

Citizen Science Using Facebook records of reptiles and amphibians

By Cora Stobie and Michael Bates

In this age of social media, Facebook has become a hub for people to upload and share information. There is probably a Facebook group for almost every conceivable topic! For example, there are several groups serving those interested in getting help identifying reptiles or amphibians, all the while providing educational information to their members. One such group based in South Africa has upwards of 170 000 members. Many of these groups receive dozens of photographs or videos on a daily basis, and represent huge virtual archives of natural history information that can be used to aid various scientific investigations, including studies on species distribution ranges.



Zoe Yannikarkis

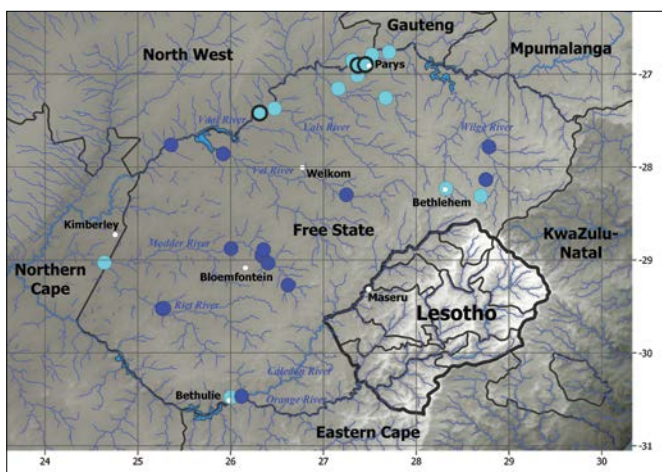
Some citizen science platforms, like iNaturalist and ReptileMap, are popular in South Africa, and the observations reported there are often used in scientific publications. However, the numbers of people actively using these platforms are much lower than those posting observations to Facebook. What makes Facebook so appealing for this purpose is its ease-of-use, the quick reaction of members in identifying the subject in photographs and videos ('expert crowdsourcing'), and the opportunity via the comments section to contact observers directly regarding their observations.

In December 2019 we set up a Facebook group, initially to collect photographs and video evidence of reptiles and amphibians from Bloemfontein, the capital city of the Free State. It soon became apparent that we were attracting records for the entire province, and so we changed the group's name. We were collecting so much valuable distribution information that the group essentially became a research project on the distribution of reptiles and amphibians in the Free State. The province was comprehensively sampled for these animals in the 1970s, with later distribution updates published in the mid-1990s. However, much has happened in the area since then, such as farming activities and urbanisation, which may have altered the current-day distributions of species. We then realised that it made sense to include areas immediately adjacent to the Free State, as well as Lesotho – a very poorly known area for reptiles and amphibians – so the group is now called 'Free State Reptiles and Amphibians (including adjacent areas and Lesotho)'. This project represents the first attempt to investigate reptile and amphibian distributions in southern Africa using Facebook as a primary source of records.

Our group is still growing, but already over a thousand photographic and video records of 83 species have been posted. The majority of these observations were shared from other established groups, but as participation



Tyrone Ping



The water monitor *Varanus niloticus*, also known as a water leguaan or *waterlikkewaan*, can grow up to 2.2 m long. On this map of its distribution in Free State Province, literature records are shown in dark blue, while new records are shown in pale blue and are separated into Facebook records (no edge) and other online records from iNaturalist and Flickr (black edge).

increases we are seeing more and more posts made directly to our group. Each of these records is recorded in a database where the species name is listed, together with date, locality, observer, and any other relevant information. This locality information is used to assess the current distribution ranges of certain species across central South Africa and Lesotho.

An example of a distribution map resulting from our project is that of the largely aquatic water monitor *Varanus niloticus*, a huge lizard that grows to a length of 2.2 m. This species is generally common in rivers and other permanent waterbodies in South Africa, though sightings in the Free State are relatively infrequent. There are currently 15 published records for the Free State, to which we have added another 19 records from Facebook and a few other sources. There is little overlap between previously published and new records, but we cannot say much about the significance of this at the moment.

The rinkhals or ring-necked spitting cobra, *Hemachatus haemachatus*, is another excellent example of how Facebook records have aided scientific research. Posts to our Facebook group have yielded 156 new rinkhals distribution records in the Free State and Lesotho, representing 63% of all known (including literature) records for the species in this region.

For both the water monitor and rinkhals, Facebook records greatly surpass the number of records supplied by citizen science platforms such as ReptileMap and iNaturalist, which are designed specifically for collecting distribution data. Furthermore, we used Facebook Messenger to contact 110 of the 126 people who posted the original rinkhals records, to ask for clarification of the locality, or further details. Approximately 46% of those approached for additional information responded, which allowed us to refine or confirm 68 localities. The information we have collected to date emphasises how valuable citizen science observations sourced from Facebook groups can be for scientific research.



The colour pattern of this rinkhals, *Hemachatus haemachatus*, photographed in the Eastern Cape, is typical of individuals from much of the Free State and Lesotho.

and pages. Many of these posts represent valuable data that researchers can use when investigating the distribution of species. We have had much success in running our relatively new Facebook group, and would like to encourage anybody and everybody with photographic or video records of reptiles and amphibians to share these with us. The records are a lot more valuable when accompanied by accurate locality information. Every contribution adds to our citizen science initiative!

- Find the Facebook group at <https://www.facebook.com/groups/FreeStateHerps/>.

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The map was produced using QGIS (QGIS Development Team, 2020) and Natural Earth (free vector and raster map data @ naturalearthdata.com). The Rivers of Africa project from the Food and Agriculture Organisation of the United Nations (FAO) (<http://www.fao.org/geonetwork/srv/en/metadata.show?id=37333&currTab=simple>) was used to add additional rivers to the map. The Global Multi-resolution Terrain Elevation Data 2010 (GMTED2010) (Danielson & Gesch, 2020) was added to provide an elevation layer.



This juvenile giant bullfrog, *Pyxicephalus adspersus*, was found in moist grassland near a dam in Bloemfontein.

Every day there are hundreds of photographs and videos of reptiles and amphibians posted on various Facebook groups

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Translated by Mbali Nguse

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