

## Submitted Abstract

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| <b>Country</b>                                      | South Africa  |
| <b>Region</b>                                       | Sub-Saharan Africa  |
| <b>Title</b>  | Expanding Our Understanding Of Non-Natives In Southern African Mountains - Expanding The Mountain Invasion Research Network (Miren) Protocol In The Maloti-Drakensberg. |
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## Abstract

In mountain areas globally, both native and non-native plants are expanding their ranges along elevational gradients in response to global change. The Maloti-Drakensberg (MD) is one of southern African's centres of endemism and is part of a regional biodiversity hotspot, but one in which there is limited data on species' range expansions. The aim of this study is to increase our knowledge of range-expanding species in the MD by establishing two new long-term Mountain Invasion Research Network (MIREN) road transects, using the MIREN protocol (<https://www.mountaininvasions.org/>) for roads and trails where relevant. The Mont-aux-Sources road transect ranges from the urban edge of Phuthaditjhaba (1,900 m) to near the summit of the Amphitheatre on Beacon Buttress (3,150 m) (South Africa) via the Witsieshoek road to the Sentinel Car Park and along the Sentinel Trail to via the Chain Ladders. The second road transect at Holomo Pass is entirely a path transect (Maqeleng) in Tsêhlanyane National Park (Lesotho), with elevation range from 1,990 m to 2,670 m. In summary, the Miren protocol involves 20 sampling sites per road transect, placed on equal elevational bands (Mout-aux-Sources = 60 m and Holomo = 33 m bands) from the bottom to the summit. Each site consisting of three plots (for roads 50 x 2 m dimensions; for paths = 10 x 2 m dimensions). The first plot is orientated adjacent to the road; the two other plots are orientated perpendicular to the first one, forming a T-shape. The plots will be re-sampled every five years, to determine any evidence of non-native and key native species moving upslope. The Mont-aux-Sources transect is important due to the large numbers of domestic and foreign tourists accessing the high MD, and provides the opportunity for early-detection of non-native species; in addition, plans to resurface the Witsieshoek road may bring in propagules of non-native species - a long-term monitoring plan such as MIREN will assist with due diligence and rapid response. Currently, non-native species richness was higher ( $p < 0.05$ ) at elevations  $< 2,500$  m compared to  $> 2,500$  m; the highest-elevation non-native known so far is the grass *Poa annua*, located at 2,800 m in the Chain Ladder gully. The statistical analysis is performed with Rstudio. At present, various factors could be "keeping" non-native species out of the higher elevations: a non-saturated habitat envelope from expansion lag, an inhospitable austro-alpine climate  $>2,800$  m, or simply a lack of detailed assessments.