

Organization: South African National Biodiversity Institute (SANBI)

Project Location: South Africa Western Cape

Web address: www.sanbi.org

Title of Grant: “Digitising the Compton Herbarium collections of the larger plant families in the Greater Cape Floristic Region (GCFR).”

Grant Amount: \$200,000 over 2 years

Principal Investigator: J.P. Roux

Organization Background:

The mission of South African National Biodiversity Institute (SANBI) is: “to promote the sustainable use, conservation, appreciation and enjoyment of the exceptionally rich biodiversity of South Africa for the benefit of all people.” This mission addresses several biodiversity matters including sustainable use, conservation, appreciation and enjoyment, and benefit sharing. None of these matters can be viewed in isolation - sustainable use, knowledge about the biota, be it a species, a vegetation type, or any other biodiversity component, can only be achieved once one has an understanding of what is at hand.

The Compton Herbarium is the second largest herbarium in the country and forms part of the South African National Biodiversity Institute. The focus of this herbarium, which houses approximately 750,000 specimens, is to document and study the flora of the Greater Cape Floristic Region (GCFR). The GCFR, commonly referred to as the Cape Floral Kingdom is the smallest of the world’s floristic regions, but it is the most diverse, and contains two of the 34 biodiversity ‘hotspots’, – the Cape Floristic Region and the Succulent Karoo. Only seven biodiversity ‘hotspots’ occur in Africa. The Succulent Karoo is one of only two hotspots that is entirely arid (the other is the Horn of Africa, east of the Ethiopian Highlands). The Succulent Karoo is the only desert ‘hotspot’, characterised by xeric woody shrubs and succulent plants. Each of these bioregions contain a number of vegetation types which is often restricted to specific soil types. Some of these soils are ideally suited for agriculture with the result that large parts of some vegetation types have been transformed.

Grant Description:

The aim of the SANBI project is to digitise and georeference the herbarium collections of the five largest plant families, the Asteraceae, Ericaceae, Fabaceae, Proteaceae, and Restionaceae, within the GCFR. The Compton Herbarium collections span a collecting period of more than 170 years. The information held by these collections will enhance the knowledge and understanding of the past and present distribution of species, current and potential threats, and how they can be minimized. This knowledge will assist scientists, conservationists, and planners in making informed decisions on land-use issues and the proclamation of new reserves. The information will be digitized into

the Pretoria Computerised Information System (PRECIS) database and made available to the broad community via the SANBI other portals.

The Problem:

Fine scale planning and the conservation of biota are only possible when sufficient knowledge about an organism and its environment is available. Currently about 12.5% of the Compton Herbarium holdings, assembled over more than 170 years, are digitized and the information available electronically. Less than half of these databased collections are georeferenced. There is thus a large amount of valuable floristic and spatial data 'trapped' on herbarium labels that are not easily accessible to researchers, conservation biologists or planners. The availability of this information will greatly enhance the knowledge and understanding of the past and current species distributions, their current and potential threats. Of the 230 seed plant families recorded in southern Africa, 150 occur within the GCFR. Of these, 60 families have either more than 50% of their species occurring in the Cape Region.

The Solution:

The goal of this project is to database and geo-reference the specimens of those families where 50% or more of the species occur within the GCFR by employing dedicated digitisers over a two year period. Data-capturing will take place in the PRECIS database. It is anticipated that between 80,000 to 100,000 herbarium specimen records can be digitized and geo-referenced during the two year period of the project.

The South African Biodiversity Information Facility (SABIF) is the national node of the Global Biodiversity Information Facility (GBIF) and is currently housed in the same research complex as the Compton Herbarium. The primary objective of SABIF is to contribute to sustainable development by facilitation access to biodiversity information via the internet. Within the framework of this project, it is intended to serve the herbarium specimen information captured in the PRECIS database through the SANBI and SABIF portals.

Global Impact:.

South African law requires that no land development may take place, whether for agriculture or urban development, until an environmental impact assessment is carried out and approved by the Provincial authorities. Having the herbarium collection digitised will greatly assist planners and those involved in environmental impact assessments in determining what grows, or potentially grows at a particular site. This may prevent the development of ecologically sensitive areas or identify areas of lower conservation value. Accurately geo-referenced data will also aid the broader scientific community and the information can also be used in vegetation modeling in light of climate change. Here predictive models, such as niche based modeling tools can be applied to relevant datasets, to look at the current and projected distributions of species. This is a powerful tool and very valuable for feeding into policy and decision making processes, not just at the scientific level, but also at the governmental level.