

Shale Gas Development Strategic Environmental Assessment – Biodiversity Component



environmental affairs

Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

SANBI

Biodiversity for Life

South African National Biodiversity Institute



“BioGaps: Filling biodiversity information gaps to support development decision making in the Karoo”

FBIP Integrated grant 2016-2018



National
Research
Foundation



**science
& technology**

Department:
Science and Technology
REPUBLIC OF SOUTH AFRICA

Background:

1. Shale gas exploration and development requested of government by oil companies.
2. Shale Gas Development Strategic Environment Assessment commissioned by DEA
3. SANBI commissioned to work with CSIR on biodiversity Component of the assessment (May 2015- June 16).



- SANBI worked with 40 experts to determine which are the threatened and endemic species of the Karoo region.
- Gathered all distribution records for these species from collections institutions (museums and herbaria), cleaned and georeferenced these so they could be used in the spatial plan Stephen just demonstrated.

2431 Plant records and 993 Animal records for species of conservation concern were made available as part of the SGD SEA.



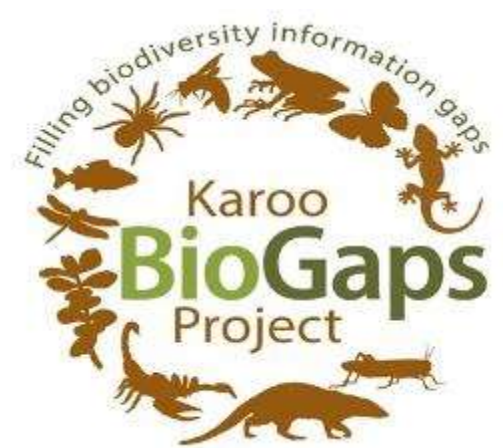
Lessons from SGD SEA:

- No rain had occurred in many parts of Karoo for the entire period of SEA, so field samples were limited.
- Time frames of the SEA were inadequate to fully mobilize biodiversity data for the Shale Gas Development Zone.
- Few surveys have been carried out in the Karoo in the past
- Existing data for the Karoo is fragmented across a number of institutions and requiring a large amount of input before it is useful (imaging, transcribing and georeferencing).
- Biased records, most records collected along major roads, around the Karoo towns and also in the Protected Areas.

Systematic surveying of all major habitat types in the Karoo is required

BioGaps: Filling biodiversity information gaps to support development decision making in the Karoo”

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Project aims:

To mobilise foundational biodiversity data to support the SEAs for Shale Gas Development (SGD) and other infrastructure development projects in the Karoo basin.

The lack of biodiversity data for the Karoo region will be addressed through:

1) integrating and upgrading existing data

2) conducting detailed surveys for 11 representative taxonomic groups in areas targeted for shale gas exploration (plants, mammals, reptiles, amphibians, freshwater fish, butterflies, dragonflies, spiders, bees, scorpions, grasshoppers)

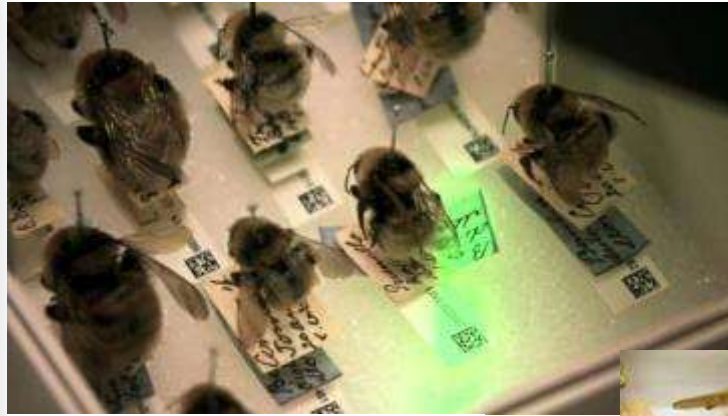
These data will also be useful for monitoring long-term effects of shale gas extraction.



1. Integrating & upgrading existing data



120,000 plant specimens



10,000 bee specimens

**PLUS ~8,000
scorpion
specimens –
at AMNH!**



6,270 grasshopper specimens

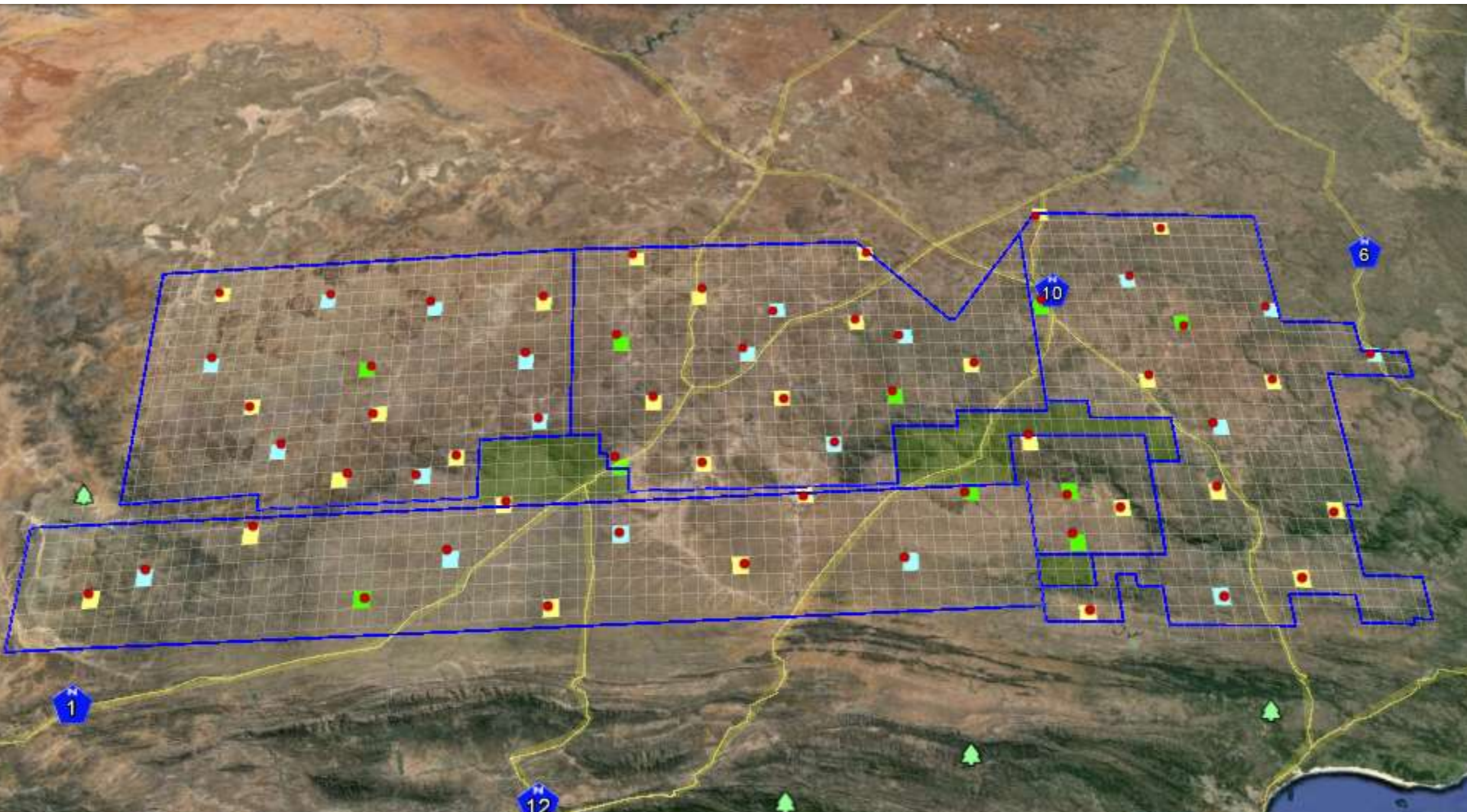
a) High quality occurrence data for target taxa obtained through national level specimen digitisation

b) Existing records from iSpot and ADU virtual museums integrated into existing data sets for reptiles, amphibians, plants, butterflies, spiders, scorpions, dragonflies.

2. High quality occurrence data for target taxa collected through field sampling

- 60 field sites have been selected across the area zoned for SGD (60 pentads: 30 essential, 20 optional, 10 extra for plants)
- Each taxonomic group will sample sites.
- Field sampling must be standardised and collector effort quantified.
- 15 sites for long-term monitoring selected by SAEON.





60 pentads (areas of 8 x 8 km) have been statistically selected to represent all different environments in the Karoo, all 11 taxonomic groups will be sampled.



1km² observatory broken down into different landscape units

BioGaps project outputs:

- **200 000 new species occurrence records** mobilised
- Research on species distribution patterns will be conducted (**9 postgraduates**)
- **11 young scientists** will take part in BioGaps
- **300 Red List assessments** completed for priority Karoo endemics
- Add 1,340 animal & 300 plant **barcodes to IBOL**, with corresponding vouchers deposited at partner museums & herbaria.
- **800 species pages** compiled
- Accurate distribution records of priority species and associated **landuse guidelines** fed to decision makers at the international, national, provincial and local levels



Citizen Scientists:

- Transcribing on DigiVol
- Loading observations on iSpot and other virtual museums

BioGaps collaborative network led by SANBI:

- **SAEON** – fieldwork and monitoring of permanent plots.
- **SANBI, BotSoc, SAIAB, LepSoc, ARC, AMNH, SU, UCT, PE Museum** – fieldwork and threat assessments for taxonomic groups.
- **Collections institutions** involved in digitisation and specimen curation: Selmar Schonland Herbarium (Rhodes University), Port Elizabeth Museum at Bayworld, Bews Herbarium (University of KwaZulu-Natal), Bolus Herbarium (University of Cape Town), Compton Herbarium (SANBI), Ditsong Museum, Iziko Museum, and National Museum.
- **Universities** involved in surveys and co-supervising postgraduate research: **UKZN, UCT, SU, UP.**
- DNA barcoding work SANBI, the **National Zoological Gardens** and the **University of Johannesburg.**
- Species threat assessment (**BotSoc, EWT** and **IUCN**)



BAYWORLD



ALBANY
MUSEUM



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INYUVESI
YAKWAZULU-NATALI

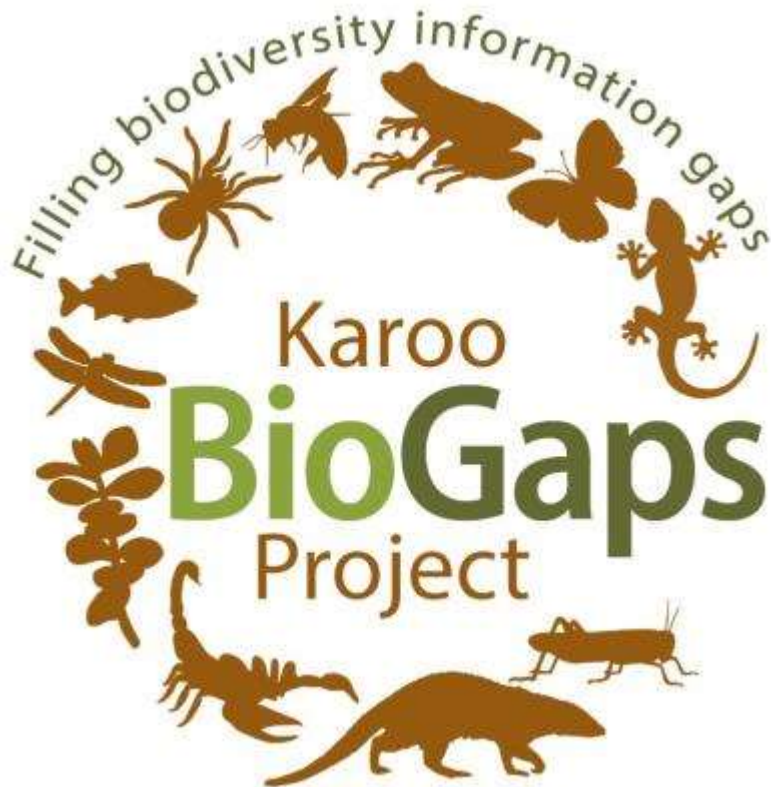


SAIAB
South African Institute
for Aquatic Biodiversity



Conclusions

- By the end of the Karoo BioGaps Project there will be accurate distributions for species from 11 taxonomic groups.
- A Postdoc will analyse all the collected and collated data with aims to identify areas of high endemism and diversity of species.
- It will be very interesting to compare the results of the SEA that used biased species data to what we will have at the end of the BioGaps project... will our priority areas change and if so by how much? ...Watch this space.
- The sound scientific approach that underlies BioGaps will mean that there will be a strong foundation of biodiversity information to feed into decision making for any future land uses that take place in the Karoo.



BioGaps Project Management Team:

Domitilla Raimondo

Krystal Tolley

Brenda Daly

Carol Poole

Project Manager:

Dr Theresa Sethusa

t.sethusa@sanbi.org.za

012 843 5116



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