

Appendix F: GCC *Erica* working group and plenary discussions

Notes from the discussion sessions. Obstacles that apply across all target outcomes include limitations in funding and human resources, and the large numbers of species involved. Space in living collections is limited.

Outcomes	Obstacles	Actions	Measures of success
<i>In situ:</i> Update Red List assessments	Limited capacity, rare species. Lack up to date data, especially high-altitude spp., population level monitoring, threats (aliens, land development, grazing).	Obtain data on distributions; numbers; threats. Make a priority list, per area, per flowering time. Enlist Citizen Scientists; coordinate, champion, supervise	Number of taxa updated

Outcomes	Obstacles	Actions	Measures of success
Improve Conservation management & Restoration	<p>Lack ecological knowledge necessary for effective strategies. Not enough specialists and funds.</p> <p>Knowledge gaps: Soils [shale species in Cape]; mycorrhizae; pollination and seed set; seed and germination ecology; seed dispersal ecology; fire ecology – regimes for different species, age to maturity; dependence on intermediate disturbance; climate change effects on e.g. high altitude and range restricted spp. and implications for assisted relocation; population genetics of small populations</p>	<p>Select priority species</p> <p>Communicate info to stewardship officers</p>	<p>Publications on ecology and management</p> <p>Adoption of results in conservation management</p>
Protection of range restricted ericas	Vulnerability of spp. known from one locality or <10 km ² . Many on private land. Reasons for range restriction unclear	Collaborate with conservation stewardship to identify highest restoration potential; improve protection status; prioritise for <i>ex situ</i> collections.	Number of taxa for which protection level is identified
Identify species for horticultural industry	<p>Knowledge gaps: Growing conditions? Which are easy growing species? Medicinal uses? Overharvesting of flowers (e.g. <i>E. pillansii</i>) and collection of rare species</p>	Create awareness, new trends, link it to ecosystem services like pollinator attraction	Priority species in the trade

Outcomes	Obstacles	Actions	Measures of success
Counter threats	<p>Alien invasives</p> <p>Habitat loss</p>	<p>Prioritise areas with high number of (threatened) species and high alien density</p> <p>Prioritising centres of endemism and phylogenetic diversity e.g. Kogelberg, Riviersonderend</p> <p>Biocontrol options (alien invasives)</p> <p>Land-use screening tool</p>	<p>Funding for alien clearing</p> <p>Priority areas adopted by alien invasive clearing network</p>
<p>Ex situ:</p> <p>Conservation grade (multi-provenance) accessions of all threatened <i>Erica</i> species seed banked and duplicated across banks.</p>	<p>Access to seed/material (some species not so easy to access e.g. Madagascar, Lebanon, Libya, Syria)</p> <p>Unknown longevity of <i>Erica</i> seed in seedbank</p>	<p>Use networks</p> <p>Gap analysis, priority species list, develop collecting plan – long term</p> <p>Funding proposals; species conservation funds</p>	<p>Numbers of species/accessions seed banked</p>
Gap analysis of <i>ex situ</i> seed and living collections	<p>Access to data</p> <p>Data not always up to date or ‘ground-truthed’</p>	<p>Get potential data</p> <p>Prioritize - gap analysis</p> <p>Verify/ground truth priority species</p>	<p>Gap analysis report (this document)</p>

Outcomes	Obstacles	Actions	Measures of success
Germination protocols for difficult to germinate species	Germination may be different under controlled lab environments vs growing in a nursery	Identify difficult to germinate species (MSBP germination data and information from gardens) Prioritize species and develop research projects	Published protocols
All threatened <i>Erica</i> species in cultivation (at the most appropriate place) and collections duplicated across gardens	Access to seed/material (getting seed/material from other countries, phytosanitary requirements, etc.) Limited skilled people with experience Some species are difficult to cultivate	Gap analysis and prioritize species for cultivation Coordination of who has which plants (meta-collection) Gardens share species with specific Gardens/individuals responsible for specific species (species stewards)	Establishment of meta-collection and species stewards
Cultivation protocols established with testing of species in different microclimates for cultivation across the world and gardens	Obtaining seeds and materials for propagation	Research projects on cultivation looking at topics, such as: substrates; dormancy; climate; frost survival; high altitude	Publication of protocols

Outcomes	Obstacles	Actions	Measures of success
Genetically diverse <i>ex situ</i> collections	<p>Collections often from few mother plants; continuous propagation via cuttings</p> <p>Knowledge gap: what makes a good conservation collection?</p>	<p>Apply seed bank standards (MSBP research = min of 50 seeds)</p> <p>Research project defining good conservation collections</p> <p>Develop protocol for maintaining diverse conservation collections</p>	Publication and application of protocols
Data and information easily accessible	Data or information is currently spread between organizations and people	<p>Use BGCI plant search</p> <p>Organise a database or repository for all to access, with links to other available databases (Seed Information Database)</p>	Open database
Active research on <i>ex situ</i> collections, i.e. climate change, distribution niche modelling	Lack of information regarding <i>Erica</i> spp. and their resilience to climate change	Initiate climate change research and modelling	Publication
<p>Research:</p> <p>Perfect WFO checklist</p>	Lack of time	Systematically work through unplaced names.	Incremental improvements in 6-monthly updates

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Complete e-Flora	Descriptions in Latin only or lacking from the e-Flora; taxa absent in <i>Erica</i> ID aid; threat Status lacking/outdated; descriptions older than 1967	Add taxa to the <i>Erica</i> ID aid. Resolve status – revise. Autonyms: need a short description; harvest more information from literature Synchronise threat status data; prioritise, including older descriptions	e-Flora and ID aid synchronised – achieved in version 4.02 Further milestones: e.g. resolution of DDT taxa; descriptions for all taxa
Linked up data	Lacking stable URLs for red-listing, types, iNaturalist	Within SANBI: confirm linking with WFO identifiers Species showcases: SANBI pages for focal species (re-find, link-up, use)	e-Flora milestones/ID aid updates
Improved knowledge of TEA/Madagascan species	Bias in knowledge: Europe, RSA Permitting & CBD	Collect data – also for common species. Develop network: connections in institutions working across the full distribution	Publish new taxa/revisions
Improved knowledge of natural history	Lack knowledge of pollination, phenology, germination ecology, seed vitality, etc., particularly for non-charismatic species	Citizen science: target an accessible area, e.g. Table Mountain N.P., do field courses	Publish results

Outcomes	Obstacles	Actions	Measures of success
Protect old-growth forest & common (not just threatened) species	Loss of old growth forest, with threat to common species not recognised, e.g. of <i>E. arborea</i> in Ethiopia	Obtain funding for restoration	Funding; demonstrable action
Predictive niche models under climate change, particularly high elevation species	Complexity of the niche: not just temperature and precipitation, also rain shadow (distance to coast), community-level (mycorrhizae, etc.), impacts of climate change, etc. Lack high quality data	Identify and target gaps in data Bioblitz	Document improvements to data (successive gap analyses) Publish analyses
Complete and resolved phylogenetic tree for <i>Erica</i>	Lacking basal resolution, species representation (only 65%), species complexes (undescribed diversity)	Obtain funding; sample more species (Sanger or high-throughput sequencing); phylogenomic analyses to resolve rapid radiations; supermatrix approaches	Publications
Up to date revision of <i>Erica</i>	Scale of task demands stepwise approach; lack resolved phylogenetic tree to target smaller clades	Target species/complexes, subspecific variation, taxonomic uncertainty	Publications