Research request: Develop biodiversity impact monitoring protocols to assess effects of Invasive Alien Species management in the Berg, Breede and Riviersonderend catchments

Background

One of the biggest challenges to CapeNature in its endeavour to conserve the biodiversity of the WCP is the impact of invasive alien species. Although the negative effects of Invasive alien plants species (IAPS) are well known (e.g. Richardson et al. 1996, Richardson & van Wilgen 2004, van Wilgen et al. 2008) CapeNature needs to know whether the management actions we carry out on IAPS are having the desired effect on biodiversity. This information will also allow us to evaluate different IAPS management methods relative to biodiversity outcomes (see e.g. Reid et al. 2009, Downey et al. 2010a, b & c). This will also allow us to incorporate this information in prioritisation processes for working out where managing IAS will have the greatest effect (see Research Requirements: Where will managing Invasive Alien Species have the greatest positive impact on biodiversity?).

We need simple but robust measures of biodiversity using well-chosen indicator populations and/or functional groups. These measures must be able to form the basis of a long-term monitoring protocol that can be applied wherever IAS management takes place. The results of the monitoring must be sensitive and informative enough to direct future management responses.

Another aspect that needs research is to establish which areas have been covered in dense infestations of IAPS for so long that additional restoration efforts may be required (dense for >40 years). This may be achievable by analysis of old imagery with the application of modern classification methods.

To this end CapeNature requests that research be undertaken to formally develop and test standard monitoring and evaluation protocols for assessing the effects of IA plant species management on indigenous biodiversity in CapeNature Protected Areas. This is to be started by a pilot project tin the Berg, Breede and Riviersonderend catchments. This protocol will have to take into account the

spatial variation in both biodiversity and IAPS across the pilot area. Although this is a pilot implementation the design of the project must take into consideration that the method must be extensible to at least the rest of the Cape Fold Mountains.

Research questions

Where are plots best placed to monitor the effects of IAPS and their management (and how many are required)?

How do we measure indigenous biodiversity response to IAS and their management? In other words what will be an effective and informative protocol for collecting and evaluating the monitoring data recorded?

Where are old (>40 years), dense infestations of IAPS located?

Are the effects of IAPS and their management different for these dense stands?

Equipment and support

The following equipment and services will be supplied by CapeNature:

Stakes and metal tags to mark permanent plot sites.

Collaboration from Scientists, Technicians, Regional Ecologists and Ecological Coordinators. Access to relevant data curated by CapeNature and assistance with data requests to other state agencies.

Funding

There may be opportunities to source bursary funding for this project. CapeNature will endeavour with partners to provide at least some of the operational funding for this project.

Sample sites

Sample sites will be plots located in the Berg, Breede and Riviersonderend catchments. Sample sites should include both reference and treatment sites. This project will include the identification and set up of reference and treatment sites. Sample sites must be representative of the biological environments and there must be enough sites to cope with fire. Use may also be made of existing CapeNature permanent Protea plots. Sites must also include representation of densely invaded sites.

Time lines

Ideally this research will be completed in two to three years after initiation.

References

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