

PLANT RECORDS AND  
LIVING COLLECTIONS  
DATA POLICY AND  
PROCEDURES

*EDEN PROJECT*  
2016



## Introduction

Eden Project has a legal requirement to keep an accurate and up-to-date record of all plant material; this is specified and required by the following legislation and licenses:

- UK Wildlife and Countryside Act (Appendix )
- Invasive Plants (Schedule 9)
- Protection of Wild Plants
- Endangered Species (Schedule 5 and Import and Export)
- Plant Health Order (Containment Notice)
- CITES License
- CBD – Nagoya Protocol (See Procurement Section)
- Cannabis Cultivation License
- HSE - Management of the risk from falling trees or branches (See Tree Assessment Section)

Therefore, the importance of record keeping and accurate data management must remain one of Eden Project's highest priorities.

In 1997, when the procurement of plants started in earnest, we created a plant records system to enhance the scientific and horticultural usefulness of the living collections. The protocols of other botanic gardens such as RBG Edinburgh, RHS Wisley and RBG Kew have been an invaluable help, however, Eden is a unique modern garden so whilst we ensure highly accurate records, the systems that we put in place are flexible and adaptable to keep up with the fluidity of the project.

In 1998 we acquired BG-BASE as our plant records database. This has served our purposes sufficiently but we are open to exploring new database solutions. Our plant records procedures and administration have been designed around BG-BASE enabling easier data capture. However we are aiming for this handbook to be applicable and useful independent of the database we currently use.

The key to accurate plant records is a good relationship and understanding between the Green Team and the Plant Records department. The process is two-way, with the horticultural staff ensuring up-to-date information gathering and Plant Records disseminating that information back to the Green Team, other Eden Project teams and the public.

Many thanks to Joanna Thomas, who created the first Plant Records Policy in 2008, and to Dr. Alistair Griffiths, who was a driving force behind many of the innovative uses of Plant Records at Eden Project.

## **Name Verification and Horticulture at Eden Project**

Here at Eden we use the Angiosperm Phylogeny Group III (APG III) classification system. It is essential that our name verification and interpretative labels adhere to this.

Name verification is the responsibility of the Plant Records Lead who ensures that any name used at Eden Project has been verified by every means available within his/ her resource. It is essential that every 'Accepted' name has a reference source and all synonyms are linked within the database. Plant taxa with Plant Breeders Rights (PBR) are to be recorded as restricted material in the Accessions Table (see accessions and propagations).

Common names must also have a reference source.

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## **Plant Records and Plant Procurement**

A plant to be accessioned must fit within the defined goals and purposes of a specific collection or garden area. A team lead may provide a manager with a list of needed plants, if a taxon fits the requirements of the plant bed, the team manager will investigate the practical logistics of obtaining them.

It is essential for Eden Project to procure plants as responsibly as possible. In order to do this we must work within a particular framework (see **Procurement and Acquisitions policy**) which is heavily reliant on good records and data stored within our database. Sources that we use will be investigated for factors that could be potentially infringe any CBD restrictions, be detrimental to our plant collection and reputation (Appendix 1). It is essential that we comply with aspects listed in the introduction.

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## **Plant Record Forms**

There are several forms that exist that have been used here at Eden Project in the past; these can be found in the Appendix. However, in some cases to avoid double-handling of data and to save time it is acceptable to communicate Plant Records with hand written lists and/ or email. There is an electronic plant records form that can instantly be sent to the Plant Records Lead.

All data and records must include an Accession number, date of recording, number of plants, type of record and source if new accession.

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## **Accessioning and Record Keeping**

Eden's unique accession number contains eight figures; the first four being the accession year and the second four are sequential. For example 19981972 or 20080036.

Once the plant material has been delivered to site or the nursery then it must be allocated an accession number as soon as possible.

The accession number links the plant material to details on botany, taxonomy, donor/source, seed storage, propagation and planting history.

Accession numbers are allocated exclusively by the Plant Records Lead or Seed Store Lead.

Here at Eden Project a single accession number is given to a plant or number of plants when it is:

- the same taxa
- from the same source
- received in the same period
- the same propagule type (plant, seed, bulb, cutting etc.)

Any deviation from one or more of these four factors will require a separate accession number.

For wild collected plant material a single accession number should be allocated when the collection information differs in any aspect i.e. material collected on different days, material collected from the same species but from different plants etc.

### **Accession Workflow**

**The accessioning of plant material is not only important; we are required to do it legally. Therefore it is essential to do this as soon as the material arrives.**

Forward delivery notes and/or the New Accessions Form (Appendix 4) to Plant Records as soon as possible on arrival of the plant material.

Liaise with Plant Health Team to ensure knowledge of plant material arrival.

The members of staff responsible for completing this paperwork are the Team Manager, the Team Leads at Bodelva or at Watering Lane Nursery or the horticulturist in charge of the area.

An accession number is designated to the plant material by Plant Records (with the exception of seed), the information captured onto the database and the appropriate plant labels sent to the member of staff.

All accessions that have been donated by an institution, are accompanied by a Standard Material Transfer Agreement or have Plant Breeders Rights are required to have a 'Yes' in the RESTRICTION field in the BG Base Accessions record. All other plant material will display a 'No'

All accessions forms, delivery notes, collection details and MTAs are filed by plant records in hard copy and archived in the Horticultural Drive.

### **Accessioning seed**

All seed deliveries must be addressed and sent to the Seed Store Lead at Watering Lane nursery with the exception of bulky sacks to be sown in situ which can go straight to site.

The Seed Store Lead allocates seed accession numbers, writes clearly on the seed packets and stores the seed prior to propagation.

The Seed Store Lead writes the accession numbers on the delivery note next to the plant names or on a New Accessions Form. This information is entered onto the database

The relevant Lead, propagator and horticulturist are notified of the seeds arrival and accession numbers.

Accession labels are sent to the propagator if and when requested.

### **Accessioning Wild Collected Material**

Plant material that has been collected from the wild or is a propagule of wild sourced material is to be treated as restricted material. All wild collected material must be sourced responsibly and comply with the requirements of the CBD and Nagoya Protocol (Appendices 2 & 3). Original location and collection data must be entered in the relevant fields in BG Base

### **Plant material which does not need accessioning**

This should be reviewed from time to time due to the nature and scale of the project where plant material is brought in for numerous reasons. If in doubt, please discuss this with plant records before making a decision.

### **Commercial plants**

Commercial plants cover any plant material (seed, bulbs, plants) which enter Eden for retail and as such are exempt from accessioning. Any plants subsequently joining the permanent collection must be accessioned retrospectively.

### **Trials and research**

Seed procured for agricultural and commercial trials (conducted at Watering Lane Nursery or within the Bodelva estate) may need to be accessioned to enable seed storage management. This is to be reviewed on a case-by-case basis.

### **Reaccessioning**

**Reaccessioning should always be the last resort.**

Plant material may have to be reaccessioned for a number of reasons:

- If the original plant label has been lost and details of the plant cannot be accurately found.
- When 2 or more accessions of the same species have grown together and there is no way of differentiating the different accession numbers.
- If the plant material accessioned was thought to consist of one taxa and is found to contain a mixture of taxa.
- When seed is collected from a plant, the seed will require a new accession number because it is genetically different from its parent. This is also true for seedlings which have self-seeded from a particular plant.
- If the plant is vegetatively propagated, sometimes it is necessary to reaccession if the material is going to be used in a research project. This may make the tracking of the plant material easier through the duration of the project.

In all cases the final decision for reaccessioning is made by Plant Records, however with more pressures on staff time and resources the decision to destroy material devoid of accession information is very likely. This decision will be decided by the relevant team manager and plant records.

The details of this reaccessioning process are to be recorded in the RECD\_HOW and Source Information fields of all accessions potentially involved. Where relevant include the mother accession's name(s) and accession number, and the date that the seed or cuttings were collected.

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## **Labelling**

The labelling of accessions must be viewed in a long-term perspective, as many of our collections have been in the garden for several years, and their identity must be preserved with labels despite weathering, natural disasters, and reorganization in the garden. They are vital to successful identification and accurate plant records. This will always require the diligence of staff to maintain its effectiveness. Permanent labels eventually deteriorate and should be checked annually and renewed when required.

Permanent labels must only be made by designated Plant Records staff trained in the correct use of the database and the labelling printers. As much as possible, mature plants ready for planting should be given permanent labels while still in the nursery.

When the Plant Records form is submitted for a proposed plant out, the horticultural staff will make sure that there are accession labels. Permanent labels will be affixed on, or adjacent to, permanent plantings in the best manner appropriate to the type of plant material. This may be on a stake, or on a coiled wire around the trunk or large limb of a tree. If a number of individual plants of the same accession are planted as a contiguous group, they may be labelled as a group with several permanent labels as needed to identify them. This may be the case with ground covers, mass seed broadcasts and in the restoration projects.

The correct labelling of plants at Eden is crucial both for staff and visitors. There are two main types of label, the accession label and the display label.

### **Accession labelling**

The accession label is crucial in linking the plant to the records on the database and therefore the plant's provenance and history. Once an accession label has been lost it makes tracking down the details of the plant in question very difficult, and in most cases all this information will be lost. Only in certain cases can a new Accession number be allocated (3.5)

The accession label is a discrete green plastic label which displays the plant's scientific name, accession number and in some cases the qualifier. The label is placed in the ground or container behind the plant or attached to the woody parts of the plant with plastic coated wire. This is the final step in the accessioning and planting process.

## **Requesting an accession label**

Request all labels from plant records.

The information required is the name, accession number, location of the plants and the number required.

Annual plants do not automatically get accession labels due to the constraints of time and resources. They can be produced if requested by the receiving horticultural team member, ideally as early as possible after procurement.

## **Attaching an accession label**

Please see Appendix 5 for full details.

The number of labels needed may not necessarily reflect the number of plants planted. Only one or two labels may be required in some cases.

## **Interpretation Labels**

For greater detail refer to the **Interpretation Labels Policy**.

The name/s of taxon/taxa selected for an interpretation label must be verified with source, this also applies to any common name used.

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## **Watering Lane Nursery**

With little or no access to Eden Project network and internet, all propagation records are recorded on a Watering Lane Excel spread sheet. It is for this reason that there is a gap in the plant records on BG-Base. When propagation material is deemed acceptable to join the living collection a record is created.

Implementation of the propagation program is the responsibility of the Nursery Manager. To ensure the smooth continuity of records communication is vital between Nursery and Seed Store teams.

Due to the nature of the Eden Project, propagation is carried out at a significant rate; therefore use these guidelines only for propagation of certain trials, research projects, hard to propagate material or material not propagated previously and which is destined for use in the biomes or pit.

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## **Propagation Records**

### **Recording Propagation**

Propagation activities can be placed into two categories:

- Seed sowing (at the nursery or in situ on site)
- Vegetative propagation (cuttings, division, tubers and other propagules separated)

Details should be recorded in the relevant section of the nursery spreadsheet, with as many sections filled in as possible.

If material is taken from an existing plant in the form of seeds then the parent accession number and qualifier should be noted. Plant Records allocates a new accession number (see Re-accessioning).

In most cases the number of seed or cuttings being propagated can be recorded as 'mass' unless a very small number is propagated.

If seed is sown directly into a bed on site then the information can be recorded on a Plant Records Form (Appendix 6), and the condition recorded as alive.

If material is taken from an existing plant in the form of cuttings then the parent accession number and qualifier should be noted. Plant Records allocates a new qualifier.

If tubers are divided from the mother plant or a plant is divided and replanted then the information can be recorded on a Plant Records Form. A new qualifier can be allocated.

Send to the plant records department with number of labels requested and whether a qualifier is required.

When the material propagated has rooted or is pricked out, then the material can be classed as plant material and a therefore can be recorded as a plant record.

Plants will be moved through the nursery as their cultural requirements dictate. The designated lead of the relevant collection or location will be notified when requested plants are available for planting out. Requests for propagation will be considered fulfilled when the appropriate plant material has reached finished pot size. Any replacement of plants will require a new propagation request. Labelling of nursery plants may be handwritten or machine printed. If the plants are potted up individually and may be used for more than one garden site, they should have one plastic tag per pot. For ease of labelling and tracking, it is preferable not to combine different accession numbers of the same species in the same flat in the nursery, and to keep individual plants of the same accession together until they are ready for movement to Bodelva. As much as possible, Plant Records staff will facilitate this process by preparing an appropriate number of greenhouse labels for a flat of seedlings prior to the first pricking out and potting up.

#### **Propagation activities which do not get recorded**

Do not record propagation activities for annuals, crops, vegetables, bedding etc. The Nursery lead at Watering Lane collates this information and stores it in spread sheet format on Eden's intranet at <http://wln/>

Do not record propagation details for trials on commercial ornamental or agricultural crops for the Agronomist or Commercial Development teams.

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## **Quarantine Records**

**Refer to Plant Health Operating Procedures for complete picture of requirements.**

The importance of keeping up-to-date records for P1 and Quarantine 4 (QUAR4) quarantine facilities is essential. There is a high volume of plant movement in these areas and the potential for disease escape is higher than other areas. It is therefore suggested that each facility is to undergo a full stock check every three months, on top of general record keeping to 'iron-out' any outlying accessions etc.

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## **Plant Records**

Once a plant has arrived and has been accessioned, it will then be planted or located at the nursery or horticultural compound ready for planting. It is at this stage that a plant record should be created. The accession number which is first allocated when the plant material arrives is then given a qualifier.

### **Qualifiers**

A qualifier is a label allocated to the accession when it is first recorded at a location. This becomes a suffix added to the accession number.

The qualifier links an individual plant or group of plants at a certain location with the accession (it is the location that is the important piece of information).

Qualifiers run alphabetically and consecutively from A to Z and are determined by the next available qualifier for that accession on the database.

There are three main reasons why and when we use qualifiers:

- When accessions are planted in different areas therefore there are separate records created which keep track of the accession in each location.
- To easily distinguish different age or size of plants as would be the case if cuttings of the parent plant were taken.
- A batch of plants may be required for study and individuals of each accession can be separated easily by giving them different qualifiers. This is often carried out with tree species whose individual heights and growth is of interest or for plants used in scientific experiments.

Labels designated for Temporary Display plants are produced without Qualifiers. This is to avoid confusion around the recording of a large group of plants that are constantly moving. However, qualifiers for these accessions are used on the database.

### **Recording plant activities**

It is vital that 'significant changes' with an accession and qualifier are recorded. These include: planting, dividing, removing dead material, disease, moving and heavy pruning. It is essential that this happens as soon as possible to ensure that we can keep track of our plants at all times. The

minimum information this will give us is the location, number and condition of every plant on site and allows us to accurately query the database and provide up to date information about our living collection.

Horticultural activities which include planting, moving and removal of plants should ideally be recorded on a Plant Records Form.

Inventories or lists of plants can be produced from the database when large numbers of plants are being recorded, for example when stocktaking or planting or removing a large batch of material (Appendix 7)

### **Number of plants**

This is the number that is being planted, removed or moved.

If the number of plants is greater than 20 or are difficult to count due to mergence or size than the term 'mass' can be used.

When planting bulbs or seed is sown directly into a bed the term mass can also be used as the emergence from the ground may differ from the amount planted/sown.

'Number left' refers to the amount of plants in the same accession in the old location when plants have been moved. Or it could mean the amount left in the same location after plants have been removed or are dead.

### **Location of plants**

Please refer to Maps Folder on J:\ Drive for site maps and bed locations at Eden:

J:\Common\6. Science Team\PlantRecords\Maps+ Locations

Further, in-depth maps of Eden and Watering Lane nursery may be obtained from Plant Records.

When a plant is planted for the first time or dead or removed, the location needs to be written.

When a plant is being moved or divided then the old and new location needs to be written.

### **Condition of plants**

When plant information is recorded, either on the Plant Records Form, New Accessions Form or stocktaking list, record the condition of the plant or plant material when it arrives and/or is planted.

There are 7 codes which should be used:

- **Good (G):** This is when a plant has an overall good or excellent appearance.
- **Fair (F):** The plant may be slightly damaged or have a pest problem.
- **Alive (A):** This code is often used for herbaceous perennials or bulbs when they are dormant and the vegetative parts of the plants are not visible. This code is also used by the plant records department when no condition has been recorded by the horticulturist but other information has been recorded about a plant.
- **Poor (P):** This is when a plant looks very unhealthy.

- **Removed (R):** This is when a plant/s are harvested or a plant is no longer required in its present location.
- **Dead (D):** This is used when a plant dies. A reason for death must be put into the CHECKNOTE field if the death is attributed to a pest or disease.
- **Unable to locate (U):** This is used when a plant is entered on the database as being in a certain location but cannot be found there but it is unknown what has happened to it.

If a plant has a condition other than good (G) or fair (F) then the reasons why should be explained including any visible pests and reasons for death or removal. For more information refer to the Plant Health Operating Procedures.

Once an accession has been recorded as dead, it will no longer show up on inventory lists of live plants but all historical information will remain on the database.

## **Stocktaking**

In addition to completing Plant Record Forms which detail day-to-day horticultural activities, it is still important that regular stocktakes of all areas are carried out to remove any problems caused by human error, oversight, or the death or self-seeding of plants. It is also a time to request new labels if they have been lost or to replace old ones.

### **Types of stocktaking**

One-off stocktakes can be carried out if redevelopment or renovation work has been done in certain areas or when a new member of horticultural staff needs to familiarise themselves with a certain area. Equally if there is any confusion over plants or labels.

Regular stocktakes must be carried out on every area on site and at Watering Lane nursery. These ideally should be carried out once a year but every two years is the norm. They take place in the horticulturalist's quieter periods.

The gardeners in charge of each area are responsible for stocktaking, recording and sending the forms or lists to Plant Records, under the supervision of their line manager. Plant Records can lead or assist this process at any time.

### **Recording a stocktake**

An inventory list for each area can be printed from the database and recorded onto for stocktaking (Appendix 7).

A simple tick if the plant is there, noting any amendments to numbers and condition.

If the plant is dead, removed, moved or divided then use the codes as on Plant Records Form with any new locations of divisions.

If any new plants or accessions are found then these can be added to the list to include the plant name, accession number, number and condition. If the accession number is not known please

indicate any information as to where the plant came from in order to assist Plant Records in recording.

Any new labels that are needed can also be requested and Plant Records will print and send back to the member of staff.

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### **Temporary Display Team Records**

A vital part of horticulture here at Eden, the workflow of Temporary Displays team has a high risk potential for the spread of disease (see Plant Health Procedures) and loss of accession data. It is for this reason that the urgency and speed of the records is high.

Accession labels for Temporary Displays will not, as of 2016, contain a Qualifier. However, the qualifier information will still exist on the database.

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### **Transfer and use of material by externals outside of Eden Project**

**As an Educational Charity, our plant material cannot be distributed for the financial gain of any party.**

Requests from other institutions, including botanical gardens, arboreta, universities and individual researchers should be referred to the Science Team Manager and Plant Records Lead for approval. The request should specify the exact plant materials, amounts of material needed, and the purpose for which they will be used. Eden Project's response should include an attachment of two Standard Material Transfer Agreement forms (Appendix x) one of which should be completed and returned to Eden, the other to be kept by said institution or individual. Restricted special collections or collections made under permits are not to be distributed without approval of original donor or permitting agency. This information will be stored on file along with all of the other SMTA's.

If there is any doubt about the integrity of said institution or person, it is essential that more in-depth inquiries are made.

For more in-depth information please refer to the **Material Transfer Agreement Policy** (Appendix 8) and **Sustainable Supplier Form** (Appendix 2)

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