



The Red Banks Alvar
State Natural Area in
Brown County.

Sparse and special

RED BANKS ALVAR STATE NATURAL AREA HOSTS RARE SPECIES.

Story by Joe Henry, photos by Thomas A. Meyer

Over the past 18 years, vacations for my family have been spent at our property on the Garden Peninsula in Michigan's Upper Peninsula. Spending time outdoors exploring nature is one of my favorite things to do while on vacation.

One of my most memorable adventures was hiking to Point Detour, the tip of the peninsula. During this hike, one of the things that caught my attention was the amount of exposed bedrock that was evident along the coast. Long sections of the shoreline were strewn with large chunks of limestone boulders often paralleled by short cliffs ornate with dwarf lake iris. As I approached the tip, the boulders gave way to a flattened landscape where the bedrock turned into an expansive pavement transitioning into Lake Michigan.

Seeing all of this rock intrigued me and as I learned more about it I realized what I saw that day were distinct geologic features linked together by the bedrock. The limestone bedrock forms the basis of a wide array of related natural communities that hug the coastlines of the upper Great Lakes. Examples of these natural communities include Great Lakes alkaline rockshores, cobble beaches and alvars.

The term "alvar" was first used in North America by Scandinavian immigrants who settled in Ontario and were familiar with this habitat from their homelands. Alvars are grass and sedge-dominated plant communities occurring on broad, often exposed, expanses of limestone bedrock.

Some alvar communities are covered by thin sheets of discontinuous mineral soil often 10 inches thick or less. Many alvar communities are characterized by less than 60 percent tree cover.

Biologists have recognized several distinct alvar plant communities: open alvar pavements that are sparsely vegetated, alvar grasslands that are closely associated with short-grass prairies, alvar shrublands that resemble brushy prairies, and alvar woodlands and savannas that somewhat resemble oak savannas of the Midwest.

Geographically, alvars are rare, isolated and known to exist in only five areas of the world: the Baltic region of Europe, County Clare in Ireland, the Northwest Territories and Newfoundland of Canada, and the Great Lakes region of North America.

Great Lakes alvars are associated with the Niagara Escarpment, a prominent dolomite ridge that runs from Wisconsin through northern Lake Michigan and across northern Lake Huron through eastern Ontario to Niagara Falls, New York. Great Lakes alvars are unique from other alvars because of the distinctive plant and animal communities associated with the region. Since these species are found nowhere else in the world they are known as Great Lakes endemics. Occurrences of Great Lakes alvars are found in the province of Ontario, and the states of Ohio, Michigan, New York and Wisconsin.

The geographic context and geologic history of western Great Lakes alvars have shaped the unique flora and fauna that call these alvars home.

Approximately 100,000 years ago during the Wisconsin glaciation, scouring by the glaciers created the alvar pavements by scraping off topsoil leaving room for plants to grow only in the fractured bedrock; this same scouring also resulted in shallow depressions in the pavement that today form into ephemeral wetlands.

Alvars are known for their moisture extremes. Alvars can be seasonally flooded in the spring and fall as the shallow soils and exposed bedrock hold the melting snow and rains. These periods of wetness are contrasted by extreme drought during July and August where surface temperatures can reach up to 120 degrees. During these droughty months the wetlands dry up, and the vegetation must survive without water.

Despite the extreme environmental conditions, nearly 50 rare or declining

species have been documented on alvars in the Great Lakes region. Species like the federally threatened dwarf lake iris occur in Ontario, Michigan and Wisconsin. Another federally threatened species, lakeside daisy (named after Lakeside, Ohio), is found in Michigan, Ohio and Ontario. Rare species like loggerhead shrike and the eastern massasauga rattlesnake are strongly associated with alvars in Michigan.

Managing alvars can range from minimal visits to inspect sites for trash or newly established populations of invasive species, to intensive management for invasive species and to control shrub and tree encroachment.

Common invasive species found on alvars include woody species like autumn olive, European honeysuckles, exotic buckthorns, and herbaceous species like sweet clover, spotted knapweed, Canada thistle, and, in some cases, Phragmites, or common reed.

Some alvars need active management. Plant communities with well-developed ground and shrub cover lacking a closed, mature tree canopy, are created or maintained by intense or recurring disturbances.

To maintain alvars, land managers often use an integrated approach applying a variety of management tools ranging from timber harvests, mowing, herbicide application, and limited use of grazing under the right conditions. To a lesser extent, prescribed fire is also used on alvar grasslands, alvar shrublands and alvar woodlands and savannas where natural fires or fires set by Native Americans would have occurred more frequently. While many alvar communities need active management, communities like alvar pavements don't require any management and remain static on their own.

The fate of alvars is much like that of the tallgrass prairie with the majority of the original habitat having been destroyed. Historically, alvars covered a maximum of 600 square miles in the Great Lakes region with over three-quarters of the habitat occurring in Ontario.

Unfortunately, 93 percent of alvar habitat has been lost due to housing developments, rock quarrying, changes in hydrology resulting from quarrying, overgrazing and off road vehicle use. Presently, about 43 square miles of alvar habitat remain with the largest tracts in Ontario and smaller to medium sized remnants in Michigan.

If you want to visit Wisconsin's only



Cherrystone drop, a tiny terrestrial snail, is a state threatened species found in this area.

site, it is located at Red Banks Alvar State Natural Area, near Dyckesville in northeastern Brown County. Red Banks Alvar, acquired in 2001, protects 192 acres of habitat and is co-owned by the Department of Natural Resources and the Northeast Wisconsin Land Trust. Most of Red Banks is part of a larger oak woodland, a plant community more typically found in the southern part of the state.

This northerly occurrence of an oak woodland in Brown County is largely from the influence of the Potawatomi and Ho-Chunk who had numerous campsites, gardens and villages in Brown County. One Ho-Chunk village near Red Banks was estimated to have between 500 to 750 acres of cleared fields that were still visible in 1905. In conjunction with farming, Native Americans burned the land to aid in land clearing and increased food production. These agricultural practices helped to establish and perpetuate the prairie and savanna flora that are still found on this unique area today.

While the centerpiece of Red Banks is the alvar, it is flanked on its western border by a forested escarpment comprised of trees associated with southern mesic forests like basswood, white ash, and hackberry and shrubs like elderberry, ninebark and eastern wahoo. The Red Banks occurrences of hackberry and wahoo are the northeasternmost records for these species in Wisconsin.

These plants are able to survive here because the escarpment functions like a natural refrigerator keeping the environment cooler and moister than the surrounding landscape. Temperatures can vary as much as 10 to 15 degrees below the escarpment where cool air and water vent from the caves, and fractures in the rock face.

In 2008, the Botanical Club of Wisconsin spent several days at Red Banks Alvar identifying as many plant species as possible. When their field work was



Dwarf lake iris is also found to grow here.

completed, the club documented 208 species of herbaceous plants, shrubs, and trees, and 68 species of mosses and lichens.

Plant data was collected separately for both the escarpment woods and the alvar savanna and prairie. Species like bur and white oak, shagbark hickory, little and big bluestem, culver's root and shooting star were prominent on the alvar but were not found in the escarpment woods. Similarly, hackberry, basswood, mountain maple, bloodroot and wild ginger were prominent in the escarpment woods but did not occur in the alvar.

The dichotomy of these plant occurrences underscores the distinct nature of the plant communities and the influence the bedrock geology has on the growing environment. The compiled botanical report can be found at the Botanical Club website: <https://sites.google.com/site/botanicalclubofwisconsin/home>.

Land snail and butterfly surveys were conducted at Red Banks in the late 1990s. Surveyors found nearly two dozen glacial relict land snails that are associated with the Niagara escarpment including the state threatened Cherrystone drop and state endangered Midwest Pleistocene vertigo. Over 20 species of butterflies were documented on or near Red Banks; one of the most interesting finds was the mottled dusky wing, now listed as a state species of special concern.

The past surveys help establish a baseline of species living at the SNA. Surveys that are done in the future can provide information about any changes in what species are there now, and that can help guide us in adjusting management activities at Red Banks Alvar.

If you, like me, find unique features of Wisconsin's natural history interesting, Red Banks Alvar may be the place for you.



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