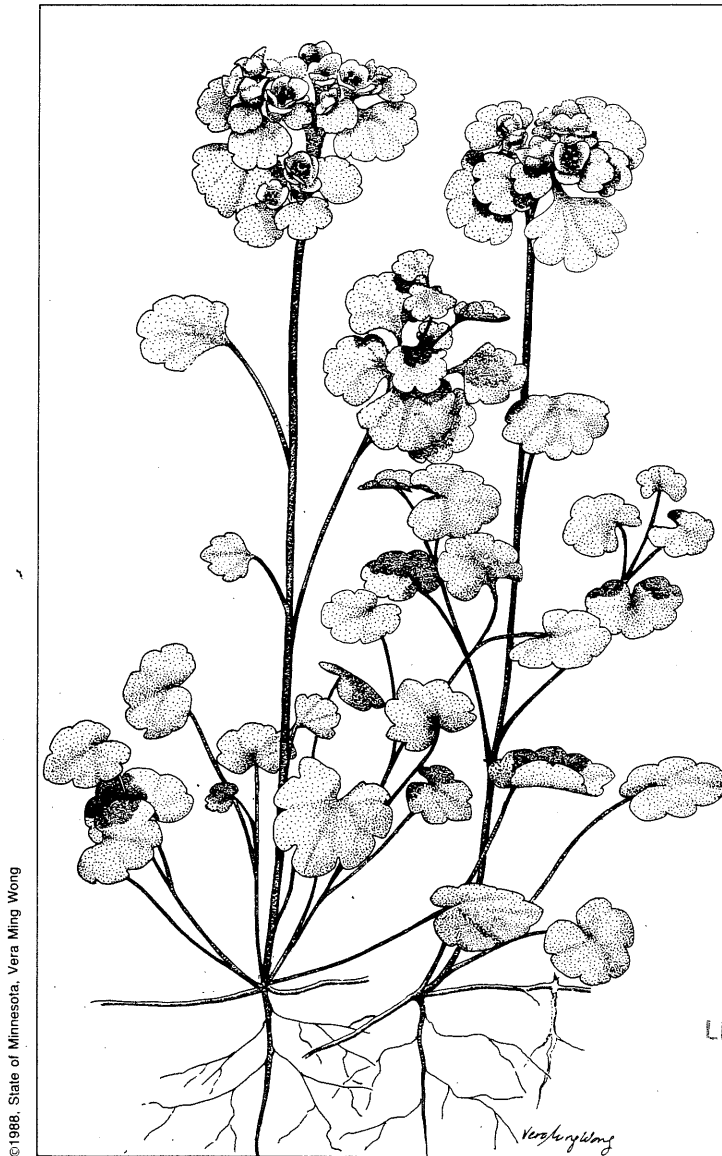


STATUS REPORT ON Chrysopenium iowense (Golden saxifrage) IN MINNESOTA

Report compiled under contract
for
USFW Service Endangered Species Office

by
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Section of Wildlife - Natural Heritage Program

March, 1989



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Status report on Chrysosplenium iowense Rydb. (golden saxifrage) in Minnesota

Taxon name: Chrysosplenium iowense Rydb.

Common name: Golden saxifrage

Family: Saxifragaceae

States where taxon occurs: Minnesota and Iowa

Current federal status: Category 2

Recommended federal status: Threatened (for Minnesota populations)

Author of report: Welby Smith

Date of report: March, 1989

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I. SPECIES INFORMATION

1. Classification and nomenclature

A. Species

1. Scientific name

- a. Chrysosplenium iowense Rydb.
- b. Rydberg, P.A. in: Britton, N.L. 1901. Manual of the flora of the northern United States and Canada. Henry Holt & Co., N.Y.
- c. The type specimen is in the Gray Herbarium, Harvard University (E.W.D. Holway)

2. Pertinent synonym

Because of the considerable uncertainty regarding the taxonomy of this species, it is difficult to determine what are synonyms and what are not. The following binomials may be synonyms, all or in part, depending on their usage.

Chrysosplenium ioense Rydb.
Chrysosplenium alternifolium L.
Chrysosplenium alternifolium L.f. iowensis (Rydb.) Rosend.
Chrysosplenium alternifolium L. var. sibiricum Ser. Hara.
Chrysosplenium tetrandrum (Lund) Fries.

3. Common name

Golden saxifrage

4. Taxon codes

TNC code: PDSAX07030

5. Size of genus

There are about 15 species of Chrysosplenium worldwide

B. Family Classification

1. Family name

Saxifragaceae

2. Pertinent family synonym

None

3. Common name for family

Saxifrage family

C. Major plant group

Dicot

D. History of knowledge of taxon.

If the narrow taxonomic view is adopted, Chrysosplenium iowense was discovered by E.W.D. Holway 6 miles north of Decorah, Iowa on July 1, 1888. That site is the type locality, and was recollected by Holway in 1889, and 1893. The same site was collected by A.F. Kovarik in 1889 and 1900, and by C.O. Rosendahl in 1919. The species has since been collected from a number of localities in Minnesota and Iowa.

E. Comments on current alternative taxonomic treatment.

When Rydberg (1901) described C. iowense he gave its range as "Iowa", thereby asserting that it was distinct from all other species of Chrysosplenium and was endemic to Iowa. Several subsequent, although superficial treatments lumped C. iowense with the arctic C. tetrandrum or the European C. alternifolium. In a detailed revision, Rosendahl (1947) considered C. iowense to be a distinct species with a range of Iowa, western Canada, Arctic Canada and possibly northern Europe. Packer (1963) also conducted extensive research on C. iowense, and agreed with Rosendahl that C. iowense is a distinct species, but gave its range as only Iowa and western Canada. He considered the specimens from the arctic to be a new species he named C. rosendahlia.

Rosendahl and Packer present the only modern, authoritative revisions of this group. They both accept iowense as a distinct species, but neither maintain it as endemic to Iowa (or Iowa and Minnesota).

2. Present legal or other formal status.

A. International

Chrysosplenium iowense is not currently, nor is it recommended to receive international legal protection.

B. National

Chrysosplenium iowense is currently under review by the U.S. Fish and Wildlife Service for inclusion in the endangered and threatened species list as a threatened species. It is listed as a category 2 species, which indicates that additional information is needed on biological vulnerability and threats.

C. State

1. Chrysosplenium iowense is currently listed as endangered in Minnesota (Minnesota Statute 97.488).
2. It is listed as endangered in Iowa under the Iowa Endangered Species Act, Chapter 109, Code of Iowa.

3. Description

A. General nontechnical description.

A low growing herbaceous plant with alternate kidney-shaped leaves that have several rounded teeth. The flowers are small with bright yellow sepals and 5-8 stamens.

B. Technical description.

The following description was taken from Packer (1963):

Stolons leafy, the leaves occasionally rudimentary. Radical and stolon leaves orbicular to reniform, dark green and conspicuously veined above in living material, 5-20 mm across, crenate, some leaves at least (generally the smaller) pubescent above and below; petioles 1-3.5 cm, mostly glabrous but often villous; cauline leaves (1-) 2 (-3) reniform to flabellate with 5-7 (-9) well-developed lobes, glabrous; bracts yellow, distinctly 3- to 7-lobed, at most only slightly broader than long, glabrous; tannin cells absent throughout. Stem erect, 3-15 cm. Flowers 5-12, short campanulate 2.5-5.0 mm across at anthesis, the center flowers 3.5-5.0 mm the lateral flowers 2.5-3.5 mm. Sepals golden yellow, 3-nerved. Stamens 2-8, varying in flowers of the same inflorescence, 5-8 in the center flowers, 2-4 in the lateral, 0.5-0.7 mm. Disc narrow, entire. Styles 0.3-0.4 mm. Edges of the dehisced capsule equalling the sepals. Seeds smooth, 0.7-0.85 mm, light chestnut brown.

C. Local field characters.

1. Short plant (1 to 7 inches tall).
2. Leaves roundish, toothed, alternate.
3. Flowers terminal, small, yellowish.

D. Identifying characteristics of material which is in interstate or international commerce or trade.

Not applicable

E. Photographs and/or line drawings.

Coffin, B. and L. Pfannmuller. 1988. Minnesota's endangered flora and fauna. University of Minnesota Press. 473pp.

Rosendahl, C. O. 1947. Studies in Chrysosplenium, with special reference to the taxonomic status and distribution of C. iowense. Rhodora 49:24-35.

4. Significance of Chrysosplenium iowense

A. Natural: Ecological, evolutionary, physiographic, etc.

Unknown

B. Human: Agricultural, aesthetic, cultural, economic, etc.

Unknown

5. Geographic distribution

A. Geographic range

Chrysosplenium iowense is known to occur in: Minnesota (Fillmore County), Iowa (Allamakee, Clayton, Dubuque, Fayette, Winneshiek, Delaware, Howard and Jackson Counties), Alberta, Manitoba, Northwest Territories and Saskatchewan.

B. Precise occurrences

I. Populations currently or recently known extant.

- 1a. Fillmore County, Minnesota (Wykoff balsam fir site)
- 1b. Latitude: 43° 37' 42" N Longitude: 92° 18' 40" W
- 1c. SE1/4 NE1/4 section 19; T103N, R12W
- 1d. Quad: Wykoff
- 1e. Year of discovery: 1977
- 1f. Most recent observation or collection: Specimens were seen at this locality by Welby Smith in June 1982. The site was revisited by Smith on June 14, 1988 and no plants were found. The habitat was intact, but was extremely dry because of a lack of rainfall. It is presumed that the plants will reappear when the soil moisture returns to normal levels.
- 1g. Summit of steep moist springy N-facing slope just south of Spring Valley Creek, at west end of slope.

- 2a. Fillmore County, Minnesota (Wykoff 17)
- 2b. Latitude: 43° 43' 05" N Longitude: 92° 18' 30" W
- 2c. SW1/4 SW1/4 section 17; T103N, R12W
- 2d. Quad: Wykoff
- 2e. Year of discovery: 1978
- 2f. Most recent observation or collection: Specimens were seen at this locality by Welby Smith in June 1982. The site was revisited by Smith on June 14, 1988 and no plants found. The habitat was intact, but conditions were extremely dry because of a lack of rainfall. It is presumed that the plants will reappear when the soil moisture returns to normal levels.
- 2g. On bank of Spring Valley Creek at southern-most part of loop in stream.

- 3a. Fillmore County, Minnesota (Saxifrage Hollow)
- 3b. Latitude: 43° 37' 26" N Longitude: 92° 16' 36" W
- 3c. SW1/4 NE1/4 section 21; T102N, R12W
- 3d. Quad: Cherry Grove
- 3e. Year of discovery: June 3, 1982
- 3f. Most recent observation or collection: Smith MIN; May 26, 1988.
- 3g. In the valley of the South Branch Root River, about 2.5 miles north of Cherry Grove.

- 4a. Fillmore County, Minnesota (Forestville 23)
- 4b. Latitude: 43° 37' 14" N Longitude: 92° 13' 56" W
- 4c. NE1/4 SE1/4 section 23; T102N, R12W
- 4d. Quad: Greenleafton
- 4e. Year of discovery: June 4, 1982
- 4f. Most recent observation or collection: Smith(6123)MIN; June 4, 1982.
- 4g. On the south side of South Branch Root River, about 3.5 miles northeast of Cherry Grove.

- 5a. Fillmore County, Minnesota (Greenleafton)
- 5b. Latitude: 43° 36' 49" N Longitude: 92° 14' 45" W
- 5c. SE1/4 NW1/4 NW1/4 section 26; T102N, R12W
- 5d. Quad: Greenleafton
- 5e. Year of discovery: 1982
- 5f. Most recent observation or collection: Smith(6124)MIN; June, 1982.
- 5g. On the south side of the South Branch Root River, about 3 miles northeast of Cherry Grove.

II. Populations known or assumed extirpated.

None

III. Historically known populations where current status is unknown.

None

C. Biogeographical and phylogenetic history.

Presumably, C. iowense was widespread in North America during the pleistocene. But during the last glacial advance, it survived in boreal-like habitats south of the glaciated area, and perhaps in the "driftless area". When the glaciers retreated, C. iowense followed the boreal-like habitat as it moved northward. Today, the species is known only from true boreal habitats in western Canada, and from relict boreal-like habitats in the Driftless Area.

6. General environment and habitat description.

A. Concise statement of general environment and habitat.

C. iowense is restricted to steep, north-facing, moss-covered slopes with cold air emanating from fissures in the limestone. The cold air results from ice which forms in the fractures of the limestone and remains throughout the summer. The cold air flows downward across the slope, modifying the environment. The above-described habitat has been termed algific talus slope by Terry Frest (Watson and Roosa, 1988).

7. Population biology of Chrysosplenium iowense

A. General summary

A survey of the published literature has failed to locate any pertinent information on population biology.

B. Demography

- 1. Wykoff balsam fir site: Population size unknown.
- 2. Wykoff 17: Population size unknown.
- 3. Saxifrage Hollow: "abundant", 5,000-10,000 plants.
- 4. Forestville 23: "infrequent", no numerical estimate available.

5. Greenleafton: "Locally abundant", no numerical estimate available.

C. Phenology

Chrysosplenium iowense flowers in the spring, usually May. Weber (1978) also reports the species flowering in the fall.

D. Reproductive biology

Weber (1978) reports that Chrysosplenium iowense reproduces both apomictically and amphimictically, and is cross-fertile.

8. Population ecology of Chrysosplenium iowense

9. Current land ownership and management responsibility.

- 1a. Public (Wykoff balsam fir site)
- 1b. Minnesota DNR, Scientific and Natural Areas Program.

- 2a. Private (Wykoff 17)
- 2b. Specific ownership unknown.

- 3a. Private (Saxifrage Hollow)
- 3b. The Nature Conservancy.

- 4a. Private (Forestville 23)
- 4b. Vreeman, J.

- 5a. Private (Greenleafton)
- 5b. Vreeman, K.

10. Management practices and experience.

A. Habitat management

There have been no attempts to manage this species or its habitat in Minnesota.

B. Cultivation

It is not known if Chrysosplenium iowense is being maintained in cultivation anywhere.

11. Evidence of threat to survival.

A. Present or threatened destruction, modification, or curtailment of habitat or range.

Although threats have not been thoroughly studied, it is apparent that at least 2 sites are threatened by cattle grazing.

II. Assessment and Recommendations

12. General assessment of vigor, trends, and status

Based on our current knowledge of this species in Minnesota, it is evident that Chrysosplenium iowense is very rare and has always been rare in the state. There is no indication of a large scale decline or loss of habitat, so its rarity must be attributed to its unusual habitat requirements.

13. Recommendations for listing or status change

Based on the information presented in this report, a federal status of threatened is recommended for populations of Chrysosplenium iowense that occur in Minnesota.

14. Recommended critical habitat

Critical habitat cannot be recommended at this time.

15. Conservation/recovery recommendation

No specific recommendations can be made at this time.

16. Interested Parties

The Minnesota Natural Heritage Program
Minnesota Department of Natural Resources
500 Lafayette Road
St. Paul, MN 55155-4007

III. Information Sources

17. Sources of Information

A. Publications

Coffin, B. and L. Pfanmuller. 1988. Minnesota's endangered flora and fauna. University of Minnesota Press. 473pp.

Packer, J. G. 1963. The taxonomy of some North American species of Chrysosplenium L. section alternifolia Franchet. Canadian Journal of Botany 41:83-103.

Rosendahl, C. O. 1947. Studies in Chrysosplenium with special reference to the taxonomic status and distribution of C. iowense. Rhodora 49:25-35.

Weber, M. 1978. Reproduction in Chrysosplenium iowense. Eleventh Annual meeting of the Mississippi River Research Consortium.

Watson, W. C. and D. M. Roosa. 1988. Status report of Chrysosplenium iowense Rydb. in Iowa. Unpublished report to the U.S. Fish and Wildlife Service.

B. Museum Collections

Herbaria searched: University of Minnesota, St. Paul, MN
University of Minnesota, Duluth, MN
University of Wisconsin, Madison, WI
North Dakota State University, Fargo, ND
St. Cloud State University, St. Cloud, MN
Winona State University, Winona, MN

D. Fieldwork

Approximately 2 field days were devoted to visiting known sites of Chrysosplenium iowense. Because of the severe drought conditions, plants could be found at only one of the sites. For this reason, no attempt was made to look for the species at new sites.

IV. Authorship

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