Gardens to Celebrate Great Lakes Biodiversity

The Great Lakes Region has long been known for its floral diversity. Few regions in the country are blessed with as great a range of habitats—from majestic sand dunes, limestone bluffs and pavement found around the Great Lakes to prairies, oak openings (or oak savannas), and coniferous and deciduous forests. Among these various ecosystems are many endemic plants, i.e., those found here and no where else in the world.

These gardens will celebrate the distinctive beauty of the Great Lakes flora and to help visitors understand why conservation of this unique diversity is so important. With a series of accessible pathways, boardwalks and overlooks, visitors will be able to see plants up close that they might never have a chance to see in the wild. It is fitting that such a garden be created at the University of Michigan—with its great tradition of botanists knowledgeable of our region’s flora and home to the Michigan Flora Project at the U-M Herbarium.
Coastal Garden

The Great Lakes collectively make up the largest surface of freshwater lakes in the world. The shorelines of those lakes provide some of the most dramatic and treasured scenery to be found anywhere.

Our Great Lakes Gardens showcase key examples of the unique habitats and plants found around the Great Lakes. The “Coastal Garden” will include a representation of the dunes with their unique flora, a cobble beach area, and two forms of alvar—the unique limestone formations found in only a few other places around the world, namely Great Britain, Sweden, and Estonia.
Coastal Garden—

Alvar

The coastal alvar habitats found in several places around the Great Lakes region are covered by thin layers of soil or consist of bare limestone rock. These are some of the world’s most beautiful natural rock gardens found anywhere with unique plants such as the lakeside daisy (*Hymenoxys acaulis* [Pursh] K.F. Parker), ram’s head ladyslipper (*Cypripedium arietinum* R. Br.), and dwarf lake iris (*Iris lacustis* Nutt.)—Michigan’s state wildflower. Plants on these alvar habitats must be tough, tolerant of wet conditions in the spring followed by extreme heat and drought later in summer. Lichens and moss abound on the rocky surfaces, and often plants are confined to the fissures or “strikes” between slabs of limestone. Trees and shrubs are often stunted, pruned back by both wind and drought. Our garden will showcase some of the most distinctive plants in this zone.
Coastal Garden-
Grassland Alvar

At times, the alvar known as limestone pavement is covered with a thin layer of mineral soil and supports a calcareous grassland. These places are home to a number of rare plants and animals more commonly found in prairie grasslands.

One of the best examples of this habitat is found on Drummond Island, Michigan and is known as the Maxton Plains. Here on the 400 million-year-old bedrock grow grasses such as prairie dropseed (*Sporobolis heterolepis* A. Gray) together with broad-leaved forbs such as prairie smoke (*Geum triflorum* Pursh.), early buttercup (*Ranunculus fascicularis* Muhl. ex Bigelow) and early saxifrage (*Saxifraga virginiensis* Michx.). A portion of our Coastal Garden will simulate this unique grassland alvar habitat.
Coastal Garden-
Cobble Beach

In many places around the Great Lakes, the wave-action together with freezing and thawing of limestone bedrock have created beaches of varying thicknesses of limestone cobble. These are often on the scenic headlands where lighthouses still stand as sentinals.

Common vegetation on these beaches can include harebell (*Campanula rotundifolia* L.), sedges (*Carex eburnea* Boott. and others), Indian paintbrush (*Castilleja coccinea* L.) Spreng.), fringed gentian (*Gentianopsis procera* [Holm] Ma), and silverweed (*Potentilla anserina* L.). Noteworthy woody plants include paper birch (*Betula papyrifera* Marshall), balsam poplar (*Populus balsamifera* L.) and northern white cedar (*Thuja occidentalis* L.).
Coastal Garden-Dune

The broad sand and gravel beaches and the majestic dunes (Grand Sable, Indiana, Saugatuck, Sleeping Bear, Warren, Whitefish and others) are what many people associate with vacations along the Great Lakes.

These popular places host unique flora that will be featured in our Great Lakes Garden, including the endemic Pitcher’s thistle (*Cirsium pitcheri* [Torr. ex Eaton] Torr. & A. Gray) and Lake Huron tansy (*Tanacetum huronense* Nutt.). Other characteristic plants include marram grass (*Ammophila brevigulata* Fernald), wild wormwood (*Artemesia campestris* L.), sand reed grass (*Calimovilfa longifolia* (Hook.) Hack. ex Scribn. & Southw.), sand cherry (*Prunus pumila* L.), starry false Solomon’s seal (*Smilacina stellata* (L.) Desf.), and various willows (*Salix* spp.) and grasses.
Prairie Garden

Prairies are among the most threatened of Michigan’s native plant communities, particularly because many of the soils where prairies were historically found were easily converted to farming and other uses. Native prairies in the Great Lakes Region range from wet to mesic (moist) to dry soil conditions. In addition, the lakeplain areas of Michigan have a distinctive prairie flora all their own as do the sand prairies region. Today, many prairie species have become highly valued in butterfly or pollinator gardens, rain gardens or as alternatives to the traditional lawn.

The Prairie Garden will provide a sampling of the distinctive grasses and forbs (wildflowers) found in the Great Lakes Region.
Oak Openings Garden

Oak openings (or oak savannas) once characterized much of southern Michigan, even inspiring the book *The Oak Openings*, written by James Fenimore Cooper in 1852. They were preferred locations for homesteads, cemeteries, towns, and college campuses, and many sites were converted to these uses. Today, these natural systems are among the rarest in the state.

Dominated by towering oaks (white, bur, chinkapin, black, and northern red) and occasional hickories, this system had an understory kept open by frequent fires. A few shrubs such as hazelnut (*Corylus americana* Walter) and New Jersey tea (*Ceanothus americanus* L.) were commonly found with the rich array of native grasses, sedges and wildflowers. Our oak openings garden will acquaint visitors with this lost feature of the Michigan landscape.
Woodland Garden (dry)

The Great Lakes Region has long been known for the timber resources of its diverse and grand forests. Over time, appreciation also grew of the rich wildflower diversity found in the region.

Our Woodland Wildflower Garden will have two basic sections—a larger section featuring dry to mesic (or moist) habitats and a smaller section on the floodplain of Fleming Creek featuring the flora of our wet woodlands. In the drier portion of the Woodland Wildflower Garden, we will feature many of the favorite wildflowers pictured here: trillium (*T. grandiflorum* (Michx.) Salisb. and *T. flexipes* Raf.), dogtooth violet (*Erythronium americanum* Ker Gawl.), twinflower (*Jeffersonia diphylla* (L.) Pers.) and wild ginger (*Asarum canadense* L.), ferns, bloodroot (*Sanguinaria canadensis* L.), and some of the showier understory trees such as witchhazel (*Hamamelis virginiana* L.).
Woodland Garden (wet)

The wet portion of our Woodland Wildflower Garden will feature the rich diversity of our floodplain forests and other wet forested habitats. An accessible boardwalk trail will allow visitors to experience the beauty of these woods up close.

Featured here are plants such as skunk cabbage (*Symlocarpus foetidus* (L.) W. Salisb.), golden ragwort (*Packera aurea* (L.) Á. Löve & D. Löve), blue flag (*Iris virginica* var. *shrevei* (Small) E.S. Anderson), marsh marigold (*Caltha palustris* L.), cardinal flower (*Lobelia cardinalis* L.), horsetail or scouring rush (*Equisetum fluviatile* L.), many sedges such as the fals hop sedge (*Carex lupiliformis* Sartwell ex Dewey), and many ferns such as ostrich fern (*Matteuccia struthiopteris* (L.) Tod.).
Orchid Garden

Orchids are among the world’s most fascinating plants, and the Great Lakes Region surpasses all other parts of temperate North America in the number of native orchids, with the exception of Florida. Our geography, lake-influenced climate, and glacial history all contribute to the diversity of orchids found within our region.

This garden will be constructed on an east facing slope, kept moist by a seepage of groundwater. We will showcase many of the distinctive orchids of the region as well as associated plants found in this moist habitat—native lilies, ferns, mosses, and sedges. A short boardwalk near the base of the slope will give visitors dramatic views of the display of orchids and related plants.
Warren H. Wagner
Fern Collection

Like orchids, ferns are another of the most fascinating and beloved of plants. In Michigan, no name is more closely associated with botany, field research and conservation than Warren H. (Herb) Wagner. With his wife Florence, he documented the systematics, hybridization and evolutionary history of ferns and fern-like plants. The Warren H. Wagner Fern Collection will include diminutive individuals from Wagner’s particular specialty--the *Botrychiaceae*--in addition to a wide variety of ferns from across the Great Lakes Region associated with the various habitats found in the Great Lakes Gardens.

Herb’s sense of curiosity about plants and the natural world inspired countless students at the University of Michigan. Herb served as the second Director of Matthaei Botanical Gardens from 1966-1971 where he gave shape to the combination of research, teaching and public outreach that mark today’s Matthaei Botanical Gardens and Nichols Arboretum.
How can you help?

If you want future generations to experience the unique living heritage of the Great Lakes region and would like to support the development of this garden, please contact:

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Pictured at right: Great Lakes Ecosystem mosaics created by Yulia Hanansen and volunteers at MosaicSphere Studios in Ann Arbor. These mosaic panels are featured at the west entrance to our classroom building at Matthaei Botanical Gardens.