

Collaboration on South Georgia

Rosemary Newton & Colin Clubbe



Kew: repository for plant information for 260 years



Kew's Living Collections: a sample of the world's plant diversity (27,000 taxa)

Kew's Herbarium: >7 Million specimens



The newest wing of Kew's Herbarium



Wing B of the Herbarium, added in 1902



The Fungarium, located in the Jodrell Laboratory

South Georgia Collections

Tree Filters Manage Filters (1/1 active)

Collectors (+)

Geography (-)

Geo Search: Enter country...

- British Indian Ocean Ter. (3)
- British Virgin Islands (26)
- Cayman Islands (4)
- Falkland Islands (20)
- Gibraltar (1)
- Montserrat (1)
- Pitcairn Islands (4)
- Saint Helena (1)
- South Georgia (1)
- Tristan da Cunha (4)
- Turks and Caicos Islands (15)

Collapse All Filter:

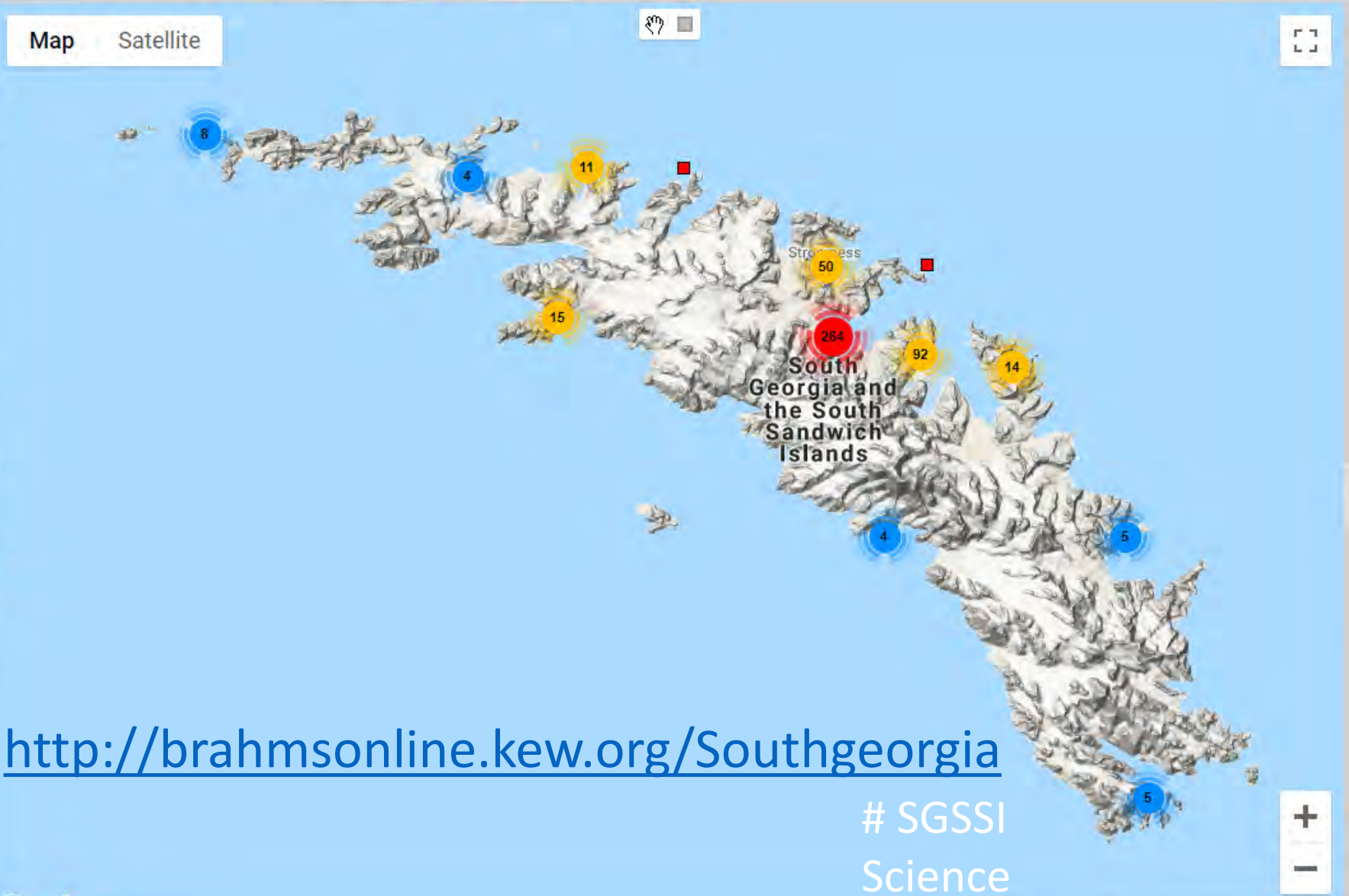
Taxa (-)

Species Search: Enter Genus + Species...

- Families
- Acanthaceae (16)
 - Adiantaceae (7)
 - Adoxaceae (1)
 - Aizoaceae (4)
 - Alismataceae (2)
 - Alstroemeriaceae (1)
 - Amaranthaceae (18)
 - Amaryllidaceae (9)
 - Anacardiaceae (9)

Species List Advanced Grid Images Maps Help

Map Satellite



<http://brahmsonline.kew.org/Southgeorgia>

SGSSI
Science

Millennium Seed Bank at Wakehurst

There is no technological reason why any plant species should become extinct...



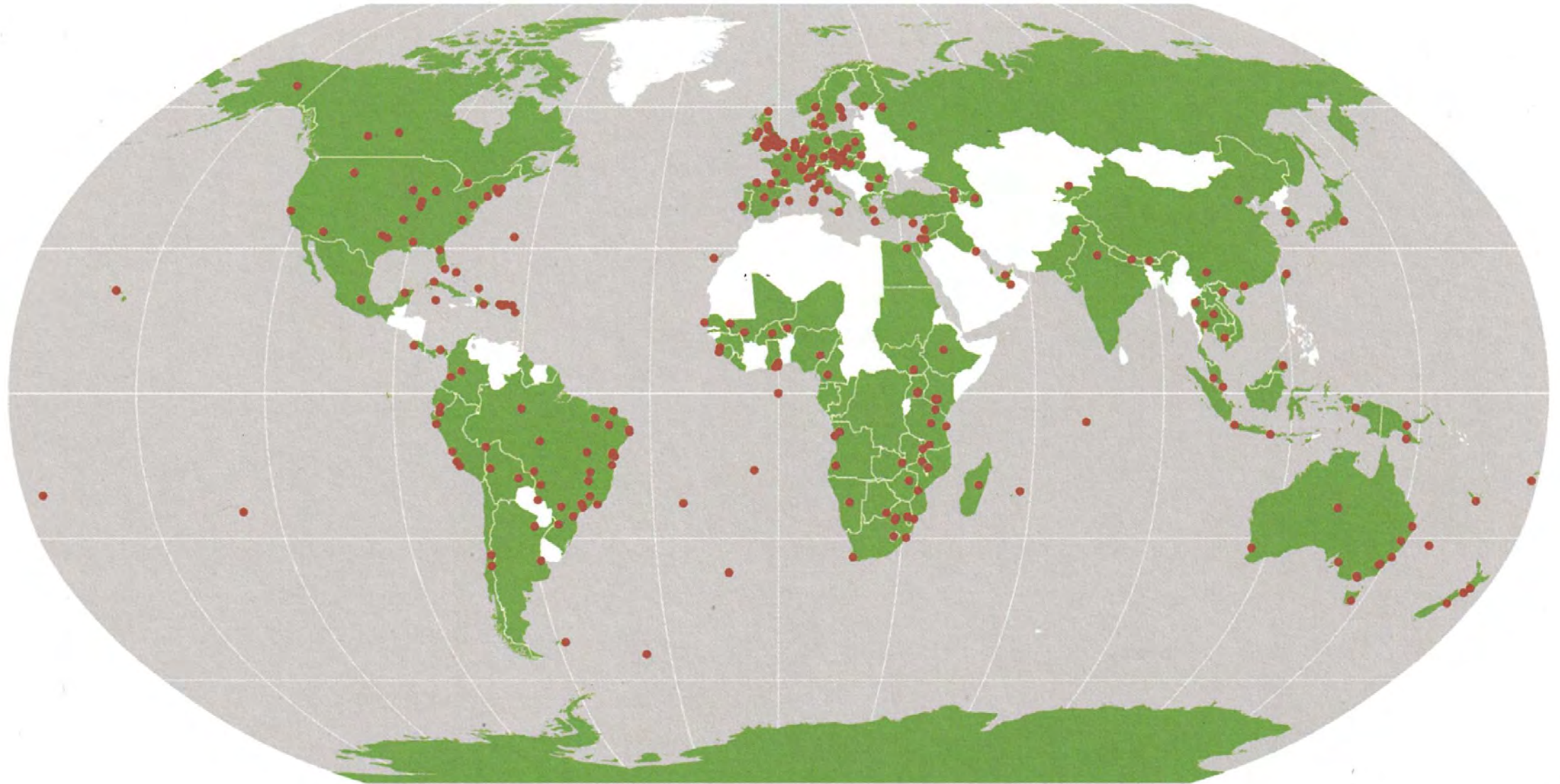
Millennium Seed Bank Holdings

- 94,000 collections
- 40,700 species
- 2.3 Billion seeds



Kew's Global Collaboration Network

110 Countries; 400 Institutions



Looking Forward

Biodiversity Action Plan for South Georgia
& the South Sandwich Islands

2016-2020



South Georgia & the
South Sandwich Islands

Strategy 2016-2020



South Georgia Non-Native Plant
Management Strategy
2016 - 2020



Programme delivery highly prioritised and strategic

Royal Botanic Gardens
Kew



The South Georgia Non-Native Plant Management Programme is on track to achieve the Strategy Targets



Securing South Georgia's native habitats following invasive species control (Darwin Plus)

Kew



Rosemary Newton
Project leader



Colin Clubbe
Steering group chair and advisor



Bradley Myer
Managing director & logistical support



Kelvin Floyd
Field team leader



Pamela Quilodrán
Field team member

Durham University



Wayne Dawson
Invasion ecology statistical expert



Kaitalin White
QMUL MSc student



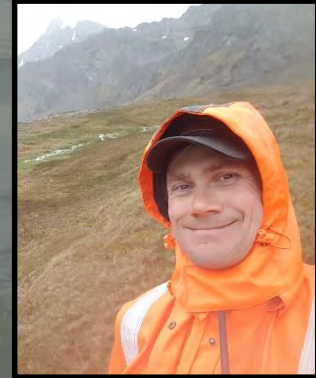
Marcella Corcoran
Seed germination and horticulture



Sally Poncet
Field team member



Ken Passfield
Field team member



Jörg Kluge
Field team member



Support



Aim of Darwin Plus project is to safeguard South Georgia's native habitats by:



Monitoring and assessing vegetation changes following non-native plant species control

Estimating from soil seed bank viability studies the risk of non-native plant species persisting past 2020

Aim of Darwin Plus project is to safeguard South Georgia's native habitats by:

Image: Indigena Field Team



Quantifying the potential for non-native plant species to disperse into new areas following glacial retreat due to climate change



© RBG Kew

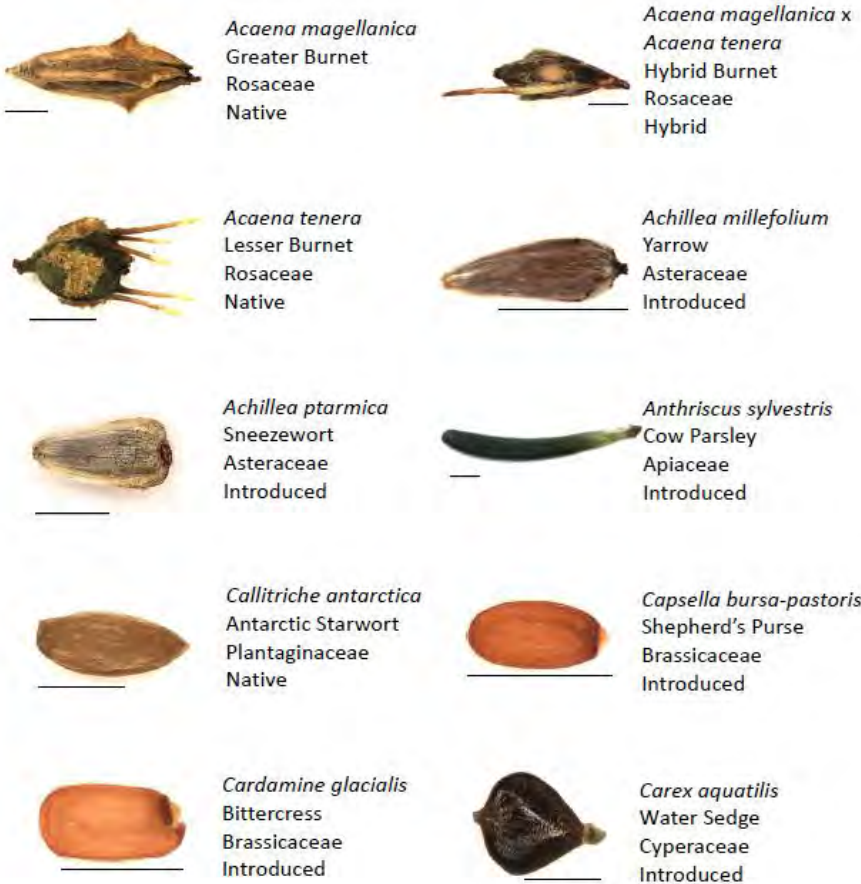
Securing seed and fern spore collections of native plant species for conservation in the Millennium Seed Bank

Laboratory work

Seed and seedling imaging and dichotomous key

Seeds of the Vascular Angiosperms of South Georgia

Species are listed alphabetically by genus. Poaceae are listed separately, at the end.
Scale bar = 1mm



18	Appendage is an apical beak	19
	Appendage is basal, wedge shape, seed is ovoid, translucent sheath may be present	<i>Leptinella scariosa</i>
19	Spinulose on apical half, seed brown, elongated, surface sulcate	<i>Taraxacum officinale</i>
	Apical beak terminating in a hook, spindle shape	<i>Carex merindensis</i>
20	Biconvex, shallow planoconvex, lanceolate-cylindrical or lanceolate shape	23
	Shape is different	21
21	Globose (spherical), irregularly globose, subglobose (sides of sphere flattened) or half-moon shape	28
	Shape is different	22
22	Pyriform, oblong or pyramidal	32
	Elongated, curved form, 6 – 8 mm in length, deep groove on abaxial surface, colour lightens towards base	<i>Anthriscus sylvestris</i>
23	Biconvex shape, protuberance at radicle end, surface rugose, reddish colour	<i>Vaccinium vitis-idaea</i>
	Shape shallow planoconvex, lanceolate-cylindrical or lanceolate	24
24	Shallow planoconvex shape, protuberance at radicle end on plane	<i>Callitriche antarctica</i>
	Shape lanceolate-cylindrical or lanceolate	25
25	Lanceolate-cylindrical shape, light coloured lateral protuberances (4) on dark seed, apex and base truncate	<i>Tripleurospermum inodorum</i>
	Lanceolate shape	26
26	Lanceolate shape, translucent sheathing present	27
	Lanceolate or irregular lanceolate shape, sheathing absent, angular sides, dark brown colour, shrivelled appearance	<i>Rostkovia magellanicus</i>
27	Translucent sheathing whitish with ribbed surface, can draw straight line from base to apex	<i>Achillea millefolium</i>
	Translucent sheathing yellowish with scalariform surface, seed tends to curl, straight line cannot be drawn from base to apex	<i>Achillea ptarmica</i>



Native:
Montia fontana



Non-native:
Tripleurospermum inodorum

54 of 56 angiosperm species

Laboratory work Seed extraction from soil



Results:

Number of sites investigated so far:
4 (5 reps per site)

Total amount of soil processed:
20 samples of 20 ml each = 400 cm³

Total seeds / seed fragments
extracted: > 600 items

Total number of full seeds: 122

Total number of viable seeds: 51

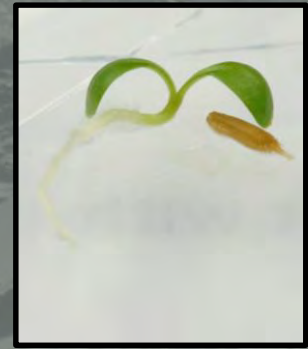
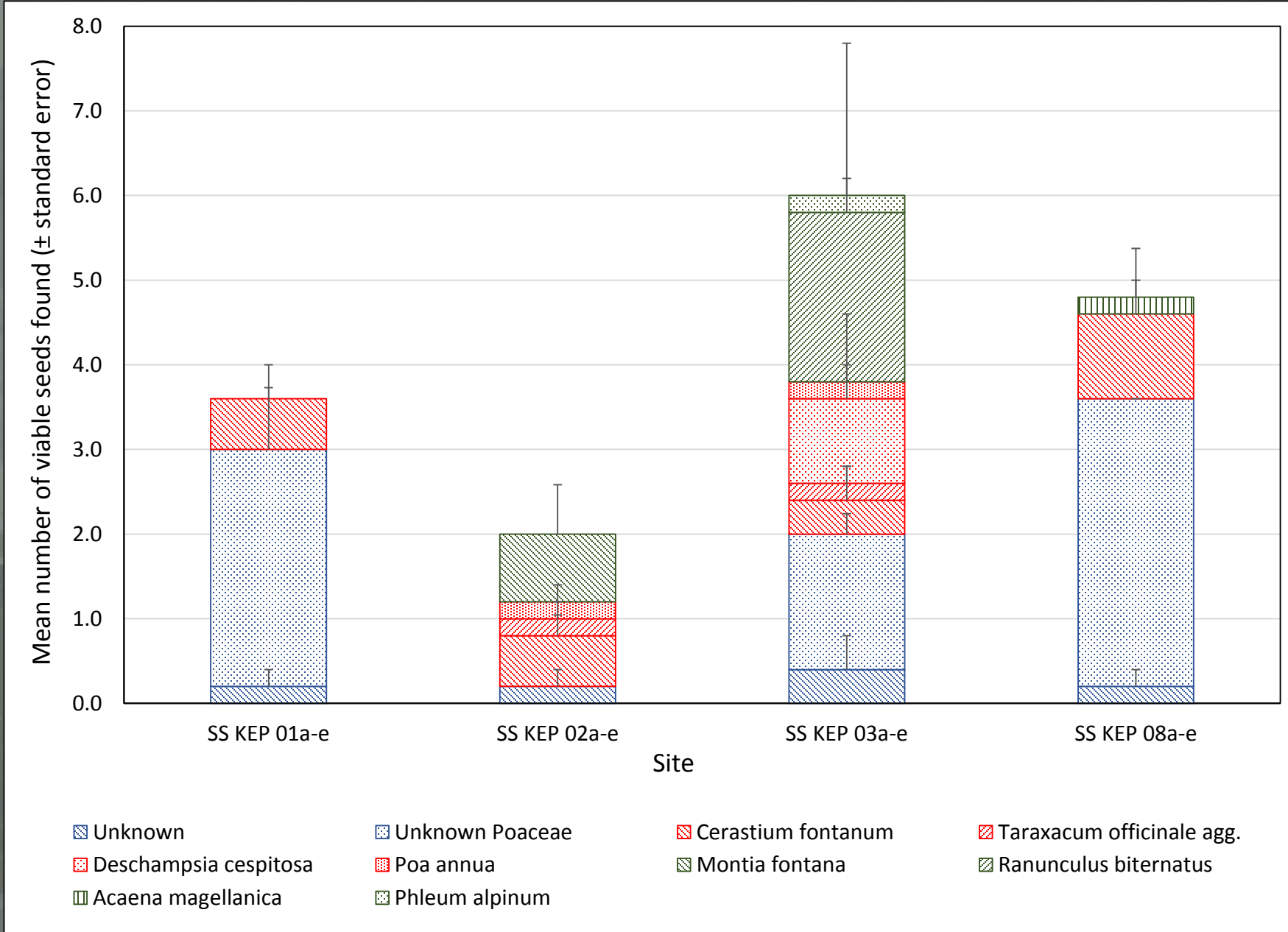
Laboratory work Viable seeds in the soil



Native:
Acaena magellanica



Native:
Ranunculus biternatus



Non-native:
Class 3
Taraxacum officinale agg.



Non-native:
Class 1
Deschampsia cespitosa

Laboratory work

Thermal gradient plate

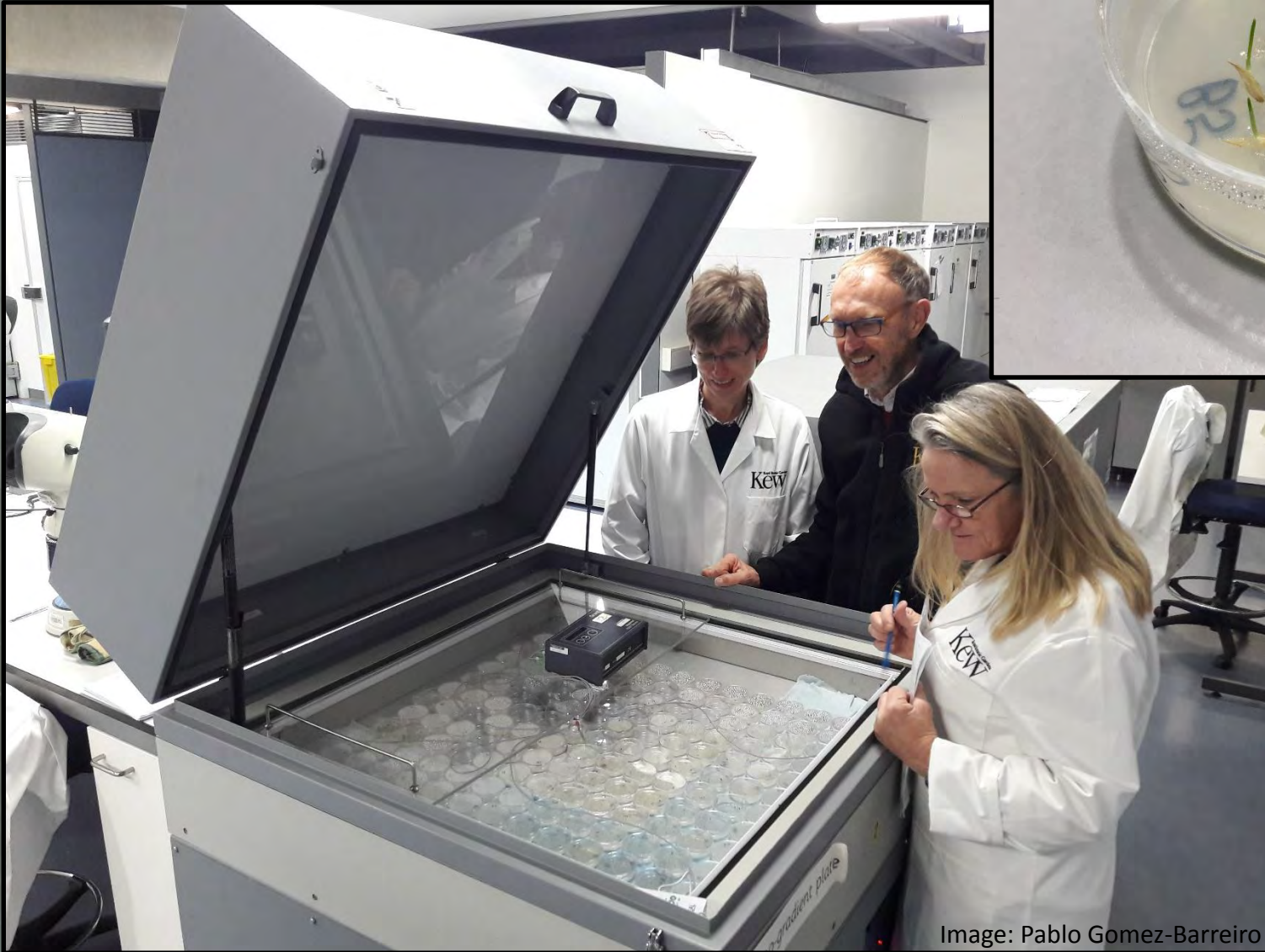


Image: Pablo Gomez-Barreiro

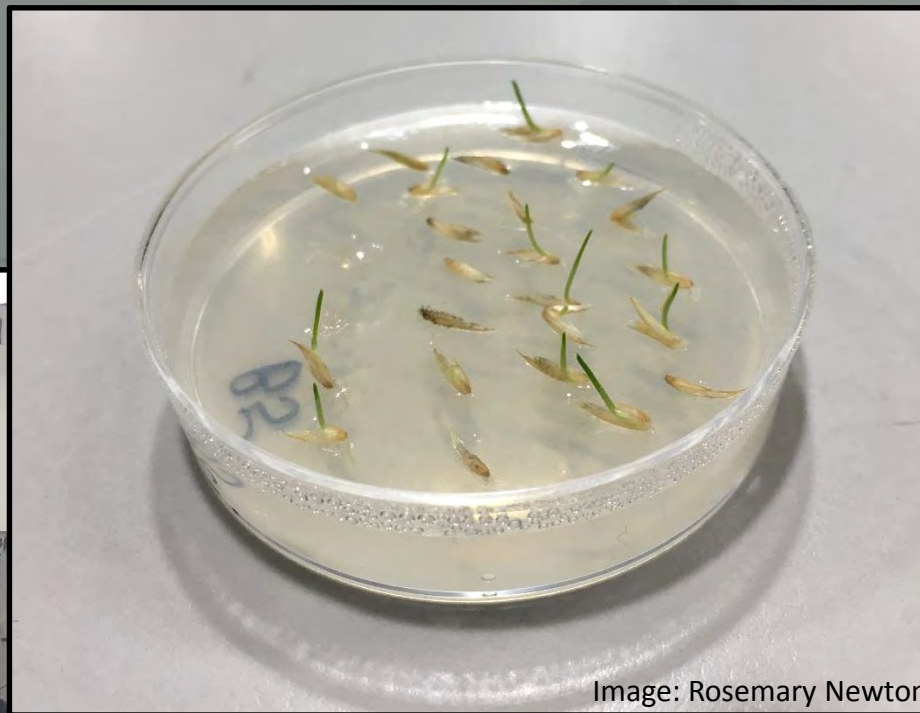


Image: Rosemary Newton



Image: Rosemary Newton



Image: Colin Clubbe

Field work 29 collections during 2018-2019 field season

Native spore collections (11):

1. *Blechnum penna-marina* (1)
2. *Cystopteris fragilis* (3)
3. *Grammitis poeppigeana* (1)
4. *Hymenophyllum falklandicum* (1)
5. *Lycopodium magellanicum* (1)
6. *Ophioglossum opacum* (1)
7. *Polystichum mohrioides* (3)

Native seed collections (11):

1. *Acaena magellanica* x *A. tenera* (2)
2. *Alopecurus magellanicus* (1)
3. *Deschampsia antarctica* (2)
4. *Festuca contracta* (2)
5. *Juncus scheuchzerioides* (2)
6. *Poa flabellata* (2)

Non-native seed collections (7):

1. *Deschampsia cespitosa* (1)
2. *Deschampsia parvula* (1)
3. *Festuca rubra* (1)
4. *Poa annua* (2)
5. *Poa pratensis* (2)



