BioSoundSCape

Matt Clark (PI)
Sonoma State University

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Main Co-Investigators and Collaborators

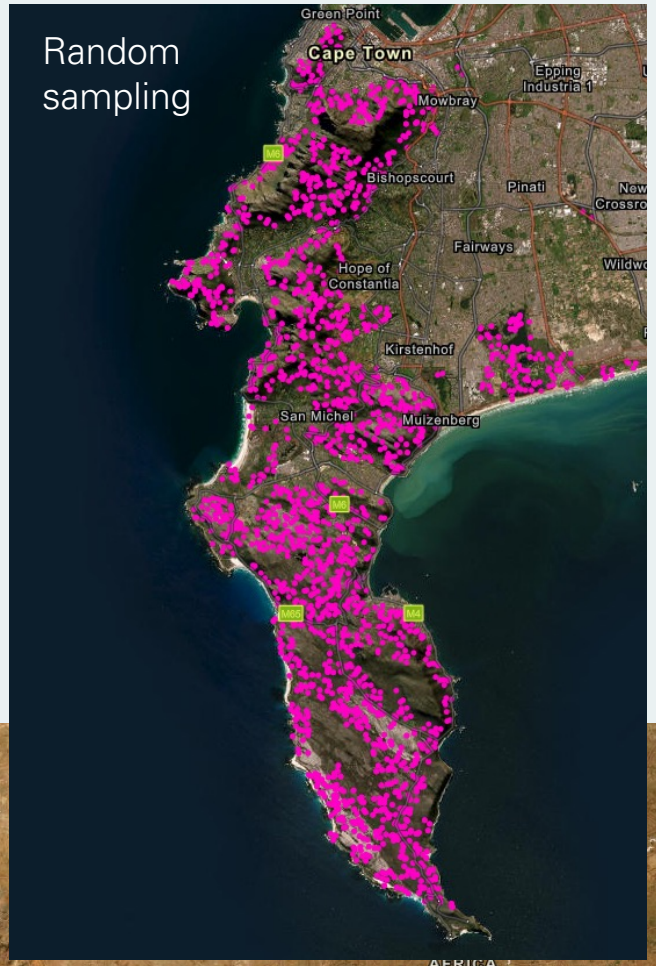
- Festus Adegbola (University at Buffalo, USA)
- António Ferraz (Jet Propulsion Lab, USA)
- Gurman Gill (Sonoma State University, USA)
- Alan Lee (BirdLife South Africa, South Africa)
- David Leland (Point Blue Conservation Science)
- John Measey (Univ. Stellenbosch, South Africa)
- Ryan Pavlick (Jet Propulsion Lab, USA)
- Leo Salas (Point Blue Conservation Science, USA)
- Fabian Schneider (Jet Propulsion Lab, USA)
- Colleen Seymour (SANBI, South Africa)
- Rose Snyder (Point Blue Conservation Science, USA)
- Wendy Schackwitz (Point Blue Conservation Science)
- Andrew Turner (CapeNature, South Africa)

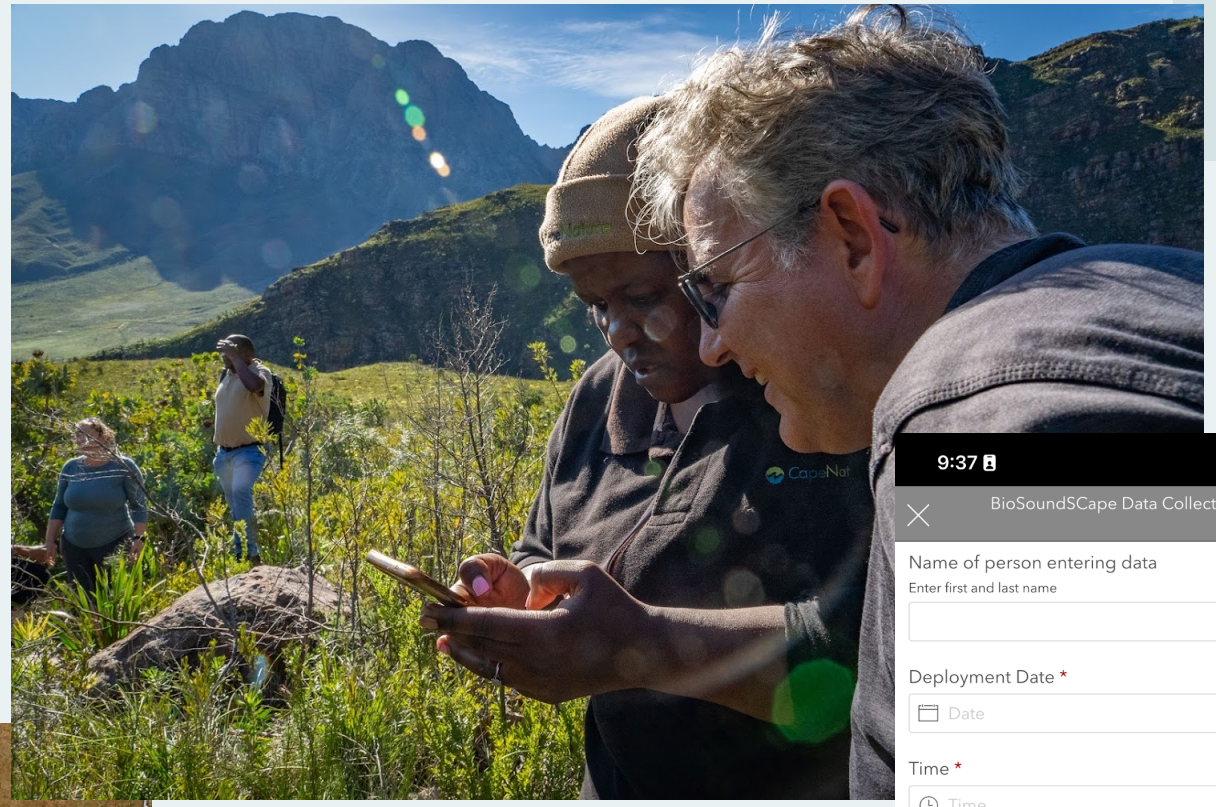
BioScape Team Meeting, South Africa, May 2023

AudioMoth recorder deployed at Jonkershoek Nature Reserve

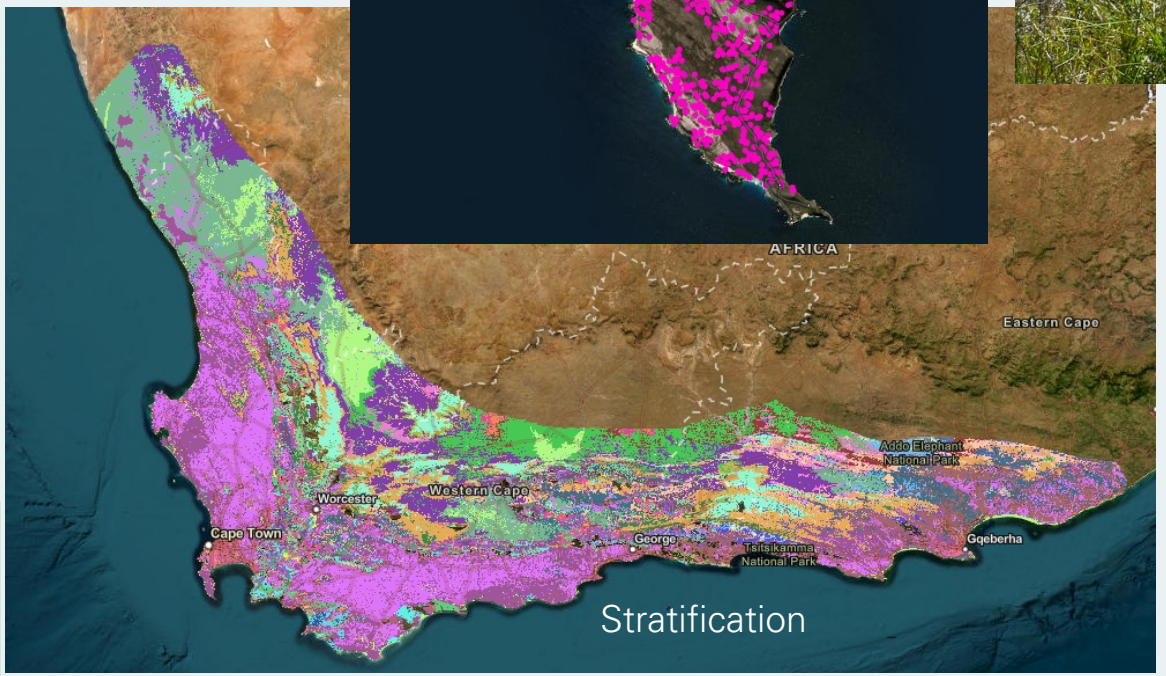
Objectives

- *Measure ground-based animal diversity using low-cost sound recorders across the Cape region in South Africa*
- *Scale these measurements using remotely-sensed indicators of habitat variation*





Survey123 app



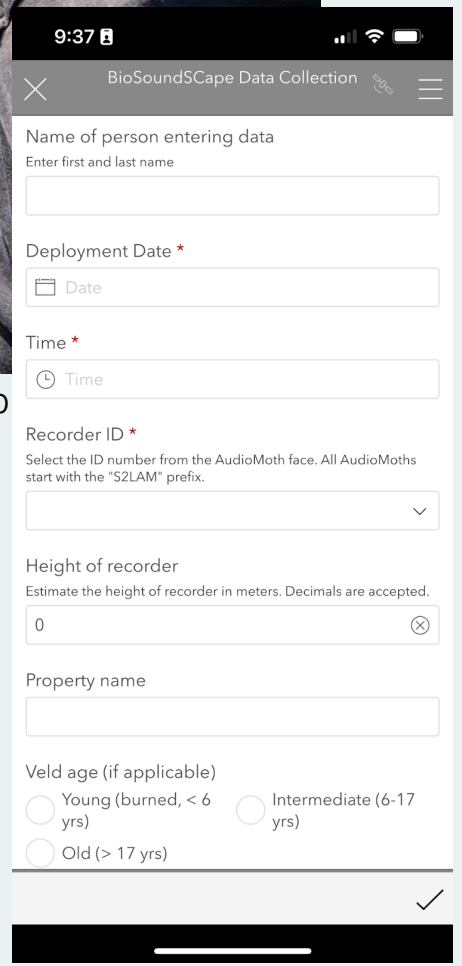
Field Campaigns

Wet season

June to August, 2023

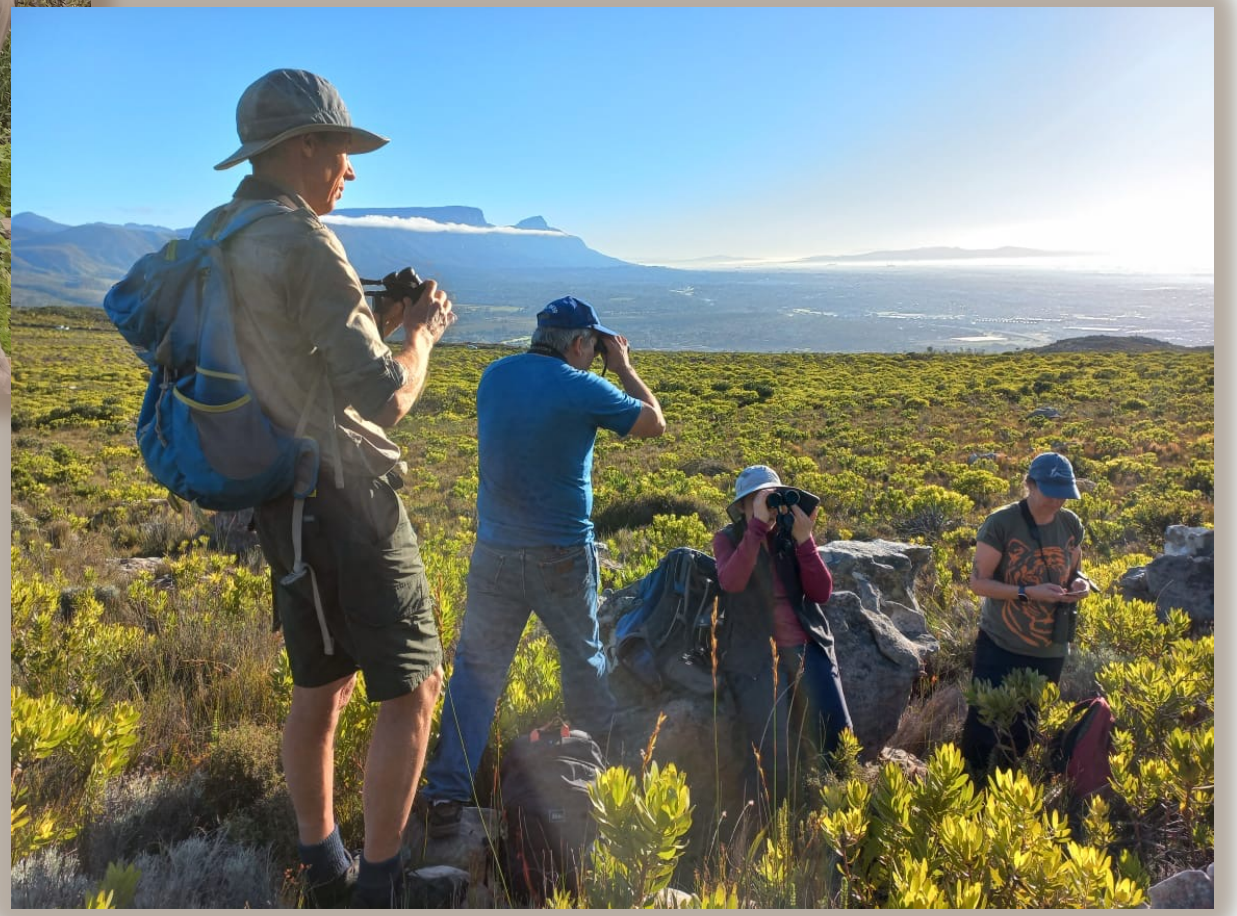
Dry season

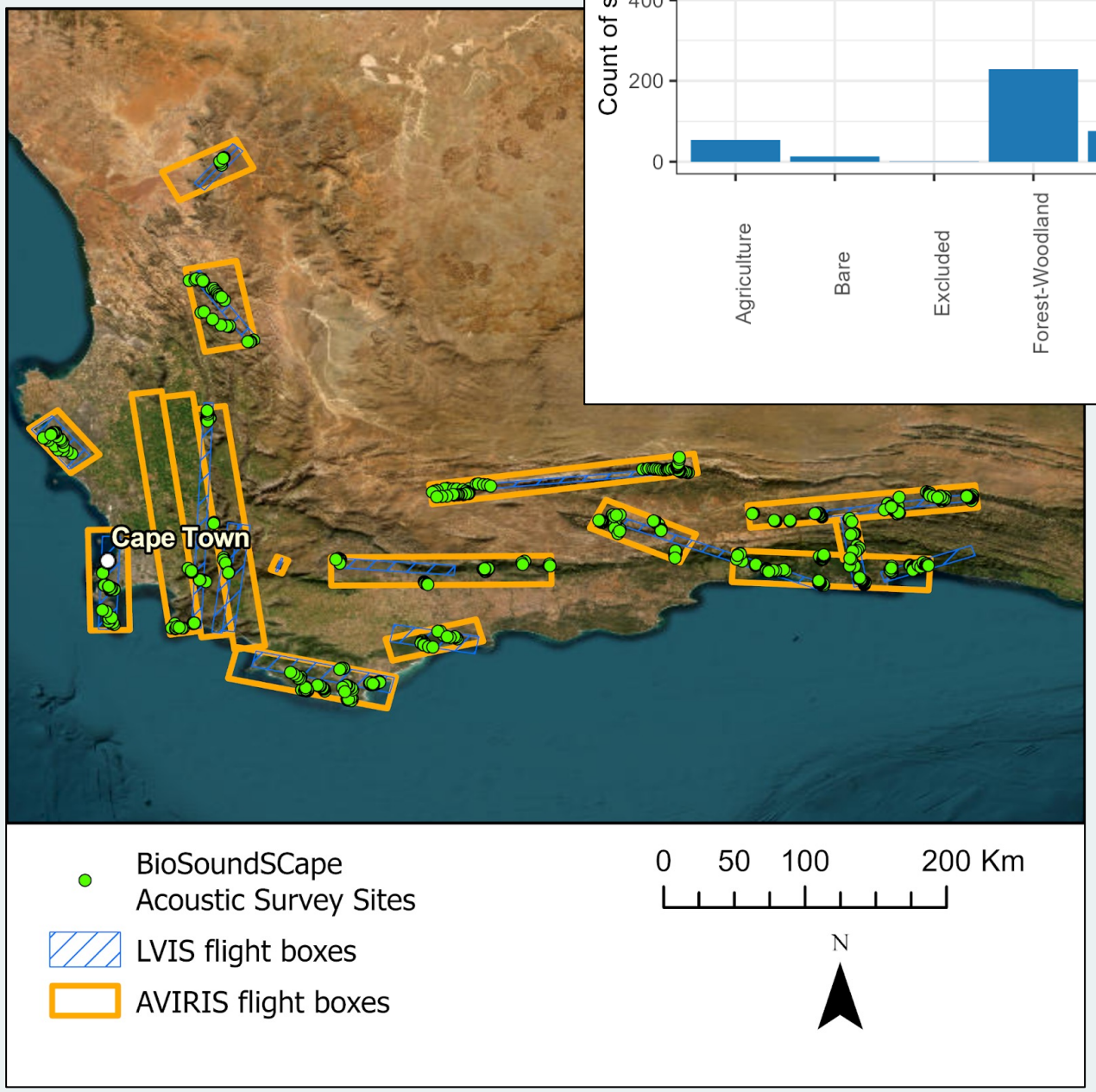
October to December, 2023

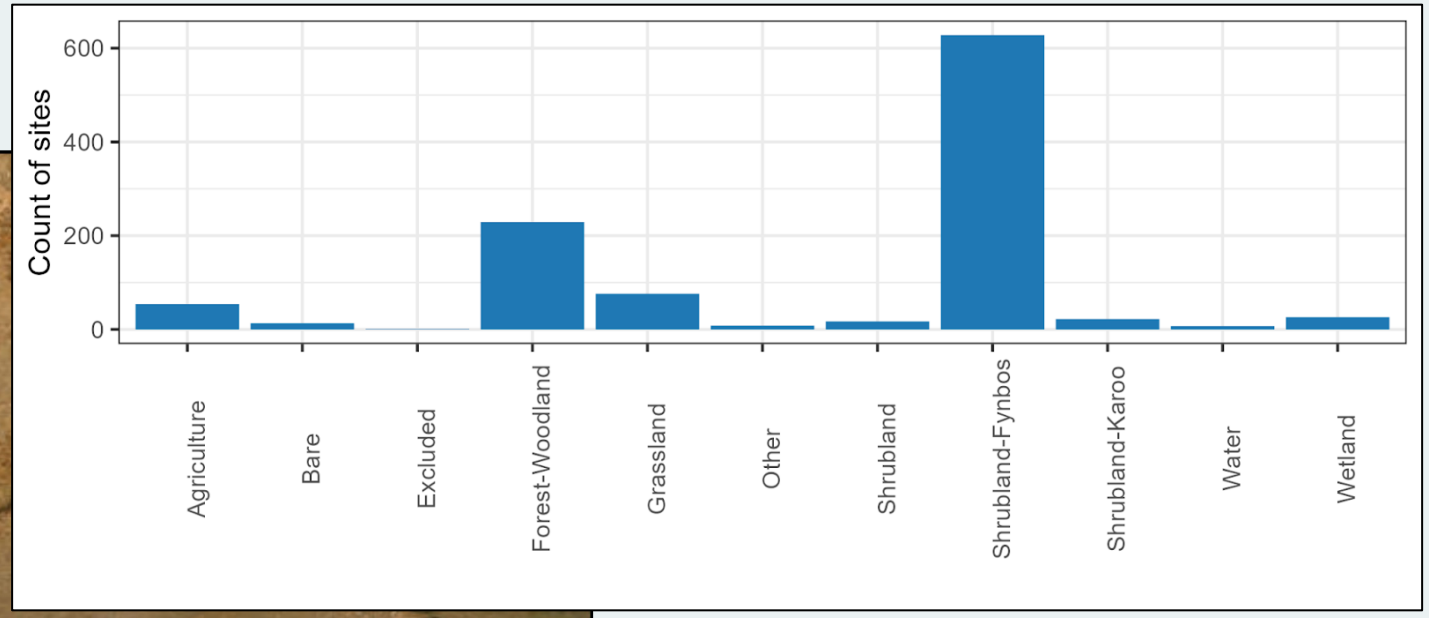


21 CapeNature rangers

20 volunteers



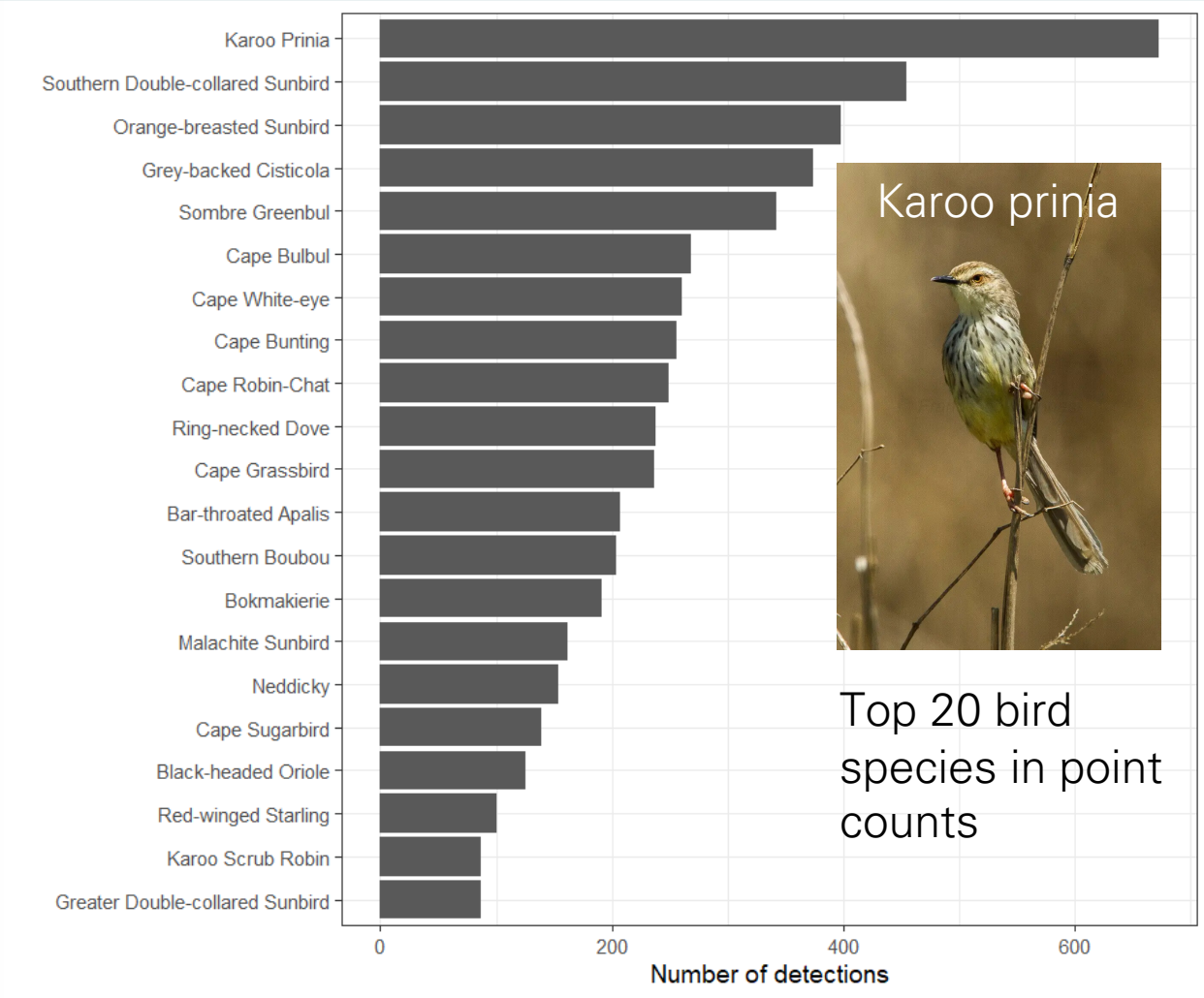




Acoustic data

- 150 AudioMoths
- 909,309 minutes of recordings
- 538 sites in the wet season
- 543 sites in the dry season
- Most sites co-located between seasons
- All sites w/ AVIRIS, 61% w/ LVIS

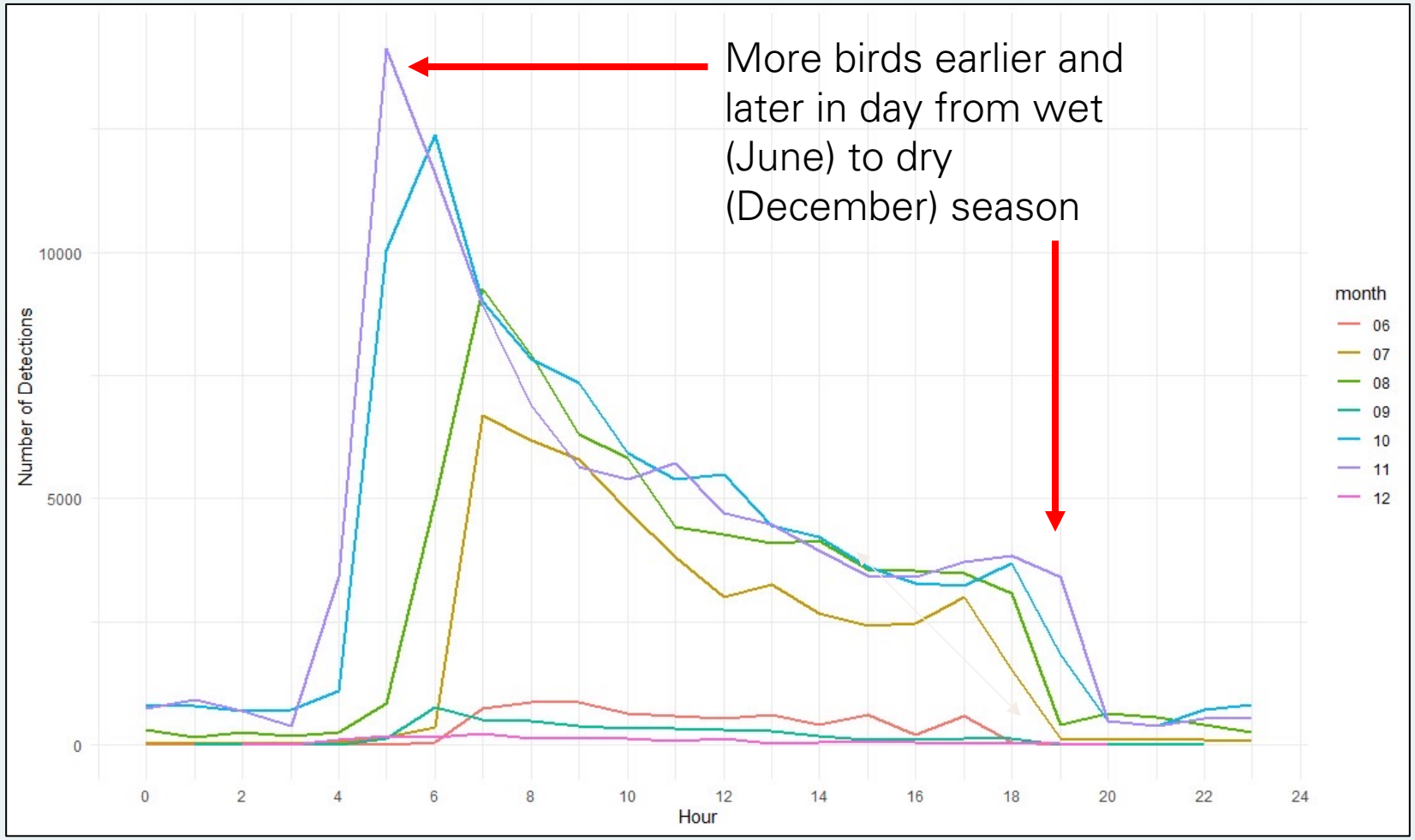
Bird Point Counts



884 counts conducted, 8639 observations, 249 species

BirdNET detections

Convolutional Neural Network (CNN), aka deep learning

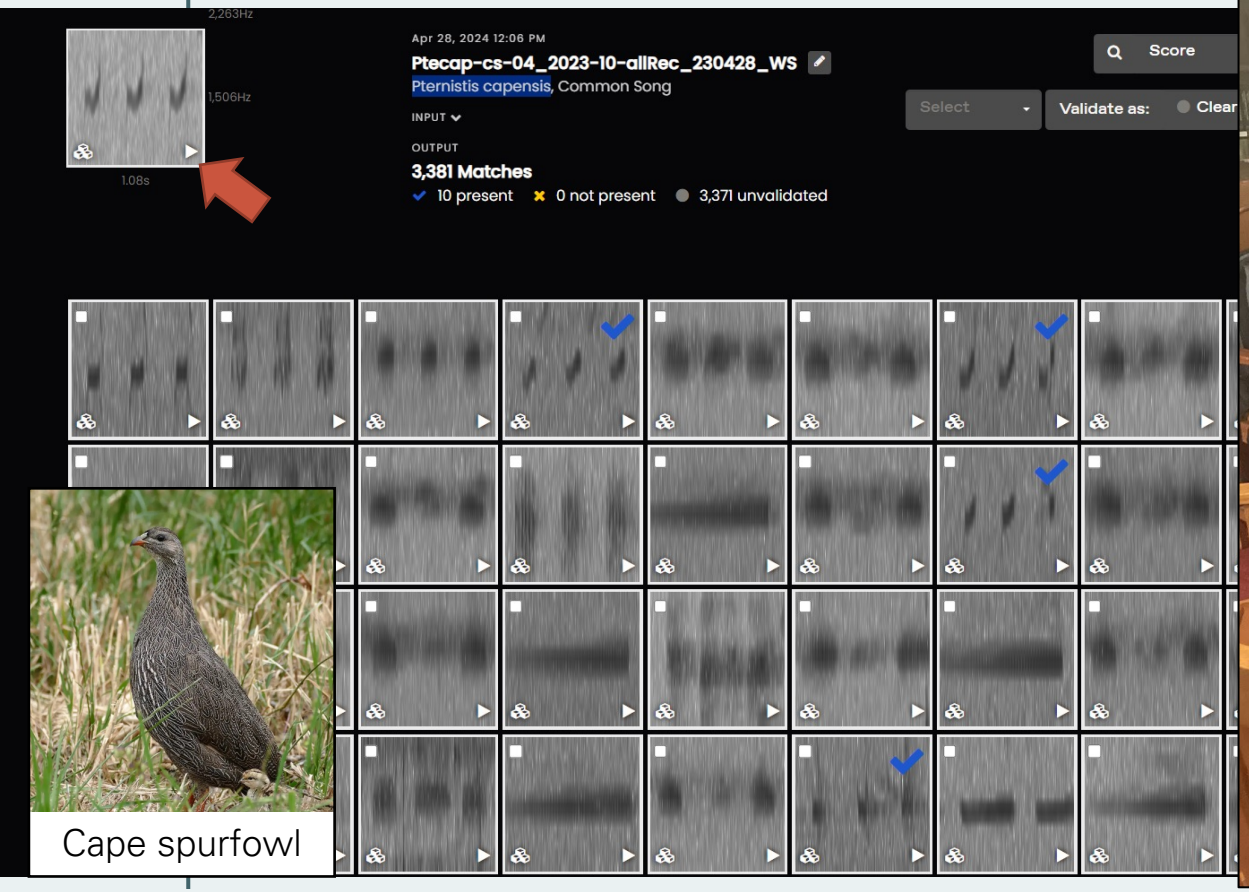


164 bird species

320,202 detections

(> 80% confidence)

Collecting reference vocalizations for training a frog and bird CNN

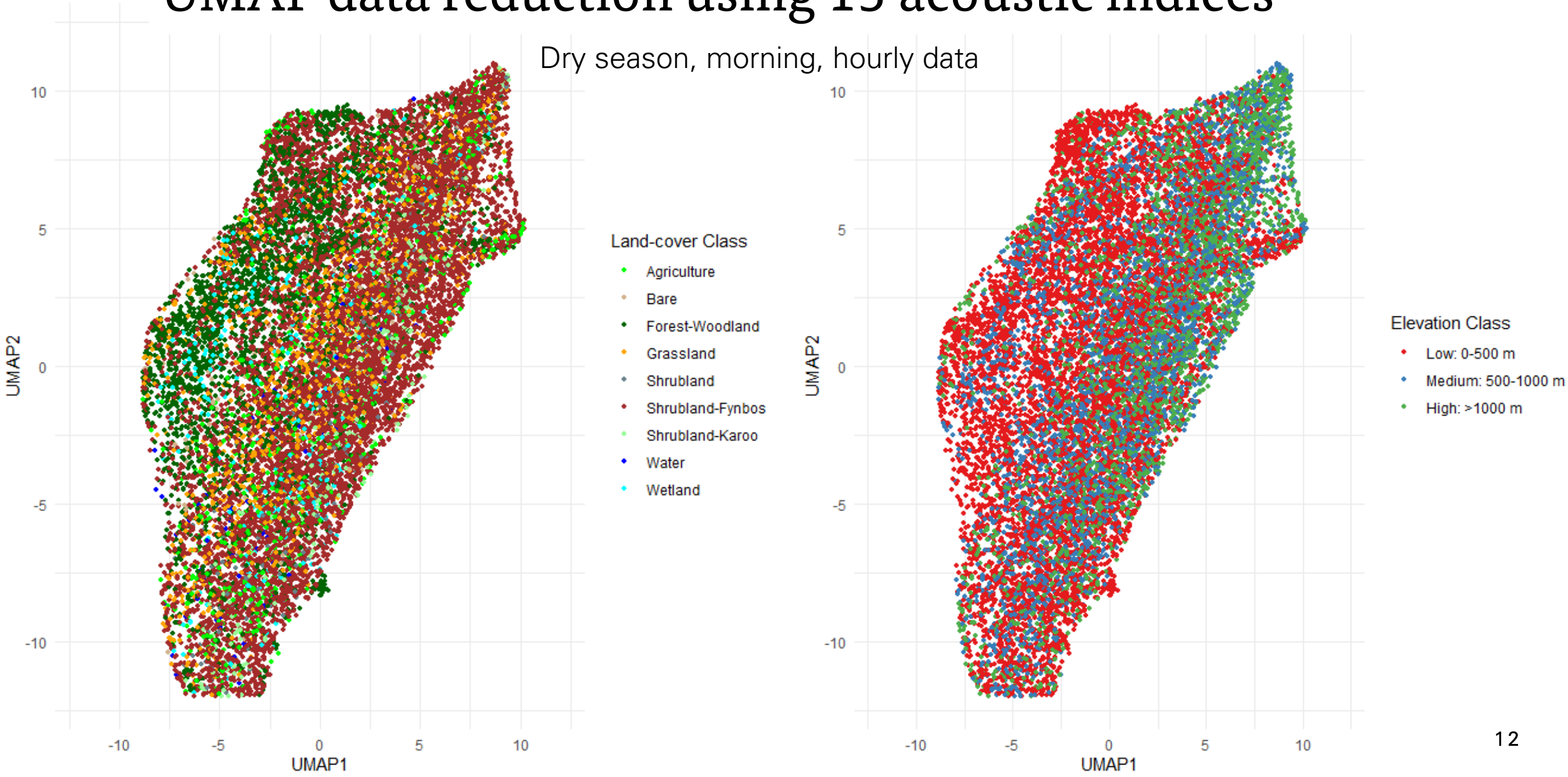


Pattern matching in Arbimon – 15 frog, 54 bird species

BioBlitz at the FitzPatrick Institute of African Ornithology, Cape Town. November, 2023

UMAP data reduction using 15 acoustic indices

Dry season, morning, hourly data



Year 3 plan

- Data paper for recordings
- Bird and amphibian CNN
- Relate acoustic diversity to estimates of *in situ* animal diversity (point counts, CNN detections)
- Relate acoustic diversity with spectral (AVIRIS NG) and structural diversity (LVIS)

Thank you

Field team volunteers

Christina Haagen
Eugene Hahndrek
Saskia Thomas
Vanessa Stephen
Jacky Spiby
Kyle Walker
Peter Ryan
Sally Hofmeyr
Eric Herrman
Michelle Fuchs
Patty Taljaard
Wim de Klerk
Salome Willemse
Grant Joseph
Melissa Stander
Tessa Oliver
Simphiwe Madlala
Daniel Cloete

CapeNature Rangers

Brenden-Lee Jonas
Richard James
Bruney Plaatjies
John Rossouw
Michael Jennet
Whilmien Geduld
Cornelius Julies
Willem Goemas
Willem Wagenaar
Dominique Coetzee
Nicklaas Lukas
Andre Saptou
Masehly Scheepers
Esethu Mxoli
Eben Lourens
Marius Vaughan
Linda Sigwela
Greg Kobedoer
Jacques van Rooi
Anele Mdeleni
Nicolaas Swarts