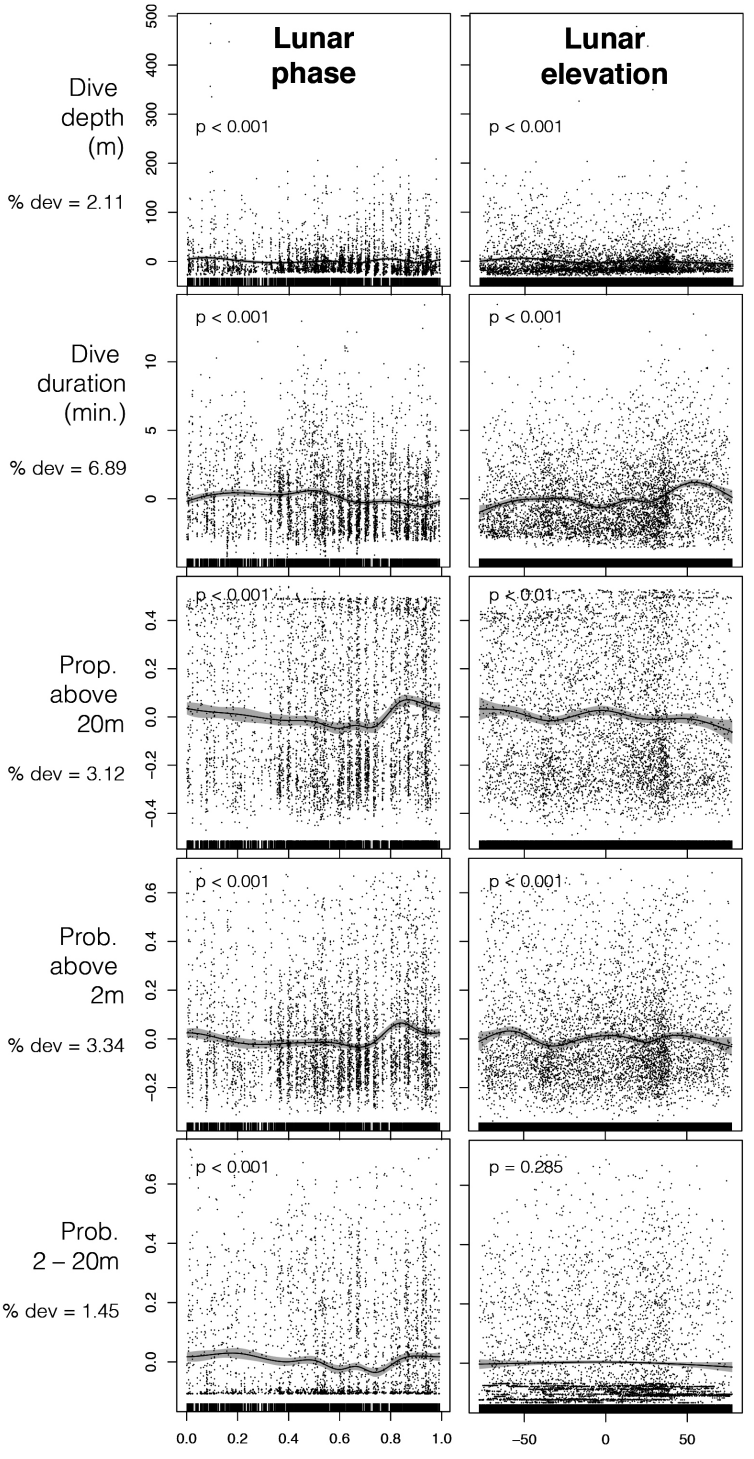

Figure S3. Spline functions of GAMs, with residuals and confidence intervals shown, that predict dive behaviors (rows) as functions of lunar phase (left column) and altitude (right column). The *p* values in each pane are the significance levels of spline functions. Percentage of data deviance explained by each model is provided under each dive behavior as "% dev."

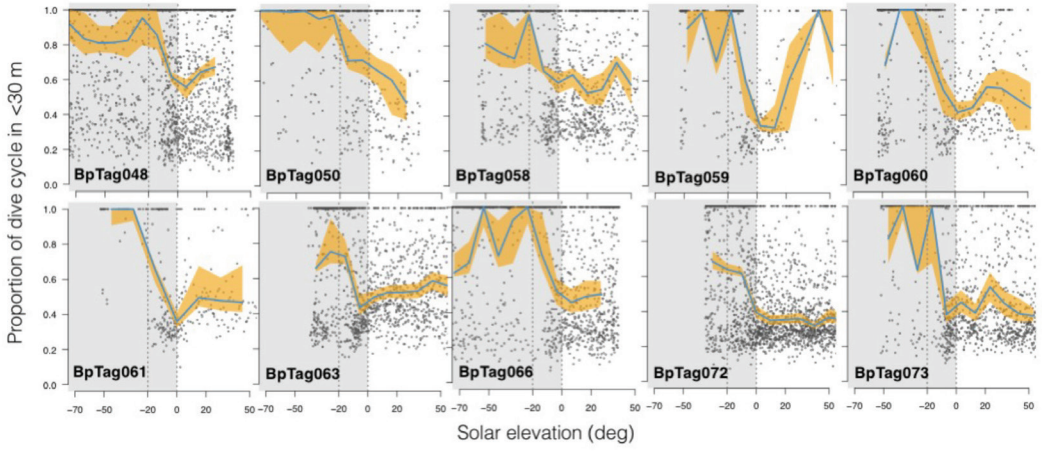

Figure S4. Individual variability in changes in proportion of dive cycle shallower than 30 m as a function of solar elevation, revealing diel modes of fin whale behavior and ship-strike risk. The blue line is a running median (window size = 10º of solar elevation); the orange area is the 95% CI of the median calculated using Wilcoxon sign rank test. Vertical dashed lines delineate the transition zone between the nighttime dive mode (less than -20º of solar elevation) and daytime dive mode (greater than 0º of solar elevation).

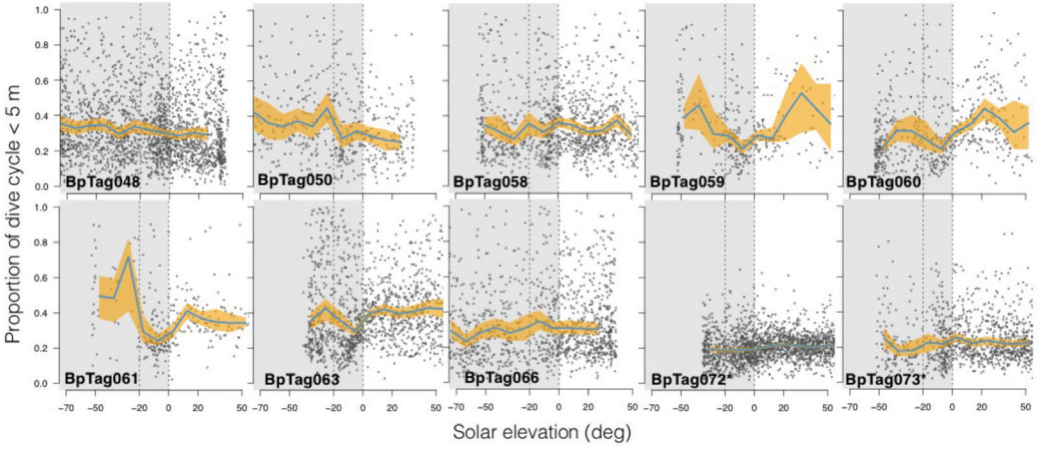

Figure S5. Individual variability in changes in proportion of dive cycle at the surface (< 5 m) as a function of solar elevation, revealing diel modes of fin whale behavior and ship-strike risk. The blue line is a running median (window size = 10º of solar elevation); the orange area is the 95% CI of the median calculated using Wilcoxon sign rank test. Vertical dashed lines delineate the transition zone between the nighttime dive mode (less than -20º of solar elevation) and daytime dive mode (greater than 0º of solar elevation). **Note:** BpTag072 and BpTag073 were programmed with a surface cutoff of 2 m instead of 5 m.

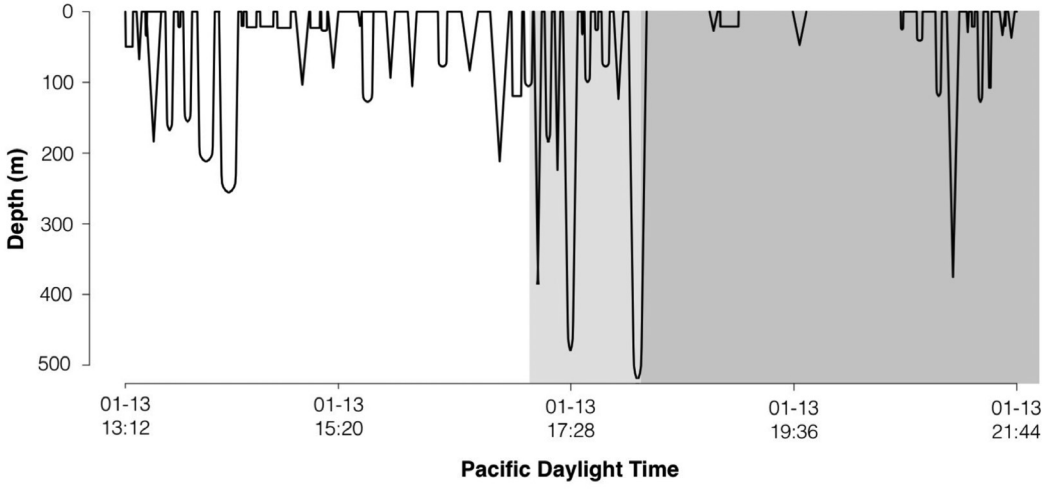

Figure S6. Dive profiles from the crepuscular time period surrounding the deepest recorded dive in the dataset (BpTag048, max = 527 m)