

# The North American Orchid Conservation Center

A Chance for Orchid Lovers to Benefit Conservation

BY DENNIS F. WHIGHAM, TOM MIRENDA, JAY O'NEILL AND MELISSA MCCORMICK



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DAVID MCADOO

WE ALL LOVE orchids! That is one reason you are reading this latest issue of *Orchids!* The reasons for our interest in orchids are varied and complex, ranging from their extreme beauty to the exciting hybrids constantly streaming our way from so many talented breeders. We may not be fully aware, however, that the beauty we observe and love had its origin with wild, native species and that there are still new species to be found — perhaps thousands — to add to the genetic richness of the Orchidaceae. As we follow the news about the direct and indirect impacts of humans on the earth's biodiversity we have become painfully aware that many orchids are threatened. To date, most of the global efforts to conserve our rich orchid diversity rely on international treaties that involve the trade in orchids. Until recently there has not been any effort to assure the survival or the genetic diversity of native orchids within the geographic boundary of any country — let alone the world.

The North American Orchid Conservation Center (NAOCC) was initiated by the Smithsonian Institution and the United States Botanic Garden with the specific goal of assuring the survival of all native orchids in the USA and Canada. Attaining this goal will not be easy, due in part to the fact that there have been few ecological or conservation studies of our native orchids and most have been limited to species that have been given legal protection because of their scarcity and ongoing threats to their survival. The eastern (*Platanthera leucophaea*) and western (*Platanthera praeclara*) prairie fringed orchids are two examples of native species that have received a lot of attention from researchers and conservation scientists. Very few native orchids in the USA and Canada have been propagated for conservation purposes or for use in horticulture, even though many of our native orchids have tremendous potential. Lady's slipper orchids and species in the genus *Platanthera* are but a few examples of our native orchids that have the potential to brighten our days and our gardens.

The North American Orchid Conservation Center's ambitious goal has several elements that make it different from any other conservation effort. The North American Orchid Conservation Center is the only plant-oriented conservation effort that focuses on an entire family of plants at the scale of an area that is as large as the USA and Canada. The North American Orchid Conservation



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Center is also unique because it is based on ecological principles, because it won't be possible to propagate and restore native orchids without also illuminating the complex relationships between orchids and mycorrhizal fungi. In effect, orchid conservation also requires conservation of fungi and, for many orchids, pollinators.

To be successful, NAOCC's goals will only be accomplished by involving citizens across the two countries and a network of collaborating organizations, including botanical gardens, to take on the tasks that will result in the conservation of the genetic diversity of all native orchids while providing the framework that has the potential to enable species to survive in an ever-changing world. You can learn about NAOCC and its partners by viewing a video on the opening page of the NAOCC website at <http://northamericanorchidcenter.org>. While you are there, you can explore and learn more about the ecology of our native orchids and view images of orchids in the gallery, but best of all, you will also find links to *Go Orchids*, an interactive website that you can use to read about each species as well as expand your skills and learn how to identify all of the native orchids in the USA and Canada.

How will NAOCC and its collaborators ensure the survival of native orchids? First, seeds of all native orchids will be collected across their range of distribution and stored in regional, national and international seed banks. Second, when collections are made of orchid seeds, root tips will also be sampled and fungi that the orchids interact with will be extracted from them, to be cultured and stored in a fungal bank at the Smithsonian Institution. Collecting and culturing fungi may sound



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- [1] The western prairie fringed orchid (*Platanthera praeclara*) is found in the midwestern United States and Canada, from Oklahoma to Manitoba.
- [2] *Cypripedium kentuckiense* is endemic to the United States and confined to the southeastern states westward to southeastern Oklahoma.
- [3] The greater purple fringed orchid (*Platanthera grandiflora*) is found across the East Coast of the United States and Canada, from Georgia to Quebec.



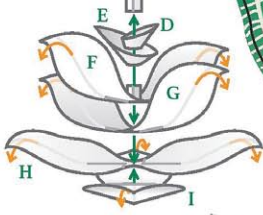
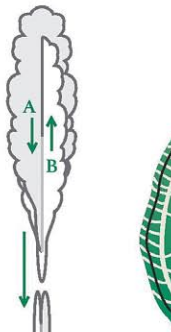
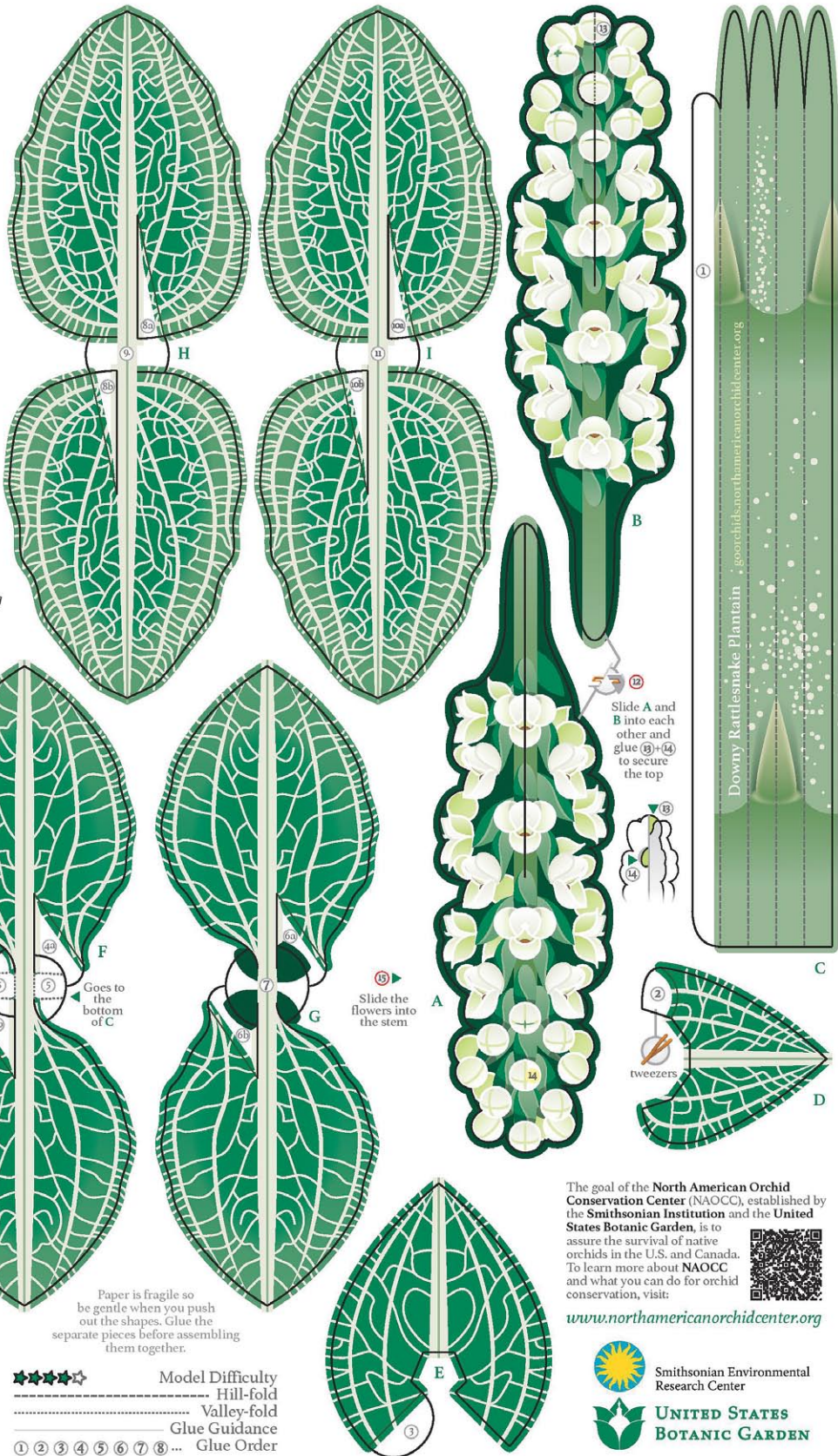
# orchid-gami

NATIVE TO THE U.S. AND CANADA

*Goodyera pubescens*  
Downy Rattlesnake Plantain



This evergreen orchid (it has leaves throughout the year) is easy to spot in the forests of eastern North America. The veined leaves form a rosette in winter, and the lovely white blossoms appear in midsummer, when few other plants are flowering in the forest. To learn more about the Downy Rattlesnake Plantain, scan the QR code with your phone or visit the species page on *Go Orchids* at <http://goorchids.northamericanorchidcenter.org>



Paper is fragile so be gentle when you push out the shapes. Glue the separate pieces before assembling them together.

- ★★★★★ Model Difficulty  
 - - - - - Hill-fold  
 ..... Valley-fold  
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Orange arrows indicate where you can gently curl the paper around a pencil or similar object.



The goal of the North American Orchid Conservation Center (NAOCC), established by the Smithsonian Institution and the United States Botanic Garden, is to assure the survival of native orchids in the U.S. and Canada. To learn more about NAOCC and what you can do for orchid conservation, visit: [www.northamericanorchidcenter.org](http://www.northamericanorchidcenter.org)



easy but the issues related to the ecology of orchid–fungal interactions are complex and almost all of the fungi that have been isolated and identified thus far (this can only be done by extracting and analyzing the fungal DNA) are completely new to science! Third, the stored seeds and fungi will be used by NAOCC partners to propagate and cultivate each species. The goal of this part of the effort will be to establish sustainable populations of native species in botanical gardens. The seed and fungal germplasm banks and the populations they generate will assure the genetic survival of our precious native species.

We get an added bonus from the propagation efforts because the lessons learned and the techniques developed will be available to the public. Imagine having sustainable populations of beautiful native orchids grown in private gardens. Many of our natives have enormous potential for use in the horticultural trade, further supporting conservation efforts. In addition, once we have learned how to propagate native orchids, this knowledge will enable NAOCC to support restoration efforts. The fourth element of NAOCC is education. As you are aware, having been smitten, orchids are charismatic and we believe that dissemination of information about orchid ecology and conservation can potentially increase the botanical literacy in our countries. As one example, NAOCC is designing punch-out models of native orchids (orchid-gami) that will be used in a variety of educational venues. The models are fun and beautiful and are sure to capture the imagination of youngsters, but they also convey information about NAOCC and the conservation status and ecology of the species. Examples of the constructed models are shown here. Florida’s endangered ghost orchid, (*Dendrophylax lindenii*), was chosen as one of the early models because people have long been fascinated by this elusive orchid and currently there are several efforts to restore this orchid to its native habitat. The ghost orchid model may be a bit challenging but the showy lady’s slipper (*Cypripedium reginae*) and worm vine (*Vanilla barbellata*) are simple models that can be put together without glue. While providing enjoyment, the models also provide links to the NAOCC and Go Orchids websites.

While NAOCC is still in the early stages of development, the path forward is exciting and we encourage you to get involved in the first-ever effort to conserve orchids at the scale of the



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USA and Canada. With your help and support, the successes that will result from NAOCC efforts have the potential to serve as a model for conserving native orchids around the world, including active involvement of the public.

—Dennis Whigham is a Senior Botanist at the Smithsonian Institution where he has studied the ecology of plants for almost 40 years. He is a member of the Orchid Specialist group of IUCN and his interests in native orchids and their plight lead to the establishment of the North American Orchid Conservation Center (email WhighamD@si.edu).

—Thomas Mirenda is the orchid collection specialist at the Smithsonian Institution and an AOS accredited judge. 3000 Cedar Lane, Fairfax, Virginia 22031 (email MirendaT@si.edu).

—Melissa McCormick is an Ecologist at the Smithsonian Environmental Research Center, Edgewater, MD. She uses a combination of field and DNA-based techniques to study orchid associations with mycorrhizal fungi and how they affect orchid distribution and rarity (email McCormickM@si.edu).

—Jay O’Neill is a senior technician at the Smithsonian Environmental Research Center, Edgewater, MD. His interests include the germination of native orchids and the fungi associated with them. He also moderates the NAOCC and Go Orchids web sites (email OneillJ@si.edu).



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- [4] The template for the downy rattlesnake plantain (*Goodyera pubescens*). These punch-out models (orchid-gami) are intended to be used in a variety of educational venues.
- [5] An assembled ghost orchid (*Dendrophylax lindenii*) orchid-gami model. The ghost orchid was chosen for one of the early models because of its fascinating structure.
- [6] A larger-than-life showy lady’s slipper (*Cypripedium reginae*) towers over Florida’s worm vine (*Vanilla barbellata*).