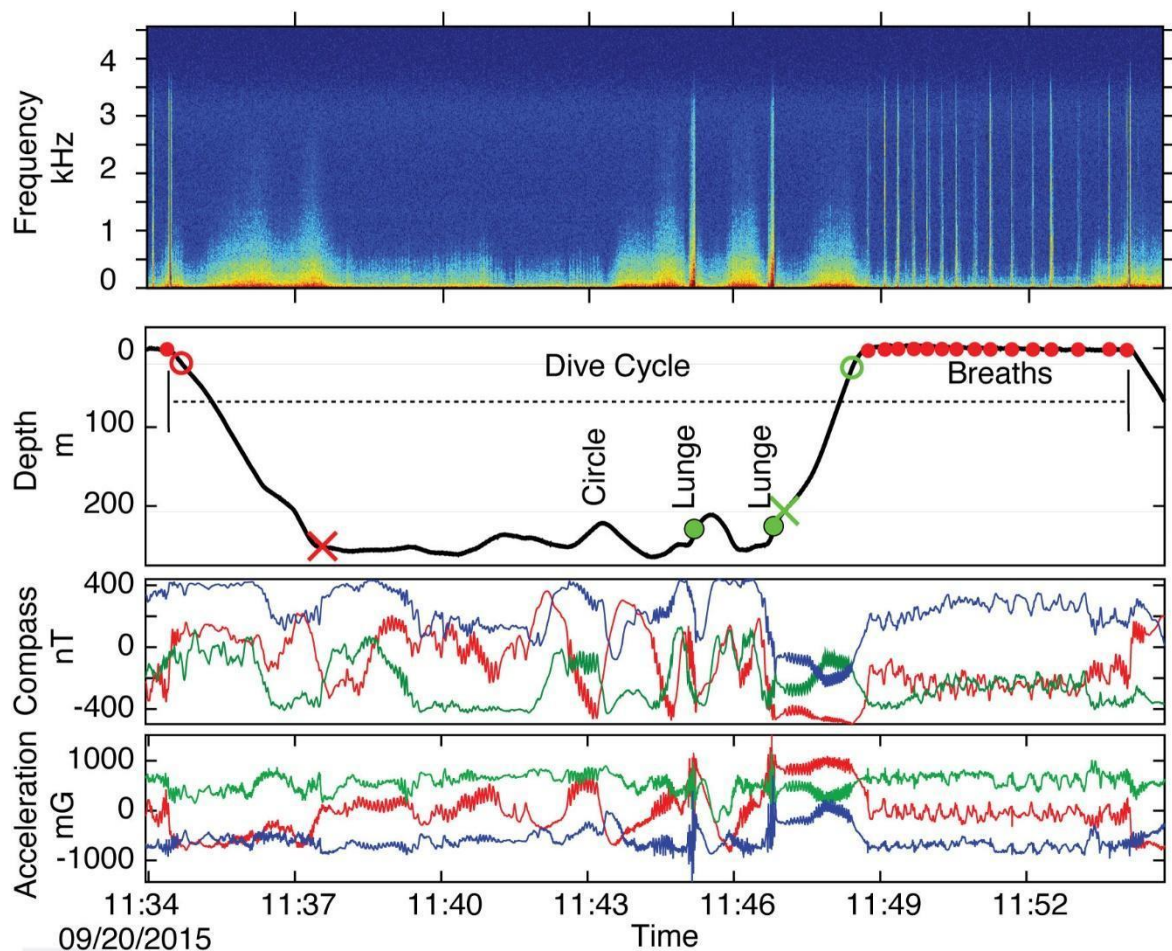


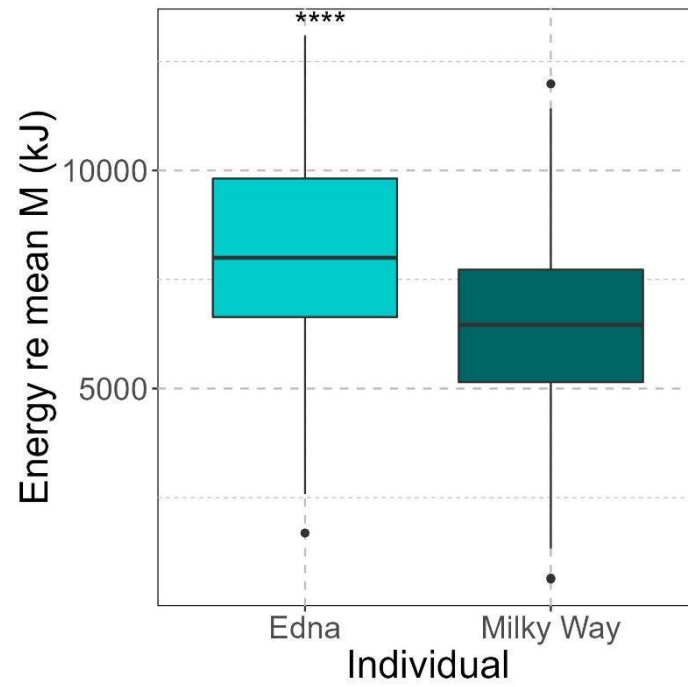
## Supplementary Information

### Kinematics and Energetics of Foraging Behavior in Rice's Whales of the Gulf of Mexico

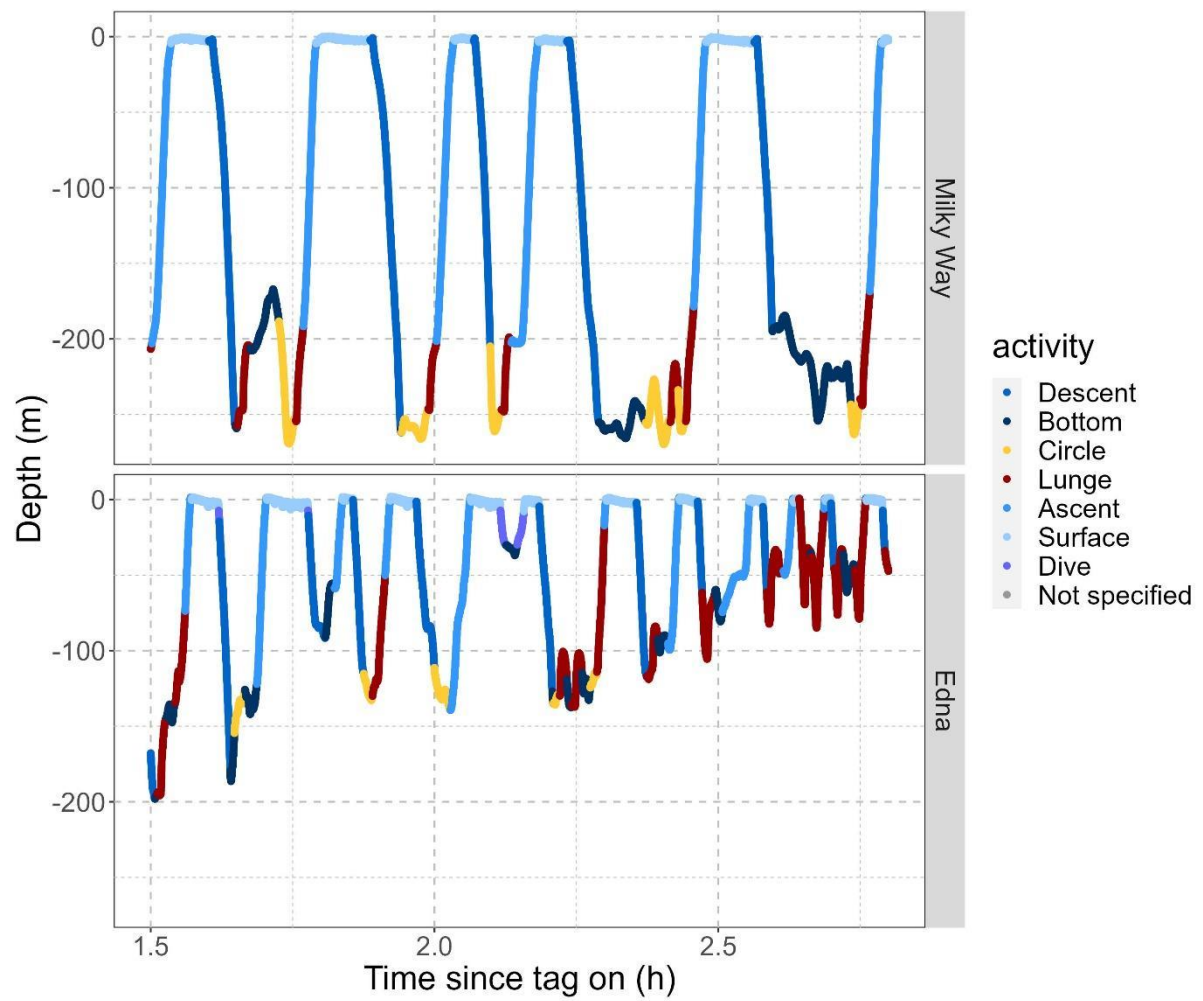
Annebelle CM Kok<sup>1\*</sup>, Maya J. Hildebrand<sup>1</sup>, Maria McArdle<sup>1</sup>, Anthony Martinez<sup>2</sup>, Lance P. Garrison<sup>2</sup>,  
Melissa S. Soldevilla<sup>2</sup> and John A. Hildebrand<sup>1</sup>



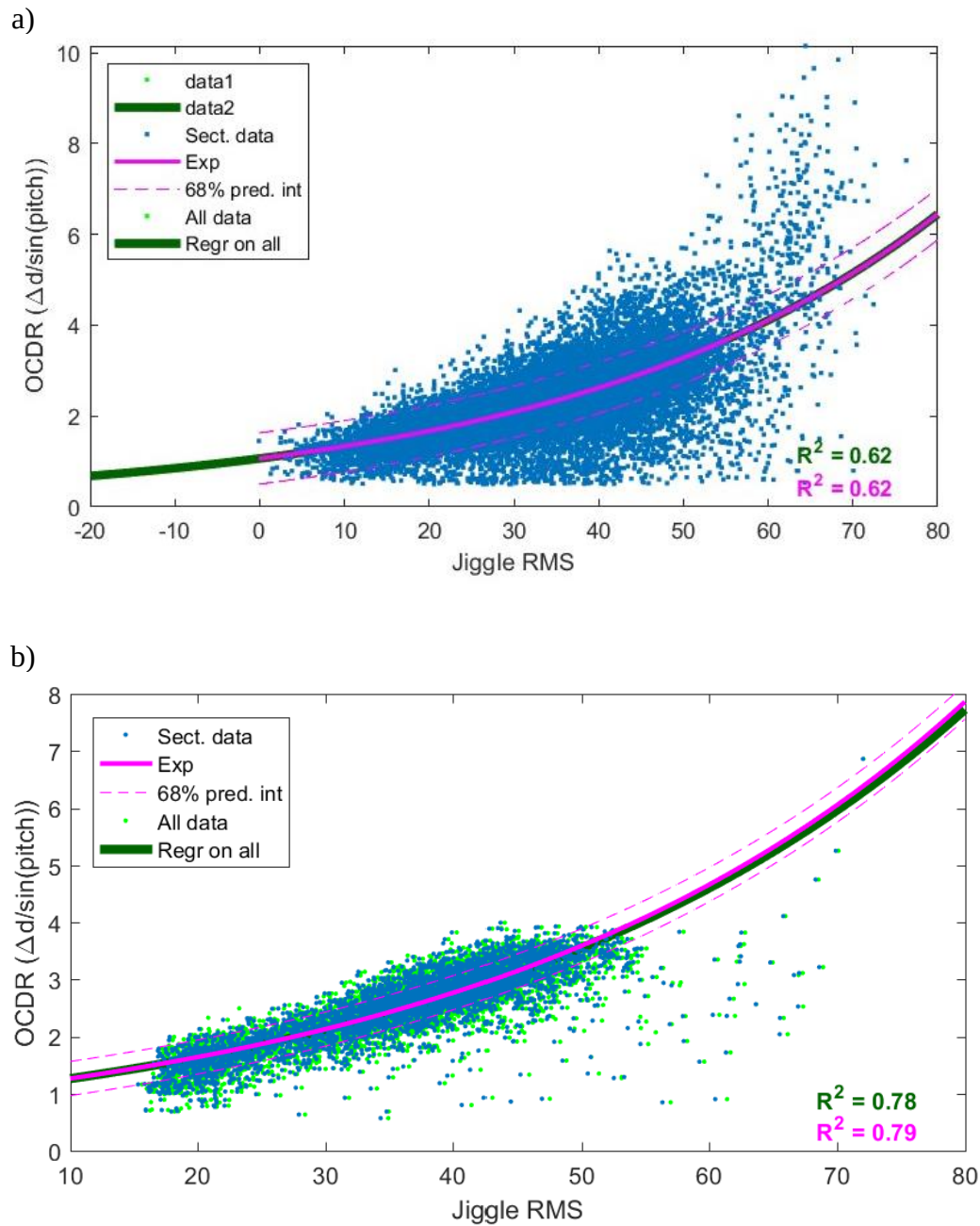
*Supplementary Figure S1. Acoustic spectrogram, depth, compass, and acceleration records for one dive cycle of Milky Way with annotations for breaths (red dots), neutral buoyancy (red and green circles), foraging lunges (green dots), end of descent (red cross), and beginning of ascent (green cross).*



Supplementary Figure S2. Energy usage relative to mean body weight per foraging dive for Edna (turquoise) and Milky Way (dark green). Energy expenditure was significantly higher for Edna (Kruskal-Wallis,  $\chi^2 = 18.332$ ,  $p < 0.001$ ). Significant differences between animals are indicated as: \*\*\*\* =  $p < 0.001$ .



Supplementary Figure S3. Section of the dive profile of both tagged animals, color-coded by assigned activity. The type of activity was based on depth, swimming speed, and pitch, roll and heading of the animal.



Supplementary Figure S4. Regression of the tag jiggle root-mean-square against the orientation corrected depth rate (OCDR) for a) Milky Way (G2015) and b) Edna (G2018). Green dots = all data points, blue dots = data points of one section of the tag, pink solid line = expected correlation between Jiggle RMS and OCDR, pink dashed line = 65% of predicted values fall within these lines, green solid line = regression based on data. *Sensu Cade et al. 2018.*

Supplementary Table 1:

| Reference                   | Species        | Prey type | Lunges/dive               | Lunges/10 min | Lunges/hour mean (sd)                     |
|-----------------------------|----------------|-----------|---------------------------|---------------|-------------------------------------------|
| (Izadi et al., 2022)        | Bryde's whale  | krill     | 5.5                       |               | 11.2 (9)                                  |
|                             |                | fish      | low                       |               |                                           |
| (Segre et al., 2022)        | Bryde's whale  | fish      | 1 (shallow)<br>4-5 (deep) | 4-5 (deep)    |                                           |
| (Alves et al., 2010)        | Bryde's whale  |           | 1-3                       |               |                                           |
| (Owen et al., 2017)         | Humpback whale | krill     |                           | 10            | 49                                        |
|                             |                | fish      |                           | 3             | 5                                         |
| (Burrows et al., 2016)      | Humpback whale | krill     | 8-10                      |               |                                           |
| (Cade et al., 2020)         | Humpback whale | fish      |                           |               | 3.9 (2)                                   |
| (Friedlaender et al., 2020) | Fin whale      | krill     | 4                         |               | 15.15 (4.9, shallow)<br>29.33 (1.5, deep) |

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