

FLORA News



Newsletter of Hampshire & Isle of Wight Wildlife Trust's Flora Group

Special Edition, Spring 1998

Kew - Millennium Seed Bank

On 29 March Michael Way of Kew provided the group members with a very helpful training day on the collection of wildflower seeds for storage in the seed bank at Wakehurst Place. This training day was very inspiring and provided us with much to think about.

Seeds Needed from Hampshire and the Isle of Wight

Lesser Marshwort	<i>Apium inundatum</i>	Heath reserves and New Forest
Italian Lords & Ladies	<i>Arum italicum</i>	St Lawrence Undercliff reserve/Noar Hill/ Hampshire hangers
Musk Orchid	<i>Herminium monorchis</i>	Noar Hill
Coral Necklace	<i>Illecebrum verticillatum</i>	New Forest
Golden Samphire	<i>Inula crithmoides</i>	Hurst Spit/Keyhaven
Upright Chickweed	<i>Moenchia erecta</i>	Heath reserves and New Forest
Narrow-leaved Lungwort	<i>Pulmonaria longifolia</i>	Isle of Wight/New Forest/Roydon
Creeping Willow	<i>Salix repens</i>	Greywell/Heath reserves/New Forest
Shoreweed	<i>Littorella uniflora</i>	Heath reserves/New Forest/North Hampshire
Green-winged Orchid	<i>Orchis morio</i>	Headley Gravel Pit/meadow reserves
Floating Club Rush	<i>Eleocharis fluitans</i>	New Forest
Copse Bindweed	<i>Fallopia dumetorum</i>	Avon Valley
Sea Heath	<i>Frankenia laevis</i>	Hampshire and Island coast
Slender Bedstraw	<i>Galium pumilum</i>	Micheldever Spoil Heaps
Lesser Tussock Sedge	<i>Carex diandra</i>	Greywell
Divided Sedge	<i>Carex divisa</i>	Farlington and coastal reserves
Needle Spike-rush	<i>Eleocharis acicularis</i>	Blashford Lakes and North Hampshire
Lesser Butterfly Orchid	<i>Platanthera bifolia</i>	Fletchwood, New Forest, Micheldever Spoil Heaps
Narrow-leaved Helleborine	<i>Cephalanthera longifolia</i>	Chappetts Copse
Field Fleawort	<i>Tephrosia integrifolia</i>	Broughton Down, Martin Down
Greater Broomrape	<i>Orobancha rapum-genistae</i>	Isle of Wight road verges

At the meeting we agreed to contact Flora Group members not at the training session to ask for their help.

The Trust would like to help Kew in the collection of seeds and therefore is asking for volunteers to come forward to collect from certain species. If you can volunteer please let us know AS SOON AS POSSIBLE. We need to advise Kew as to how we can help, within 10 days of this newsletter being posted.

The full list of species to be collected

throughout the United Kingdom is very long. We have therefore extracted a species list of those plants known from Hampshire and the Isle of Wight. We have particularly concentrated on species which are known from our nature reserves, or on other lands owned by public bodies. The Trust is currently contacting local government bodies and the Forestry Commission for permission to collect on their land.

If you feel you can collect seeds from one or more of these species, please do let us know. In the next few weeks

the seeds of Narrow-leaved Lungwort will be ready to collect, so if you live near a population on the Island or in south-west Hampshire we hope to hear from you soon.

Collecting bags, advice notes and stamped addressed envelopes are all available from Catherine Chatters, the Group Secretary. Please let Catherine know if you can collect one or more species and we will send you a bundle in the post.

At the moment the Group Committee will act as the co-ordinator of the project. We would however very much appreciate it if an individual would come forward to help this co-ordination. The job should be very interesting. The co-ordinator would need to be available over the next 18 months to keep in contact with Kew and let them know how we are doing. The co-ordinator will also need to be in contact with other Flora Group members. Any out-of-pocket expenses can of course be met from Flora Group funds within an agreed budget.

The Trust's project work on Species and Habitat Conservation is supported by World Wide Fund for Nature (UK)



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UK SEED COLLECTING ON BEHALF OF THE
MILLENNIUM SEED BANK PROJECT,
ROYAL BOTANIC GARDENS, KEW



With help from botanists and conservation organisations across the country, the Royal Botanic Gardens, Kew (RBG Kew) is embarking on an ambitious project to complete the collection of samples of virtually the entire UK seed-bearing flora. The project, the first of its kind in the World, will underpin the future conservation, management and study of our native plants and will involve a wide range of organisations in a concerted collaborative effort over the three years leading up to the year 2000.

These notes have been compiled as background information and advice for botanists proposing to participate in the Millennium Seed Bank project.

1. AIM OF SEED COLLECTING POLICY

The principal aim of this part of the project is the establishment of verified and well documented wild species seed collections, each of which comprises a significant representation of the genetic variation within the sampled population. The collections then act as a basis for off-site conservation and, where appropriate, for introduction or recovery programmes. Material will also be available for research into seed biology, germination behaviour and many other aspects of biological study.

The target established by RBG Kew is the conservation of at least one population sample of the estimated 873 UK native seed-bearing plant species that regularly set seed but are not yet represented in the existing seed bank. Although a significant proportion of the genetic variation of many outbreeding¹ species can be adequately conserved in this way, it is hoped that this project will also form the basis for much wider future sampling across the natural UK range of our native species.

2. AUTHORISATION

- Please ensure that you have the permission of the landowner or occupier to collect seed from their land.
- Collection of species included in Schedule 8 of the Wildlife and Countryside Act, 1981² (see Annex 2 for list) requires a specific permit from the relevant statutory conservation agencies: contact RBG Kew for advice³
- Collecting within Sites of Special Scientific Interest (England, Scotland & Wales) or Areas of Special Scientific Interest (Northern Ireland) will require approval from the statutory conservation agencies. See Annex 3 for the checklist of information which collectors will need to submit to the appropriate conservation agency.
- Conditions imposed by landowners or by permits must be fully adhered to.

RBG Kew has sought general support from the most relevant major landowners (e.g. statutory conservation agencies, National Trust, Forest Enterprise, Ministry of Defence) but

¹ Outbreeding: reproduction is most commonly achieved by cross-pollination, not self pollination.

² For Northern Ireland: Schedule 8 of the Wildlife (Northern Ireland) Order, 1985

³ See end of document for RBG Kew contact address and telephone numbers

in most cases access arrangements will be subject to confirmation by local land managers. Individual private landowners, occupiers (or their agents) must also be contacted for clearance before seed collecting may take place on their land.

The project's objectives and methods are summarised in the sheet at Annex 4. Collectors may wish to make this available to land managers wishing to know more about the project.

3. TARGETING THE SPECIES TO COLLECT

RBG Kew has drawn up candidate lists of collecting priorities for each UK region, excluding species already represented in the RBG Kew seed bank. Through agreement with the statutory conservation agencies and other conservation organisations, including the BSBI, Plantlife and The Wildlife Trusts, local target lists have now been drawn up to set the programme for the 1997 field season. Lists for the 1998 and 1999 collecting seasons will be prepared following analysis of the first year's achievements.

If there is any doubt about inclusion of species within the target lists, RBG Kew should be contacted for advice at the address given at the end of this document. In addition, RBG Kew would appreciate being notified of particularly productive populations of species not appearing in the local target lists.

4. TARGETING THE POPULATIONS FOR COLLECTION

Where populations are suitable and the quality and quantity of seed is adequate, it may be possible to make collections of a number of different species from the same site. It is often helpful to make a preliminary visit to the site to assess the populations, to confirm the identification, to estimate the likely harvesting date and potential seed production.

The following points should be considered before harvesting takes place:

1. Collectors should try to ensure that the population is of wild origin, and neither planted nor cultivated.
2. Small populations (less than 50 individuals) or those that will yield less than 1000 viable seeds should only be collected when larger, more productive populations are not easily available. An 'ideal' collection will be from a large number of individuals and will contain between 10,000 and 20,000 seeds. In practice, these quantities can often be achieved in less than two 'collector-hours'.
3. Seed development can vary between populations of the same species, and it is often worth monitoring the seed maturation and checking levels of insect or other damage in a number of populations before making the seed collection.

5. IDENTIFICATION

When there is any likely doubt about the field identification, you will be asked for one of the following:

1. a close-up (and ideally scaled) photograph illustrating clearly the key identification features
2. comprehensive identification notes, entered on the field data form, with information about the presence of closely related species.
3. a representative herbarium specimen (unless a Schedule 8 species), ideally including: flower, fruiting structure and vegetative parts.

In all cases, quality photographs illustrating the plant and its habitat will be welcomed by RBG Kew as valuable reference material. Copyright is retained by the photographer (or the photographer's employer) and material will not be used in publications without their permission.

Confirmation of the field identification will be carried out by either RBG Kew or the BSBI Referee, and nomenclature will follow the *New Flora of the British Isles* (Stace 1991). All material should be sent to RBG Kew in the first instance.

6. SEED COLLECTING

METHODOLOGY

1. Carefully examine a small sample of seeds using a cut test & (for smaller seeds), a hand-lens.
2. For all collections of rare or nationally scarce species in Scotland, (and otherwise as time permits), estimate the seed production per fruit or capsule, per individual, and per population, and note this on the field data form.
3. Collect mature, dry seeds into either cloth or brown paper bags (the latter well secured with tape). Large collections can be made using plastic buckets and then transferred to bags.
4. Collect entire seed heads of awned or similar species into paper bags. Seed cleaning should be left to Seed Bank staff.

Fleshy fruits should be collected directly into plastic bags and allowed to aerate. Contact RBG Kew as soon as possible for specific advice.
5. Sample equally and randomly from as many plants as possible across the extent of the population, maintaining a record of the number of individuals sampled.
6. Collect no more than 20% of the viable seed available on the day of collection.

RATIONALE

To estimate the frequency of empty or damaged seeds, and confirm that the majority of seeds are fully formed and mature.

To record additional information about the plant's seed biology and to better assess the influence of the collecting operation on the population.

To ensure the highest possible viability of seed at collection. This will maximise the potential storage life of the collection in the seed bank.

To make maximum use of available field time and allow cleaning & preparation of material in controlled laboratory conditions.

Fleshy fruits can decompose rapidly and poor storage can exacerbate this problem.

To capture the widest possible genetic diversity from the plant population sampled.

To ensure that the sampled population is not endangered by the planned seed collecting.

7. Ideally collect 10-20,000 viable seeds.

Collections of between 1000 and 5000 seeds are welcomed at RBG Kew although distribution opportunities will be limited.

Collections of less than 1000 seeds, made using the above method, are welcomed only when more productive populations are not available for sampling.

To enable maximum use of the collection, i.e. so that:

- i) sufficient seed is available for initial germination and viability testing
- ii) viability monitoring can be undertaken at the Seed Bank for many decades and
- iii) a substantial sample can be conserved as a long-term safeguard against loss of the wild population, and as a resource for ecological, genetic and botanical study.

8. Where a population is very small (less than 20 individuals) the harvest from each mother plant should be collected and labelled separately (e.g. *Clark 3a, 3b, etc.*) and this should be indicated on the field data forms.

To ensure that the full genetic diversity of particularly vulnerable plant populations can be successfully released at a later date.

9. You may be requested to carry out individual harvesting (described at 8. above) in addition to random and even sampling from across the whole population (described at 6.), particularly for rare, Schedule 8 or nationally scarce species.

To ensure, in addition to the benefits of the general sampling:

- i) that the full genetic diversity of the populations can be successfully released at a later date
- ii) that material is available for studies of genetic variation between individuals of the same species.

7. FIELD DOCUMENTATION

- Record information for each collection using the field data forms at Annex 1. The boxed data fields will be directly entered into the RBG Kew seed database, and are the priority for completion.
- Please also circle appropriate keywords on the field data forms at the time of collection.
- Collectors are asked to sketch the location of particularly elusive populations on the reverse of the field data forms, and to indicate this at the foot of the form. This will assist in locating such populations in the future.
- Collectors are asked to indicate on the forms whether the landowner already holds, or would like, a copy of the completed field data form for collections made on their land.
- In the case of rare, Schedule 8 or nationally scarce species, RBG Kew will ensure that a copy of the forms is also made available to the statutory conservation agencies.

8. CARE OF SEED COLLECTIONS AFTER HARVESTING

- In general, it is critical to the successful conservation of the seed that it is dispatched to the seed bank within a few days of collection, together with the completed field data forms, using the FREEPOST address below. Voucher photos, specimens and any other additional information may be sent at a later date to RBG Kew, quoting the collector's name and the number given to the seed collection.

- In general, keep the seed collections in a cool, dry place prior to dispatch to the seed bank but do not freeze them. RBG Kew processing staff will be responsible for cleaning the collections on arrival at Wakehurst Place.
- Damp collections should, as soon as possible, be spread out on newspaper to dry naturally, either outside in the shade or in a well ventilated room, before dispatching material to RBG Kew.
- Fleshy fruits may require careful handling, partial cleaning and rapid dispatch to the seed bank: contact RBG Kew as soon as possible for advice.

Seed bags should be clearly labelled and then securely packaged for posting to RBG Kew. It is **essential** that small, delicate seed collections should be protected by a layer of cardboard or 'bubble plastic' to avoid the possibility of damage in transit. In order to qualify for our FREEPOST service, parcels must be no more than 24 inches by 18 inches by 18 inches.

9. HOW TO CONTACT RBG KEW

For correspondence & enquiries

Millennium Seed Bank project
Royal Botanic Gardens, Kew
Wakehurst Place
Ardingly, near Haywards Heath
West Sussex
RH17 6TN

To dispatch seed collections, specimens, photos, etc

Royal Botanic Gardens
FREEPOST SEA4406
HAYWARDS HEATH
West Sussex
RH17 6BR

Self-adhesive labels will be provided

Tel. (01444) 894079 (Steve Alton)
Fax (01444) 894069
Email seedbank@rbgkew.org.uk

Annexes to Protocol

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| Annex 1 | UK Field Data Form |
| Annex 2 | Plants included in Schedule 8 of the Wildlife & Countryside Act, 1981 and the Wildlife (Northern Ireland) Order 1985 |
| Annex 3 | Information checklist for seed collection within SSSIs |
| Annex 4 | Millennium Seed Bank project summary sheet for landowners/ occupiers |
| Annex 5 | Health & Safety advice |