

Chapter

11

Targeting Collecting for Conservation:

an example from Namibia



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Summary

Mandates of institutes and projects involved in germplasm collection are usually very broadly defined. An effective way of prioritisation has to be found to make the workload manageable and specific objectives attainable. In the Namibian case, the taxa in most urgent need of conservation had to be identified amongst the *circa* 4,000 indigenous taxa. The background information necessary, the criteria used, and the development of the priority database, are described here. The resulting list of priority species, and how this process is applied in the field, are discussed briefly.

Introduction

Seed collecting or conservation projects often have very broadly defined objectives or mandates. The Millennium Seed Bank Project, for example, aims to “conserve 10% of the world’s dryland plant species by 2010” (Anon., 2001) while the Southern African Development Community (SADC) Plant Genetic Resources programme, has the objective to “conserve genetic resources of indigenous wild, cultivated and other introduced plant species of actual or potential value in the SADC region” (SIDA, 1989). Such objectives are difficult to achieve, considering that resources (financial and human) are usually limited and projects themselves often have a lifespan of only five or ten years. The obvious solution is to prioritise seed collecting and concentrate on the taxa that best fit the objective(s).

There are different ways of going about prioritisation and the Namibian approach for collaboration in the Millennium Seed Bank Project (MSBP), is explained here.

Materials and Methods

The most recent list of indigenous Namibian higher plant species (Craven, 1999) was used as the basic list of taxa to be prioritised, since the whole of the country can be classified as dryland (UNESCO, 1977).

Four criteria were identified, each with several categories to which points in order of importance were allocated. These were conservation status, endemism, distribution and usefulness or value, see Table 11.1.

Table 11.1 Criteria and categories used in prioritising taxa for seed collection as part of the MSBP

Criterion	Data Source	Category	Score (points)
Conservation Status	<ul style="list-style-type: none"> – preliminary results of the Red Data Listing (RDL) project of the National Botanical Research Institute of Namibia – new IUCN categories were used 	critically endangered	3
		endangered	2
		vulnerable	1
		other	0
Endemism	<ul style="list-style-type: none"> – specimen database of the National Herbarium of Namibia (Spmndb) which contains herbarium specimen label information of about 70,000 specimens at the National Herbarium as well as some data from the National Botanical Institute in South Africa – phytogeography of Namibian endemics, a project undertaken at the institute – Checklist of Namibian plant species (Craven, 1999) 	endemic	2
		near endemic	1
		other	0
Distribution	<ul style="list-style-type: none"> – specimen database of the National Herbarium of Namibia – subsequent analysis using the system of quarter-degree squares (QDS), commonly employed by botanists in southern Africa 	known from only 1 QDS	2
		known from only 2 QDS	1
		other	0
Usefulness or value	<ul style="list-style-type: none"> – specimen database of the National Herbarium of Namibia – literature – personal experience 	crop relative	2
		human use (food, medicinal construction, cosmetic)	2
		Forage plant	1
		ornamental/ collector's item	1

All available taxa and information were entered into a database designed on Microsoft Access97 (Figure 11.1). The database was set up to calculate a total score for each taxon by adding up the points allocated by the above system.

Distribution data were mapped using ArcView 3.2 Geographical Information System. The number of priority taxa per quarter-degree square (QDS) can be displayed as well as the names of the taxa occurring in each QDS.

A collecting trip to test this system was planned to north-western Namibia, an area with a high concentration of priority species.

Results and Discussion

In order to prioritise plant taxa for seed collection, one needs to understand the objectives of the project in question or the purpose for which collecting is done. From this, criteria can be developed by which a total list of taxa occurring in the target area or covered by the objective, may be prioritised. To be successful this requires not only a complete list of taxa but also associated information relevant to the chosen criteria so that informal evaluation takes place.

The screenshot shows a Microsoft Access 97 database form titled "Priority Species for Germplasm Collection". The form is designed for data entry and includes several sections:

- Search and Identification:** A "Find Plant" button and a "Species" field. Below it, a table lists species names and their corresponding reference numbers (RefNo).

Species	RefNo
Asphodelaceae	109
Aloe	pillansii
- Status and Endemicity:** Two columns of criteria with associated scores.

Status	Score	Endemic	Score
CE = critically endangered	3	E = endemic	2
E = endangered	2	nE = near endemic	1
V = vulnerable	1	A = Alien /cultiv.	0
other	0	other	0
- Distribution:** A section for "Distribution" with criteria and scores.

Distribution	Score
OG = known from only 1 grid	2
2G = known from only 2 grids	1
- Value:** A section for "Value" with criteria and scores.

Value	Score
CR = crop relative	2
HU = human use	2
FP = forage plant	1
OR = ornamental	1
- Grids for this Species:** A table showing the distribution of the species across different grids.

Grid	RefNo
2716DD	109
	109
- Score Calculation:** A "CLICK HERE TO UPDATE SCORE" button and a "SCORE:" field displaying the value "6". A note below the score field states: "MUST be clicked when changes were made".

The form also includes a "Records" section at the bottom showing "49 of 1304" records and a "Form View" button. The Microsoft Access 97 interface is visible, including the menu bar and toolbar.

Figure 11.1 Data entry form of database showing criterion options and values.

When developing the criteria for this project, it was considered that the basic aim of the MSBP is to CONSERVE seed of DRYLAND plant species. As mentioned earlier, all of Namibia is classified as dryland. Hence all species of indigenous higher plants were included with the initial pool to be prioritised. Criteria should therefore select taxa in greatest need of conservation, i.e., rare, endemic taxa with restricted distribution within Namibia and possibly some usefulness. Taxa occurring in the driest parts of the country should be prioritised over the rest.

Data on the conservation status of taxa in Namibia were still preliminary and not all taxa have been evaluated by the RDL project.

Data on endemism were fairly complete. Only taxa with 100% of their populations occurring within the political borders of Namibia, were included. Near-endemic taxa were mainly those that are known as “Namib Desert endemics”, which includes taxa endemic to, or only occurring in the Namib Desert which stretches from just north of the Namibian border in Angola to just south of the Namibian border in South Africa. Information on near endemics in other parts of the country is rather scarce and this information still needs to be found.

“Usefulness” was restricted to plants that have some known, direct value to humans in order not to make this category too wide and therefore defeat the object of prioritising. The categories used may have to be refined in future.

Initially, aridity was not included in the prioritisation criteria. This was determined once taxa prioritised by the chosen four criteria were mapped and overlayed on GIS with rainfall maps. In Namibia, rainfall occurs along an increasing gradient from south-west to north-east and west to east.

Out of a total of about 4,200 taxa of higher plants that are indigenous to Namibia, 844 (c. 20%) taxa obtained a total score of between one and three, 179 (c. 4%) taxa had a total score of four to five and only 7 (0.2%) taxa scored more than five points in total. The priority species are distributed mainly in the western half of the country with concentrations in the southern and northern Namib Desert (Figure 11.2).

It was decided to use the list of 179 taxa with a score between four and five for testing in the field during the first season of seed collecting in April to June 2001. A collecting trip into north-western Namibia was undertaken in early June.

Identification of the priority taxa while in the field, proved to be difficult. Aids to identification, like descriptions, keys, distinguishing characters and photographs will therefore be added to the GIS in future. Photos may prove particularly useful when collectors are trying to locate a specific plant with the help of non-botanists resident in the area.

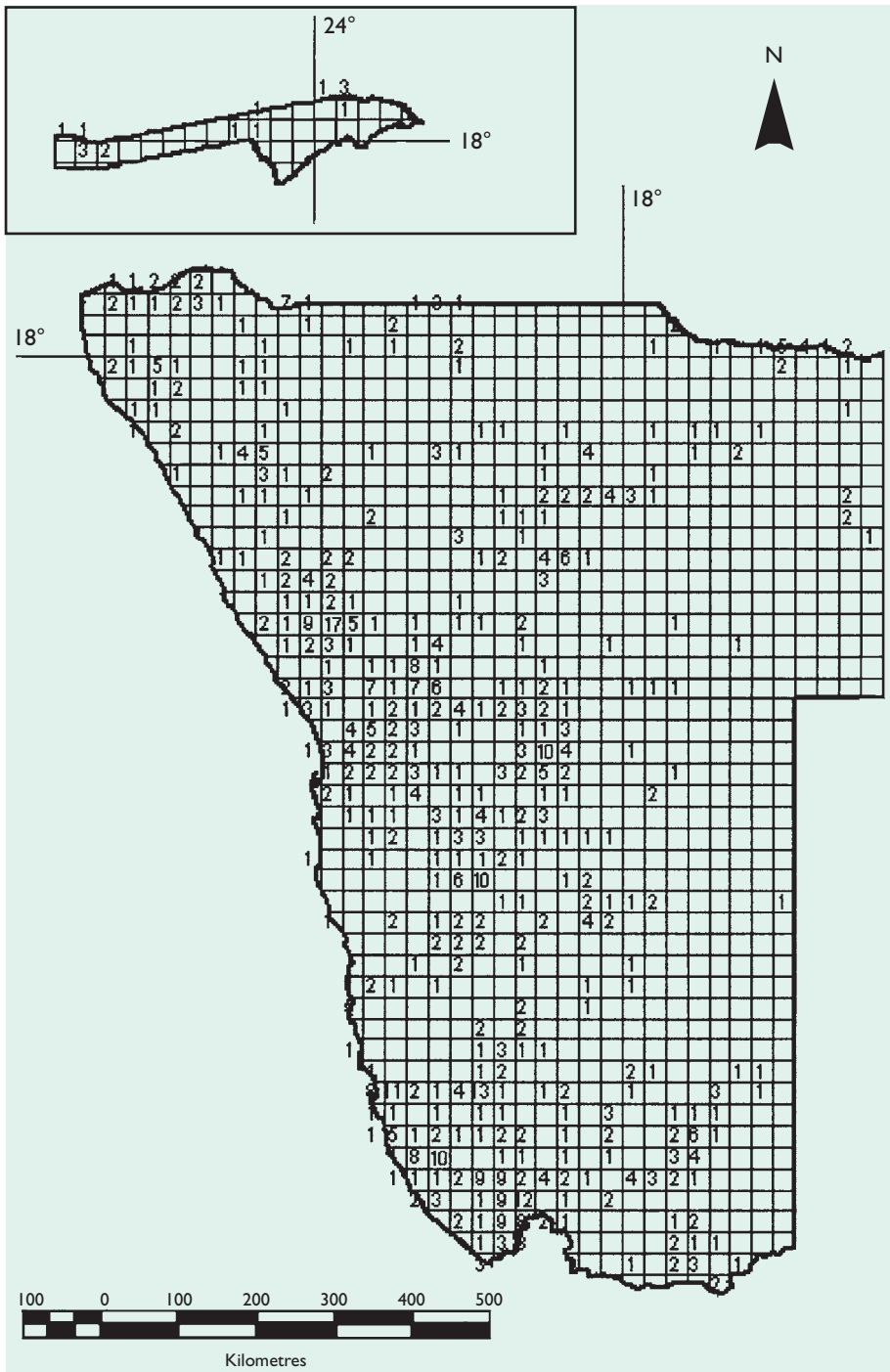


Figure 11.2 Distribution of 179 priority taxa in number of taxa per quarter-degree square.

A further problem experienced was the timing of the seed collecting mission. In future, information on the phenology of the priority taxa will be included in the database to try and pinpoint time of fruiting and therefore time of collecting more closely.

The QDS system used was found to be too inaccurate for locating populations of the identified priority species. It is understandable that an area of 25×25 km (the approximate size of a QDS) is very large when one is trying to locate the rarer taxa with restricted distributions, where a population often is only a few square metres in size. Adding exact localities and information on habitat preferences to the database may alleviate this difficulty in future.

Conclusions

A system like the one used here will obviously improve as better information becomes available. This depends very much on input from other projects and programmes.

The categories and points allocated may also need to be refined and adjusted in future as available information and local conditions change.

Even though a list of priority species focuses collecting and generally breaks down a huge task into manageable units, flexibility in the field remains important. Collecting missions are expensive and time consuming. If top priority species are not found, collectors and the system by which they work should be flexible and allow collection of species of lower priority rather than returning to base empty handed.

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References

- Anon (2001). *The Millennium Seed Bank Project. International Programme*. Royal Botanic Gardens, Kew, UK.
- Craven, P. (ed) (1999). *Checklist of Namibian plant species*. Southern African Botanical Diversity Network. Report No. 7. SABONET, Windhoek, Namibia. pp. 204.
- SIDA (1989). *A Regional Plant Genetic Resources Center SADCC. Plan of Operation 1989–1992*. SIDA, Alnarp, Sweden.
- UNESCO. (1977). *Map of the world distribution of arid regions*. MAB Technical notes 7. UNESCO.

