

REVISED DRAFT POLICY – COLLECTION OF ENDANGERED PLANTS BY AUTHORIZED BOTANICAL GARDENS IN HAWAII

We start with the assumption that the collectors, or the gardens they represent, already possess all relevant permits, follow appropriate protocols for collecting, and have permission of the land owner to collect at that site.

1. There are two primary concerns when collecting endangered species for propagation by botanical gardens:
 - A. Protecting the wild population from harm due to overcollection.
 - B. Collecting adequate material to assure maximum available genetic variability of the ex-situ collection.
2. For genetic safety net species, i.e., those with 20 or fewer known wild plants remaining, efforts should be made to collect material from each individual plant.
 - A. Seed collections should be made from each individual plant that has seeds, and seeds from each plant should be kept as a separate collection.
 - B. Material for vegetative propagation should be taken from each plant not producing seeds, and material from each plant treated as a separate collection.
 - C. Collecting and storing pollen may also be a useful technique to employ.
3. For seed collections:
 - A. As a general rule not more than 20% of the seeds should be removed from any one plant, if the plant is growing in a place where it appears that it could produce offspring successfully in the wild.
 - B. If the plant is surrounded by as thick growth of alien species, or fruits are being attacked by rats or other alien species, then the collector should utilize judgment and determine whether harvesting more than 20% of the seeds would benefit the survival of the species more than leaving them on the plant. If so, more seeds may be collected.
 - C. If seeds are intended for long-term storage, or for conventional propagation, they should be mature at time of collection. If seeds are intended for micropropagation, they could be either immature (preferable) or mature.
 - D. Even if very large amounts of seed are available, care should be taken not to collect excess numbers of seed, but only the number that can reasonably be accommodated in existing propagation and storage facilities. Keep in mind however, that in some Hawaiian plants, both rare and common, the percentage of seed germination is very low.
4. For collections of vegetative propagating material:
 - A. Do not remove so much material that the wild plant is harmed in any significant way. In general, if the plant is a healthy multibranched tree or large shrub one could take 5 to 10 branch tip cuttings, for either conventional propagation or micropropagation. If the plant has only a single stem, look for lateral buds or basal sprouts that could be removed and used for micropropagation, or as a last resort consider taking a couple of immature leaves or roots that might respond to micropropagation, but do not take the terminal bud.

5. Removing entire plants from the wild for propagation:

This is almost never necessary, but there may be rare occasions (see examples below) where this is the only feasible solution for conserving the taxon. Such action should be taken only after considering all possible alternatives, and seeking the opinion of appropriate experts, including U.S. Fish and Wildlife Service botanists and the Hawai'i state botanist at the Division Of Forestry And Wildlife. Examples of circumstances in which it may be necessary to remove entire plants include:

 - A. For some very small annuals, e.g., *Centaurium sebaeoides*, seedlings or pre-flowering plants may be the only propagules available at certain seasons. As annuals, the plants will die after flowering, and it may be necessary to take some pre-flowering specimens and flower them in a greenhouse.
 - B. If a plant is in the path of a new road or construction project where permission has already been given to permit "incidental take" as part of the construction, and no alternative sites or routes are feasible. (Note: removal of plants from wild populations should never be cited as an option for mitigation. It should become an option only if someone already has a permit that allows for "incidental take").
 - C. If a plant seems to be in jeopardy from some known, or unknown, cause, and fencing, treating with insecticide or fungicide, fertilizing, or other ameliorating measures do not seem likely to solve the problem, then consideration may be given to removing the entire plant to a site where it can be grown and propagated successfully. As an example, the one known population of a rare (but unlisted) *Stenogyne* was being monitored by field biologists for the Army. Three of the five known plants died within a short period of time, and the remaining two appeared to be sickly. The site was visited by an Army biologist accompanied by two horticulturists, a plant pathologist, and an entomologist. After investigation the scientists agreed that the outlook for the last two plants *in situ* was poor. The agreement was made to remove one entire plant, and some cuttings of the second plant, to a botanical garden for rescue work. That material was all propagated successfully and several plants are now thriving in the greenhouse. The remaining wild plant died shortly thereafter. In this case the right decision was made, but future cases should be subjected to similar appropriate rigorous evaluation before any decision is made.
6. Generally for wild-collected material one should prepare a herbarium voucher specimen for each plant collected and deposit it in a recognized herbarium. However, this may be difficult to do without harming the plant. Use your best judgment in determining what to collect, and if necessary to avoid damage to the plant, take only one or two of the oldest leaves, or even fallen leaves, and perhaps one flower, as a voucher. If material, including a voucher, has previously been collected from the individual, it is not necessary to collect another one, but merely to note that a voucher already exists.
7. For collections from genetic safety net species with 21-50 wild individuals, or for more common species, use the collecting guidelines given in:

Falk, D.A. & K.E. Holsinger, (Eds.) *Genetics and Conservation of Rare Plants*. Oxford University Press. 1991.

OR

Guerrant, E. & B. Pavlik, chapter in *Conservation Biology for the Coming Decade - 2nd edition*. (P.L. Fiedler & P.M. Kareiva, (Eds.). 1997