

Vocalizations of free ranging penguins (*Eudyptula minor*) at St. Kilda, Victoria.



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OUTLINE

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OBJECTIVE

To determine if rate of vocalizations in penguins was influenced by

- a) Gender
- b) Capture Experience
- c) Weight

To Determine the feasibility of recording penguin vocalizations to construct a signature key

Methods

The study was conducted at the St Kilda pier along the breakwater.

This site was selected because of several logistical reasons:

- Earthcare has collected long-term data on this population of penguins,
- The ability to work simultaneously with Earthcare volunteers minimizing the level of disturbance to the target animals and
- Study site access.

Penguins randomly caught.

Penguin delivered to mobile work station.

Penguins weighed/sexed.

Recording of Vocalization's began.

Penguins checked for tag & microchip.


**Sex & weight of penguin recorded.
1st minute scan**

**# of Vocalisations
Continuously recorded
During
every one-minute scan.**

No tag.

Tag.

**Tag # Recorded.
First minute scan**

 **every 1 minute
of vocalizations recorded.
Procedure was repeated
up to 4 min.**

**MicroC by
VET**

**Tag#
recorded.**

**Capture Experience was
documented**

**Microchip#
recorded.**

**Time handling was
completed was recorded.**

Penguin returned.

Procedure would be repeated for each penguin caught.

VOCALIZATIONS PER MINUTE PER PENGUIN

Vocalizations were quantified as number of vocalizations produced per minute per penguin.

This could be achieved as only one penguin was brought to the workstation at any given time.

- The recording microphone was placed in close proximity to the penguin to ensure that the vocalizations recorded were from the study animal.
- The individual could also be distinguished as vocalizing by observing the movement of its beak.

PPVI

To utilize whistling rates in the last minute we developed a formula to standardize whistling rates per penguin per minute.

The formula was defined as
Penguin Probability Vocalization Index (PPVI).

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$$- \quad = \frac{\text{Number of Vocalization recorded} \times \text{Sixty seconds}}{\text{Length of scan}}$$

For example if 2 vocalisation were recorded in 48 seconds we multiplied 2 by 60 and then divided it by 48.

The PPVI equalling 2.5 vocalizations per minute per penguin.
This procedure was only employed if more than 30 seconds of vocalization data was obtained.
If less than 30 seconds of data was obtained the scan would be disregarded from the dataset.

RESULTS

A total of 50 penguins were captured from May-September 2004.

A total of 29 female and 21 male penguins were captured.

The maximum number of penguins caught during a field trip was 12 (Mean = 6.25, Range = 0-12, N = 8).

The mean period of time each penguin was handled was 149.5 seconds (Range = 73-333, S.D = 58.6, N = 50).

Fig 1: Mean number of vocalizations produced by penguins according to gender (p=0.2334)

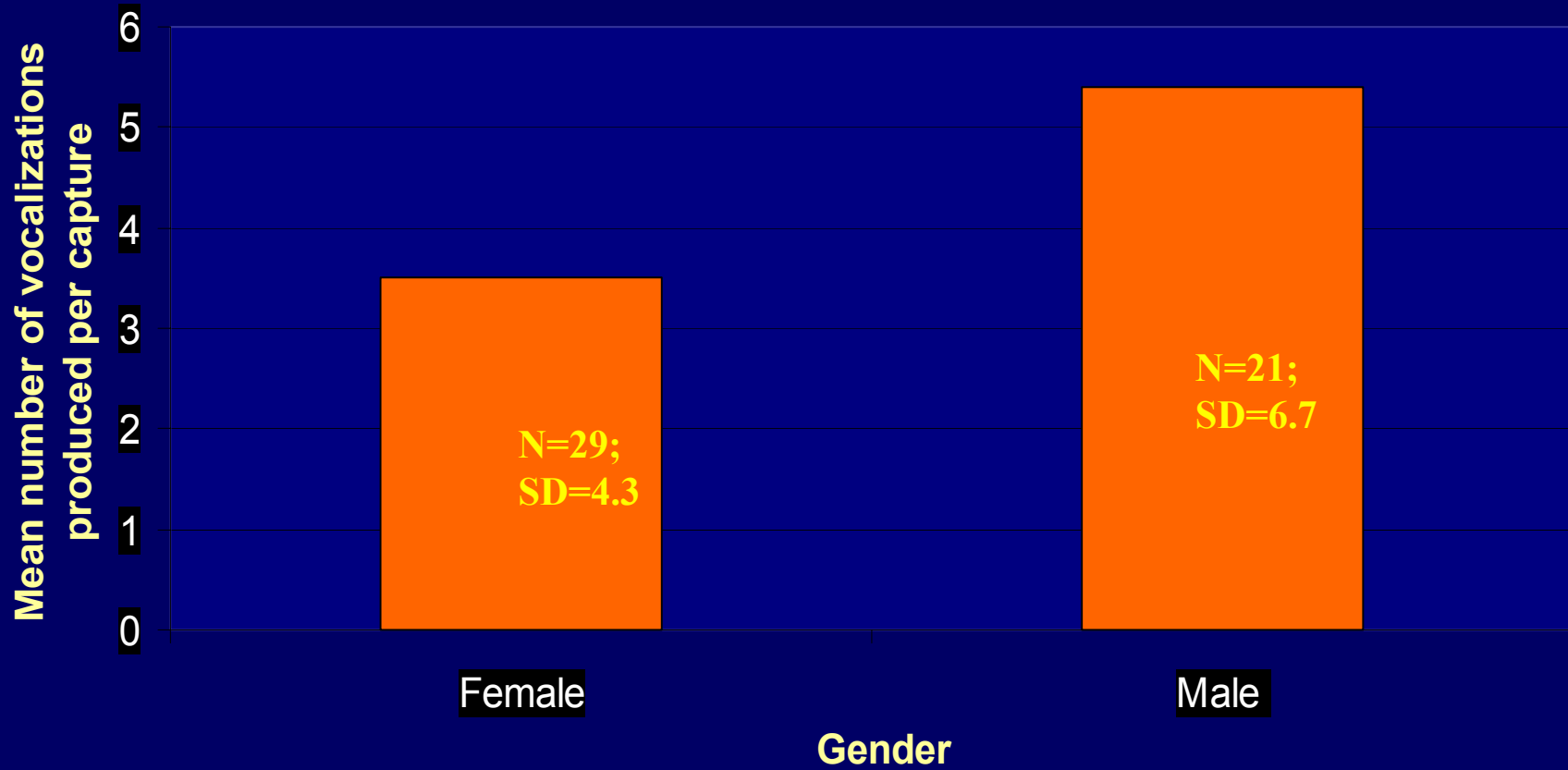


Fig 2: Mean Vocalization produced per minute according to capture experience

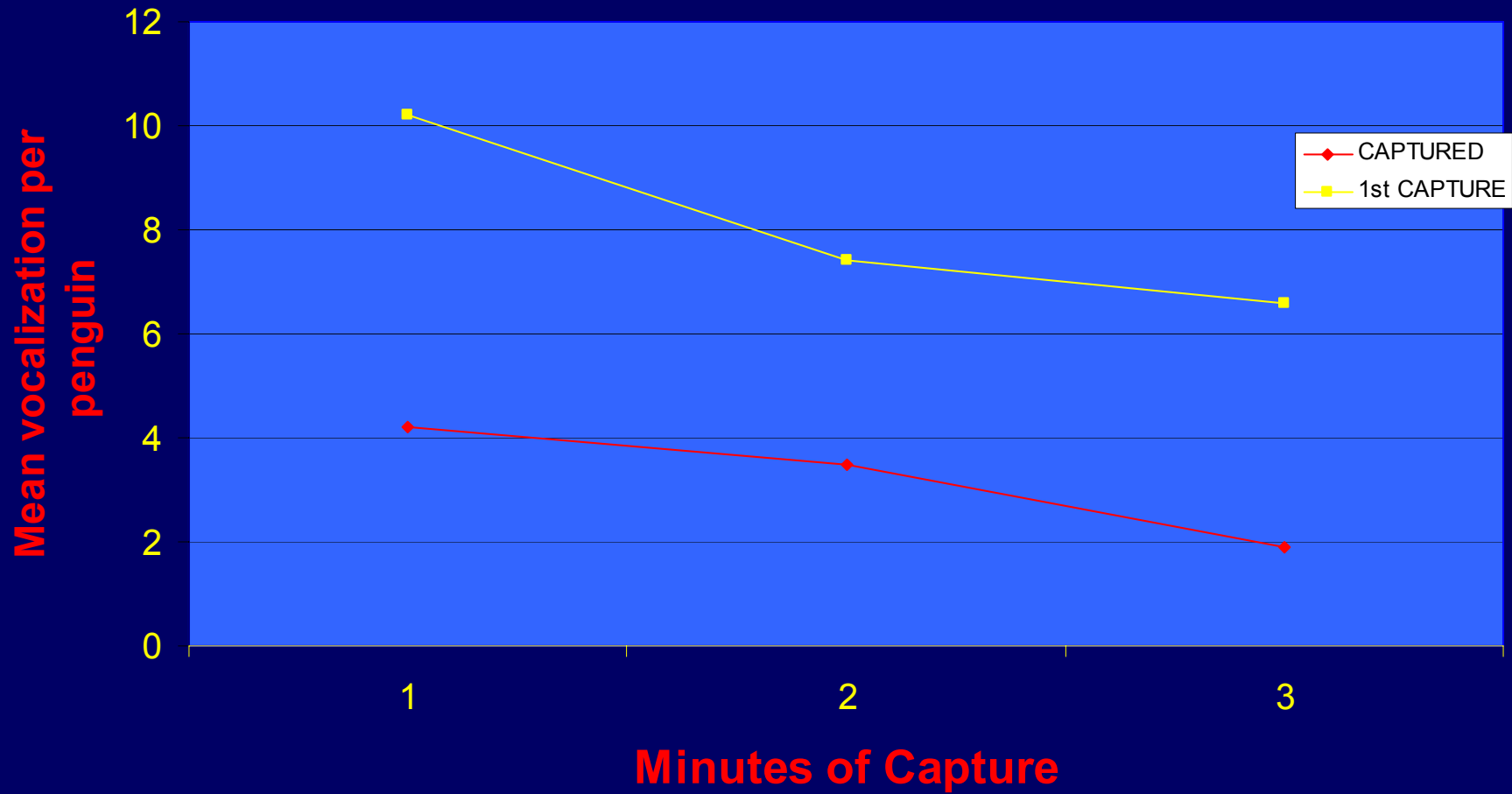


Table 1: Mean number of vocalizations produced by penguins during minute 1 of capture

	MEAN	N	SD	
CAPTURED	4.2	40	5.2	$p=0.015$
1st CAPTURE	10.2	10	11	

Table 2: Mean number of vocalizations produced by penguins during minute 2 of capture

	MEAN	N	SD	
CAPTURED	3.5	40	5.0	$p=0.042$
1st CAPTURE	7.4	10	6.3	

Table 3: Mean number of vocalizations produced by penguins during minute 3 of capture

	MEAN	N	SD	
CAPTURED	1.9	20	5.2	$p=0.086$
1st CAPTURE	6.6	10	11	

FUTURE RESEARCH

Increase sample size

Signature calls to estimate population size

ACKNOWLEDGEMENT

Earthcare and Earthcare Volunteers

Victoria University of Technology

Volunteers