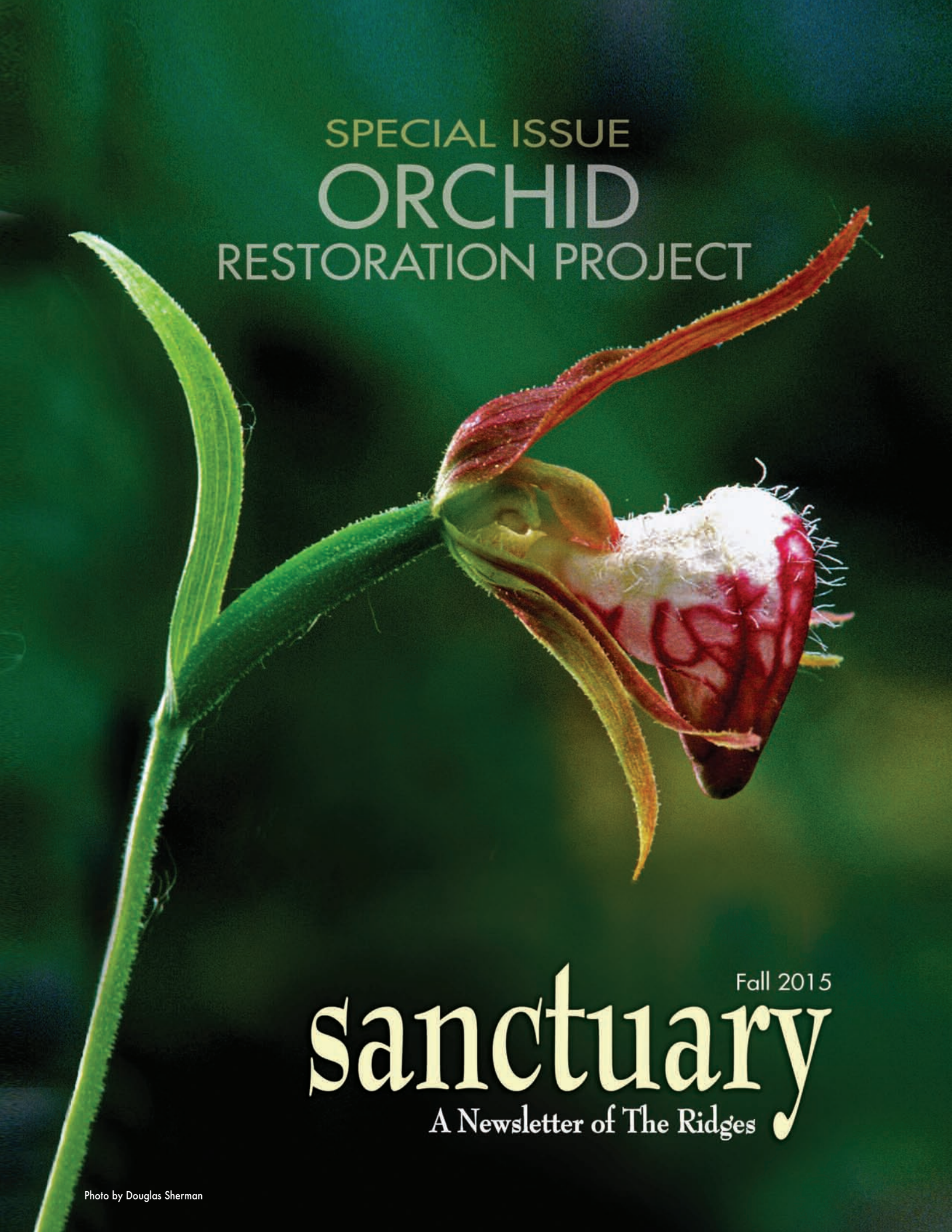


SPECIAL ISSUE

# ORCHID RESTORATION PROJECT

Fall 2015

# sanctuary

A Newsletter of The Ridges

Photo by Douglas Sherman

*"Are we going to let future generations inherit a Wisconsin denuded of its forests and swamps, or are we going to set aside here and there through the state, areas where bits of the state in its pristine beauty can be seen by them."*

– "Our Wisconsin Orchids and Their Preservation"- Albert Fuller, 1926

**When the Cook-Albert Fuller Center** opened its doors to the public on June 13, 2015, it represented the culmination of years of analysis, planning and fundraising and a critical step in securing the future of The Ridges. Since then, the increased visibility of the Center has attracted over 15,000 visitors to The Ridges and provided us with many opportunities to tell our story and communicate our mission of research, education and preservation.

These opportunities have not been limited to contact with the general public. If you've been following the progress of the Orchid Restoration Project along Hidden Brook trail, then you know that our efforts to protect and propagate several rare, native species of orchids began in 2013. Earlier this year, botanist Melissa Curran from Stantec, supervised our volunteers during the second phase of the project – the outplanting of 1,400 fragile ram's-head lady's-slipper orchid seedlings.

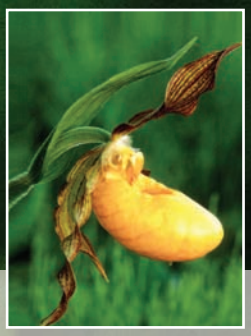
In addition to being closely watched by the research community, our orchid project captured the attention of the Smithsonian's North American Orchid Conservation Center. On September 30, 2015, representatives from the Smithsonian, Illinois College, Wabash College, University of Wisconsin – Green Bay, Minnesota Landscape Arboretum, Chicago Botanic Gardens, Kew Gardens, Stantec Engineering, and Ridges staff and volunteers met at the Fuller Center to discuss ways in which the group could collaborate on conservation initiatives to protect native orchids in the Midwest.

In this special edition of Sanctuary, we'll highlight the outcomes of that meeting, address future needs to protect the 26 orchid species on our site, outline possible collaborative efforts from all the Midwest participants, and explain how these collective efforts will be shared within the North American Orchid Conservation Center.

## Why Orchids?

Orchids are one of the largest families of flowers in the world, accounting for roughly 10% of all flowering plants. Worldwide there are 30,000 species of orchids occurring in almost every habitat and on every continent with the exception of Antarctica. Because their complex life history relies on specific conditions, including the presence of certain pollinators and fungi, orchids are among the first species to disappear when an ecosystem is dramatically altered or lost. This makes them a good indicator species – a botanical equivalent of the canary in the coal mine – providing valuable early warning for the declining health of an ecosystem and allowing conservation action to be taken before it's too late.

The immediate need to understand orchids and their complex natural life history arises from the increasing number of species designated as threatened or endangered. In North America alone, there are 210 species in 66 classes. 57% are listed as threatened or endangered at the state or federal level.



**Of the 49 orchids native to Wisconsin, 35 are found in Door County. The original plant survey in 1935 identified 26 orchid species within The Ridges Sanctuary - one of the highest concentrations of orchid species per acre in North America.**

- Pink moccasin
- Ram's-head
- Large yellow
- Small yellow
- Showy
- Small round-leaved
- Tall bog candle
- Hooker's
- Tall leafy – green
- Ragged-fringed
- Blunt-leaf
- Large round-leaved green
- Small purple fringed orchid
- Heart-leaved twayblade
- Arethusa
- Grass pink
- Nodding ladies tresses
- Hooded ladies tresses
- Dwarf rattlesnake plantain
- White adder's mouth
- Loesel's twayblade
- Spotted coralroot
- Striped coralroot
- Early summer coralroot
- Club-spur
- Calypso

Photo by Douglas Sherman

*"… scientific research will disclose methods whereby the seeds of our native orchids can be made to germinate readily."*

– Albert Fuller, 1935

**That day is here; that time is now.**

## Why The Ridges?

In 1935 botanist Albert Fuller, our founding father, realized that land acquisition alone would not be enough to save Wisconsin's orchids. In his book ***Orchids of Wisconsin***, he said, "Conservation of native plants is possible in two ways: by the establishment of permanent wildlife sanctuaries … and growing them in our gardens."

Since the founding of this organization, purchasing land adjacent to the original 40 acres has been a priority. And since those early days, flora and fauna surveys have been conducted to facilitate a better understanding of The Ridges' diversity and to help prioritize land acquisitions. Volunteers, and eventually staff when The Ridges hired Roy Lukes in 1968, also used this valuable survey information to inform visitors and members through guided hikes, bird programs and workshops. The surveys, like the diversity of orchids and blooming times, formed the basis for education programs and the constant promotion to visitors and members on the need to protect this special place.

Although the science behind propagation protocols was not known in 1935, Fuller predicted that "… scientific research will disclose methods whereby the seeds of our native orchids can be made to germinate readily. " That day is here; that time is now.

Steve Leonard, Executive Director
steve@ridgessanctuary.org

## North American Orchid Conservation Center (NAOCC)

North America contains more than 200 species of orchids, and greater than half are threatened somewhere in their native range. Yet despite their beauty, there has been no broad-based effort to engage the public to understand or preserve them. The NAOCC was established by the Smithsonian Institution and the United States Botanic Garden to meet this challenge. A coalition of public and private organizations across the continent, the NAOCC is committed to ensuring the survival of native orchids and conserving our orchid heritage throughout North America. Though their partners, they support a three-pronged approach of preservation, propagation and education. The Midwest regional network, consisting of the Smithsonian, Illinois College, Wabash College, Minnesota Landscape Arboretum, Chicago Botanic Gardens, UW-Green Bay, Stantec Engineering and The Ridges, will act as the model for other regional efforts throughout North America.

## NAOCC Members:

**Smithsonian Institution**
**United States Botanic Garden**

- **Alaska Botanical Garden**
- **Atlanta Botanical Garden**
- **Chicago Botanic Garden**
- **Center for Plant Conservation**
- **Desert Botanical Garden**
- **Duke Farms**
- **Illinois College**
- **Mt. Cuba Center, Inc.**
- **Native Orchid Conference, Inc.**
- **New England Wild Flower Society, Inc.**
- **The Nature Conservancy**
- **The Ridges Sanctuary**
- **University of Alberta**

**Participating Organizations**

- APHIS - USDA
- Kew Gardens
- Longwood Gardens
- Michigan State University
- Minnesota Landscape Arboretum
- NatureServe
- Old Dominion University
- Orchid Conservation Coalition
- Pollinator Partnership
- Seeds for Success
- UC, Berkley
- UC, Santa Cruz
- University of Florida
- US Forest Service
- Virginia Native Plant Society
- Wabash College
- Wintergreen Nature Foundation

Photo by Len Villano

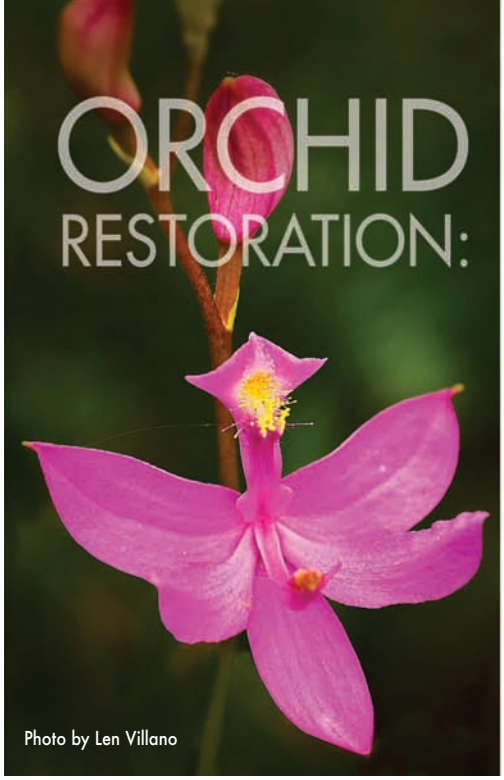


Photo by Len Villano

# PUTTING THE PIECES TOGETHER

The effective propagation and outplanting of orchid species has best been compared to assembling a jigsaw puzzle without the benefit of having the completed picture on the top of the box. There are numerous pieces to the puzzle and many unknowns with respect to understanding how the process will work. That said, on September 30, participants at the **Midwest Regional Orchid Meeting** took the first step toward developing a collaborative plan to protect orchids at The Ridges and throughout the Midwest.

## Atlanta Botanic Garden Orchid Conservation Model)

In August, Director Steve Leonard visited with Jennifer Cruse Sanders (VP, Science & Conservation) and Matt Richards (Conservation Coordinator) at the Atlanta Botanic Garden to learn about their success with native orchid conservation efforts in the Southwest. Realizing that no single organization has the resources or talents to do it all, the Atlanta Botanic Garden set up a collaborative effort among conservation horticulturalists, regulatory agencies and land managers. Conservation horticulturalists at Atlanta Botanic Garden developed propagation protocols and began raising orchids. Both state and federal regulatory agencies were involved for oversight and permits. Land managers handled the orchid outplantings, field research and management of the restoration site. This proved to be an effective model, and it is the one we will follow at The Ridges.

## The Ridges Orchid Conservation Model

The Ridges is just one of many land managers housing orchid species. However, two features make us unique: 1) the diversity of species represented within such a concentrated area; and, 2) the orchid restoration effort in progress along the new boardwalk trail.

At the meeting, efforts throughout the Midwest were discussed and analyzed for ways in which they could help with our orchid conservation efforts, ultimately allowing us to match the strengths of different organizations to the ten components – or puzzle pieces – required to best protect The Ridges orchids.

***The Midwest Regional Orchid Meeting***
**September 30, 2015**

**Attendees:**
*Smithsonian:* Dennis Whigham
*Illinois College:* Larry Zettler
*Wabash College:* Amanda Ingram (Skype)
*Chicago Botanic Gardens:* Pati Vitt
*University of Wisconsin Green Bay:* Matthew Dornbush, Vicki Medland, Lisa Grubisha, Amy Wolf
*University of Minnesota:* David Remucal
*Kew Gardens:* Phil Seaton (Skype);
*Southern Door High School:* Tony Kriszonas
*Stantec:* Melissa Curran
*The Ridges:* Steve Leonard, Brian Forest, Jane Whitney, Julie Knox, George Cobb, Debbie Rzentkowski

# TEN PIECES OF THE PUZZLE:

### 1. Orchid Survey

The Ridges needs to assess the status of the 26 orchids on site to determine location and populations. A habitat assessment will also be a part of the survey. GPS coordinates will be collected so locations and densities can be entered into an analytical software program to store data, create maps and determine change over time.

RIDGES ROLE: Stantec, Wabash College, Illinois College, Chicago Botanic Gardens, and UW- Green Bay have offered to assist Ridges staff and volunteers in developing protocols and to provide graduate students to assist with field assessment.

REGIONAL EFFORT: Partners will share information on regional orchid populations.

### 2. Seed Bank

Orchid seeds must be collected and stored to preserve the genetic integrity of the 26 species at The Ridges. Each seed pod contains thousands of seeds, so collecting one to two pods per species will provide seeds we can dry and freeze for future use. Seeds will be stored in three locations: on site at The Ridges, nationally at the Smithsonian in Washington DC, and internationally at Kew Gardens in England.

RIDGES ROLE: Stantec will work with Ridges staff and volunteers to facilitate seed collection and storage on site.

REGIONAL EFFORT: The other partners will implement processes to collect orchid seeds, store them at their own facilities and send them to the Smithsonian and Kew Gardens.

### 3. Relation to Mycorrhizal Fungi

Orchids cannot germinate or sustain themselves without the right fungal species in the soil. There is very little known on the relationship between orchid and fungal species, but the technology is finally available to isolate the fungi in orchids and soils. Identifying the fungi is essential for orchid conservation, restoration and propagation.

RIDGES ROLE: Small soil samples will be collected in strategic locations and then sent to the partners who will isolate the different fungal species. Small orchid seedlings will also be tested. Identifying the fungal species in the soil, as well as which fungus each orchid species requires, will give our orchid restoration project a better chance to succeed.

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REGIONAL EFFORT: Illinois College, UW - Green Bay and the Smithsonian have capabilities to isolate fungal species for us.

### 4. Pollinators

It is critical to understand how orchids interrelate with pollinators, soil and fungal relationships and so many other factors in their surrounding ecosystem in order to protect the entire system. To date, there is very limited information on orchid pollinators.

RIDGES ROLE: Great potential exists for graduate students to work with Ridges staff and volunteers to monitor pollinators.

REGIONAL EFFORT: The NAOCC network will identify research needs and seek out universities or other institutions to assist with monitoring. UW-Green Bay has staff who may be able to assist with the regional effort.

### 5. Propagation

For the past two years, Ridges staff and volunteers have been working under the supervision of botanist Melissa Curran (Stantec) to cross pollinate orchids on site and send seed pods to two labs - Bill Steele in Minnesota and Scott Weber in Wisconsin – where ram's-head, showy lady's-slipper, grass pink and yellow lady's-slipper orchids have been successfully germinated. The first outplanting of over 1,400 ram's-head orchids was completed in the spring of 2015. On average, 20% of the orchids survived per outplanting plot – a significant success when compared to the expectation of achieving a 10% survival rate.

RIDGES ROLE: The Ridges will collect and send out seed for propagating as needed.

REGIONAL EFFORT: There is a need to institutionalize the propagation process per species. Very little is known about this process, and it was clear that a collaborative effort involving Bill Steele, Scott Weber, Melissa Curran (Stantec), Minnesota Landscape Arboretum, Illinois College and Chicago Botanic Gardens should be initiated.

### 6. Greenhouses

Once seeds germinate, there must be sufficient greenhouse space for growing the orchids. The structure does not need to be elaborate, but must have enough space to grow orchids for several years until they are ready for outplanting.

RIDGES ROLE: Build tent style greenhouses on site to support orchids when they

*continued*

come back from the propagating labs.

REGIONAL EFFORT: Several greenhouses for housing and growing orchids have been identified.

### 7. Orchid Restoration Efforts

The Ridges' outplanting effort is one of the most ambitious efforts in North America. Because its unique landscape supports 26 orchid species, the Sanctuary provides an excellent opportunity to develop best management techniques for repopulating key species.

RIDGES ROLE: The Ridges will use the 16-acre "Living Laboratory" along the boardwalk for orchid outplantings. Monitoring protocols will measure success rates of outplantings, canopy cover, soil moisture and pH, mycorrhizal fungi, air quality and many other factors that will be used to develop and teach others best management practices for repopulating.

REGIONAL EFFORT: The partners have offered to assign graduate students to assist Ridges staff and volunteers with developing protocols and monitoring.

### 8. Ridges Management Plan

As we continue to assess and monitor habitats and their populations, land management plans for The Ridges' properties in Baileys Harbor and on Logan Creek must be developed. These plans will identify best management practices to address water quality issues at a watershed level, assess air quality impacts coming off Lake Michigan, control of invasive species, potential impacts from climate change, etc. The orchid research project is an important part of a comprehensive land management plan to sustain the diversity of The Ridges.

RIDGES ROLE: The Ridges and UW-Green Bay will formalize an agreement to pool resources to develop a management plan for both The Ridges and the adjacent Toft Point State Natural Area owned by the university. UW-Green Bay graduate students will help develop key components of the plan through their research. The Ridges will develop a more thorough citizen monitoring program to assist graduate studies and monitoring on site.

REGIONAL EFFORT: All partners agreed to work towards developing protocols for using orchids as indicators of an ecosystem's health.

*continued*

### 9. Education

The orchids at The Ridges have always been an excellent way to teach members and visitors about the importance of conservation in a fragile, sensitive environment.

RIDGES ROLE: Having orchid restoration plots along the Hidden Brook boardwalk gives us an opportunity to teach visitors about orchids as they observe them in their natural habitat.

REGIONAL EFFORT: The Smithsonian created the NAOCC website (northamericanorchidcenter.org) as a resource on orchid conservation and Go Orchids (goorchids.northamericanorchidcenter.org) as an online identification guide.

### 10. Student Involvement

Phil Seaton retired from Kew Gardens after co-authoring Growing Hardy Orchids. He has been successful at integrating an orchid propagation project in the neighboring King Charles I High School. Students raise orchids and then hold a plant sale to generate income for the program. Seaton has offered to work with The Ridges to implement a student exchange program to start the project here.

RIDGES ROLE: We will work with high school teachers and students to establish this program in local schools. Once implemented, we will coordinate with King Charles I High School as well as interested schools in the Midwest.

## How You Can Get Involved in 2016

- **DONATE TIME!**
  Volunteer in support of the orchid project. We'll need greenhouse workers and help with planting, monitoring and surveying our orchid plots.
- **DONATE HOUSING!**
  Host graduate students and/or visiting members of partner organizations.
- **DONATE MATERIAL!**
  Help to build a resource library.
- **DONATE FINANCIAL SUPPORT!**
  Help supplement grant funding and offset operating expenses related to this critical research program.

Photo by Douglas Sherman




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