Collecting and storing seed of Threatened flora for translocation

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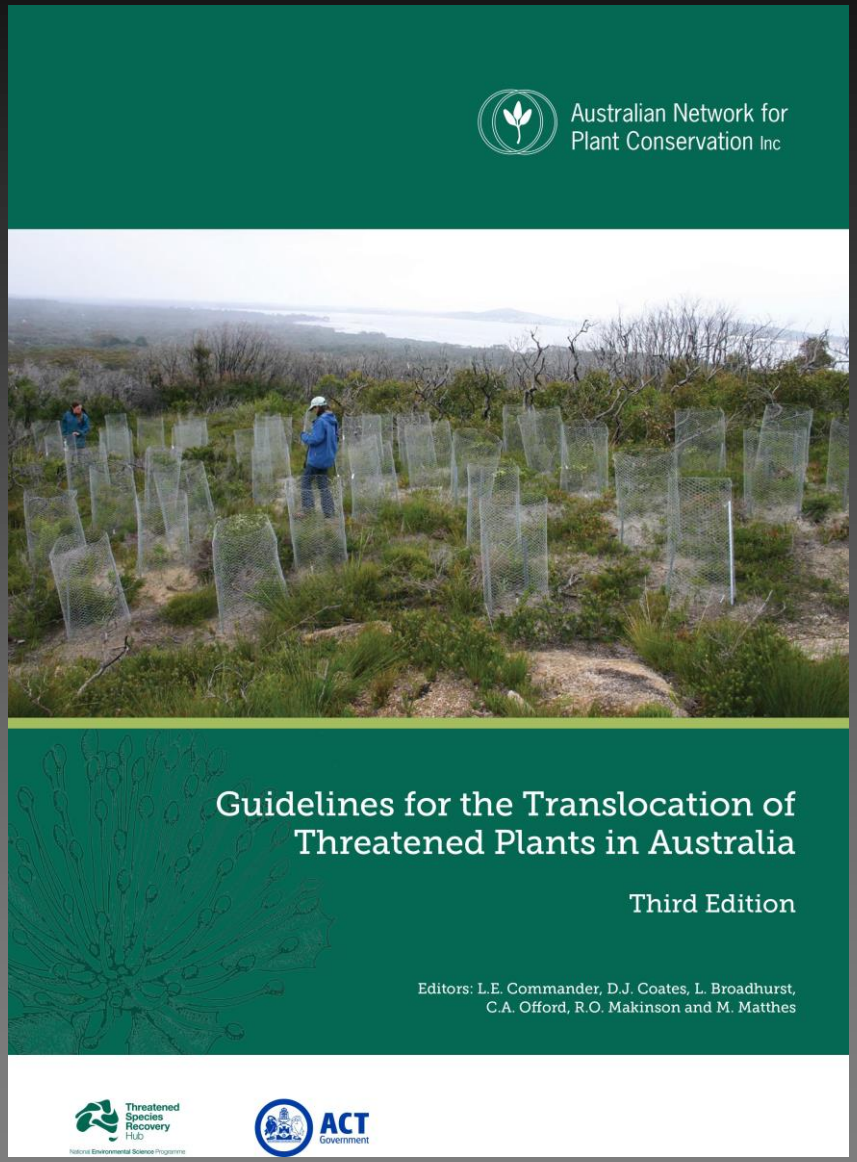
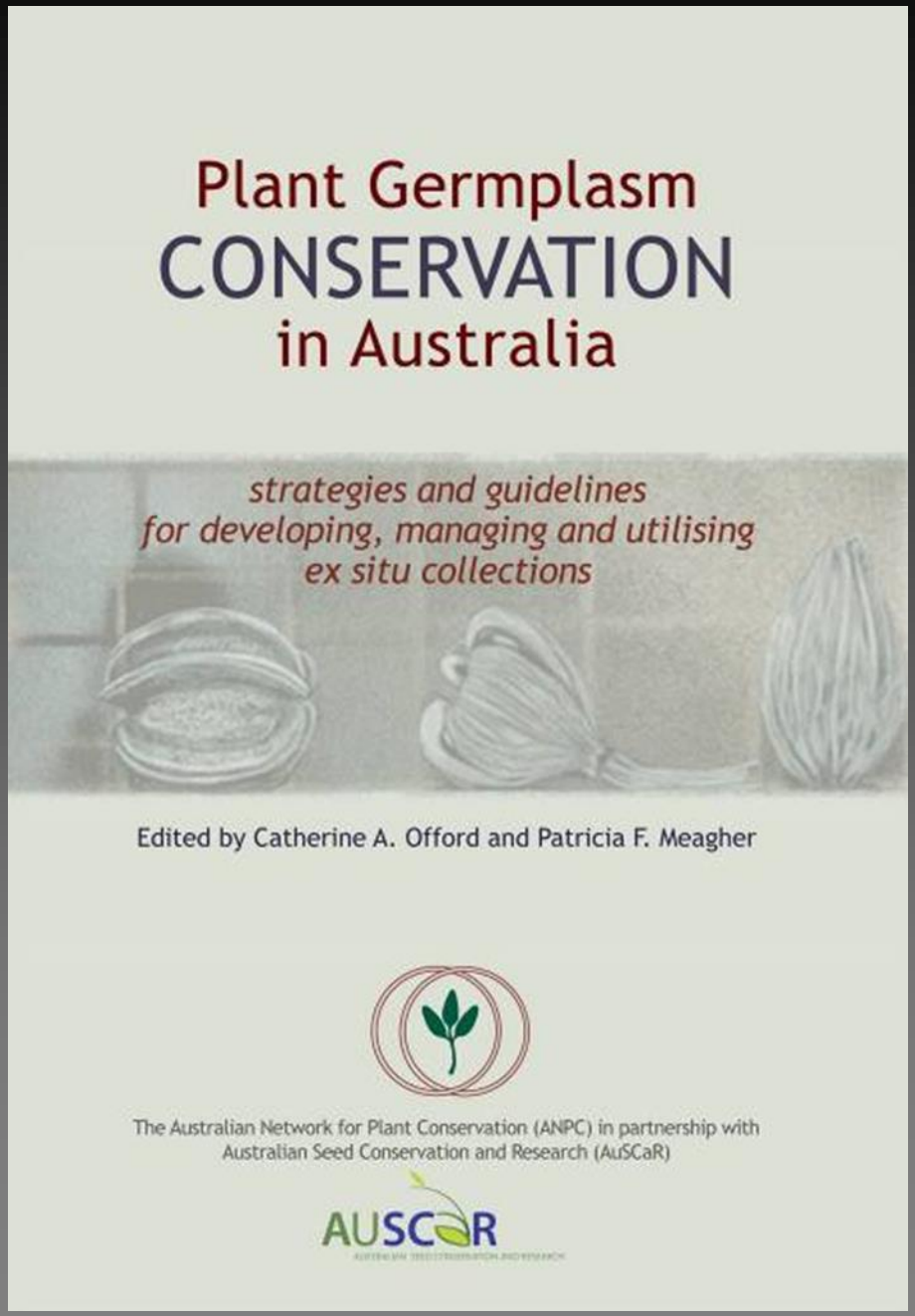


Information presented can be found in chapters 3, 4, and 6 of the translocation guidelines



For more detailed information refer to the plant germplasm conservation guidelines

What makes a good seed collection?

- Knowing what to collect & why
- Known plant identity & good collection data
- Genetically representative sample
- Collection does not impact population
- Seed is viable
- Stored under conditions that will optimise longevity

Knowing what to collect and why

- If a decision has been made to translocate this question has already been addressed
- Ideally, seed is collected prior to the need for translocation

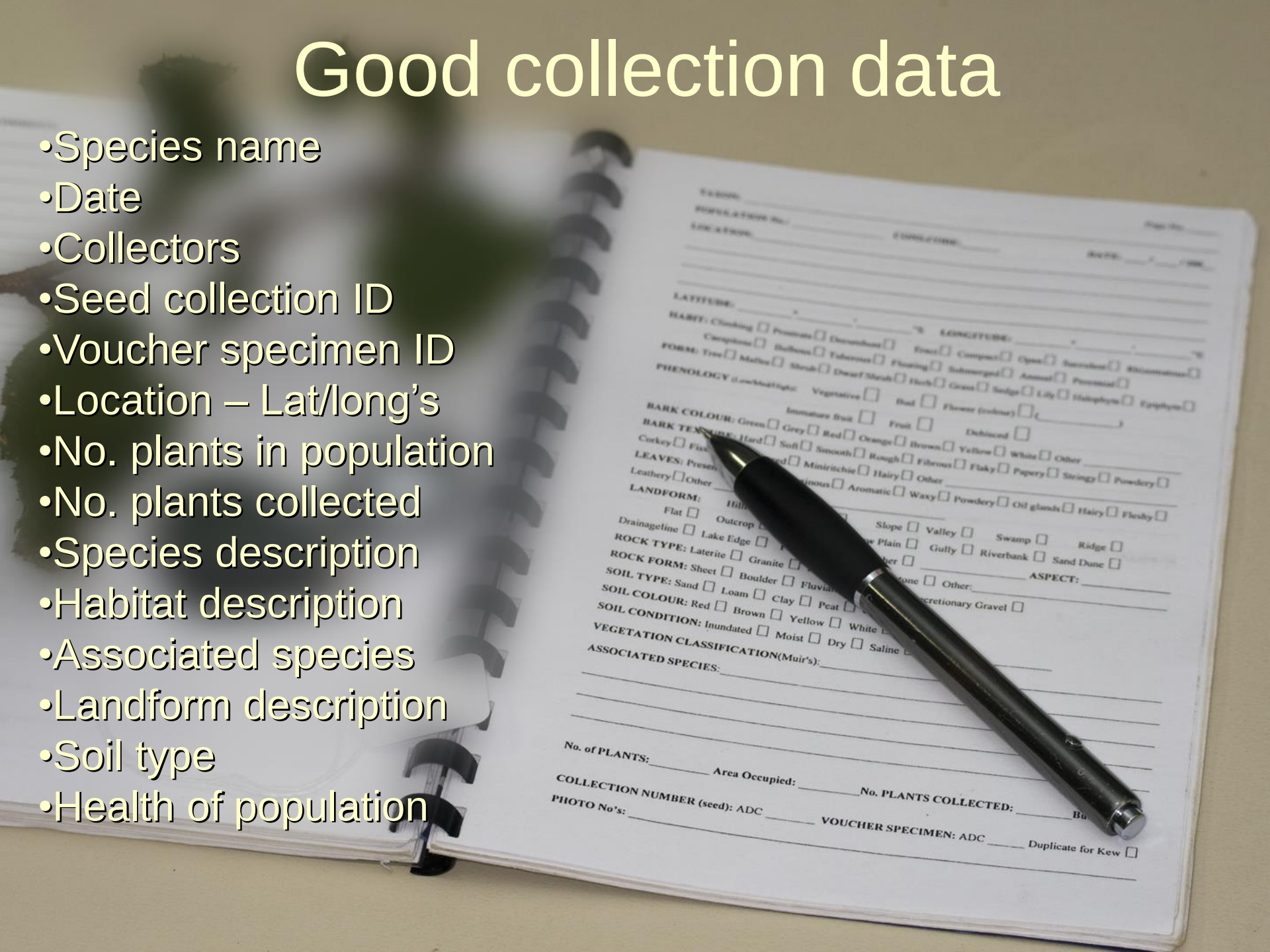
Known plant identity

- Before collection is made
  - Species descriptions
  - Specimen images
  - Photos/illustrations
- When the collection is made
  - Voucher specimen

Good collection data

Good collection data

- Species name
- Date
- Collectors
- Seed collection ID
- Voucher specimen ID
- Location – Lat/long's
- No. plants in population
- No. plants collected
- Species description
- Habitat description
- Associated species
- Landform description
- Soil type
- Health of population



Genetically representative sample

- How many individuals?
  - Theory based on collecting 95% of the most common alleles in a population
  - Depends on breeding system

Genetically representative sample

Breeding system	**No. of individuals**
outbreeding species	30
inbreeding species	59
not known < 50 individuals	from all individuals
not known > 50 individuals	at least 50

Genetically representative sample

- Sampling strategy
  - Plants should be collected randomly from across the population without biasing any individual

Ideally keep seed from each plant separate

Genetically representative sample - populations

- Aim to capture diversity of species between populations
  - If > 50 populations sample 50
  - If < 50 populations sample all
- In the first instance target the largest
- Need to consider which collections can be mixed for translocation

Collection does not impact population

- Use least damaging collection method possible
- Take no more than 20% of seed
  - based on a ‘once off’ collection
- Harvesting 10% of seeds in 10% of years (or less) is generally safe.
- Less intense, frequent harvests are safer than more intense, infrequent harvests.

Menges ES, Guerrant EO, Hamzé S. 2004. Effects of seed collection on the extinction risk of perennial plants. In: Guerrant EO, Havens K, Maunder M eds. *Ex situ plant conservation: supporting species survival in the wild.* Washington, Island Press.

Hygiene

- Avoid introducing/spreading weeds or diseases
  - clean equipment and vehicles between collections or sites.

Seed is mature and viable

- Prior to collection

- Indicators of seed/fruit maturity
  - Seed/fruit beginning to be dispersed
  - Changes in fruit colour
  - Changes in seed coat colour
  - Fleshy fruit going soft
  - Seed ‘rattling’ inside fruit

There are always exceptions!

Assessing seed maturity and viability

The cut test

- Check to see if inside of seed is firm, fresh and healthy
- Viable seeds usually firm and white

Seed viability

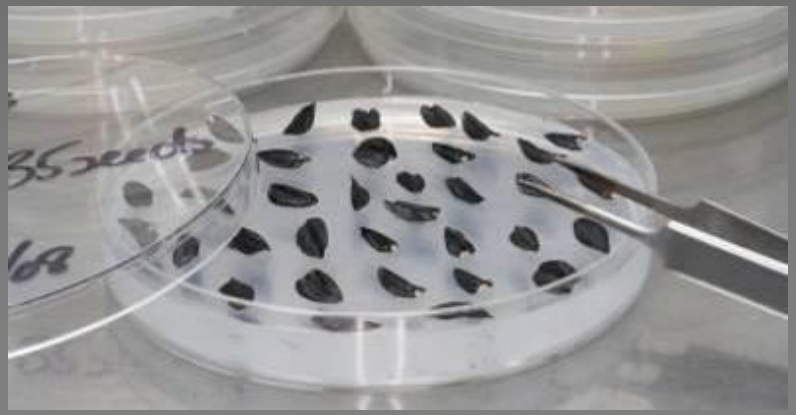
- After collection

Viability tests – all destructive

e.g.

- Cut test
- Staining
- Germination

Photo: Royal Botanic Gardens, Kew



- For threatened species seed is often limited
- Seed needs to be used judiciously
- Germination test gives estimates of seed viability as well as plants that can be used for translocation

Seed storage

- Two main factors that affect seed longevity
  - Temperature
  - Seed moisture content
- Current recommendations for long-term storage
  - Dry seed to 15% equilibrium relative humidity
  - Store at ≤ -18°C

Don’t forget there will be a tour of the seed centre at lunch