

## *Supplementary Material*

Supplementary Figure 1 – Histogram of surface phase durations. Vertical line limits 97.5% of surface phase durations.

Supplementary Figure 2 – Individual data distribution of the SD of pitch (on the log scale) during non-foraging periods, for non-exposure and exposure periods to whale watching vessels. Data from the 13 individuals that showed non-foraging behavior.

The type I and II error analysis included all data from time periods when the research boat was present, with and without whale watching vessels. For surface and non-foraging periods, recordings were characterized by the presence of loud splashing sounds which, very likely, masked other lower-level noises, such as the one produced by an engine in neutral mode. For descent periods there was a full agreement between visual and acoustic detection of whale watching vessels. We obtained 100% accordance of true positives during bottom and ascent phases, but the probability of making a type II error was 28 and 37%, respectively (Supplementary Table I). In addition, the hypothesized sperm whale avoidance responses were expected to be stronger during the whale watching exposure periods when the whale was at/near the surface and during the dives immediately after them.

Supplementary Table 1 – Number of acoustic vessel noise detections and visual whale watching detections during surface, descent, bottom and ascent phases and during non-foraging periods, with the associated percentages of true positives and true negatives.

	Surface		Descent		Bottom		Ascent		Non-foraging	
Acoustic vessel noise detection	Visual whale watching detection									
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Yes	5	0	23	0	16	0	8	0	20	15
No	17	17	0	18	7	18	7	12	38	78

  

True positives	100	100	100	100	57
True negatives	50	100	72	63	67

Supplementary Table 2 – Hypotheses, variable names and variable descriptions used in the exploratory analysis of the effects of whale watching vessels on sperm whales.

Hypothesis	Variable	Variable description
<b>Foraging effort</b>	Bottom phase depth	Median of bottom phase depth
	N° buzzes	N° of buzzes per dive
	Buzzes/minute	N° of buzz starts per minute, during the foraging phase
	Buzz duration	Mean duration of buzzes per dive
	IBI	Mean inter-buzz-interval per dive
	Search duration	Duration between the first and last usual clicks within a dive
	Search ratio	Proportion of search phase within a dive
	Foraging duration	Duration between the first and last buzzes within a dive
	Foraging ratio	Proportion of foraging phase within a dive
	Depth 1 <sup>st</sup> usual click	Depth of the first usual click within a dive
	Depth last usual click	Depth of the last usual click within a dive
	Depth 1 <sup>st</sup> buzz	Depth of the first buzz within a dive
	Depth last buzz	Depth of the last buzz within a dive
<b>Diving behavior</b>	Dive duration	Duration of dive
	Max depth	Maximum depth per dive
	Descent duration	Duration of the descent phase
	Descent ratio	Proportion of descent phase within a dive
	Bottom phase duration	Duration of the bottom phase
	Bottom phase ratio	Proportion of bottom phase within a dive
	Ascent duration	Duration of the ascent phase
	Ascent ratio	Proportion of ascent phase within a dive
	Pitch descent	Mean pitch during descent phase
	Pitch ascent	Mean pitch during ascent phase
<b>Locomotor effort</b>	Vvelocity descent	Mean vertical velocity during descent phase
	Vvelocity ascent	Mean vertical velocity during ascent phase
	ODBA descent	Mean Overall Dynamic Body Acceleration during descent phase
	ODBA bottom	Mean Overall Dynamic Body Acceleration during bottom phase
	ODBA ascent	Mean Overall Dynamic Body Acceleration during ascent phase
<b>Non-foraging behavior</b>	Pitch SD non-foraging	Standard deviation of pitch during non-foraging periods
	Roll SD non-foraging	Standard deviation of roll during non-foraging periods
	Duration vertical resting	Duration of vertical resting periods
	Duration non-foraging	Duration of non-foraging periods