**Appendix: In-air acoustic repertoire and acoustic behaviour of wild juvenile crabeater seals during rehabilitation**

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## Appendix A: Characteristics of underwater moan calls

Table A1. Average ± standard deviation of characteristics of underwater moan calls from previous studies (Klinck et al. 2010; Shabangu and Charif 2021). – represents a case when measurement was not used as it was likely limited by the Nyquist frequency of the recording. PRR is pulse repetition rate.

| Call name | 90% duration (s) | 5% minimum frequency (Hz) | 95% maximum frequency (Hz) | Peak frequency (Hz) | PRR (Hz) | Reference |
|---|---|---|---|---|---|---|
| Low moan (n=152) | 2.5 ± 0.30 | 264 ± 89 | 2520 ± 735 | 612 ± 137 | 75 ± 8 | Klinck et al. (2010) |
| High moan (n=86) | 2.6 ± 0.30 | 998 ± 67 | 4896 ± 849 | 1308 ± 124 | 50 ± 8 | Klinck et al. (2010) |
| Short moan (n=275) | 2.2 ± 0.30 | 409 ± 84 | – | 597 ± 109 | 77 ± 6 | Shabangu and Charif (2021) |

## Appendix B: PERMANOVA test for recording instrument comparability

To check whether recording instruments influenced seal call type characteristics, recordings made with a Blackview B5500 smartphone and a Sony handheld microphone in Gqeberha were compared. Permutational multivariate analysis of variance (PERMANOVA) test (Anderson 2001) was used to test if there was a significant difference in values of the different call characteristics of each call type when measured by the two instruments (Table B1). PERMANOVA test is used for distance based splitting of sources of variation by fitting linear models to distance matrices. In the present context, distance among sampling point (time of observations) defined by call characteristics was modelled as a function of call type and

instrument type. PERMANOVA test was implemented using 'adonis2' function (McArdle and Anderson, 2001) of 'vegan' package (Oksanen et al. 2020) in R.

Table B1. Results of PERMANOVA test for the effect of call type and instrument type on moan call characteristics. Statistical significances were tested by permutation in this case set to be 999. Formula used: Call characteristics ~ Call type * Instrument type. Df is degree of freedom, F is sample F-ratio which is to be compared to pseudo-F ratios obtained by permutation and Pr is probability value for rejecting the null hypothesis of no difference. Significance level ($P < 0.05$) as threshold of test significance. Boldfaced value indicates significance of Pr (>F).

| | Df | Sum of squares | $R^2$ | F | Pr (>F) |
|---|---|---|---|---|---|
| Call type | 2 | 0.114 | 0.074 | 2.674 | **0.035** |
| Instrument | 1 | 0.017 | 0.011 | 0.789 | 0.468 |
| Call type: Instrument type | 2 | 0.017 | 0.011 | 0.393 | 0.821 |
| Residual | 65 | 1.381 | 0.904 | | |
| Total | 70 | 1.528 | 1.000 | | |

## Appendix C: Sample balancing methods

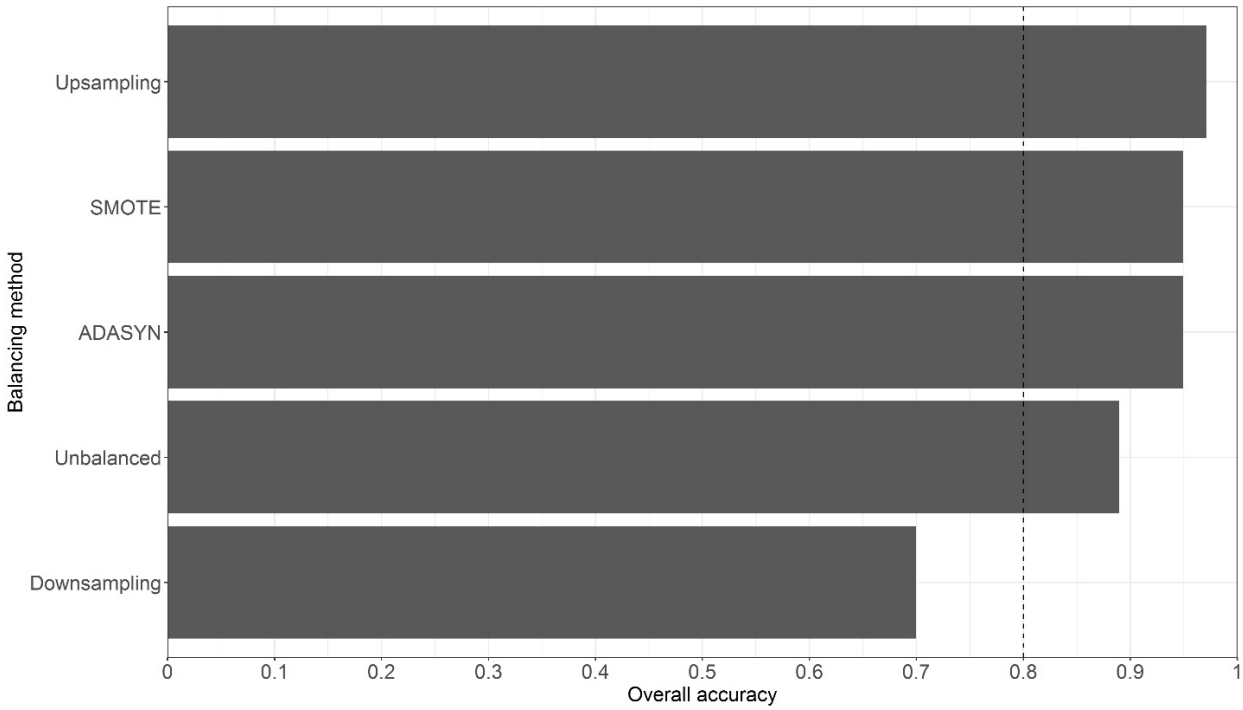


Figure C1. Overall classification accuracy of different RF models with different sample balancing methods according to the correlation threshold of 0.8 (dashed vertical line).

## Appendix D: Description of Durban recording sessions

Table D1. Description of behavioural recording sessions of Ragnar in Durban.

| Session type | Description |
|---|---|
| No session | There were no animal care staff or data collectors in or around the pen. |
| Pre-feed | The time period between which the animal care staff entered the pen area with a cooler box of fish until feeding commenced. |
| Feed | The time period between which animal care staff opened the cooler box of fish until the fish was finished and the cooler box was closed and removed from the pen. |
| Post-feed | The time period immediately after feed. |
| Transportation preparation | This includes feeding the seal with tongs in an attempt to encourage it closer to the crate and subsequently loading the seal into the crate for transportation. |

## Appendix E: Pearl behaviour observations

### *Citizen observations*

A total of 36 citizen scientists volunteered to observe the behaviours and activities of the seal over weekends: for 24 hours between 14 (15h00 Coordinated Universal Time (UTC)) and 15 (15h00 UTC) May 2021, for 51 hours between 21 (15h00 UTC) and 23 (18h00 UTC) May 2021, and for 34 hours between 26 (05h00 UTC) and 27 (15h00 UTC) June 2021. These scientists continuously observed the seal on three-hour rotating shift system outside the pen (at approximately 2 m from pen fence) under a gazebo furnished with chairs, each team consisted of one to three citizen scientists. One of us (GJGH) made sure that teams were competent i.e. if somebody had never done observations before, then somebody with experience or GJGH was coming in to make sure of the quality of the data recorded. A safety and information briefing sessions were conducted before the beginning of the first observation weekend. GJGH also briefed all observers before the start of their first shift, and regularly assessed their progress in person or telephonically. Citizen scientists were provided with a form to fill in the observed sound produced and activities: active (moving around, swimming, feeding, rolling) or resting (sleeping, not moving around or briefly

awake). Citizen scientists were requested to be silent during observations and not interact with the seal, so that they did not unintentionally influence the behaviour and/or activities of the seal. The AudioMoth recorder was simultaneously recording during observations by citizen scientists on 26 and 27 June 2021. Disturbance incurred during the observations included twice daily feeding sessions and pen cleaning by one of us (GJGH).

***Daylight regime definition***

Civil twilight was defined as when the centre of the sun was less than 6° below the horizon, nautical twilight was defined as when the centre of the sun was between 6° and 12° below the horizon, and astronomical twilight was defined as when the centre of the sun was between 12° and 18° below the horizon. These twilight zones represented dawn and dusk in the morning and evening respectively. Daytime was defined as the time between dawn and dusk, whereas night-time was the time between dusk and dawn.

## Appendix F: Comparison of Ragnar's hiss production rate

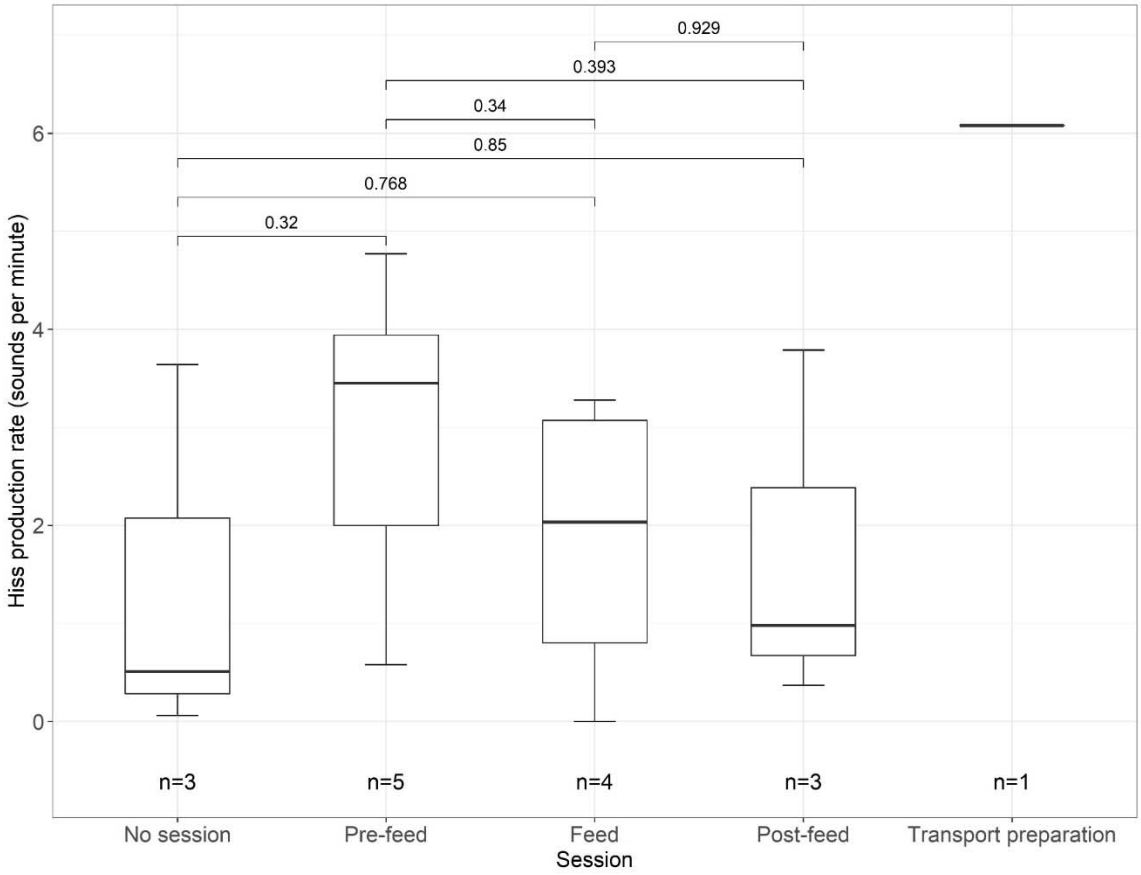


Figure F1. Box and whisker plot of hiss production rate of Ragnar for each interaction session with animal care staff in Durban. n is the sample size of each session. Boxes signify the interquartile range (i.e., the first to the third quartile), and black horizontal line inside boxes specify medians. Whiskers indicate 1.50 times the interquartile width. Lines and numbers above the plot indicate *P* values between sessions; no significant test was done for the transport preparation since it comprised one session only.

## References

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