



van den Berg



Evaluation of parameters determining rehabilitation success of harbour porpoises (*Phocoena phocoena*) to assist in adequate decision-making during stranding events

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OBJECTIVE

- Harbour porpoises frequently wash up on Dutch coasts. Alive stranded animals are reported to SOS Dolfijn, which was founded in 2004.
- Upon opening a **state-of-the-art rescue centre in 2022**, rehabilitation efforts became feasible again.
- In case of stranding, SOS Dolfijn has three options: relocate the animal back to sea, immediate euthanasia on site, or rehabilitation. Decisions on the beach faced with a distressed animal can be considerably complex.
 - The possibility of prolonged pain and suffering during the long rehabilitation period must be weighed carefully against the option for immediate euthanasia on-site.
 - An alternative is to relocate the animal directly to the sea, but this is often not preferred as most stranded animals require veterinary assistance.
- **To assist in the decision-making process during a stranding event, an animal's suitability for the rehabilitation process was investigated.**

METHOD

- Previously collected data (1967-2017) on harbour porpoises (n=208) that were registered by SOS Dolfijn, and/or the Dolfinarium Harderwijk were examined. Only animals that had entered the rehabilitation center were considered, hence animals (n=32) that i.e., died or were euthanized prior to or during transport were excluded.
- **The probability of whether an animal successfully rehabilitates was examined by binomial logistic regression, using a generalized linear model (glm)** in which family was set to binomial (link= 'logit').
- Four possible predictive parameters that could be inspected directly on site were selected: **sex, age class, body condition, and the presence of external wounds.**
 - Standard length cut-offs were used for the age-class classification (i.e., IJsseldijk et al., 2020).
 - $BMI = \frac{weight(kg)}{length(m)^2}$, was used as a proxy for body condition.
- Statistical analyses were performed with *R* version 4.0.3 at a 0.05 significance level.

RESULTS

- Univariable binary logistic regression showed that from the four selected, **BMI** (p<0.001) and **age class** (p<0.001) were found to be **predictive factors** for succeeding in the rehabilitation process.
- The multivariable analysis finds that both BMI (p<0.01) and age class (p<0.001) are factors playing a role in succeeding in the rehabilitation process.
 - Keeping other variables constant, the **odds** that an animal successfully rehabilitated and returned to the wild is about **five times higher for juveniles** [OR= 4.80; 95% CI= 1.94-13.28] compared to animals classed as non-juveniles (being neonates or adults).
 - In addition, for every unit (+1.0) increase in **BMI**, the odds of a successful rehabilitation **increase by a factor of 1.5** [OR=1.51; 95% CI= 1.30 to 1.81].
- The **hit radio** of the multivariable model with two predictors (BMI and age class) was **72%**, which means the model is doing a reasonable job in predicting the fate of a stranded harbour porpoise in a rehabilitation trajectory.

DISCUSSION & CONCLUSION

- Experiences of half a century of rescue work offered great insight into the suitability of harbour porpoises for entering into the rehabilitation process.
 - High success rates were achieved for the rehabilitation efforts of SOS Dolfijn in which **42%** could be **released** back into the wild.
- Harbour porpoises classed as **juveniles** and animals with a **high BMI** score were found to have the **best chances of successful rehabilitation.**
- As a next step, adding more parameters such as the grade and origin of the injuries, stranding season, age by radiographic assessment of the pectoral fin, or contracted diseases could be helpful.

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