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LEEDY'S ROSEROOT

A
CLIFFSIDE GLACIAL
RELICT



Photo: *Sedum integrifolium*, May, 1985, by W. R. Smith

What is Leedy's roseroot and where does it occur?

Leedy's roseroot (*Sedum integrifolium* ssp. *leedyi*) is a federally threatened cliffside wildflower, found today in only six locations in two widely separated states. Four populations of several thousand plants each are found in Fillmore and Olmsted Counties, Minnesota. The other two are in upstate New York, a large population on the shores of Seneca Lake and a single plant at Watkins Glen.

Species whose populations are so widely separated from each other geographically are known as "disjunct" species. In the case of Leedy's roseroot, not only are the two centers of population geographically distant from each other, but the subspecies is disjunct from the main species, which occurs in the western mountains. This pattern of distribution suggests that Leedy's roseroot is a glacial relict – a plant that was more widespread at the end of the last glaciation but which has since become isolated because of the loss of appropriate habitat in intervening areas as the climate has warmed.

Why be concerned about Leedy's roseroot?

For many people the beauty of a plant growing in its natural habitat and the moral issue of whether people have the right to destroy any species are sufficient reasons for concern about rare species.

Like all native species, Leedy's roseroot has a specific niche in the ecosystem and a unique relationship to other plants and animals with which it lives. In the case of Leedy's roseroot, these

relationships to other organisms remain unknown because they have never been investigated.

In addition to each species' inherent value as a member of the ecosystem it also has a unique genetic and chemical composition. This genetic information has unknown potential value for human use. For example, two little-known plants have recently made news because of their medicinal value. Rosy perwinkle, a Madagascar wildflower, contains compounds that are the best-known treatment for childhood leukemia. The Pacific yew, an understory tree of ancient forests in the Pacific Northwest, was recently discovered to contain the chemical taxol, which is the best hope for treatment of ovarian cancer. Had either of these species become extinct, these treatments would never have been discovered. Although Leedy's roseroot is not known today to possess properties useful to humans, loss of the species would eliminate forever the opportunity for future research that could discover potential uses.

What does Leedy's roseroot look like?

Leedy's roseroot is a perennial member of the stonecrop (orpine) family. Plants in this family, which includes the common jade plant, have waxy leaves that enable them to tolerate periods of water stress. A large number of *Sedum* species are cultivated plants of Eurasian origin, often used in rock gardens. Many of these species have escaped into the wild, some of them becoming more common than native species.

Unlike the more widely known ornamental species, Leedy's roseroot has a more elongate, leafy stem. The closely-packed leaves arise directly from the main stem and are smooth, with irregularly toothed to toothless edges. Although they are succulent, they can appear quite limp in dry weather. Male and female flowers are borne on separate plants. The small 4- to 5-petaled flowers are arranged in dense heads at the end of the leafy stem. They vary in color from dark red to occasional yellow or oranges.

The two other species of *Sedum* seen in Minnesota are both escaped from cultivation. Both have perfect flowers (with both stamens and pistils). *Sedum acre*, or wall-pepper, has much smaller leaves and yellow flowers. *Sedum purpureum*, or live-forever, has more widely-spaced, coarsely toothed bluish-gray to purple leaves and a much more open head of purple flowers.

Along with these two escaped species, a third non-native, *Sedum sarmentosum*, is commonly seen in the wild in New York. It has perfect yellow flowers with the leaves mostly in whorls of three.

Of the four native New York species, only *Sedum ternatum* (Mountain stonecrop) is common. It has perfect white flowers and although the green leaves are in whorls of three at the base of the stem they become more crowded near the tops of flowering plants.

Two additional native species are on the New York rare species list. *Sedum rosea* and *Sedum telephoides*. *Sedum rosea*, or Roseroot, is a dioecious species similar to Leedy's roseroot. In the past the two have at times been treated as varieties of the same species but are now known to differ genetically. Petals of *Sedum rosea* have a tendency to be smaller and more yellow than

those of Leedy's roseroot. The flowers of *Sedum telephoides* are pale pink to peach color.

In what sort of places does Leedy's roseroot grow?

In both New York and Minnesota, Leedy's roseroot grows on cool cliffs. New York populations occur on cliffs along the west shore of Seneca Lake.

Minnesota populations occur on a special habitat called a "maderate" cliff, characterized by the presence of cracks in the rocks, extending from the cliff face to cold underground caves. Roseroot seems to prefer areas where cool air from the caves comes to the cliff surface through these cracks. Often the caves connect above ground and uphill with sinkholes.

In both New York and Minnesota these cliffs support a variety of other rare species, including Whitlow grass (*Draba arabisans*), a wild member of the mustard family. In Minnesota the cliffs also harbor two newly discovered rare snails of the genus *Navisuccinea*, believed to be dependent on the cool local habitat.

The majority of Leedy's roseroot populations occur on privately-owned land. Only two of the six populations occur on public land, one in Watkins Glen State Park, New York, and one in Whitewater Wildlife Management Area, Minnesota.

It is possible to view the plants through binoculars from the public waters of Seneca Lake or the base of the cliff at Whitewater Wildlife Management Area. Wildflower enthusiasts should always remember to respect private property rights in their search for new plants to photograph and enjoy.

What activities threaten Leedy's roseroot?

Leedy's roseroot is a species whose rarity is caused more by its history, the special conditions of its unique cliffside habitat, and the infrequency of that habitat in the landscape than by direct habitat destruction.

Despite the fact that Leedy's roseroot has probably been rare for thousands of years, increased human activities could degrade its habitat. Unlike species with a wider range of preferred living conditions, it has nowhere else to go if its cliffside habitat is destroyed.

Although the steepness of the cliffs protect Leedy's roseroot from most direct impacts, surface runoffs from disturbed lands can dislodge plants or bury them during heavy rains and spring thaws. This impact is enhanced in areas where soil disturbance occurs at the top of the cliffs.

New York populations occur downhill from a number of lakeside homes. Tree cutting uphill of the plants, staircases and pipes to the lakeshore, and clearance of vegetation on the cliffs could have a negative impact on the plants.

In Minnesota ground water contamination or changes to ground water hydrology are the greatest

threats to Leedy's roseroot. Such changes could occur through misapplication of pesticides or synthetic fertilizers to nearby uplands or by use of sink holes as dump sites. Groundwater flow regimes are poorly understood and it is unclear how close these activities would need to be to adversely affect the plants. At one Minnesota site erosion of a nearby trail has created a gully several feet deep.

What laws protect Leedy's roseroot?

Leedy's roseroot was listed as federally threatened in 1992. It is protected by the 1988 reauthorization of the 1973 Endangered Species Act (PL 100-478). Under the provisions of this act it is against federal statutes to remove or destroy listed plants by any federal action or on any area under federal jurisdiction, or to knowingly violate any state law protecting the species. Violation of this statute carries civil and criminal penalties of up to \$50,000.

Leedy's roseroot is listed as endangered in both New York and Minnesota. New York law prohibits removal or destruction of the plant without permission of the landowner. Minnesota law prohibits the taking, transport, or sale of any endangered or threatened plant or animal or parts thereof.

Although activities of private landowners on their own property are not restricted by either the state or federal endangered species laws, U.S. EPA regulations may apply to the use of certain pesticides within areas where federally endangered or threatened plants occur. At the time of this publication, the EPA's federal pesticide protection program for endangered species was still under development. The Minnesota Department of Agriculture (MDA) has developed a state program by which individual landowners and a MDA representative develop a mutually acceptable pesticide management plan. At the time of this publication New York did not have a similar program.

How is location information used?

Up-to-date information on the location of Leedy's roseroot is maintained in the databases of the New York and Minnesota Natural Heritage Programs. Biologists use this information to help relocate populations for monitoring. Information from the Heritage databases is also available to consulting firms and agencies preparing environmental assessments of proposed projects and to planners seeking to develop sites in environmentally sensitive areas.

The U.S. Fish and Wildlife Service uses these locations to determine which federal projects might have a negative impact on endangered and threatened species. The EPA and the Minnesota Department of Agriculture use these data to determine areas where pesticide use restrictions may be necessary for the protection of the species.

Private and public conservation organizations use these data to plan conservation activities. Within parks and wildlife management areas, this information helps ensure that facilities, such as overlooks and trails, are appropriately located to avoid potential damage to the plants.

WHOM DO I CONTACT FOR MORE INFORMATION?

IN MINNESOTA CONTACT:

U.S. Fish and Wildlife Service
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Minnesota Department of Agriculture
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Cortland, New York 13045

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