



From London to Namibia

Students life at Royal Botanic Gardens, Kew

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Royal Botanic Gardens
Kew

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National Botanic Research Institute, Windhoek



Overview of the Talk

Royal Botanic Gardens
Kew

- Our **background** before joining the Royal Botanic Gardens, Kew
- An introduction to the **living collection** and the **growing environments** at Kew
- How **Namibia** is represented at Kew
- Delivering **landscape succession**: adapting Kew's woody collections . Species assesment and climate matching
- **Diploma in Botanical Horticulture**. An insight of the course
- **Our first two years as Diploma Students**: working placements, study trips, academic projects
- Why we chose **Namibia** and what we hope to learn
- Our **itinerary** over the next three weeks

Stefano Ciabo



Aberglasney Gardens, South Wales



Source: Aberglasney Gardens





Inner Temple Garden, London

Royal Botanic Gardens
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Chelsea Physic Garden, London

Royal Botanic Gardens
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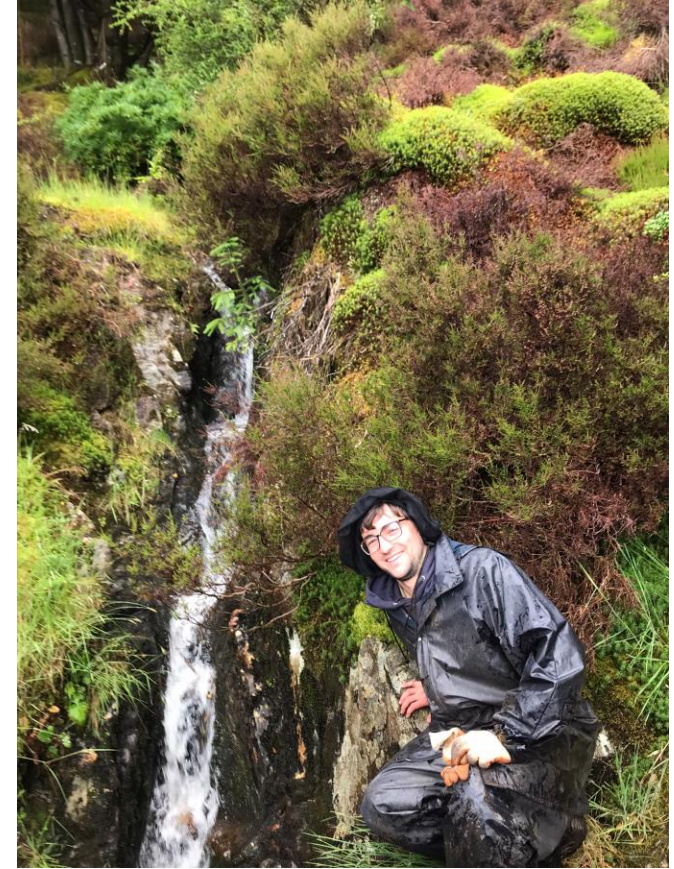


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Logan Botanic Garden, Scotland

Royal Botanic Gardens
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Kew Living Collection and Growing Environments

68,490
accessions

27,267
taxa

18,834
species

319
plant families

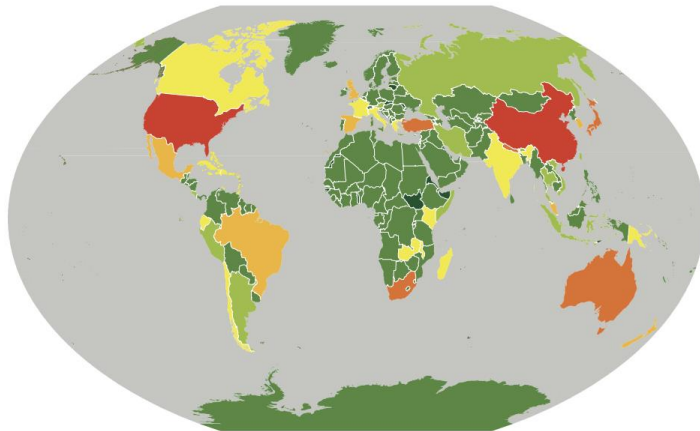
The landscapes, glasshouses and nurseries at Kew and Wakehurst house the largest, most diverse collections of living plants in the world.

Figure 2: Geographical origins of the Living Collections

Countries or regions are shaded according to the number of accessions originating there. Significant numbers of accessions have come from China, the USA, Japan, Turkey, South Africa and Australia.

Number
of accessions

- 6001–12000
- 3501–6000
- 2001–3500
- 1001–2000
- 501–1000
- 1–500
- 0



%

87% of accessions are identified to species level

39% of accessions are of wild origin

3% of taxa are threatened with extinction

5% of accessions are taxa that are threatened with extinction

13 taxa are classified as Extinct in the Wild by the IUCN

Source: Royal Botanic Gardens, Kew Living Collection Strategy 2019

Palm House



One of Kew's most iconic buildings

Grade I listed

Large central atrium approximately 20 m high, with a 9-m-high walkway that is reached by two spiral staircases

There are also two wings attached to the central atrium, which are all connected and open

Tropical environment

Waterlily House



Grade II listed

Built to house *Victoria amazonica*

Mixed tropical ornamentals

Princess of Wales Conservatory



Most complex glasshouse at Kew

10 separate climatic zones

Large collections of Orchidaceae and Cactaceae

Temperate House



Largest glasshouse at Kew

Recently undergone restoration

Collections predominantly from temperate areas of Australia, the Americas, Asia and island floras

Houses plants now extinct in the wild

Davies Alpine House



Open sided glasshouse displaying the alpine collection

Weekly orientation of potted plants from the nursery

Collections of alpine Liliaceae, Amaryllidaceae, and Iridaceae

Tropical Nursery



Large nursery complex built to supply public glasshouses and for conservation

Most diverse collection of plants at Kew

10,200 taxa divided across 21 climatically controlled zones

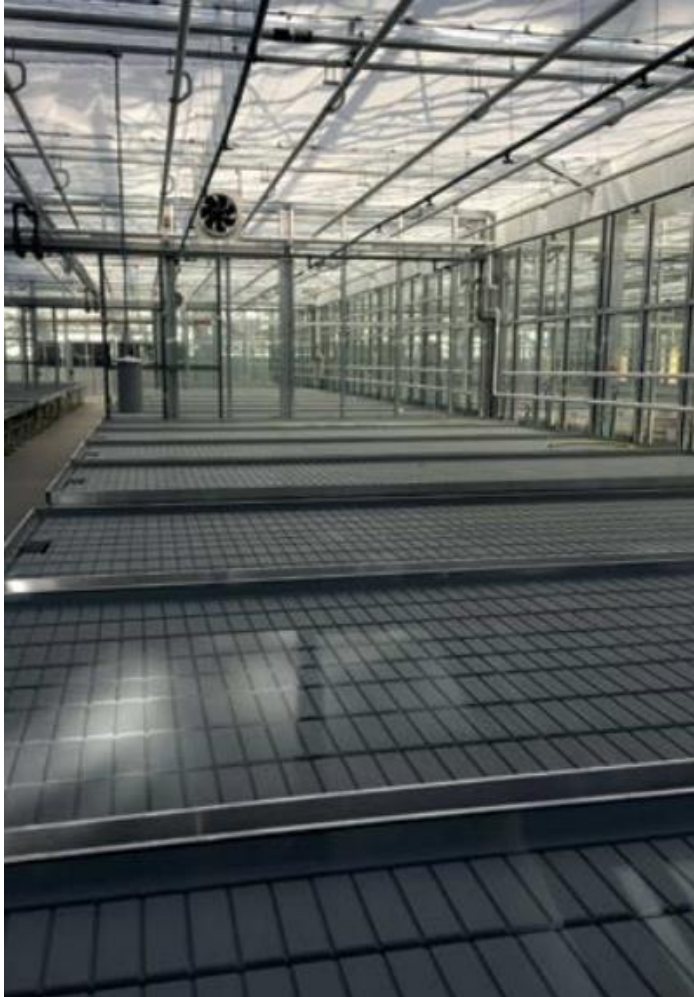
Alpine Nursery



One of the largest facilities for growing alpine plants in the world

Focus on Liliaceae, Amaryllidaceae, and Iridaceae

Arboretum Nursery



A large range of hardy woody and hardy herbaceous plants

Six environmentally controlled zones

Public access route

Jodrell Glass



Five climatic zones

Scientific research and conservation activities

Wide variety of plants

Temperate Collection: Arboretum



A collection of temperate woody plants comprising 100 ha of botanical planting and 30 ha of seminatural woodland

Most represented families are Betulaceae, Caprifoliaceae, Cupressaceae, Fagaceae, Pinaceae, Sapindaceae, Magnoliaceae and Rosaceae

Dominant geographic provenience: Central and Western China, South Korea, Japan, Europe and North America

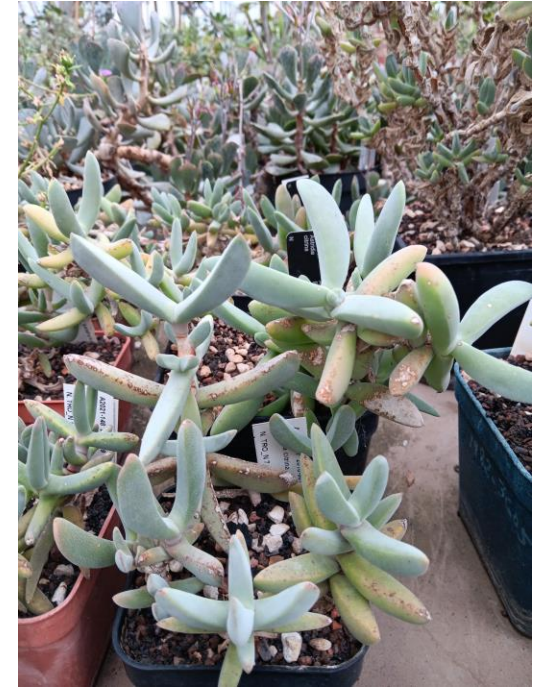
Conservation of critically endangered taxa includes *Fraxinus americana*, *Juniperus bermudiana* and *Paulownia kawakamii*

Temperate Collection: Gardens



- Rock Garden
- Rose Garden
- Agius Evolution Garden
- Peony Garden
- Woodland Garden
- Queen's Garden
- Grass Garden
- Great Broad Walk Borders
- Duke's Garden
- Carbon Garden
- Aquatic Garden
- Bonsai House
- Vegetable Garden

How Namibia is Represented at Kew



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Kew's Landscape Succession Plan



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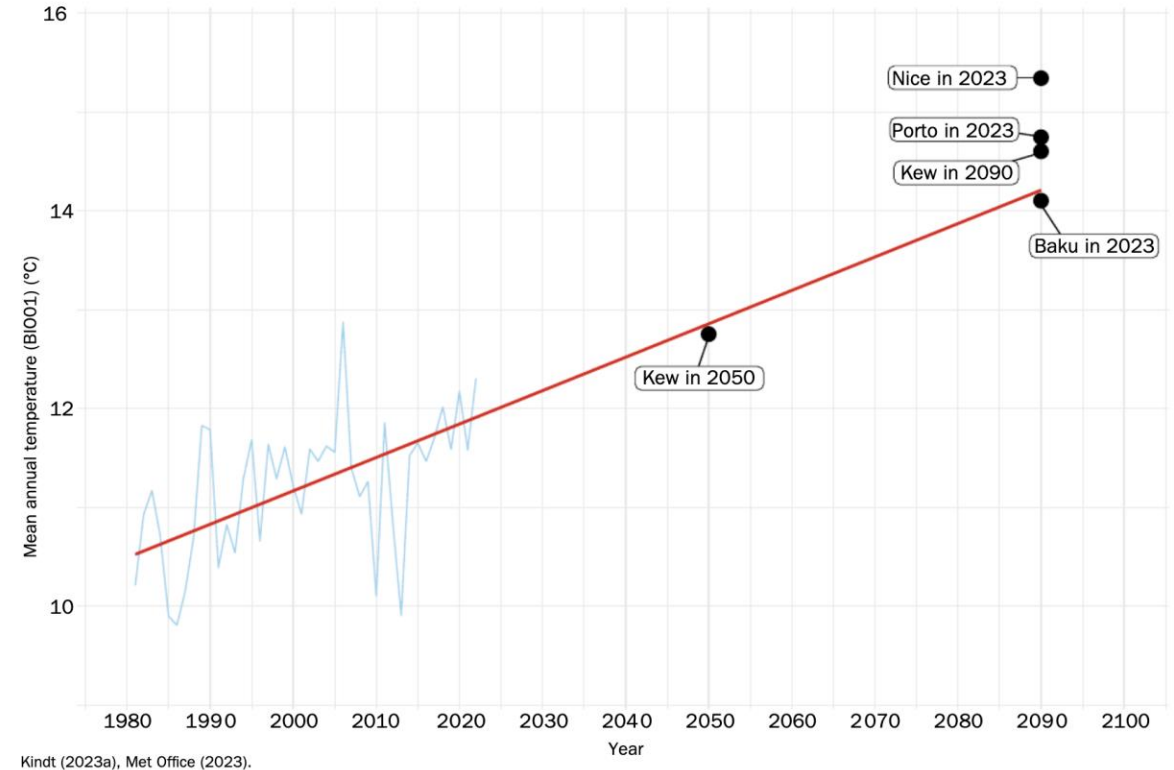
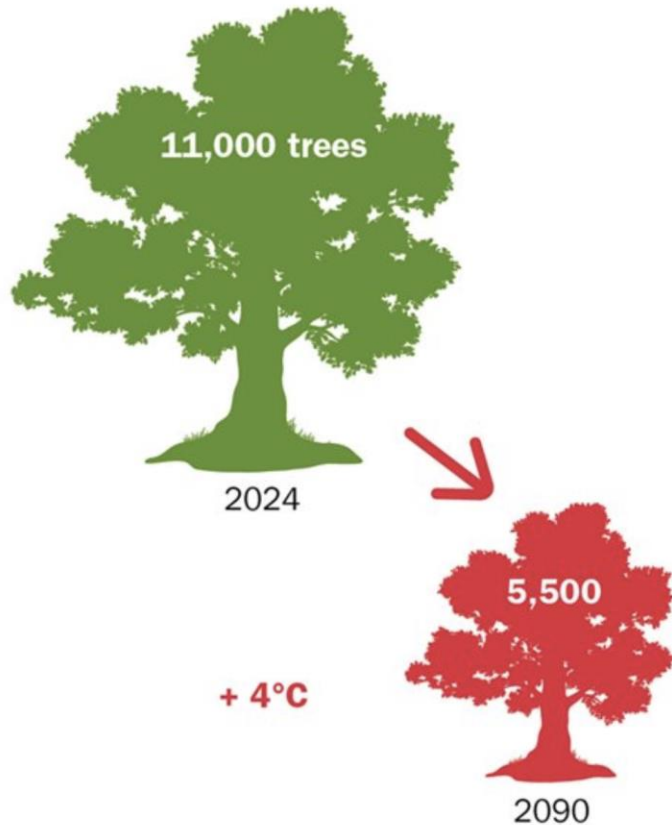
Kew's Landscape Succession Plan



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Kew's Landscape Succession Plan

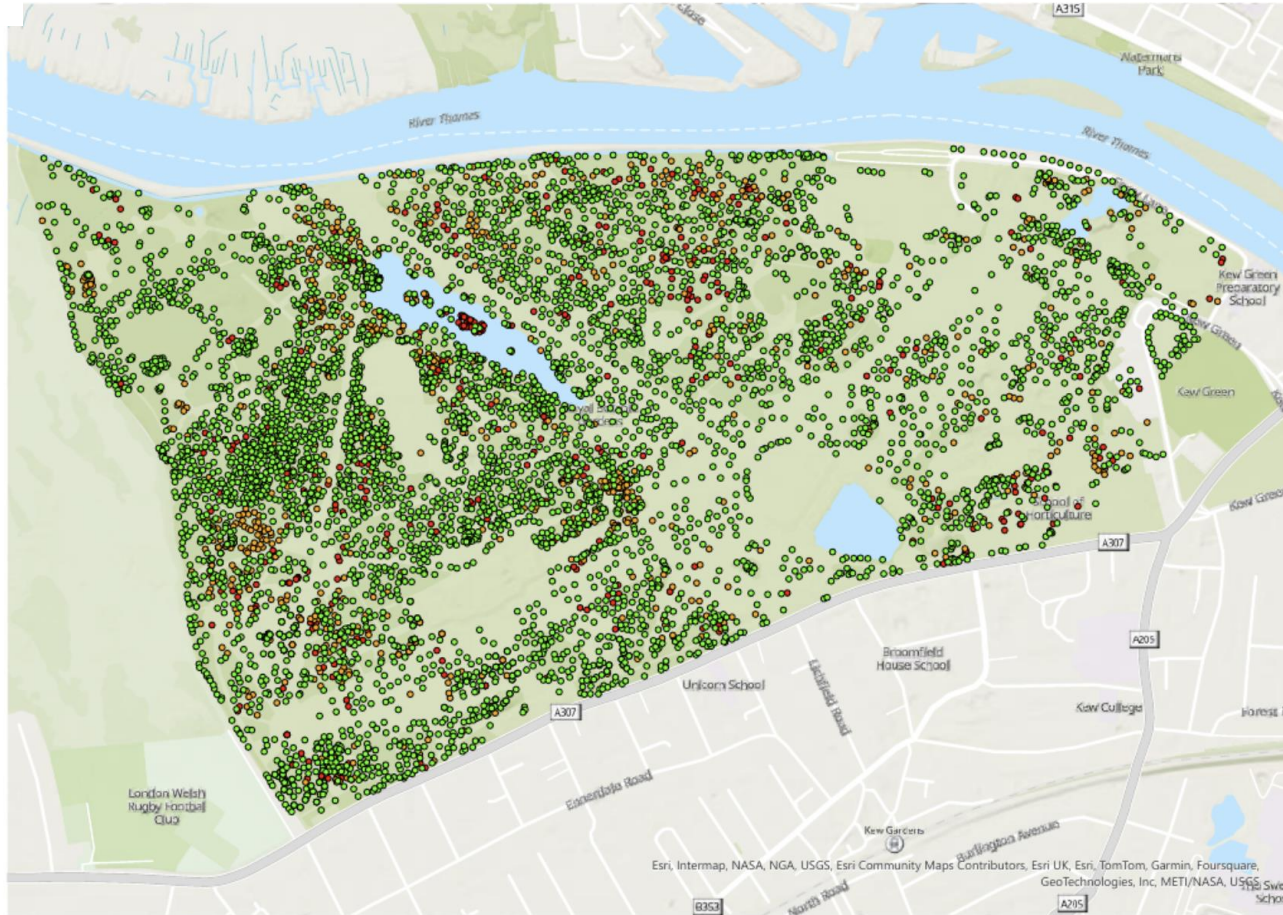
Around half of the 11,000 trees found on Kew's 320-acre London site may be at risk by 2090.



Mean annual temperature in Kew by 2100 will raise by 4* making it similar to present-day Nice, Porto or Baku

Source: Royal Botanic Gardens, Kew Living Collection Strategy 2019

Kew's Landscape Succession Plan



Freeth, Martin and Sjöman (in prep.), Kindt (2023b).

Key:

● Within known range ● Edge of known range ● Outside of known range

In **2023**, 81% of Kew's woody plants are observed to be within their wild range, 13% are observed to be at the edge of their known range and 6% outside of their known range

Source: Royal Botanic Gardens, Kew Living Collection Strategy 2019

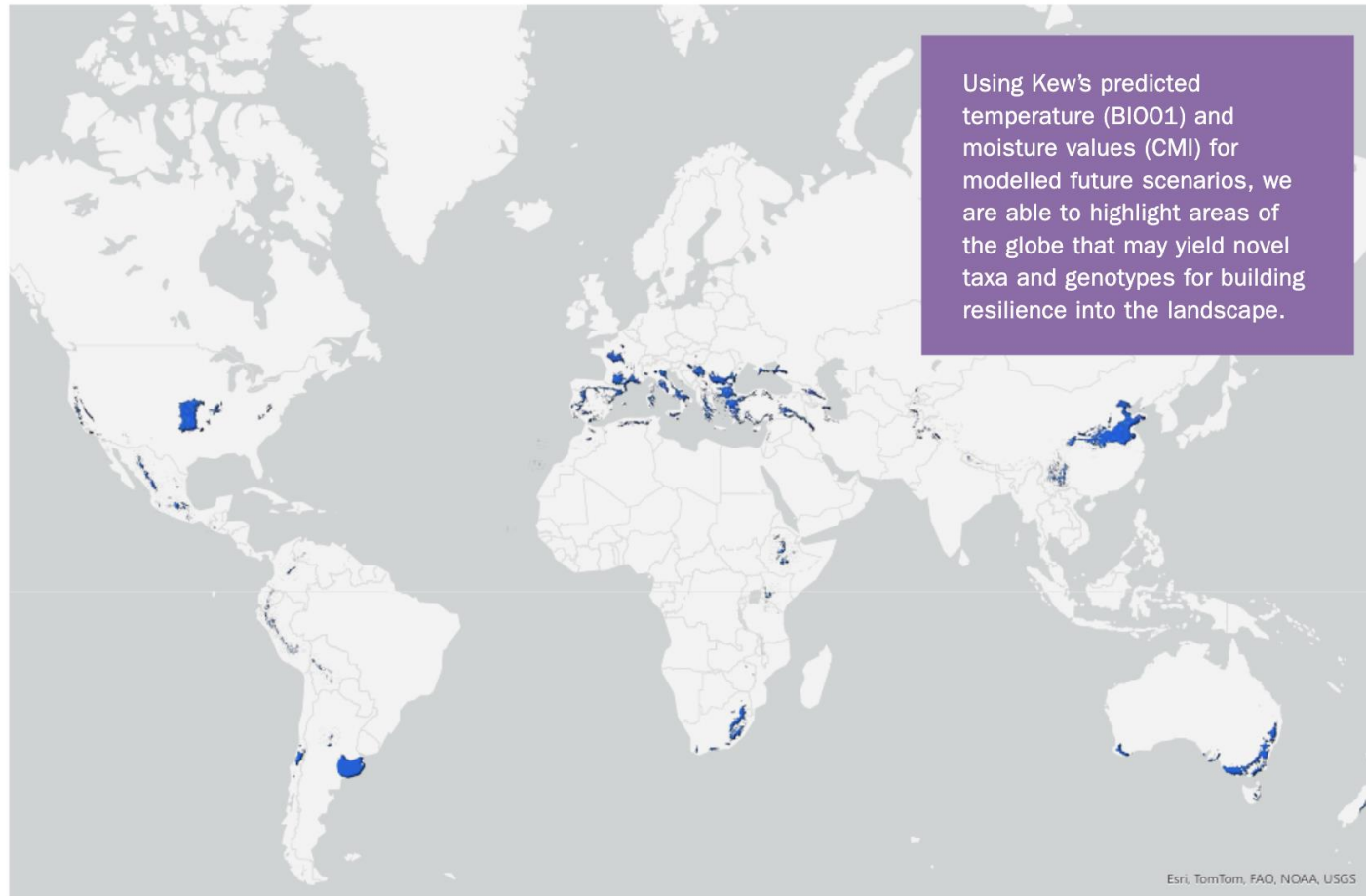


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In **2090**, 46% of Kew's woody plant collections are predicted to be within their known wild range, 45% are predicted to be at the edge of their known range and 9% outside their own range.

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Kew's Landscape Succession Plan



Key:

- Regions of the world that are a match for Kew in 2090

Fick and Hijmans (2017), Title and Bemmels (2018), Kindt (2023a).

Recent expedition of wild plant collecting brought Kew staff to Georgia, Romania and Azerbaijan

Source: Royal Botanic Gardens, Kew Living Collection Strategy 2019



A Brief of Some Strategic Action Areas

Royal Botanic Gardens
Kew

Species Adaptation

- Continue to refine climate assessments for woody species
- Further develop lists of new species and provenance for future climate suitability
- Develop a programme of wild plant collecting from identified suitable geo-climatic locations
- Identify individual vulnerable (to climate change) plants of high conservation value

Landscape Development

- Complete a comprehensive Living Landscape Plan to inform future landscape conservation and development in the context of climate change

Resources, sustainability and resilience

- Complete irrigation plan to describe technical and spatial layout of network, rainwater storage and a rationale for future irrigation
- Increase contribution to pest and disease monitoring
- Adapt horticultural practices to lower resource use

Benefit to people and habitat enhancement

- Improve shade planning, to identify spaces to improve visitor experience and wellbeing
- Ensure that new plant selection and layout takes account of provision of wildlife habitats

Source: Royal Botanic Gardens, Kew Living Collection Strategy 2019

Diploma in Botanical Horticulture



Course Content

- Lecture blocks
- Practical work placements
- Field trips
- Travel Scholarship
- Dissertation

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The Clog and Apron Race



On the right, the Director of the School of Botanical Horticulture hands in the trophie to the winner...

This is the traditional initiation ceremony for first year Diploma Students. It consists of a run down the little broadwalk in traditional gardener's attire





Lecture Blocks



Year 1

- Structural Botany
- Plant Systematic
- Entomology
- Plant Physiology
- Plant Propagation
- Soil Science

Year 2

- Garden Ecology
- Introduction to Mycology
- Protected Cropping and Environmental Control
- The Management of Tree Collection
- Introduction to Ecology
- Soil Science 2
- Genetics
- Introduction to Landscape Surveying
- Introduction to Landscape Design

Year 3

- Horticultural Management
- Garden History
- Sustainable Practices, Planting and Landscape
- The Management of Living Collection
- Plant Health, Biosecurity and Invasive Plants
- Landscape Design

Practical Work Placements



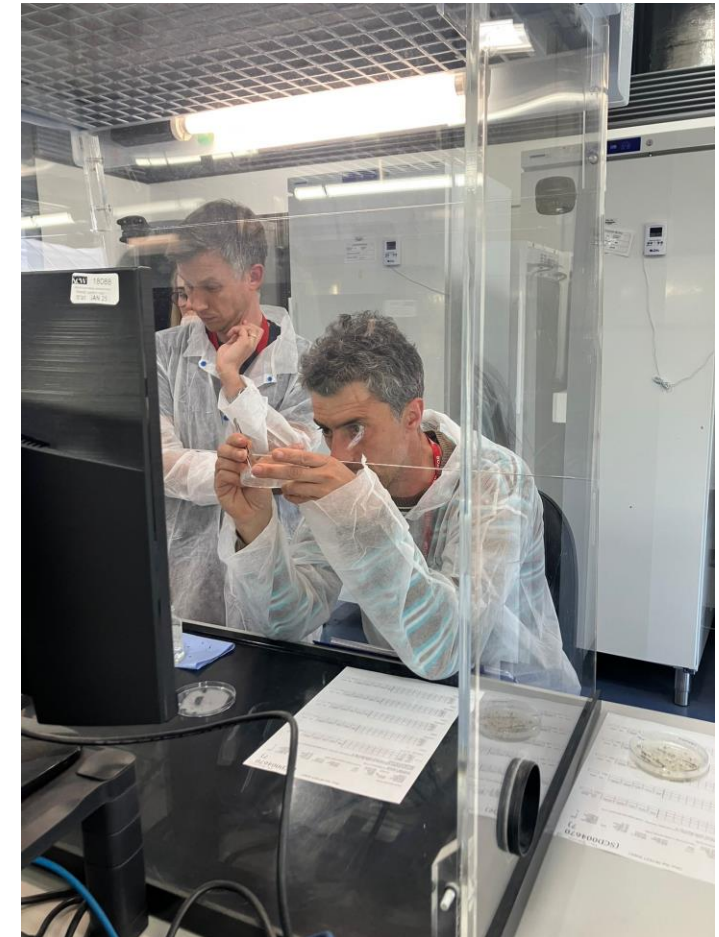
Practical Work Placements



Field Trips: Wakehurst and Millennium Seed Bank



Two weeks in-residence trip: the first week working and learning about seeds and fruit morphology in the Millennium Seed Bank and the second week exploring the work on meadow and woodland management within the Wakehurst Gardens department.



Field Trips: Wakehurst and Millennium Seed Bank



Seed collection and storage,
woodland management
practices and practical air
layering plant propagation



Field trips: North Wales Ecology Field Trip



One-week ecological field trip based in North Wales, encompassing Anglesey, the Snowdonia National Park and Great Orme at Llandudno

We have visited 11 sites with contrasting habitats, flora, fauna, geology and conservation programmes. Some of these habitats includes:

- Coastal cliffs
- Sand dunes
- Storm beach
- Limestone grassland
- Coastal and inland heath
- Oak woodland
- Upland grassland
- Scree and cliff
- Abandoned heavy metal site (once Europe's largest copper mine)

Field Trips: North Wales Ecology Field Trip



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Field Trips: North Wales Ecology Field Trip

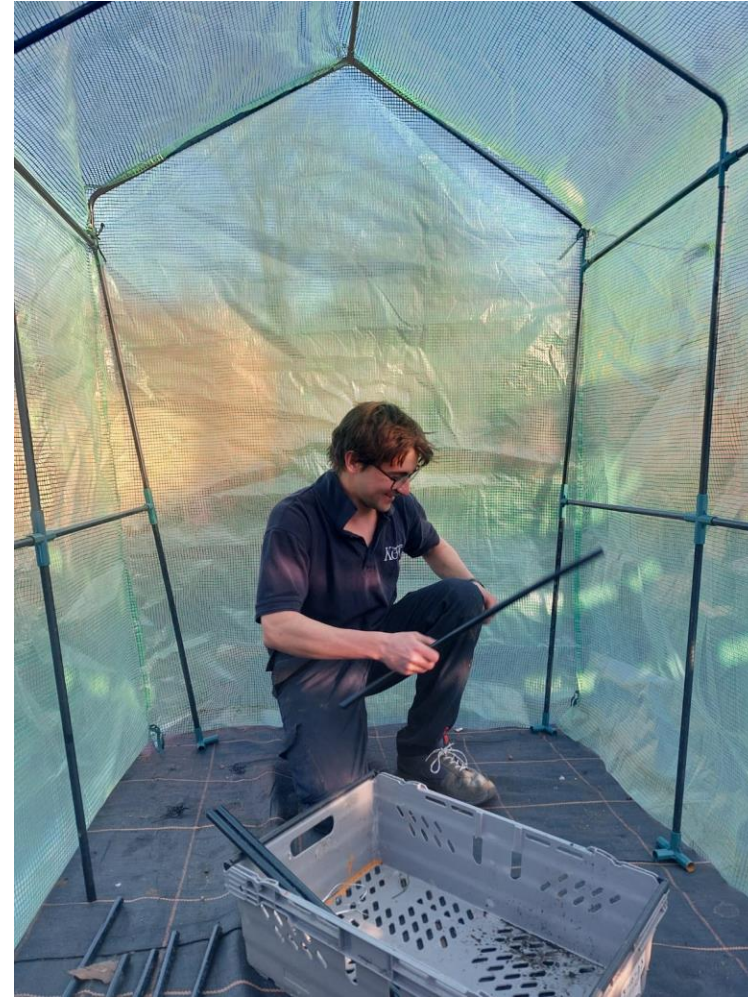


Vegetable Plot Project



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Vegetable Plot Project



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Herbarium Naming Project



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Travel Scholarship: Why we chose Namibia



Orto Botanico di Portici, near Naples, Italy,
displaying the largest ex-situ collection of
Welwitschia mirabilis in Europe



Travel Scholarship: Why we chose Namibia



Orto Botanico di Palermo, Sicily, Italy. Aiuola Giovanni Falcone

Travel Scholarship: Why we chose Namibia



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What We Hope to Learn: Aims and Objectives



To explore the country's rich biodiversity and ecology

To improve understanding of practical arid and xerophytic plants cultivation and conservation, including their safeguarding and promotion

To gain a better understanding of ex-situ conservation of Namibian endemic and indigenous plants, including challenges and issues to secure and conserve the local flora

To experience endemic and indigenous Namibian plants growing in their natural habitat, with the ecological, climatic and geological associations.

To engage with local professional and nature lovers, exchanging the passion and challenges of caring for our ecosystem

The Itinerary of our Namibian Trip



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Kew

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**Any questions
are more than
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