

## *Considerations in the Propagation of Rare Plants*

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The propagation and reintroduction of rare plants is sometimes necessary to preserve a species. This is often because the native habitat of the species is threatened by development, invasive species, or other types of habitat degradation.

The reintroduction of rare plants can be seen as a very special type of restoration activity. However, reintroductions have a special difference. The goal of a restoration is generally to restore the function of an ecological community. The function of a reintroduction is to maintain the genetic potential of a species. This means that, at every step of the process, special care must be taken to protect the genetic diversity found within natural populations. Given all the steps necessary, this can be an exceedingly difficult task.

The first step is to collect seed. Because you are not collecting all seed from all plants in all populations, you must take a sample. By virtue of the nature of sampling, you are only taking a small representation of the total genetic diversity found in the population. How many seeds (or cuttings) you take, from how many plants, depends somewhat on the size and spatial arrangement of the populations as well as, potentially, information about the breeding system of a species. Those species which outcross may have a higher genetic diversity in the population.

The next step is to germinate the seeds. Almost no species have 100% germination, and rare plants may have been through a genetic bottleneck that further reduces seed viability. Therefore, even though you may have collected 10,000 seeds, if only 50% germinate, you will lose potentially 50% of the genetic potential of your sample. Similarly, even if you get good germination, you may further lose species through propagation losses during the seedling stage.

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## *Propagation Strategies*

As the plants are held in the nursery, readying them for planting out into the wild, a number of losses may occur. First, there may be losses due to disease or predation by animals or insects. Anticipating these may be an important step to protecting the evolutionary potential of the species. Be sure to have regular and careful examinations of the species, along with such things as yellow sticky traps to monitor for many types of insects, bait or traps for slugs, and protection from grazers such as rabbits.

In the nursery there may also be "artificial selection" that contributes to a loss of genetic information and may make the plants less fit for the wild. Artificial selection occurs in nursery or greenhouse conditions, where the plants that survive best are those that are suited to the pampered regimen. Plants that like regular water and food (and there are plenty that have not evolved that way!) may be more likely to do well. When these "hothouse flowers" are installed in a dry, low nitrogen prairie, for example, they may find themselves less fit to survive than their sisters that did not survive the nursery regimen.

Finally, there are no guarantees that anything transplanted, whether a rhododendron in your garden or a rare plant in a wetland, will survive transplanting. Special care should be given to ensure that each plant is given the best chance. In the maritime Pacific Northwest, fall is a great time to plant - there will be plenty of precipitation and the roots will continue to grow

during the winter, allowing the plant to be established by spring. Planting techniques that may help ensure survival of each plant include making a planting hole that is big enough around without being too deep, back-filling the hole with soil from the site, not special rich imported soil, and watering, weeding, and aftercare for some time, until the plant establish. Basic horticultural texts can provide information about planting techniques.

It is inevitable that some genetic potential will be lost in any reintroduction program - that is why on site conservation is *always* the preferred method. However, by carefully and consciously working to sample widely and provide the best horticultural care possible, the losses may still be minimal enough to allow the reintroduction to be a useful conservation tool. Any such reintroduction should be done in conjunction with the approval of such agencies as the United State Fish and Wildlife Service and the approval of the owners of the land from which seed collected and outplanting will be conducted.