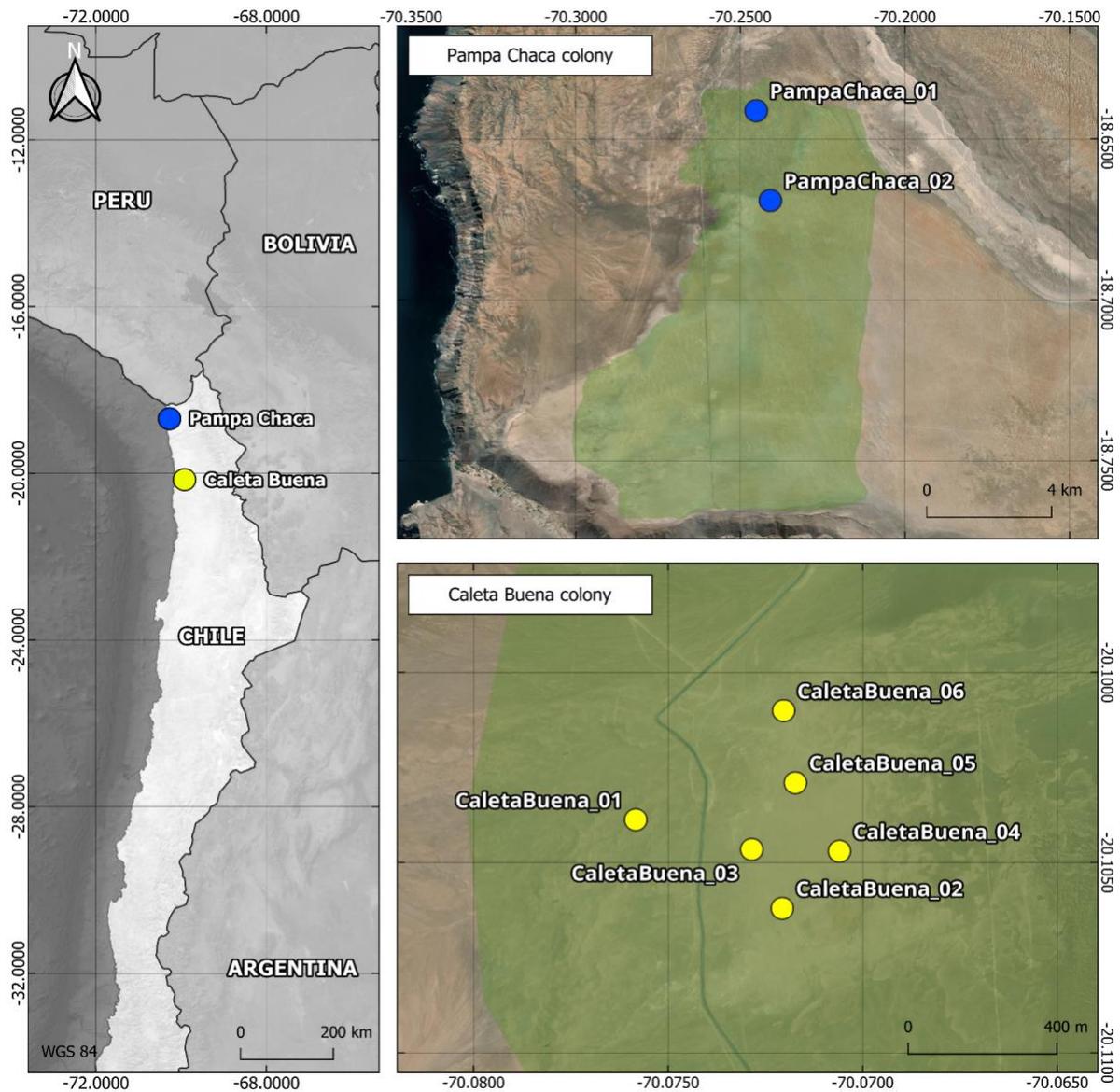


Appendix 1

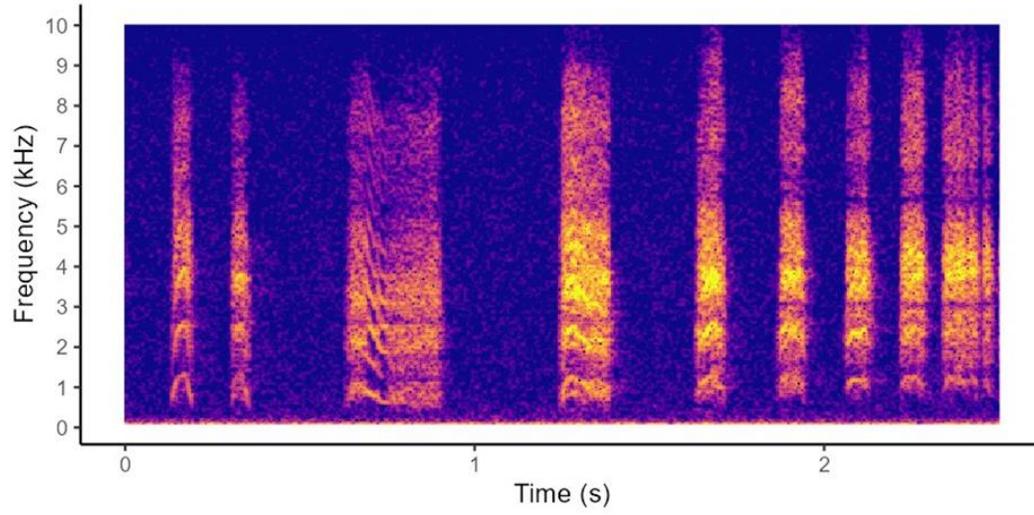
STUDY SITE MAP

Fig. A1. Map of acoustic recorder deployments for surveys of Markham's Storm-Petrel *Hydrobates markhami*. Recorders were placed in the Caleta Buena and Pampa Chaca colonies in the Atacama Desert, Chile.



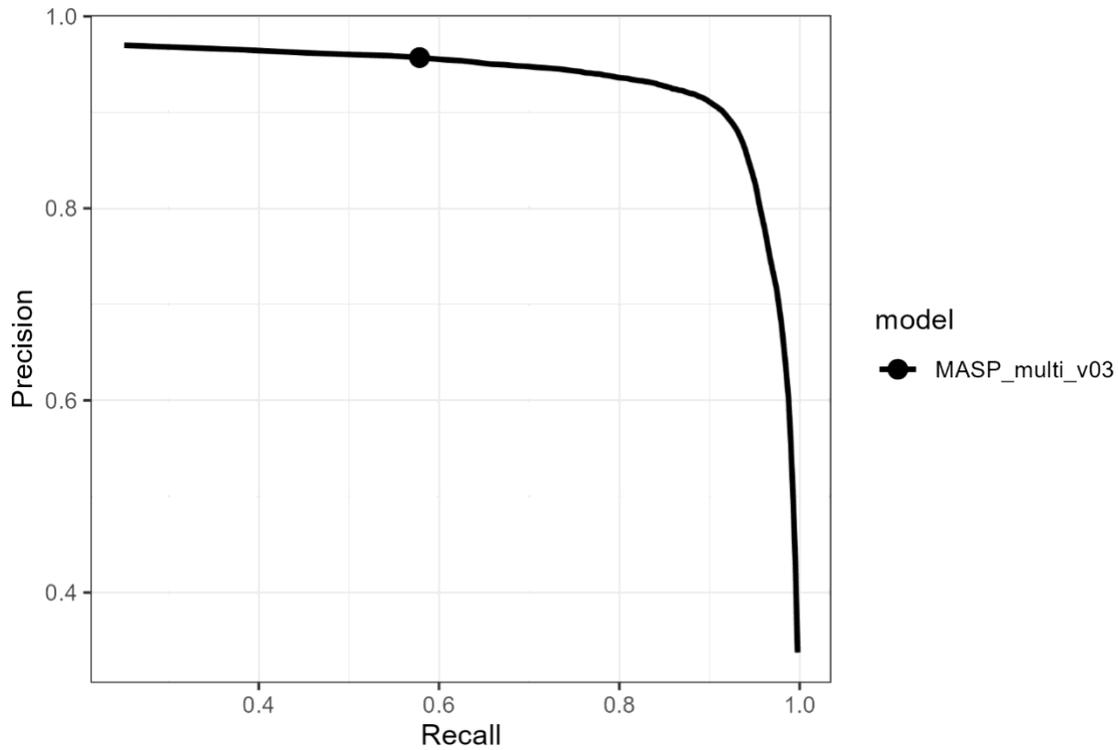
MARKHAM'S STORM PETREL VOCALIZATION

Fig. A2. Spectrogram of a vocalization from Markham's Storm Petrel (*Hydrobates markhami*).



MARKHAM'S STORM PETREL MODEL PERFORMANCE

Fig. A3. Precision-Recall curve for MASP_multi_v03 detection model. Curve is an average from 3-fold cross validation. The confidence threshold selected (0.94) was selected to achieve the highest recall with ≥ 0.95 precision.



DEPLOYMENT INFORMATION**Table A1.** Locations and recording dates of all deployments in the Caleta Buena and Pampa Chaca colonies, Chile.

Survey Site	Latitude	Longitude	First Recording	Last Recording
PampaChaca_01	-18.64126	-70.24516	2021-04-15 20:30:00	2023-05-24 07:30:00
PampaChaca_02	-18.66917	-70.24087	2021-04-15 20:30:00	2023-05-24 07:30:00
CaletaBuena_01	-20.10387	-70.07583	2019-10-29 18:48:00	2020-02-08 20:10:00
CaletaBuena_02	-20.10620	-70.07207	2019-10-29 18:48:00	2020-02-06 02:42:00
CaletaBuena_03	-20.10465	-70.07285	2019-10-29 18:48:00	2020-02-06 05:12:00
CaletaBuena_04	-20.10470	-70.07060	2019-10-29 18:48:00	2020-02-05 02:57:00
CaletaBuena_05	-20.10290	-70.07173	2019-10-29 18:48:00	2020-01-09 00:46:00
CaletaBuena_06	-20.10100	-70.07203	2019-10-29 18:48:00	2019-12-25 05:26:00

VOCALIZATION INFORMATION

Table A2. Call rate, numbers of calls detected and percentage of survey nights in which Markham's Storm Petrel *Hydrobates markhami* vocalizations were detected for all sites in the study. The percentage of nights detected only includes nights within our defined peak survey period.

Survey Site	Year	Mean	SD	% Nights Detected
PampaChaca_01	2021	8.9749	5.6827	83.6
PampaChaca_01	2022	3.0795	3.6517	85.7
PampaChaca_01	2023	3.1915	3.3699	61.7
PampaChaca_02	2021	7.2991	5.5211	80.1
PampaChaca_02	2022	3.7781	3.7404	84.4
PampaChaca_02	2023	1.6879	2.1109	57.4
CaletaBuena_01	2019	4.5873	3.7949	100
CaletaBuena_02	2019	14.5246	7.4299	100
CaletaBuena_03	2019	10.6035	5.7795	100
CaletaBuena_04	2019	10.8941	6.2911	100
CaletaBuena_05	2019	12.0855	6.7289	100
CaletaBuena_06	2019	5.1818	3.3602	100