Distribution and Biodiversity of small mammals in the Gerhard Minnebron Spa area.


E 27°07'48"
Woodlands
Gerhard minnebron
Grasslands
9/139
Wetlands
© 2016 Google
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Image © 2017 DigitalGlobe
153 m
Google Earth
2004
Imagery Date: 6/22/2016 26°29'24.08" S 27°07'55.44" E elev 1404 m eye alt 2.10 km


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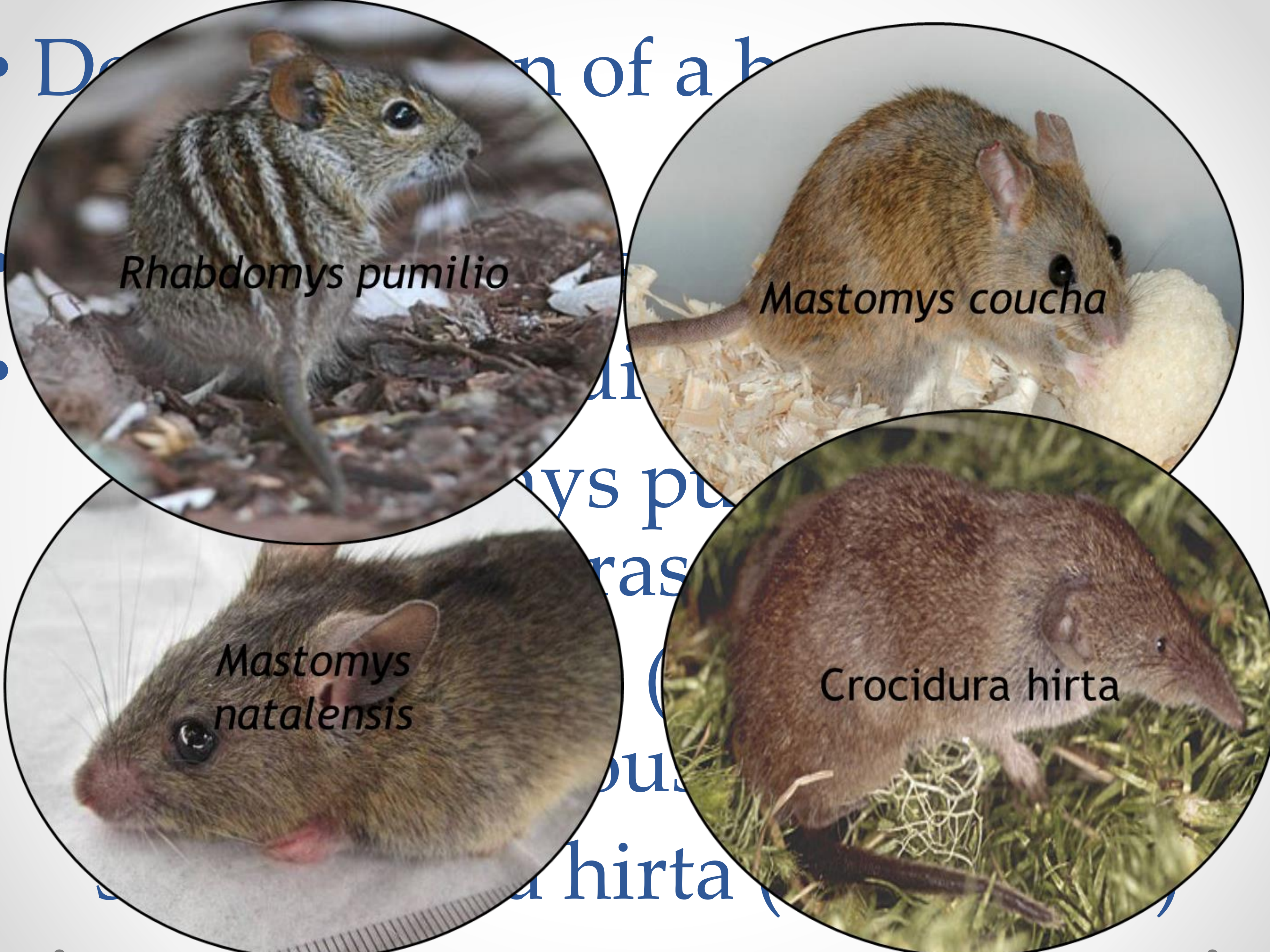
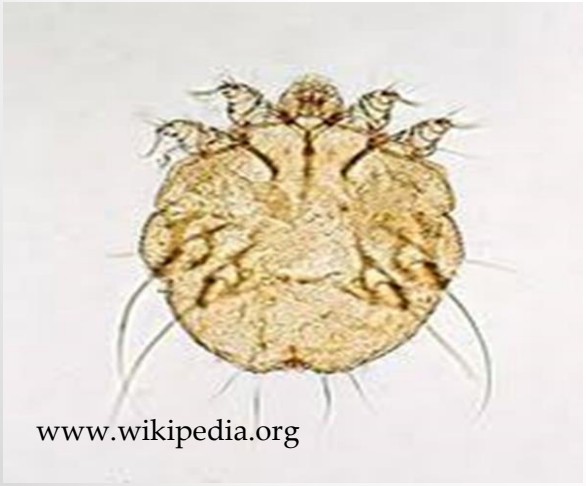


Predation:

- Ticks
- Mites
- Steppe Buzzard (Bruin jakkals voël)
- Lizard Buzzard hawk (Bleeksink valk)



Hypothesis:

- The Gerhard Minnebron Spa area is not a healthy ecosystem.

- Fire which occurred had an influence on the ecosystem.

Aims:

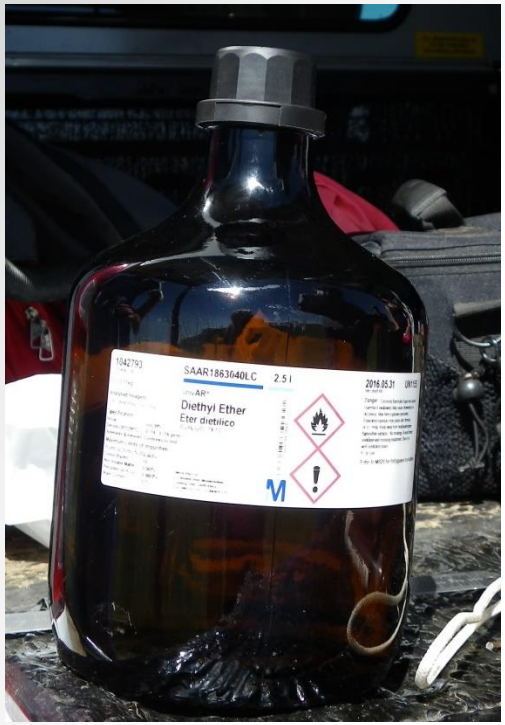
- Determining the health of the Gerhard Minnebron Spa ecosystem.
- Evaluate the effect that the fire had on the ecosystem.

Objectives:

- The examination of the distribution and biodiversity of small mammals.

- By using the data obtained the previous year, as well as the use of other indicators species such as grasses.

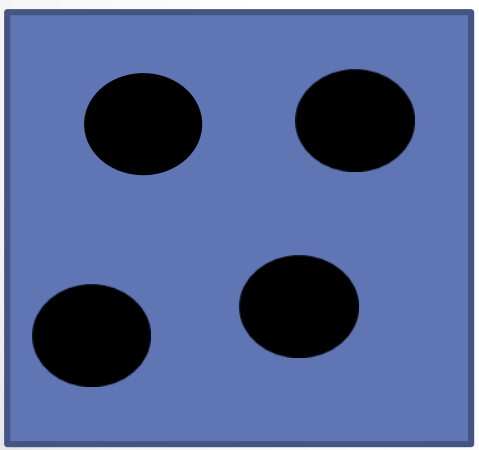
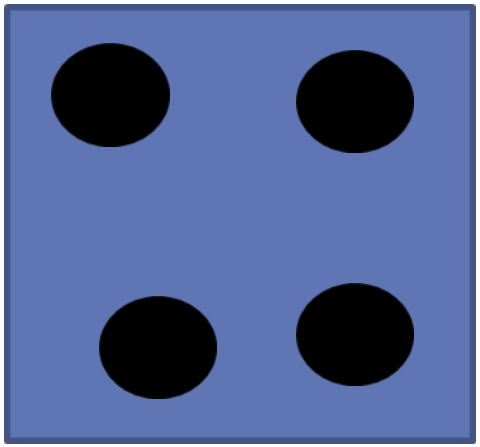
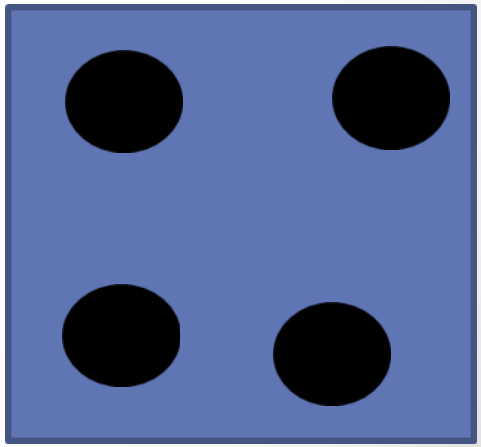
Materials:



https://www.outdoorphoto.co.za

Experimental design:

- Homogeneity
- Example: Woodland

Example of homogeneity in the Woodlands:

Method:

- Identify biotopes
- Bait and place traps
- Mark trap locations
- Retrieve traps

Method:

Capture time:

- Day: 9 hours (08:00 - 17:00)
- Night: 14 hours (17:00 – 07:00)
- Day: 9 hours (08:00 - 17:00)
- Night: 14 hours (17:00 – 07:00)

https://www.swimoutlet.com

- Maximum capture hours:

46 hours x 12 traps x 3 areas

= **Total time of 1656 hours**

Limitations:

- Live trapping were done in all biotopes
- Traps of the same size and construction were used
- The same bait was used the whole experiment
- The locations of the traps remained constant
- *Mastomys* sp.

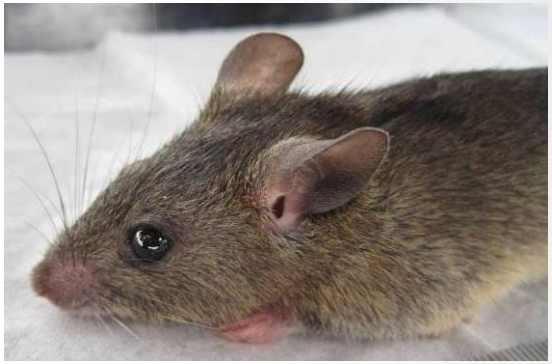
Other activities observed in the area:

- Different grass species
- Agricultural land
- Cattle
- Birds

Results and discussion

In 2017 the following specimen was caught:

- ***Mastomys sp.***
- ***Rhabdomys pumilio***
- ***Crocidura hirta***



https://en.wikipedia.org

In 2018 the only specimen caught was:

- ***Mastomys sp.***

Results and discussion

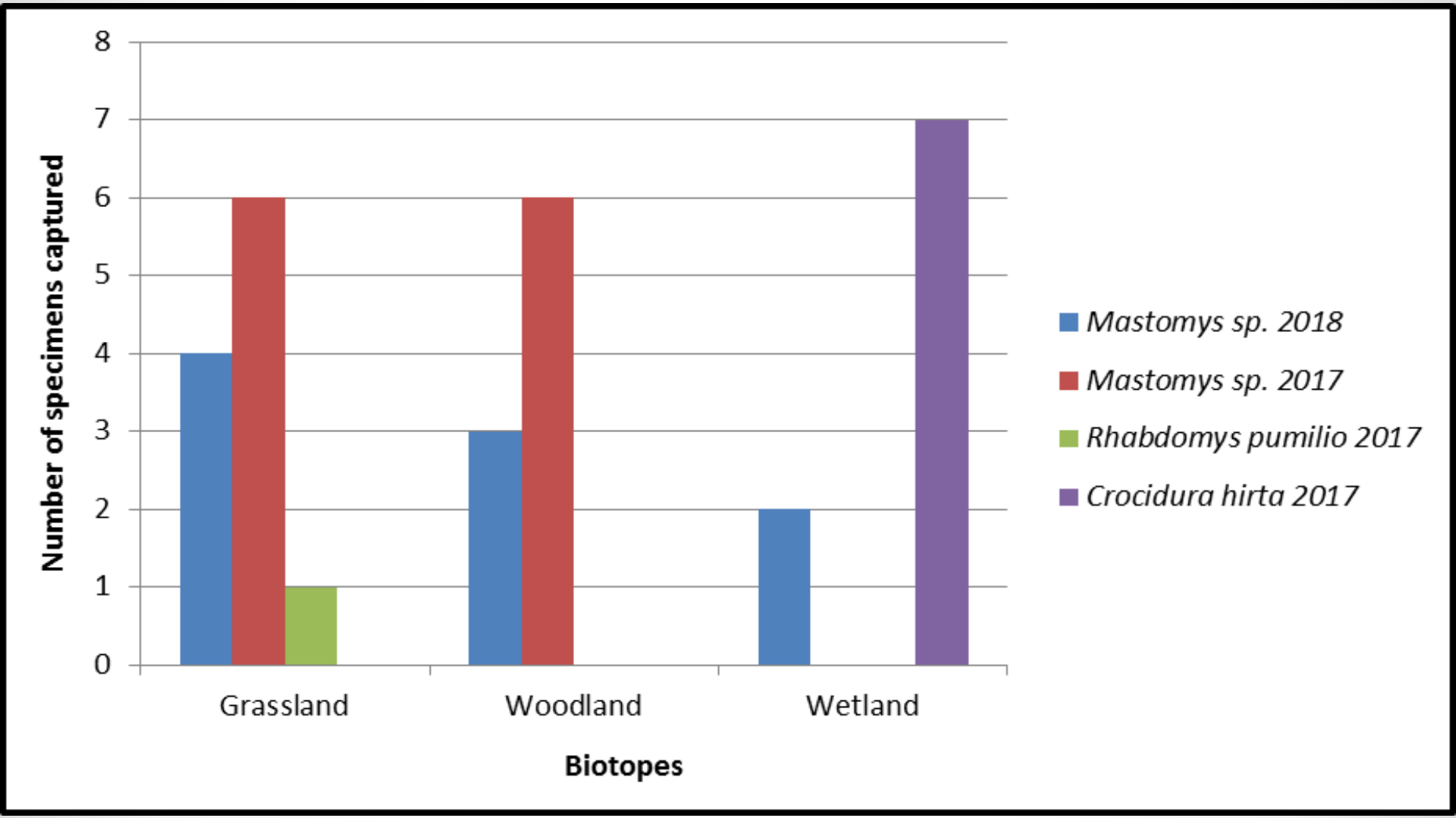


Figure 1: The amount of specimen caught during the survey conducted in 2017 and in 2018 in the different biotopes.

Results and discussion

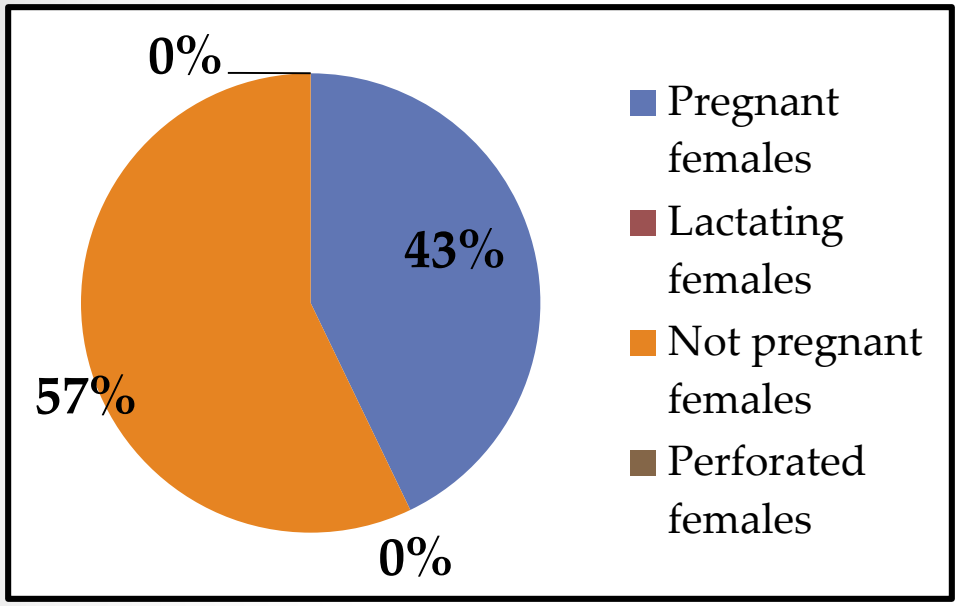


Figure 2: The percentage of female animals caught and their overall health in 2018.

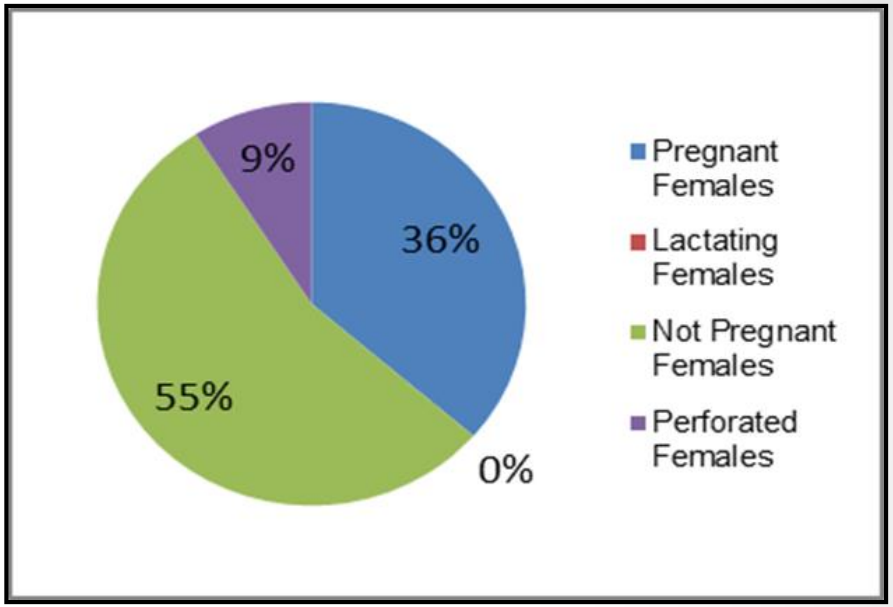


Figure 3: The percentage of female animals caught and their overall health in 2017.

Comparison of the female specimen caught in 2018 and 2017 during the survey conducted.

Results and discussion

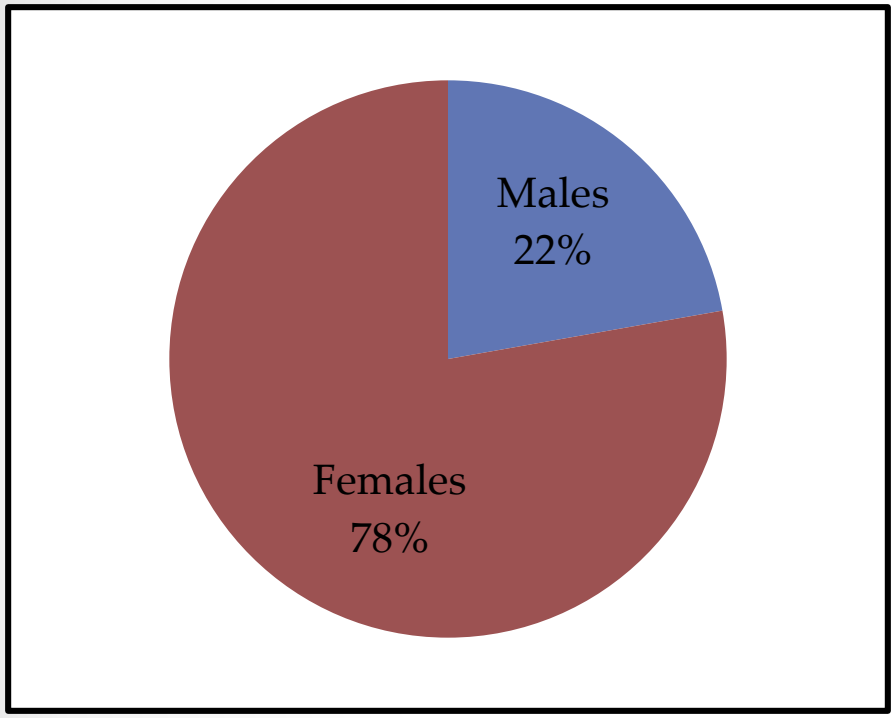


Figure 4: The total percentage of female and male animals caught in 2018.

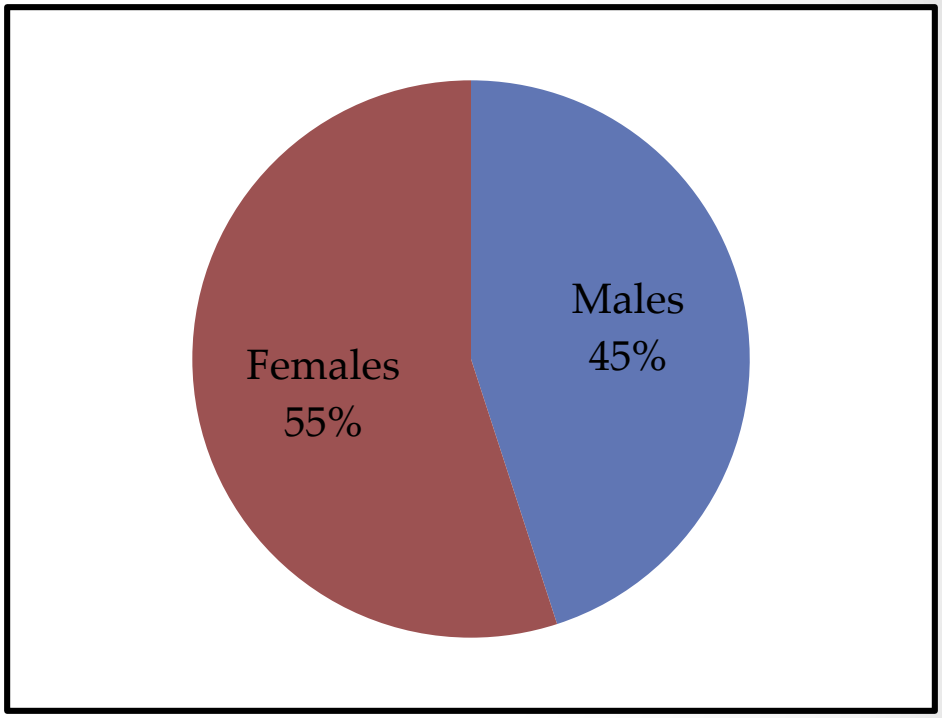


Figure 5: The total percentage of female and male animals caught in 2017.

Comparison of the total female and male specimen caught in 2018 and 2017 during the survey conducted.

Results and discussion

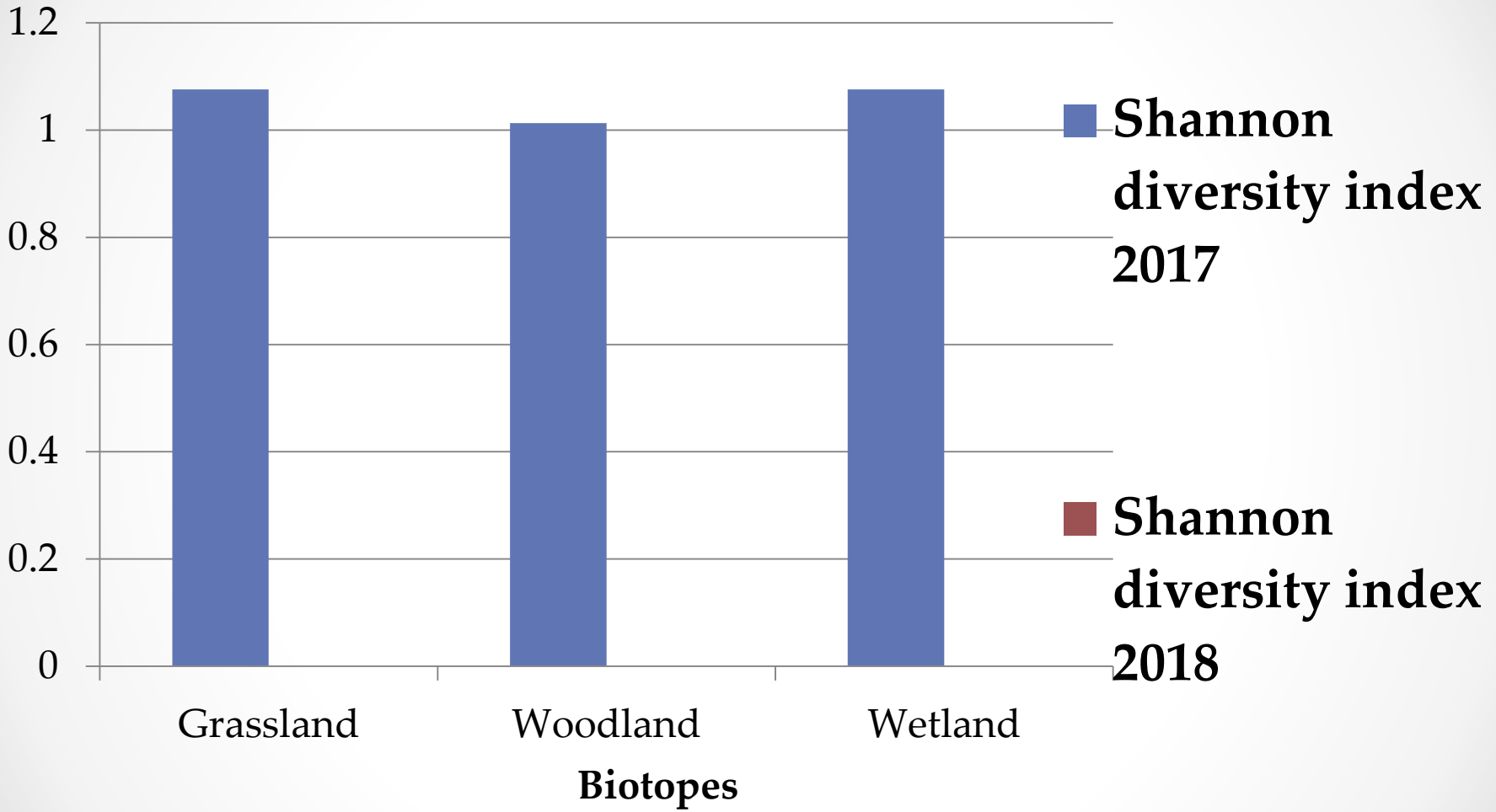


Figure 6: Comparison of the Shannon diversity index (H') of three different biotopes in 2017 and 2018.

Evidence of the fire that occurred in 2017:

2018

2017

2018

2017

Evidence of disturbances

The usage of grasses to indicate disturbances:

Eragrostis superba

Melinis repens

Conclusion

- Aims and objectives were reached
- Hypothesis was accepted
- Area is still recovering from the fire, secondary succession is still on going

Bibliography

Avenant, N. 2011. The potential utility of rodents and other small mammals as indicators of ecosystem 'integrity' of South African grasslands. Wildlife Research, 38: 626-639.

Bekker, T.S. 2010. The more effective management of the Gerhard Minnebron as important resource of potable water for Potchefstroom. Potchefstroom: NWU. (Thesis-Msc).

Costanza, R. 2012. Ecosystem health and ecological engineering. Ecological Engineering, 45: 24-29.

Jorgensen, E.E. 2002. Small mammals: consequences of stochastic data variation for modeling indicators of habitat suitability for a well-studied resource. Ecological indicators, 1(4):313-312.

Siddig, A.A.H., Ellison, A.M., Ochs, A., Villar-Leeman, C. & Lau, M.K. 2016. How do ecologists select and use indicator species to monitor ecological change? Insights from 14 years of publication in Ecological Indicators. Ecological indicators, 60:223-230.

Venter, L.C.M. 2017. Small mammals [personal interview]. 12 March, Gerhard Minnebron Spa.

Skinner, J.D. & Smithers, R.H.N. 1990. The mammals of the Southern Africa subregion. 2nd ed. Pretoria, RSA: University of Pretoria.

Van Oudsthoorn, F. 2014. Guide to grasses of Southern Africa. Briza, Cape Town.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