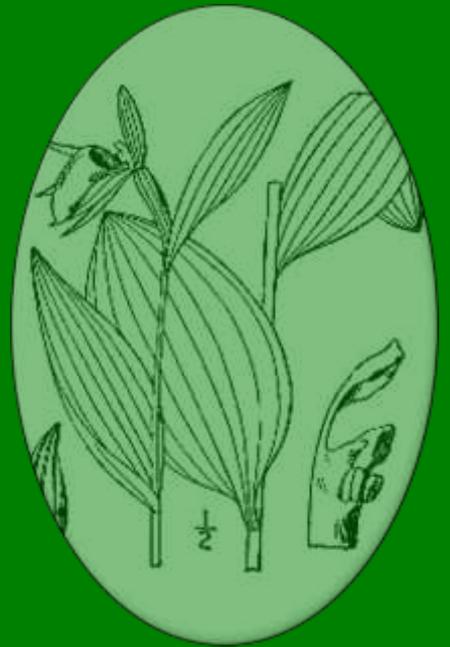


THE WILD ORCHIDS THAT SHOULDN'T BE THERE BUT ARE ANYWAY



Ram's Head Lady's Slipper

Once in a while, nature finds a way to tease us about how little we understand our world. And a delicate red and white flower is doing that right now, near Arnprior, Ontario, Canada

The Ram's Head Lady's Slipper is a wild orchid; it grows almost nowhere: a few isolated pockets in Ontario around Manitoulin Island and the Bruce Peninsula, and in some Northeastern U.S. states. Even fewer on the Prairies. Nova Scotia. A few in China.

The Ram's Head is ultra-choosy about its habitat. It will only grow in alvars, a rare landscape found mostly near the Great Lakes and in northern Europe where very thin soil covers limestone bedrock. Many isolated pockets have a few dozen plants; 150 would be a large population.

The exception? Outside the village of Braeside, west of Arnprior, where there are at least 150,000 by one professional estimate, and maybe half a million. It is the only such group of these flowers known anywhere.

As if that weren't enough, the same patch of thin, alkaline soil and cedar forest is also home to an estimated 160,000 of another rare species, with the apologetic name of neglected milk-vetch (*Astragalus neglectus*.)



Something beside this quarry is ecologically special, but no one knows what. It's an alvar forest, but some mysterious factor sets this alvar apart from all the others, and makes one patch of land the best in the world for the obscure task of growing Ram's Head Lady's Slipper orchids.

But how?

"You're looking at more Ram's Heads right now than most botanists would see in a lifetime," field ecologist Dan Brunton says, pointing at the ground in one clearing a dozen metres wide.

Orchids draw plant lovers, and rare orchids are a special prize, just as a rare bird will bring enthusiasts from miles around.

For at least 15 years, people have been sneaking onto the Braeside Quarry property to see a single patch of Ram's Head Lady's Slipper known to exist near the front of the property. (It's strictly off-limits: The quarry does blasting, and there are steep cliffs.) But the real story was a few hundred metres back in the bush all the time, unrecognized.

The Miller Group, which owns the property, applied several years ago to expand the area from which it takes aggregate. It needed an environmental assessment and hired Brunton, who found there were more of the orchids than anyone had realized. Early on he estimated there were 8,000, already a ridiculously huge number for this little plant.

As the approval process moved along, they got to the stage where they had to do regular monitoring of environmental conditions, including the state of the orchids. That demanded a more careful count.

Brunton started doing "transects" — measuring long, straight sections of the site, counting orchids one section at a time, and extrapolating from there.

He was stunned by the total: 150,000 of the little plants, more than anywhere in the world. One transect indicated the number could even reach 190,000.

It went against everything biologists know. A classic reference book, *Native Orchids of the United States and Canada, Excluding Florida* [Carlyle A. Luer, 1975] says: "The nearly legendary Ram's Head Lady's Slipper remains a rare orchid, seen but by a few students of nature."



There are at least 150,000 Ram's Heads growing at the quarry.

That wasn't all. The neglected milk-vetch likes the same alvar conditions, and it was also present in vast numbers — more than 160,000. It's not quite as rare as the ram's head, but like the little orchid it normally grows in small numbers. Again it was an unprecedented find.

"When milk-vetch plants are mature (late summer) the tiny, hard seeds rattle around inside the papery seed pods when they are disturbed by the wind or a passing botanist," Brunton says. "The plants are so numerous, in fact, that it sounds like you're disturbing a nest of rattlesnakes when you brush against the plants while crossing some glades."

In each case, he now estimates that the full total in the Braeside area could reach 500,000. On the quarry itself, they are mainly contained within a defined area where the landscape suits them. But along a ridge of high land running west of the village of Braeside, bits of alvar keep “popping up” on the surface.

“So, what’s my explanation? I haven’t got one,” he said.

He has some guesses, however. For example, it could be that the Braeside site has been disturbed less than other alvars.

“A lot of them were grazed by cows,” he notes. “Some guy would arrive from Ireland to farm and he’d say, ‘Look, there’s a clearing. Let’s put the cattle in there.’”

It’s also possible that the conditions at Braeside are a little wetter than on other alvars, such as the well-known Burnt Lands Provincial Park, near Almonte. Braeside is full of tiny pockets that look like wetlands only a metre or two wide, places where the limestone surface has a slight dip lie a shallow bowl, and is able to retain water.

Brunton adds in a written summary of his work: “Why here? Obviously the harsh, seasonally dry then seasonally soaked, limestone based habitat is perfect for these plants. They also are in a secure and naturally self-sustaining landscape.

“Still, why these two are that abundant at Braeside and not in seemingly comparable alvar forests like those in the Burnt Lands remains a mystery. Solving that would make a nice graduate thesis for some up and coming biologist one day!”

In late May, Brunton led a tour into the forest in time to catch these little orchids in bloom.

“I’m stepping from a landscape that is 11 years old into one that is 9,000 years old,” he says, leaving the dirt lane and entering the still, shady, cedar-spruce-fir forest with sunny open glades. It has never been cleared.

In these open spaces, a newcomer has to have the orchids pointed out. The flowers are a dull red and not very large — pretty, but

not flashy. And the majority of plants don’t have flowers, at least not this year. It’s possible they’re waiting until next year, or they may wait for several years. These plants are very poorly known because they are so rare.

But as you walk and peer carefully down, you get to recognize their shape easily until you see two, then five, then 20 or more in a small patch of ground. There’s a sprinkling of the (far better known) yellow ladyslipper as well (*Cypripedium parviflorum*.)

Of the more than 25,000 species of orchid around the world, the Ladyslippers are a small group that share one feature: The lower part of the flower is a long, rounded shape and someone once thought this looked like a slipper.



“This is a sodden desert. Half the time it’s soaking wet, like now, and half the time it’s completely dry,” Brunton says.

“There are only a few inches of soil. Under that it’s limestone bedrock. And it’s flat, so the water doesn’t drain.”

That creates conditions like a wet sponge in spring. But when this water evaporates away in summer, the ground underneath the surface has no reserves of water and the whole place just dries out. It is prone to fire every few decades, which clears out the trees and lets small plants pop up in glades.

After this wet spring, the land looks green, though this is illusory. There is no fertile garden here — just the opposite. The soil is poor in nutrients.

Much of the greenery under foot is scrubby evergreen species (such as bearberry) only a few centimetres high, mixed with lichen. It doesn’t grow much; rather, it just sits there. Staying green all the time is a better way to conserve the plant’s resources in a harsh environment than growing green leaves, discarding them and growing new leaves.

Even the species that look ordinary can fool you. The forest is full of cedars, with some poplar and other species, but they are very slow-growing, benefiting from some moisture at times but just sitting still and surviving when the ground dries.

Alvar plants are usually species that could lose a competition head-to-head with ordinary plants in rich, well-watered soil. But they survive through their hardiness and tolerance for extremes of hot, cold, water and dry times, punctuated by fire that sweeps away the trees.

Brunton tried transplanting some Ram's Heads from the area being developed to his Ottawa garden. They all died.

It's a strange twist that the discovery of Braeside's trove of rare flowers began when someone proposed to develop the site where they grow. They could have been destroyed. But this is no ordinary story of machines-versus-nature.

The site is an established quarry, and Ontario is always hungry for road-building materials. Its owners could legally have done the minimum, preserving some small sections as required by law, quarrying the rest.

Luckily the Miller Group offered from the start to preserve far more of the alvar habitat than the law requires. It offered to preserve half the site — more than 26 hectares — and this protection is legally binding.

As a result, this will remain in its odd but natural state, a first of small to medium evergreens and underbrush adapted to survival in stony, nutrient-poor ground. It feels like a forest, not a token stand of trees.

Ecologist Dan Brunton says the company “considerably exceeded the requirements of the provincial development approval process and represents a superior example of natural environmental protection by heavy industry.”

There's more news on the Ram's Head Lady's Slipper orchid beat: Many of the rare little orchids in West Quebec are producing two flowers apiece, rather than the single flower seen everywhere else.

The University of Ottawa is studying the little red and white flowers. It will compare them with other members of the species to try to learn whether the difference is caused by stress, a genetic mutation, a viral or bacterial infection, or generations of isolation from other members of the species.

**TOM SPEARS
OTTAWA CITIZEN**

The use of the word "alvar" to refer to this type of environment originated in Scandinavia. The largest alvar in Europe is located on the Swedish island of Öland. Here the thin soil mantle is only 0.5 to 2.0 centimeters thick in most places and in many extents consists of exposed limestone slabs. The landscape there has been designated a UNESCO World Heritage Site.

There are other more local names for similar landforms, such as a pavement barren although this term is also used for similar landforms based on sandstone. In the United Kingdom the exposed landform is called a limestone pavement and thinly covered limestone is known as calcareous grassland.

In Ireland, the most well-known is The Burren, a large alvar in northwest County Clare. While the Burren does have 25 of Ireland's 30 wild orchids, alas, there are no *Cypripedium*.



Dual flowering Ram's Head Lady's Slipper