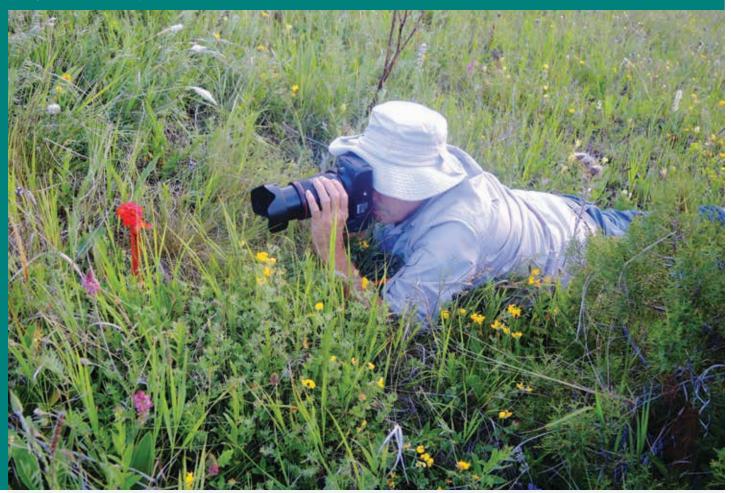
# Brief 1: How to carry out an eco-geographical survey



This brief was summarised by Yvette Harvey-Brown (BGCI) from Chapter 7 of BGCI's and IABG's Species Recovery Manual



#### Introduction

To be able to identify the most appropriate recovery actions for the target species, it is essential that you have a clear understanding of the current and historic status of the species in its natural habitat, including what has led to the decline of the species. To do this you should conduct a desk study and field work, followed by analysis of the data collected.

#### **Eco-geographical survey**

The process of gathering and synthesising information on ecological, geographical, taxonomic and genetic diversity.







## Why conduct an eco-geographical survey?

An eco-geographical survey can:

- Guide your species recovery programme and help to ensure its success
- Help you to leverage funding for a species recovery programme by demonstrating a comprehensive understanding of the species' status and needs to funders
- Provide a baseline against which to measure progress and success (or otherwise) of your recovery programme.

#### Creating a knowledge baseline

A strong knowledge baseline can be developed through a combination of a desk study and field work. Desk studies are usually less expensive than field work, however practical survey work will ensure a current and more in depth understanding of the target species.

Collecting the following information will enable you to have a better understanding of the species' requirements for survival and the threats that resulted in the species decline.

and success (or otherwise, or your recovery programme.

Factor	Description
Taxonomy and nomenclature	Taxonomic knowledge is required to ensure material surveyed and sampled is correctly identified.
Ecology of the species	Habit, growth rate, reproduction mechanisms, pollination, seed dispersal, population structure, seed storage behaviour, predators, diseases, etc.
Genetic information	Estimate of effective population size, amount of genetic variation within populations and assessment of gene flow between populations.
Habitat preferences	Habitat type, distribution, associated species, soil type, soil moisture content, aspect, climate/microclimate.
Cultivation requirements	What is the best watering/ fertilising regime? Are there any mycorrhizal or nurse species associations that can improve survival and growth rates?
Human interactions	Human induced threats and uses of the species.









#### **Desk studies**

Carrying out desk-based research for the species concerned is a cheap and effective way of gathering information. Below are some useful information sources that you can consult.

Source	Description	Useful links
Species description	Often include details of growth habit and habitat preferences.	<ul><li>- Jstor Plants (plants.jstor.org)</li><li>- GBIF (www.gbif.org)</li><li>- Plants of the World Online (www.plantsoftheworldonline.org)</li></ul>
Conservation assessment	Can contain information on distribution, population status, conservation management actions/recommendations and threats.	- BGCI's ThreatSearch Database (www.bgci.org/threat_search.php)
Herbarium records	Often contain notes on locality, associated species, habit and habitat type. Many herbaria allow people to visit for research purposes and digitised specimens can be viewed online.	<ul><li>- Jstor Plants (plants.jstor.org)</li><li>- GBIF (www.gbif.org)</li><li>- Tropicos (www.tropicos.org)</li></ul>
Published journal articles	More in-depth information is often published in scientific journal articles.	- Google Scholar (scholar.google.co.uk)
Websites/books	You can search for information on cultivation requirements, seed storage and whether conservation actions have been undertaken previously.	<ul><li>BGCI PlantSearch Database (www.bgci.org/plant_search.php)</li><li>Kew Seed Information Database (data.kew.org/sid/)</li></ul>
Historical photographs of habitat	Image search engine or visit a national archive/local museum to see if historical images are available.	
Point/location information	GPS point data can be used to make a current or past distribution map.	- Kew's GeoCat tool (geocat.kew.org/)
Habitat/vegetation/ land cover maps	Comparing point data to habitat or vegetation maps, will enable identification of appropriate vegetation type for the target species.	- ArcGIS (www.arc.gis.com) - ESRI (www.esri.com)

### **TOP TIP**

If the target species is not well studied, it is recommended that you look for information available on species of the same genus, or family, as in some cases they may share some of the same eco-geographical features.









#### Field work

During field work additional data can be collected to supplement the desk study, as well as photos, herbarium vouchers or plant samples if needed. If sufficient budget is available, repeat the field work in different seasons to capture additional information.

#### Before you go into the field:

- Check if permission is required to carry out your field survey. Additional permissions may also be needed to collect herbarium vouchers, seed or DNA samples.
- 2. Make sure suitably qualified team members have been identified for field work.
- 3. Ensure appropriate equipment is sourced for the survey.
- 4. Consider carrying out a risk assessment or having an emergency response plan. This is particularly important if the target species is found in a remote area.

#### What information to collect

Decide what data to collect before going into the field and prepare a form to ensure all required information is collected at each site or population. See Page 5 for an example format and suggested information to collect. Forms can be prepared in a notepad, Excel or Word then printed; a laptop or tablet can be carried in the field or a form can be developed and downloaded to a mobile phone (e.g. using www.opendatakit.org).

TOPTIP

If paper forms or a notepad are used, take a photo of the form whilst in the field in case it gets damaged or lost.

If electronic forms are used, make sure the data is backed up as soon as possible.

#### Herbarium vouchers, photos and samples

It is good practice to collect herbarium vouchers of the target and associated species in the field to provide a reference collection and to verify identification. Photos taken during field work can be compared to historical photos to show change over time and as a visual baseline to measure the impact of species recovery actions. Seed can be collected to test seed characteristics, storage requirements and germination techniques. DNA samples can also be collected for genetic analyses.



#### Talk with local people

Engaging the community during survey work carried out prior to commencing the species recovery actions can help to develop a relationship with the local community, who may be able to provide useful information on the target species, become involved in recovery actions and ensure the longer-term sustainability of the recovery programme. See Species Recovery Brief 4 for more detailed guidance on engaging with local communities.

#### Data analysis

Where the desk study and field work have been completed, it is good practice to collate this information in a report. It is advisable that you share this report with all relevant stakeholders to provide them with an opportunity to give further input on species recovery actions. This report will also be a helpful tool for fundraising to carry out identified actions.

If historic data is available, compare current and historic data to determine the rate of decline of the target species. Understanding the rate of decline can help to identify the urgency of the recovery actions.

Map as much of the data as possible. This will help visualise and interpret the data, but will also help communicate the project plan to funders and other interested parties. Photos and points can be added easily to Google maps (www.google.com/maps), or iNaturalist (www.inaturalist.org/). More detailed mapping may require GIS skills and software or employment of a consultant to map the data.



#### Sample data collection form

Size for number  Obte of surewy  Target species name  Family  Obte of surewy  Target species name  Family  Obte of surewy  Target species name  Family  Obte of surewy  Notes on registation type:  Position  Obte of sure species of surewy  Target species of surewy  Target species of surewy  Obte of surewy  Target species of surewy	Part and many			
Data recorder  Target species name  Target species	Project name			
Date of sareny Tamily Tamily species name Family Althoude				
Tagest species name				
Smally   Care	1			
GPS Cartured & Donature & Comment of the Comment of				
Altitude Vegetation type: Vegetation type: Vegetation type: Vegetation type: Pristine  (lick which applie) Pristine (lick which applie) Pristine (lick which applie) Pristine (lick which applie) Pristine (lick which applie) Pristine (lick which applie) Pristine (lick which applie)  Vegetation type: Vegetation ty				
Vegetation type   Notes on vegetation type:   (tick which applies)	-			
Vegetation type: Pristine Disturbed Heavily disturbed Services composition/associated species Cancopy layer (list species) Shoul Javar (list species) Shoul Javar (list species) Shoul Javar (list species) Ground laver (list species) Ground laver (list species) Shoul Javar (list species) Ground laver (list species) Shoul Javar (list species) Ground laver (list species) Shoul Javar (list species) Threats Threats Threats Threat (list and included laboration) Shoul Javar (list species) Shoul Javar (list spe	Altitude			
Notes on vegetation type: Pristine Disturbed Heavily disturbed Secrets composition/associated species Cancey layer (list species) Sociate stepsically associated species Sociated species) Sociated species Sould layer (list species) Sould	Vegetation type			
Pristine   Disturbed   Heavily disturbed   Hea	Vegetation type			
Disturbed   Heavily disturbed   Species composition/ associated species	Notes on vegetation type:		(tick which applies)	
Reading Statushed	Pristine			
Species composition/ associated species	Disturbed			
Canopy layer (list species) Shub layer (list species) Forund layer (list species) Forund layer (list species) Forund layer (list species) Freats Frea	Heavily disturbed			
Canopy layer (list species) Shub layer (list species) Forund layer (list species) Forund layer (list species) Forund layer (list species) Freats Frea	Species composition/associated species			
Smula byer (list species) Notes on species composition (e.g. invasive species)  Threats  Threat Tyre  Is this threat orgoing? Is this threat orgoing? Is this species used by local people? If yes, add details of the uses 8 level of exploitation Are there any protection measures in place for this species? If yes, add details of the protection measures and their effectiveness  Site characteristics  Locality type (e.g., mountain, slope, plateau, forest) Site soil (e.g., sand, loam, clw) Lithdogy (e.g., granics, sandstone)  Estimated slope angle Site exposure level (full shade/partial shade/full sun) Climati (microclimatic conditions) Notes on site  Population information Number of alive individuals present Number of juvenile individuals present Number of juvenile individuals present Number of juvenile individuals present Cause of death Number of individuals present Cause of death Number of alive individuals present Number of place in attrait regeneration?  Number of of alive individuals present Number of place individuals present Number of ordering the place individuals present Number of ordering the place individuals present Number of death Number of ordering the place individuals present Number of death (stanta shape) Number of				
Street August 1 (and any and 1 (and any any and 1 (and any and any any and any any and any				
Notes on species composition (e.g., invasive species)  Threat tye is this threat ongoing? Is this threat ongoing? Is this species used by local people? If yes, add details of the uses & level of exploitation Are there any protection measures in place for this species? If yes, add details of the protection measures and their effectiveness				
Threat type Interest properation of threats is this threat ongoing? Notes of threats Is this species used by local people? If yes, add details of the uses & level of exploitation Are there any protection measures in place for this species? If yes, add details of the protection measures and their effectiveness  Site characteristics  Locality type (e.g., mountain, slope, plateau, forest) Site soal (e.g., and, Loan, Clay) Lithology (e.g., granite, sandstone) Estimated slope angle Site exposure level (full shade/partial shade/full sun) Climatic (microtimatic conditions) Notes on site  Population information Number of alive individuals present Number of alive individuals present Was the population number counted or estimated? If quadrats were used, what was the quadrat size? Is there evidence of natural regeneration? Number of dead individuals present Notes on population  Samples  Type of material collected (seed, herbanium voucher, DNA samplo) Seed specimen number Number of duplicated vouchers taken Number of duplicated vouchers taken Purpose of Collection Purpose of Collection (e.g. to verify ID) DNA specimen number Number of full planted vouchers taken Purpose of Collection (e.g. to verify ID) DNA specimen number Number of duplicated vouchers taken Purpose of Collection (e.g. to verify ID) DNA specimen number Number of duplicated vouchers taken Purpose of Collection (e.g. to verify ID) DNA specimen number Number of duplicated vouchers taken Purpose of Collection (e.g. to verify ID) DNA specimen number Number of duplicated vouchers taken Purpose of collection (e.g. to verify ID) DNA specimen number Number of duplicated vouchers taken Purpose of collection (e.g. to verify ID) DNA specimen number Shouth layer Leaf arrangement Bark				
Invest type  Strist Strots Congoing?  Notes of threats  Is this species used by local people? If yes, add details of the uses & level of exploitation  Are there any protection measures in place for this species? If yes, add details of the protection measures and their effectiveness    Caucility type (e.g., mountain, slope, plateau, forest)				
Is this threat ongoing?  Notes of threat on the any protection measures in place for this species? If yes, add details of the uses & level of exploitation Are there any protection measures in place for this species? If yes, add details of the protection measures and their effectiveness  Site characteristics  Locality type (e.g., mountain, slope, plateau, forest)  It should be specially type (e.g., amountain, slope, plateau, forest)  It should be specially type (e.g., amountain, slope, plateau, forest)  It thiology (e.g., granite, sandstone)  Estimated slope angle  Site exposure level (full shade/partial shade/full sun)  Climatic/microclimatic conditions  Notes on site  Population information  Number of alive individuals present  Number of alive mature individuals present  Number of alive individuals present  Was the population number counted or estimated? If quadrats were used, what was the quadrat size?  Is there evidence of natural regeneration?  Number of flead individuals present  Was the population mumber counted or estimated? If quadrats were used, what was the quadrat size?  Is there evidence of natural regeneration?  Number of flead individuals present  Cause of death  Notes on population  Samples  Type of material collected (seed, herbarium woucher, DNA sample)  Seed specimen number  Number of Seed's collected from population  Purpose of Collection  Herbarium voucher number  Number of Seed's collected from population  Purpose of collection (e.g., to verify (i))  DNA specimen number  Number of DNA samples collected from population  Purpose of collection (e.g., to verify (ii))  DNA specimen number  Number of DNA samples collected from population  Purpose of collection  Purpose of collection  Purpose of collection  Seed  Leaf arrangement  Bark  Holtary Size  Seed  Leaf arrangement  Bark  Evidence of threats				
Notes of threats  Is this species used by local people? If yes, add details of the uses & level of exploitation Are there any protection measures in place for this species? If yes, add details of the protection measures and their effectiveness  Site characteristics  Locality type (e.g., mountain, slope, plateau, forest)  Site soil (e.g., sand, loam, clay)  Lithology (e.g., sand, loam, clay)  Lithology (e.g., sande, sandstone)  Estimated slope angle  Site exposure level (full shade/ partial shade/ full sun)  Climate( /microclimatic conditions)  Notes on site  Population information  Number of alive individuals present  Number of alive individuals present  Was the population number counted or estimated? If quadrats were used, what was the quadrat size? Is there evidence of natural regeneration?  Number of dead individuals present  Cause of death  Number of seeds collected (seed, herbarium voucher, DNA sample)  Samples  Type of material collected (seed, herbarium voucher, DNA sample)  Seed specimen number  Number of seeds collected from population  Purpose of collection  Herbarium voucher number  Number of DNA specimen number  Number of DNA samples collected from population  Purpose of collection (e.g., to verify ID)  DNA specimen number  Number of DNA s				
Is this species used by local people? If yes, add details of the uses & level of exploitation Are there any protection measures in place for this species? If yes, add details of the protection measures and their effectiveness    Cocality type (e.g. mountain, slope, plateau, forest)	0 0			
Are there any protection measures in place for this species? If yes, add details of the protection measures and their effectiveness  Site canacteristics  Locality type (e.g., mountain, slope, plateau, forest)  Site soil (e.g., sand, loam, clay)  Lithology (e.g., grantle, sandstone)  Estimated slope angle  Site exposure level (full shade/partial shade/full sun)  Climatir/microclimatic conditions  Notes on site  Population information  Number of alive individuals present  Number of alive individuals present  Number of lave individuals present  Was the population number counted or estimated? If quadrats were used, what was the quadrat size? Is there evidence of natural regeneration?  Number of dead individuals present  Number of dead individuals present  Number of selection or fartural regeneration?  Number of selection or fartural regeneration?  Number of selection or fartural regeneration?  Number of selection or such are greated in the control or estimated? If quadrats were used, what was the quadrat size? Is there evidence of natural regeneration?  Number of selection or fartural regeneration?  Number of selection or fartural regeneration?  Number of selection or fartural regeneration?  Number of selection or such are greated and individuals present  Seed selected from population  Purpose of collection  Herbanium voucher number  Number of selection (e.g., to verify ID)  DNA specimen number  Number of JNA samples collected from population  Purpose of collection (e.g., to verify ID)  DNA specimen number  Number of ONA samples collected from population  Purpose of collection (e.g., to verify ID)  DNA specimen number  Rumber of DNA samples collected from population  Purpose of collection (e.g., to verify ID)  Pu				
Site characteristics				
Locality type (e.g. mountain, slope, plateau, forest)  Site soil (e.g. sand, loam, clay)  Lithiology (e.g. granite, sandstone)  Estimated slope angle  Site exposure level (full shade/partial shade/full sun)  Climati/microclimatic conditions  Notes on site  Population information  Number of alive individuals present  Number of alive mature individuals present  Number of juvenile individuals present  Number of juvenile individuals present  Number of deven de natural regineeration?  Is there evidence of natural regeneration?  Number of dead individuals present  Samples  Samples  Samples  Samples  Seed specimen number  Number of of material collected (seed, herbarium voucher, DNA sample)  Seed specimen number  Number of seeds collected from population  Purpose of collection  Purpose of collection (e.g. to verify ID)  DNA specimen number  Number of DNA samples collected from population  Purpose of collection (e.g. to verify ID)  DNA specimen number  Number of DNA samples collected from population  Purpose of collection (e.g. to verify ID)  DNA specimen number  Number of DNA samples collected from population  Purpose of collection (e.g. to verify ID)  DNA specimen number  Number of DNA samples collected from population  Purpose of collection (e.g. to verify ID)  DNA specimen number  Number of DNA samples collected from population  Purpose of collection (e.g. to verify ID)  Photo checklist  Habitat/site  Canopy layer  Seed  Seed  Seed  Send  Service of threats		s, add details of the protection measures and their effectiveness		
Site soil (e.g. sand, loam, clay) Lithology (e.g. granite, sandstone) Estimated Slope angle Site exposure level (full shade/partial shade/full sun) Climatic/microclimatic conditions Notes on site  Population information Number of alive individuals present Number of alive individuals present Number of alive mature individuals present Number of juvenile individuals present Number of selve and individuals present Number of dead individuals present Lause of death Notes on spulation individuals present Cause of death Notes on population Samples  Type of material collected (seed, herbarium voucher, DNA sample) Seed specimen number Number of seeds collected from population Purpose of collection Herbarium voucher number Number of duplicated vouchers taken Purpose of collection (e.g. to verify ID) DNA specimen number Number of Seeds speci				
Lithology (e.g. granite, sandstone) Estimated slope angle Site exposure level (full shade/partial shade/full sun) Climatic/microclimatic conditions Number of alive individuals present Number of alive individuals present Number of alive individuals present Number of pivenile individuals present Number of alive mature individuals present Number of alive mature individuals present Number of alive mature individuals present Number of pivenile individuals present Number of pivenile individuals present Cause of death Number of dead individuals present Cause of death Number of dead individuals present Cause of death Number of death individuals present Number of death individuals present Cause of death Number of death Number of death individuals present Number of death individuals present Number of seeds collected (seed, herbarium voucher, DNA sample) Seed specimen number Number of seeds collected from population Purpose of collection Purpose of collection Number of seeds collected from population Purpose of collection (e.g. to verify ID) DNA specimen number Number of DNA samples collected from population Purpose of collection (e.g. to verify ID) DNA specimen number Number of DNA samples collected from population Purpose of collection (e.g. to verify ID) Photo checklist Habitar/site Canopy layer Seed Seed Shub layer Ground layer Fill plant Evidence of threats				
Estimated slope angle Site exposure level (full shade/partial shade/full sun) Climatic/microclimatic conditions Notes on site  Population Information Number of alive individuals present Number of alive individuals present Number of alive individuals present Number of invenite individuals present Number of invenite individuals present Number of present in the state of				
Site exposure level (full shade/partial shade/full sun)  Climatic/microclimatic conditions  Notes on site  Population information  Number of alive mature individuals present  Number of present mature individuals present  Number of present mature individuals present  Was the population number counted or estimated? If quadrats were used, what was the quadrat size?  Is there evidence of natural regeneration?  Number of dead individuals present  Cause of dead in dividuals present  Notes on population  Samples  Type of material collected (seed, herbarium voucher, DNA sample)  Seed specimen number  Number of seeds collected from population  Purpose of collection  Herbarium voucher number  Number of duplicated vouchers taken  Purpose of collection (e.g. to vorify ID)  DNA specimen number  Number of DNA samples collected from population  Purpose of collection (e.g. to vorify ID)  DNA specimen number  Number of DNA samples collected from population  Purpose of collection (e.g. to vorify ID)  DNA specimen number  Number of DNA samples collected from population  Purpose of collection (e.g. to vorify ID)  DNA specimen number  Number of DNA samples collected from population  Purpose of collection (e.g. to vorify ID)  DNA specimen number  Number of DNA samples collected from population  Purpose of collection (e.g. to vorify ID)  Photo checklist  Habitat/site  Canopy layer  Seed  Ground layer  Flul plant  Evidence of threats				
Climatic/microclimatic conditions Notes on site  Population information  Number of alive individuals present Number of alive individuals present Number of alive individuals present Was the population number counted or estimated? If quadrats were used, what was the quadrat size? Is there evidence of natural regeneration? Number of dead individuals present Cause of death Notes on population  Samples  Type of material collected (seed, herbarium voucher, DNA sample) Seed specimen number Number of seeds collected from population Purpose of collection Herbarium voucher number Number of duplicated vouchers taken Purpose of collection (e.g. to verify ID) DNA specimen number Number of DNA samples collected from population Purpose of collection (e.g. to verify ID) DNA specimen number Number of DNA samples collected from population Purpose of collection (e.g. to verify ID) DNA specimen number Number of DNA samples collected from population Purpose of collection Pur	Estimated slone angle			
Notes on site  Population Information Number of alive individuals present Number of alive mature individuals present Was the population number counted or estimated? If quadrats were used, what was the quadrat size? Is there evidence of natural regeneration? Number of dead individuals present Cause of death Notes on population  Samples  Type of material collected (seed, herbarium voucher, DNA sample) Seed specimen number Number of seeds collected from population Purpose of collection Herbarium voucher number Number of duplicated vouchers taken Purpose of collection (e.g. to verify ID) DNA specimen number Number of DNA samples collected from population Purpose of collection Purpose of collection Flows collected from population Purpose of collection Photo checklist Flower Canopy layer Seed Seed Shrub layer Ground layer Bark Full plant Evidence of threats				
Population information Number of alive individuals present Number of alive mature individuals present Number of pluvenile individuals present Was the population number counted or estimated? If quadrats were used, what was the quadrat size? Is there evidence of natural regeneration? Number of dead individuals present Cause of death Notes on population Samples Type of material collected (seed, herbarium voucher, DNA sample) Seed specimen number Number of deeds collected from population Purpose of collection Herbarium voucher number Number of Jupiciated vouchers taken Purpose of collection (e.g. to verify ID) DNA specimen number Number of MAS samples collected from population Purpose of collection (e.g. to verify ID) DNA specimen number Number of DNA samples collected from population Purpose of collection (e.g. to verify ID) DNA specimen number Shayber of the samples collected from population Purpose of collection Purpose of collection Photo checklist Habitat/site Canopy layer Seed Shrub layer Ground layer Full plant Evidence of threats	Site exposure level (full shade/partial shade/full sun)			
Number of alive individuals present Number of alive mature individuals present Number of juvenile individuals present Was the population number counted or estimated? If quadrats were used, what was the quadrat size? Is there evidence of natural regeneration? Number of dead individuals present Cause of death Notes on population  Samples Type of material collected (seed, herbarium voucher, DNA sample) Seed specimen number Number of seeds collected from population Purpose of collection Herbarium voucher number Number of duplicated vouchers taken Purpose of collection (e.g. to verify ID) DNA specimen number Number of DNA samples collected from population Purpose of collection Purpose of collection Herbarium voucher number Number of DNA samples collected from population Purpose of collection Purpose of collection Endowment of the properties of the population Purpose of collection Part of DNA samples collected from population Purpose of collection Purpose of collection Photo checklist Ground Javer Leaf arrangement Ground Javer Flower Canopy Javer Seed Seed Shrub Javer Full plant Evidence of threats	Site exposure level (full shade/partial shade/full sun) Climatic/microclimatic conditions			
Number of alive mature individuals present Number of juvenile individuals present Was the population number counted or estimated? If quadrats were used, what was the quadrat size? Is there evidence of natural regeneration? Number of dead individuals present Cause of death Notes on population  Samples  Type of material collected (seed, herbarium voucher, DNA sample) Seed specimen number Number of seeds collected from population Purpose of collection Herbarium voucher number Number of duplicated vouchers taken Purpose of collection (e.g. to verify ID) DNA specimen number Number of DNA samples collected from population Purpose of collection  Photo checklist Habitat/site Canopy layer Seed Shrub layer Ground layer Full plant Evidence of threats	Site exposure level (full shade/partial shade/full sun) Climatic/microclimatic conditions			
Number of juvenile individuals present  Was the population number counted or estimated? If quadrats were used, what was the quadrat size?  Is there evidence of natural regeneration?  Number of dead individuals present  Cause of death Notes on population  Samples  Type of material collected (seed, herbarium voucher, DNA sample)  Seed specimen number  Number of seeds collected from population  Purpose of collection  Herbarium voucher number  Number of duplicated vouchers taken  Purpose of collection (e.g. to verify ID)  DNA specimen number  Number of DNA samples collected from population  Purpose of collection  Photo checklist  Habitat/site  Canopy layer  Seed  Shrub layer  Flower  Ground layer  Full plant  Evidence of threats	Site exposure level (full shade/partial shade/full sun) Climatic/microclimatic conditions Notes on site			
Was the population number counted or estimated? If quadrats were used, what was the quadrat size?  Is there evidence of natural regeneration?  Number of dead individuals present  Cause of death Notes on population  Samples  Type of material collected (seed, herbarium voucher, DNA sample)  Seed specimen number  Number of seeds collected from population  Purpose of collection  Herbarium voucher number  Number of duplicated vouchers taken  Purpose of collection (e.g. to verify ID)  DNA specimen number  Number of DNA samples collected from population  Purpose of collection (e.g. to verify ID)  DNA specimen number  Number of DNA samples collected from population  Purpose of collection (e.g. to verify ID)  Seed Specimen number  Number of DNA samples collected from population  Purpose of collection  Poto checklist  Habitat/site  Canopy layer  Seed  Shrub layer  Foround layer  Full plant  Evidence of threats	Site exposure level (full shade/partial shade/full sun) Climatic/microclimatic conditions Notes on site  Population information			
Is there evidence of natural regeneration?  Number of dead individuals present  Cause of death  Notes on population  Samples  Type of material collected (seed, herbarium voucher, DNA sample)  Seed specimen number  Number of seeds collected from population  Purpose of collection  Herbarium voucher number  Number of duplicated vouchers taken  Purpose of collection (e.g. to verify ID)  DNA specimen number  Number of DNA samples collected from population  Purpose of collection (e.g. to verify ID)  DNA specimen number  Number of DNA samples collected from population  Purpose of collection  Purpose of collection  Each of the collection (e.g. to verify ID)  DNA specimen number  Number of DNA samples collected from population  Purpose of collection  Pioto checklist  Habitat/site  Canopy layer  Seed  Shrub layer  Leaf arrangement  Ground layer  Full plant  Evidence of threats	Site exposure level (full shade/partial shade/full sun) Climatic/microclimatic conditions Notes on site  Population information Number of alive individuals present			
Is there evidence of natural regeneration?  Number of dead individuals present  Cause of death  Notes on population  Samples  Type of material collected (seed, herbarium voucher, DNA sample)  Seed specimen number  Number of seeds collected from population  Purpose of collection  Herbarium voucher number  Number of duplicated vouchers taken  Purpose of collection (e.g. to verify ID)  DNA specimen number  Number of DNA samples collected from population  Purpose of collection (e.g. to verify ID)  DNA specimen number  Number of DNA samples collected from population  Purpose of collection  Purpose of collection  Each of the collection (e.g. to verify ID)  DNA specimen number  Number of DNA samples collected from population  Purpose of collection  Pioto checklist  Habitat/site  Canopy layer  Seed  Shrub layer  Leaf arrangement  Ground layer  Full plant  Evidence of threats	Site exposure level (full shade/partial shade/full sun) Climatic/microclimatic conditions Notes on site  Population information Number of alive individuals present Number of alive mature individuals present			
Cause of death Notes on population  Samples  Type of material collected (seed, herbarium voucher, DNA sample) Seed specimen number Number of seeds collected from population Purpose of collection Herbarium voucher number Number of duplicated vouchers taken Purpose of collection (e.g. to verify ID) DNA specimen number Number of DNA samples collected from population Purpose of collection  Photo checklist Habitat/site Canopy layer Seed Shrub layer Ground layer Full plant Evidence of threats	Site exposure level (full shade/partial shade/full sun) Climatic/microclimatic conditions Notes on site  Population information Number of alive individuals present Number of juvenile individuals present	ere used, what was the quadrat size?		
Cause of death Notes on population  Samples  Type of material collected (seed, herbarium voucher, DNA sample) Seed specimen number Number of seeds collected from population Purpose of collection Herbarium voucher number Number of duplicated vouchers taken Purpose of collection (e.g. to verify ID) DNA specimen number Number of DNA samples collected from population Purpose of collection  Photo checklist Habitat/site Canopy layer Seed Shrub layer Ground layer Full plant Evidence of threats	Site exposure level (full shade/partial shade/full sun) Climatic/microclimatic conditions Notes on site  Population information Number of alive individuals present Number of alive mature individuals present Number of juvenile individuals present Was the population number counted or estimated? If quadrats w	ere used, what was the quadrat size?		
Samples Type of material collected (seed, herbarium voucher, DNA sample) Seed specimen number Number of seeds collected from population Purpose of collection Herbarium voucher number Number of duplicated vouchers taken Purpose of collection (e.g. to verify ID) DNA specimen number Number of DNA samples collected from population Purpose of collection  Photo checklist Habitat/site Canopy layer Shrub layer Ground layer Ground layer Full plant Evidence of threats	Site exposure level (full shade/partial shade/full sun) Climatic/microclimatic conditions Notes on site  Population information Number of alive individuals present Number of alive mature individuals present Number of juvenile individuals present Was the population number counted or estimated? If quadrats w Is there evidence of natural regeneration?	ere used, what was the quadrat size?		
Samples Type of material collected (seed, herbarium voucher, DNA sample) Seed specimen number Number of seeds collected from population Purpose of collection Herbarium voucher number Number of duplicated vouchers taken Purpose of collection (e.g. to verify ID) DNA specimen number Number of DNA samples collected from population Purpose of collection  Photo checklist Habitat/site Canopy layer Shrub layer Ground layer Ground layer Full plant Evidence of threats	Site exposure level (full shade/partial shade/full sun) Climatic/microclimatic conditions Notes on site  Population information Number of alive individuals present Number of sive mature individuals present Number of juvenile individuals present Was the population number counted or estimated? If quadrats w Is there evidence of natural regeneration? Number of dead individuals present	ere used, what was the quadrat size?		
Type of material collected (seed, herbarium voucher, DNA sample)  Seed specimen number  Number of seeds collected from population  Herbarium voucher number  Number of duplicated vouchers taken  Purpose of collection (e.g. to verify ID)  DNA specimen number  Number of DNA samples collected from population  Purpose of collection  Purpose of collection  Photo checklist  Habitat/site  Canopy layer  Shrub layer  Ground layer  Found layer  Full plant  Evidence of threats	Site exposure level (full shade/partial shade/full sun) Climatic/microclimatic conditions Notes on site  Population information Number of alive individuals present Number of alive mature individuals present Number of juvenile individuals present Was the population number counted or estimated? If quadrats w Is there evidence of natural regeneration? Number of dead individuals present Cause of death	ere used, what was the quadrat size?		
Seed specimen number Number of seeds collected from population Purpose of collection Herbarium voucher number Number of duplicated vouchers taken Purpose of collection (e.g. to verify ID) DNA specimen number Number of DNA samples collected from population Purpose of collection Purpose of collection Purpose of collection Flower of DNA samples collected from population Purpose of collection Photo checklist Habitat/site Canopy layer Seed Shrub layer Ground layer Full plant Evidence of threats	Site exposure level (full shade/partial shade/full sun) Climatic/microclimatic conditions Notes on site  Population information Number of alive individuals present Number of alive mature individuals present Number of juvenile individuals present Was the population number counted or estimated? If quadrats w Is there evidence of natural regeneration? Number of dead individuals present Cause of death Notes on population	ere used, what was the quadrat size?		
Number of seeds collected from population  Purpose of collection  Herbarium voucher number  Number of duplicated vouchers taken  Purpose of collection (e.g. to verify ID)  DNA specimen number  Number of DNA samples collected from population  Purpose of collection  Purpose of collection  Photo checklist  Habitat/site  Canopy layer  Seed  Shrub layer  Ground layer  Found layer  Full plant  Evidence of threats	Site exposure level (full shade/partial shade/full sun) Climatic/microclimatic conditions Notes on site  Population information Number of alive individuals present Number of alive mature individuals present Number of juvenile individuals present Was the population number counted or estimated? If quadrats w Is there evidence of natural regeneration? Number of dead individuals present Cause of death Notes on population			
Purpose of collection Herbarium voucher number Number of duplicated vouchers taken Purpose of collection (e.g. to verify ID) DNA specimen number Number of DNA samples collected from population Purpose of collection  Photo checklist Habitat/site Canopy layer Shrub layer Ground layer Found layer Full plant Evidence of threats	Site exposure level (full shade/partial shade/full sun) Climatic/microclimatic conditions Notes on site  Population information Number of alive individuals present Number of alive mature individuals present Number of juvenile individuals present Was the population number counted or estimated? If quadrats w Is there evidence of natural regeneration? Number of dead individuals present Cause of death Notes on population  Samples Type of material collected (seed, herbarium voucher, DNA sample)			
Herbarium voucher number  Number of duplicated vouchers taken  Purpose of collection (e.g. to verify ID)  DNA specimen number  Number of DNA samples collected from population  Purpose of collection  Photo checklist  Habitat/site  Canopy layer  Shrub layer  Ground layer  Ground layer  Full plant  Evidence of threats	Site exposure level (full shade/partial shade/full sun) Climatic/microclimatic conditions Notes on site  Population information Number of alive individuals present Number of alive mature individuals present Number of juvenile individuals present Was the population number counted or estimated? If quadrats w Is there evidence of natural regeneration? Number of dead individuals present Cause of death Notes on population  Samples Type of material collected (seed, herbarium voucher, DNA samples Seed specimen number			
Number of duplicated vouchers taken  Purpose of collection (e.g. to verify ID)  DNA specimen number  Number of DNA samples collected from population  Purpose of collection  Photo checklist  Habitat/site Flower  Canopy layer Seed  Shrub layer Leaf arrangement  Ground layer Bark  Full plant Evidence of threats	Site exposure level (full shade/partial shade/full sun) Climatic/microclimatic conditions Notes on site  Population information Number of alive individuals present Number of alive mature individuals present Number of juvenile individuals present Was the population number counted or estimated? If quadrats w Is there evidence of natural regeneration? Number of dead individuals present Cause of death Notes on population  Samples Type of material collected (seed, herbarium voucher, DNA sample Seed specimen number Number of seeds collected from population			
Purpose of collection (e.g. to verify ID)  DNA specimen number  Number of DNA samples collected from population  Purpose of collection  Photo checklist  Habitat/site Flower  Canopy layer Seed  Shrub layer Leaf arrangement  Ground layer Bark  Full plant Evidence of threats	Site exposure level (full shade/partial shade/full sun) Climatic/microclimatic conditions Notes on site  Population information  Number of alive individuals present Number of ive individuals present Number of juvenile individuals present Was the population number counted or estimated? If quadrats w Is there evidence of natural regeneration? Number of dead individuals present Cause of death Notes on population  Samples Type of material collected (seed, herbarium voucher, DNA sample Seed specimen number Number of seeds collected from population Purpose of collection			
DNA specimen number Number of DNA samples collected from population Purpose of collection  Photo checklist  Habitat/site Flower Canopy layer Seed Shrub layer Leaf arrangement Ground layer Bark Full plant Evidence of threats	Site exposure level (full shade/partial shade/full sun) Climatic/microclimatic conditions Notes on site  Population information Number of alive individuals present Number of alive mature individuals present Was the population number counted or estimated? If quadrats w Is there evidence of natural regeneration? Number of dead individuals present Cause of death Notes on population  Samples Type of material collected (seed, herbarium voucher, DNA sample Seed specimen number Number of seeds collected from population Purpose of collection Herbarium voucher number			
Number of DNA samples collected from population Purpose of collection  Photo checklist  Habitat/site Flower Canopy layer Seed Shrub layer Leaf arrangement Ground layer Bark Full plant Evidence of threats	Site exposure level (full shade/partial shade/full sun) Climatic/microclimatic conditions Notes on site  Population information Number of alive individuals present Number of alive mature individuals present Was the population number counted or estimated? If quadrats w Is there evidence of natural regeneration? Number of dead individuals present Cause of death Notes on population  Samples Type of material collected (seed, herbarium voucher, DNA sample Seed specimen number Number of seeds collected from population  Purpose of collection Herbarium voucher number Number of duplicated vouchers taken			
Purpose of collection  Photo checklist  Habitat/site Flower  Canopy layer Seed Shrub layer Leaf arrangement Ground layer Bark Full plant Evidence of threats	Site exposure level (full shade/partial shade/full sun) Climatic/microclimatic conditions Notes on site  Population information Number of alive individuals present Number of alive mature individuals present Number of juvenile individuals present Was the population number counted or estimated? If quadrats w Is there evidence of natural regeneration? Number of dead individuals present Cause of death Notes on population  Samples Type of material collected (seed, herbarium voucher, DNA sample Seed specimen number Number of seeds collected from population Purpose of collection Herbarium voucher number Number of duplicated vouchers taken Purpose of collection (e.g. to verify ID)			
Photo checklist  Habitat/site Flower  Canopy layer Seed  Shrub layer Leaf arrangement  Ground layer Bark  Full plant Evidence of threats	Site exposure level (full shade/partial shade/full sun) Climatic/microclimatic conditions Notes on site  Population information Number of alive individuals present Number of alive mature individuals present Number of juvenile individuals present Was the population number counted or estimated? If quadrats w Is there evidence of natural regeneration? Number of dead individuals present Cause of death Notes on population  Samples Type of material collected (seed, herbarium voucher, DNA sample Seed specimen number Number of seeds collected from population Purpose of collection Herbarium voucher number Number of duplicated vouchers taken Purpose of collection (e.g. to verify ID) DNA specimen number			
Habitat/site Flower Canopy layer Seed Shrub layer Leaf arrangement Ground layer Bark Full plant Evidence of threats	Site exposure level (full shade/partial shade/full sun) Climatic/microclimatic conditions Notes on site  Population information Number of alive individuals present Number of alive mature individuals present Number of juvenile individuals present Was the population number counted or estimated? If quadrats w Is there evidence of natural regeneration? Number of dead individuals present Cause of death Notes on population  Samples Type of material collected (seed, herbarium voucher, DNA sample Seed specimen number Number of seeds collected from population Purpose of collection Herbarium voucher number Number of duplicated vouchers taken Purpose of collection (e.g. to verify ID) DNA specimen number Number of DNA samples collected from population			
Canopy layer Seed Shrub layer Leaf arrangement Ground layer Bark Full plant Evidence of threats	Site exposure level (full shade/partial shade/full sun) Climatic/microclimatic conditions Notes on site  Population information Number of alive individuals present Number of alive mature individuals present Number of juvenile individuals present Was the population number counted or estimated? If quadrats w Is there evidence of natural regeneration? Number of dead individuals present Cause of death Notes on population  Samples Type of material collected (seed, herbarium voucher, DNA sample Seed specimen number Number of seeds collected from population Purpose of collection Herbarium voucher number Number of duplicated vouchers taken Purpose of collection (e.g. to verify ID) DNA specimen number Number of DNA samples collected from population			
Shrub layer Leaf arrangement Ground layer Bark Full plant Evidence of threats	Site exposure level (full shade/partial shade/full sun) Climatic/microclimatic conditions Notes on site  Population information Number of alive individuals present Number of alive mature individuals present Number of juvenile individuals present Was the population number counted or estimated? If quadrats w Is there evidence of natural regeneration? Number of dead individuals present Cause of death Notes on population  Samples Type of material collected (seed, herbarium voucher, DNA sample Seed specimen number Number of seeds collected from population Purpose of collection Herbarium voucher number Number of duplicated vouchers taken Purpose of collection (e.g. to verify ID) DNA specimen number Number of DNA samples collected from population Purpose of collection Purpose of collection			
Ground layer Bark Full plant Evidence of threats	Site exposure level (full shade/partial shade/full sun) Climatic/microclimatic conditions Notes on site  Population information Number of alive individuals present Number of alive mature individuals present Number of juvenile individuals present Was the population number counted or estimated? If quadrats w Is there evidence of natural regeneration? Number of dead individuals present Cause of death Notes on population  Samples Type of material collected (seed, herbarium voucher, DNA sample Seed specimen number Number of seeds collected from population Purpose of collection Herbarium voucher number Number of duplicated vouchers taken Purpose of collection (e.g. to verify ID) DNA specimen number Number of DNA samples collected from population Purpose of collection Purpose of collection Purpose of collection		Flower	
Ground layer Bark Full plant Evidence of threats	Site exposure level (full shade/partial shade/full sun) Climatic/microclimatic conditions Notes on site  Population information Number of alive individuals present Number of alive mature individuals present Number of juvenile individuals present Was the population number counted or estimated? If quadrats w Is there evidence of natural regeneration? Number of dead individuals present Cause of death Notes on population  Samples Type of material collected (seed, herbarium voucher, DNA sample Seed specimen number Number of seeds collected from population Purpose of collection Herbarium voucher number Number of duplicated vouchers taken Purpose of collection (e.g. to verify ID) DNA specimen number Number of DNA samples collected from population Purpose of collection Purpose of collection Purpose of collection Purpose of collection			
Full plant Evidence of threats	Site exposure level (full shade/partial shade/full sun) Climatic/microclimatic conditions Notes on site  Population information Number of alive individuals present Number of alive mature individuals present Number of juvenile individuals present Was the population number counted or estimated? If quadrats w Is there evidence of natural regeneration? Number of dead individuals present Cause of death Notes on population  Samples Type of material collected (seed, herbarium voucher, DNA sample Seed specimen number Number of seeds collected from population Purpose of collection Herbarium voucher number Number of duplicated vouchers taken Purpose of collection (e.g. to verify ID) DNA specimen number Number of DNA samples collected from population Purpose of collection Photo checklist Habitat/site Canopy layer		Seed	
	Site exposure level (full shade/partial shade/full sun) Climatic/microclimatic conditions Notes on site  Population information Number of alive individuals present Number of alive mature individuals present Number of juvenile individuals present Was the population number counted or estimated? If quadrats w Is there evidence of natural regeneration? Number of dead individuals present Cause of death Notes on population  Samples Type of material collected (seed, herbarium voucher, DNA sample Seed specimen number Number of seeds collected from population Purpose of collection Herbarium voucher number Number of duplicated vouchers taken Purpose of collection (e.g. to verify ID) DNA specimen number Number of DNA samples collected from population Purpose of collection Photo checklist Habitat/site Canopy layer Shrub layer		Seed Leaf arrangement	
WHEN COMPLETE TAKE A PHOTO OF THIS DATA COLLECTION FORM	Site exposure level (full shade/partial shade/full sun) Climatic/microclimatic conditions Notes on site  Population information Number of alive individuals present Number of alive mature individuals present Number of juvenile individuals present Was the population number counted or estimated? If quadrats w Is there evidence of natural regeneration? Number of dead individuals present Cause of death Notes on population  Samples Type of material collected (seed, herbarium voucher, DNA sample Seed specimen number Number of seeds collected from population Purpose of collection Herbarium voucher number Number of duplicated vouchers taken Purpose of collection (e.g. to verify ID) DNA specimen number Number of DNA samples collected from population Purpose of collection Photo checklist Habitat/site Canopy layer Shrub layer Ground layer		Seed Leaf arrangement Bark	

Botanic Gardens
Conservation International
BGCI – Plants for the Planet
Descaps of House 100 Kew Road

Descanso House, 199 Kew Road, Richmond, Surrey, TW9 3BW, U.K.

Tel: +44 (0)20 8332 5953 Fax: +44 (0)20 8332 5956 E-mail: info@bgci.org

Visit: www.bgci.org

