Seed conservation and storage behavior in the Hawaiian Islands

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Determining storage behavior has important implications for seed conservation. The intermediate category includes three subcategories: desiccation-intermediate, freeze-sensitive, and short-lived (Walters, 2015). Worldwide, 3.7% of angiosperms are observed as desiccation-sensitive, yet neither island specific floras nor intermediate storage behavior are specifically assessed (Wyse and Dickie, 2017). Based on 22 years of research in the Hawai'i Seed Bank Partnership (expanding on Yoshinaga and Walters 2003), current estimates for the native flora show that ~3% are desiccation-sensitive, comparable to worldwide estimates of tropical dry forests (3%), but considerably lower than tropical moist forests (18.5%) - the more abundant habitat type in Hawai'i. It is hypothesized that long distance dispersal selects against desiccation sensitivity (Carlquist, 1974), thus Hawai'i's isolation, at >3800 km away from any landmass, may explain the discrepancy. Uniquely, about 1/3 of the Hawaiian seed flora studied exhibits freeze-sensitivity, with a steep drop in viability under dry, frozen storage conditions. There are cases of species responding anomalously to temperatures between +10 and -30°C (Walters, 2015), however there are no reports of large proportions of a regional flora displaying this behavior. This may be due to a lack of characterization of seed storage behavior in tropical and subtropical regions, especially on islands. It is hoped that future collaborative research will further investigate the relationship between storage behavior and seed morphology, ecology, and climatic variables, as well develop new storage protocols, including cryopreservation.

Susan Deans, Seana Walsh and Dustin Wolkis collecting seeds of *Capparis sandwichiana* in September 2016.

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Get growing! Sheep poop and native plant seeds prove a successful recipe for habitat restoration

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Erosion is a feature of Falklands' landscapes. Common causes of erosion are fire, unsuccessful planting and overgrazing. Sometimes removing or reducing grazing is sufficient to reverse the erosion, but in other cases erosion is very difficult to reverse. In agricultural areas it means a loss of fodder and contamination of valuable wool with soil, in conservation areas it saps biodiversity from the bottom up.

In 2016, Falklands Conservation completed a Darwin Initiative project to find ways of tackling erosion using native plant seeds. Using native plant seeds is an exciting new technique for tackling erosion in the Falklands – previous techniques have used non-native plants or tillers of tussac (*Poa flabellata*) and bluegrass (*Poa alopecurus*).

Eroded areas in the Falklands are a harsh place for plants because they are often: very dry and very windy, and the soil is impenetrably hard or very, very moveable. Tricky! But this project took that on: it found out which native plants could grow from seed and how we could help them to