

USDA Forest Service Botany in the News

Chicago Botanic Garden Partnership to Collect Native Seeds

The current Challenge Cost Share agreement between the Eastern Region of the U.S. Forest Service and Chicago Botanic Garden (CBG) aims to preserve native plants of concern within the Eastern Region of the Forest Service, in particular by collecting and banking the seeds of Regional Forester Sensitive Species (RFSS), as well as associated plant species sharing the same habitat. Collection priorities for these species have been set by the level of concern for the species at the forest unit level and across the region as a whole. For example, a priority 1 species on the Shawnee would be designated as such because it is an RFSS species on that unit. A priority 2 species on the same unit could be quite common on the Shawnee, but is a designated RFSS species and quite rare elsewhere in the Eastern Region of the Forest Service.

As the Eastern Region is so large and covers a broad range of habitat types, CBG has partnered with other botanic gardens and seed banks to ensure collection throughout the region. For example, the Mid-Atlantic Regions Seed Bank (MARS-B) made collections on both the Allegheny and the Monongahela National Forests, while the New England Wildflower Society made collections on the White and Green Mountain National Forests. In addition, there were two active contract collectors, Susanne Masi, a retired botanist at the Chicago Botanic Garden who made several collections on the Shawnee, and Tim Chambers, who made collections on the Chequamegon-Nicolet National Forest.

Perhaps the greatest challenge for this type of conservation effort is simply locating viable populations of these often elusive and hard-to-identify species. We worked with the Heritage Database administrators in Indiana (Hoosier), Illinois (Shawnee), and Minnesota (Superior) to obtain Historic locality information for all RFSS species for which they had data. Some 6,000 miles of travel within and around these units found several historic populations extirpated or too small to withstand seed collection. Others yielded only very small collections of just a few seeds each. For example, Susanne Masi collected approximately 20 seeds of *Panax quinquefolius* at Shawnee National Forest, while Clara Holmes of MARS-B collected just five seeds from a very small population of the same species in Allegheny National Forest.



Iris.



Seed collection in such small populations (with fewer than 50 reproductive adult plants) is done along maternal lines, where the seeds from each genetically distinct plant are collected, cleaned, processed, and stored separately. In small, potentially inbred populations of rare species, seed quantity and quality may vary among individuals. If seeds from all plants were bulk collected, seeds from highly productive maternal plants would dominate the sample, as well as any resulting populations. Those genes would then be over-represented, and rare alleles might not be established at all causing a founder effect, or a loss of genetic variation that occurs when a very small number of individuals from a larger population establish a new population. When the seeds are used to establish a new population, being able to choose an equal number of seeds from each “mom” eliminates founder effects.

For the first time this year, an effort to collect Crop Wild Relatives (CWR) was also undertaken, with several *Vaccinium* species collected, including collections of small cranberry (*V. oxycoccus*), large-fruited cranberry (*V. macrocarpon*), and bog bilberry (*V. uliginosum*), which is also an RFSS collection. A joint Forest Service and Agricultural Research Service training workshop to collect both the seeds and the genetic material (leaf tissue) was conducted at the Keweenaw Bay Indian Community, focusing on collections of the small cranberry and the large-fruited cranberry in bogs local to the

region. Several collections of taxa in the genus *Helianthus* were also accessioned into the seed bank at the Chicago Botanic Garden this year.

Native Plant Conservation Highlights of 2014

- Contract seed collectors were active at Chequamegon (Tim Chambers), Shawnee (Susanne Masi), Allegheny (Mars-B), White (New England Wildflower Society), Green (New England Wildflower Society), and Monongahela (MARS-B).
- Seasonal collectors were active at Mark Twain (Alan Brant), Chippewa (Josh Trautner), and Superior (Jessica Lusk).
- CBG staff collectors were active at Hoosier (Dave Sollenberger) and Midewin (Laney Weidener and Rachel Goad).
- One hundred and ninety-two collections have been accessioned and are currently being processed for cleaning and storage.