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## STATUS REPORT ON Polemonium occidentale (Western Jacob's ladder) IN MINNESOTA

Report compiled under contract  
for  
USFW Service Endangered Species Office  
  
by  
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Minnesota Department of Natural Resources  
Section of Wildlife - Natural Heritage Program

February, 1989



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Status report on Polemonium occidentale var. lacustre (Western Jacob's Ladder)

Taxon name: Polemonium occidentale Greene var. lacustre  
(Wherry) Lak.

Common name: Western Jacob's Ladder

Family: Polemoniaceae

States where taxon occurs: Minnesota, Wisconsin

Current federal status: Category 2

Recommended federal status: Endangered

Author of report: Nancy Sather

Date of report: February 15, 1989

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## I. SPECIES INFORMATION

### 1. Classification and nomenclature

#### A. Species

##### 1. Scientific name

a. Polemonium occidentale Greene var. lacustre (Wherry) Lak.

b.

c. The type specimen (Lakela 5575) is in the Herbarium of the Academy of Natural Sciences Philadelphia ( )

##### 2. Pertinent synonym

Polemonium caeruleum L. ssp occidentale Green, comb. nov.

##### 3. Common name

Western Jacob's Ladder

##### 4. Taxon codes

TNC code: PDPLM0E0F3

##### 5. Size of genus

Approximately 50 species of Polemonium are estimated to occur worldwide, and 40 are claimed for the United States.

#### B. Family Classification

##### 1. Family name

Polemoniaceae

##### 2. Pertinent family synonym

None

##### 3. Common name for family

Polemonium family

#### C. Major plant group

Dicotyledoneae

D. History of knowledge of taxon.

The eastern variety lacustre of the western species Polemonium occidentale was first discovered by Olga Lakela in 1944 and investigated by Edgar T. Wherry who assigned the material to Polemonium occidentale subspecies lacustre. Differences from P. occidentale typicum included: pubescence egiandular; leaves only moderately diminished in size up the stem; and inflorescence branched into a thyrsoid panicle.

E. Comments on current alternative taxonomic treatment.

Review of the genus by Davidson (1950) placed all of Polemonium occidentale into the taxon Polemonium caeruleum ssp. occidentale. Davidson's list of specimens reviewed does not include the Minnesota material and no variety lacustre is recognized. The author is unaware of any subsequent revisions in nomenclature that affect this taxon. However there does appear to be disagreement in acceptance of the two alternative treatments for the taxon Polemonium occidentale. Polemonium occidentale is recognized as a distinct species in the Checklist of Species for Flora of North America (1978); Fernald's Gray's Manual of Botany, Eighth Edition (1950) and Gleason and Cronquist (1963). Davidson's (1950) nomenclature (Polemonium caeruleum var. occidentale) is followed by Ownbey (in prep.) in his checklist of the Minnesota flora and by the Department of Botany at the University of Manitoba. Kartesz and Kartesz (1985) treat Polemonium occidentale var. lacustre as synonymous with Polemonium occidentale var. typicum and with Polemonium caeruleum ssp. occidentale. The basis for this synonymous treatment is unknown to the author of this report.

2. Present legal or other formal status.

A. International

Polemonium occidentale var. lacustre is not currently, nor is it recommended to receive international legal protection.

B. National

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

C. State

Polemonium occidentale var. lacustre has no official status in the Minnesota list of endangered, threatened and special concern species (Minnesota Statute 97.488), but is tracked by the Natural Heritage Program.

### 3. Description

#### A. General nontechnical description.

Polemonium occidentale var. lacustre is a perennial flowering plant with a slender horizontally creeping rhizome. The alternate leaves are each comprised of up to 13 ladder-like opposite leaflets. The flowering stem is up to 70 cm tall with several flowers arising in an openly branched elongate flower head. Each flower, is about 1 cm in diameter with five bright violet petals becoming white in the center.

#### B. Technical description.

Rhizome slender and horizontally creeping. Stems up to 7 dm, summit viscid and pilose without elongate glands. Leaves alternate. Leaflets lance-linear, 2-7 mm. wide, the lowest leaf with 9-13 pinnate leaflets. Panicle branching and open; peduncles and pedicels densely viscid pubescent. Calyx-lobes deltoid-oblong to lanceolate, acutish, Corolla bright violet whitened at center, 1-1.5 cm high, with spreading lobes. Style filamentous with ascending stigmatic lobes. Stamens included, filaments dilated, declined hair-tufted below. Ovary with nectar gland. Fruit a capsule.

#### C. Local field characters.

- \*Leaves pinnate with up to 13 dark green entire leaflets
- \*Flowering stems 30-70 cm tall with up to 50 flowers on pods per head
- \*Capsules stiff, greenish-yellow to yellowish-brown, depending on age, persistent.

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

Not applicable

#### E. Photographs and/or line drawings.

Ray Neumann, Minnesota DNR, 1201 E. Hwy 2, Grand Rapids, MN 55744 (photographs of Minnesota population)

Nancy Sather, Minnesota Natural Heritage Program, DNR - Box 7, 500 Lafayette Road, St. Paul, MN 55155-4007 (photographs of Minnesota population)

June Dobberpohl, Botanist, Office of Endangered Species, Wisconsin DNR, P.O. Box 7921, Madison, WI 53707 (photographs of Wisconsin population)

### 4. Significance of Polemonium occidentale var. lacustre

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

Unknown

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

Unknown



7. Population biology of Polemonium occidentale var. lacustre

A. General summary

1. A review of the literature has failed to reveal any information regarding the population biology of Polemonium occidentale var. lacustre. Observation at both the Minnesota and Wisconsin sites reveals that a higher proportion of flowering plants occur in canopy openings than in shaded areas.

B. Demography

1. The population of Polemonium occidentale var. lacustre discovered by Lakela in 1944 was reported as a colony about an acre in size. The 1988 population consists of over 400 blooming and several thousand (estimate) vegetative plants in at least 15 acres of habitat. Observation of 4  $1m^2$  plots on July 10, 1988 indicated a total of 158 vegetative plants (average 40 plants  $1m^2$ ) and 33 plants of reproductive age (8 plants  $1m^2$ ).

C. Phenology

Polemonium occidentale var. lacustre flowers in late June to early July. Flowering proceeds from the top of the inflorescence downward. On July 10, 1988, 1,044 propagules were observed on 33 mature plants. Nine percent of these were buds, 11% were flowers, 13% were aborted and 67% were capsules.

D. Reproductive biology

Little is known about the reproductive biology of Polemonium occidentale var. lacustre except that it is a perennial that reproduces by seed.

8. Population ecology of Polemonium occidentale var. lacustre

A review of the literature failed to reveal any information regarding the population ecology of Polemonium occidentale var. lacustre.

9. Current land ownership and management responsibility.

- 1a. Public
- 1b. St. Louis County, tax forfeit land administered by St. Louis County Lands Department  
Contact Denny Bone (218) 749-7132

10. Management practices and experience.

A. Habitat management

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



B. Cultivation

The presently known Minnesota population appears to be too large to have been an introduction. There are no known attempts to cultivate this species within the state.

11. Evidence of threat to survival.

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

Both the Minnesota and Wisconsin sites have been logged in the past and populations appear to be concentrated in areas of canopy opening.

However strip cutting was the prevailing historic method of management for such sites, whereas clearcutting is the more prevalent present method. The potential impact of clearcutting on the population of Polemonium occidentale var. lacustre is unknown.

B. Overutilization for commercial, sporting, scientific or educational purposes.

There do not appear to be any immediate threats from these activities.

C. Disease or predation.

Potential threats from disease or predation have not been determined.

D. Inadequacy of existing regulatory mechanisms.

The adequacy of existing regulatory mechanisms has not been determined.

E. Other natural or manmade factors

Existing or potential threats from other natural or manmade factors have not been determined.

II. Assessment and Recommendations

12. General assessment of vigor, trends, and status

Present knowledge of the taxon in Minnesota suggests that the single known population is vigorous and reproducing. It is unknown whether the population has increased significantly in size since 1944 (from a colony of 1 acre to multiple colonies in at least 15 acres) or whether the original discovery did not include the entire population. The nativity of the population has been in doubt because it has remained unobserved in the intervening years. The size, vigor and reproduction of the present population suggest that Polemonium occidentale var. lacustre is in fact a native species.

13. Recommendations for listing or status change

Polemonium occidentale var. lacustre is apparently rare in Minnesota and Wisconsin. Based on the size and vigor of populations it appears to be a native species. On the basis of this rarity the plant should probably be elevated to candidacy for federal listing (category 1) as an endangered species. However, because of the nomenclatural confusion surrounding Polemonium occidentale there may be a need for further taxonomic investigation to clarify whether the midwestern collections represent a distinct taxon. During the process of this investigation the plant should remain in category 2. If it proved not to be a valid species it would be moved to category 3b.

14. Recommended critical habitat

Critical habitat is not being recommended at this time.

15. Conservation/recovery recommendation

It is recommended that the site tax-forfeit land managed by the St. Louis County Lands Department be acquired by the Minnesota Scientific and Natural Areas program and managed to assure habitat preservation.

16. Interested Parties

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

Scientific and Natural Areas Program  
Minnesota Department of Natural Resources  
500 Lafayette Road  
St. Paul, MN 55155-4007

St. Louis County Land Department  
Highway 135 E  
Virginia, MN 55772-2999

III. Information Sources

17. Sources of Information

A. Publications

Federal Register, Vol. 41, No. 117. June 16, 1976.

Davidson, John F. 1950. The genus Polemonium [Tournefort] L. University of California Publications in Botany. Vol. 23, No. 5 pp. 209-282.

Shetler, S. G. and L. Skog. 1978. A provisional checklist of species for flora North America. Missouri Botanical Garden, St. Louis.

Solheim, Stephen L. and Emmet J. Judziewicz. 1984. Four noteworthy Wisconsin plants. *Phytologia*, Vol. 54, No. 7. pp. 490-492.

Lakela, Olga. 1947. Western Polemonium in Minnesota. *Rhodora* 49:118-119.

Wherry, E. T. 1945. Supplementary notes on the genus Polemonium. *American Midland Naturalist* 34(2):375-380.

Fernald, M. L. 1950. *Gray's Manual of Botany*, Eighth edition. American Book Company. New York.

Kartesz, J. T. and R. Kartesz. 1985. A synonymized checklist of the vascular flora of the United States, Canada and Greenland. University of North Carolina Press, Chapel Hill.

Gleason and Cronquist. 1963. *Manual of the vascular plants of the Northeastern United States and adjacent Canada*. Van Nostrand, New York.

B. Personal communications:

Dr. Deifer Wilkin  
Department of Botany  
Colorado State University  
Fort Collins, Colorado 80523

C. Museum collections

1. Herbaria searched:

University of Minnesota, St. Paul  
University of Minnesota, Duluth  
Herbarium of the Quetico-Superior Wilderness Research Station,  
Winton

D. Fieldwork

1. Approximately 15 days were spent in preparation for and search for Polemonium occidentale var. lacustre. A search image was established by visiting the known Wisconsin site in Florence County to observe both the plant and its habitat. The type locality was first searched fruitlessly on the east side of County 5, then on the west side where the species is located. 16 hours were spent searching the type locality alone before any plants were located. An additional 10 hours were spent delineating and characterizing the population and its habitat once it was located.

All conifer wetlands within 1/4 mile of the road in French township were assessed and those that proved likely habitat were searched in an effort to relocate the site of the second Minnesota collection (G. Monson, 309).

In all, 18 acres of potential habitat were investigated on foot in St. Louis and Itasca Counties within a 25 mile radius of the type locality, (see Appendix I). No further populations of Polemonium occidentale var. lacustre were located. Field work was conducted by Nancy Sather of the Minnesota Natural Heritage Program.

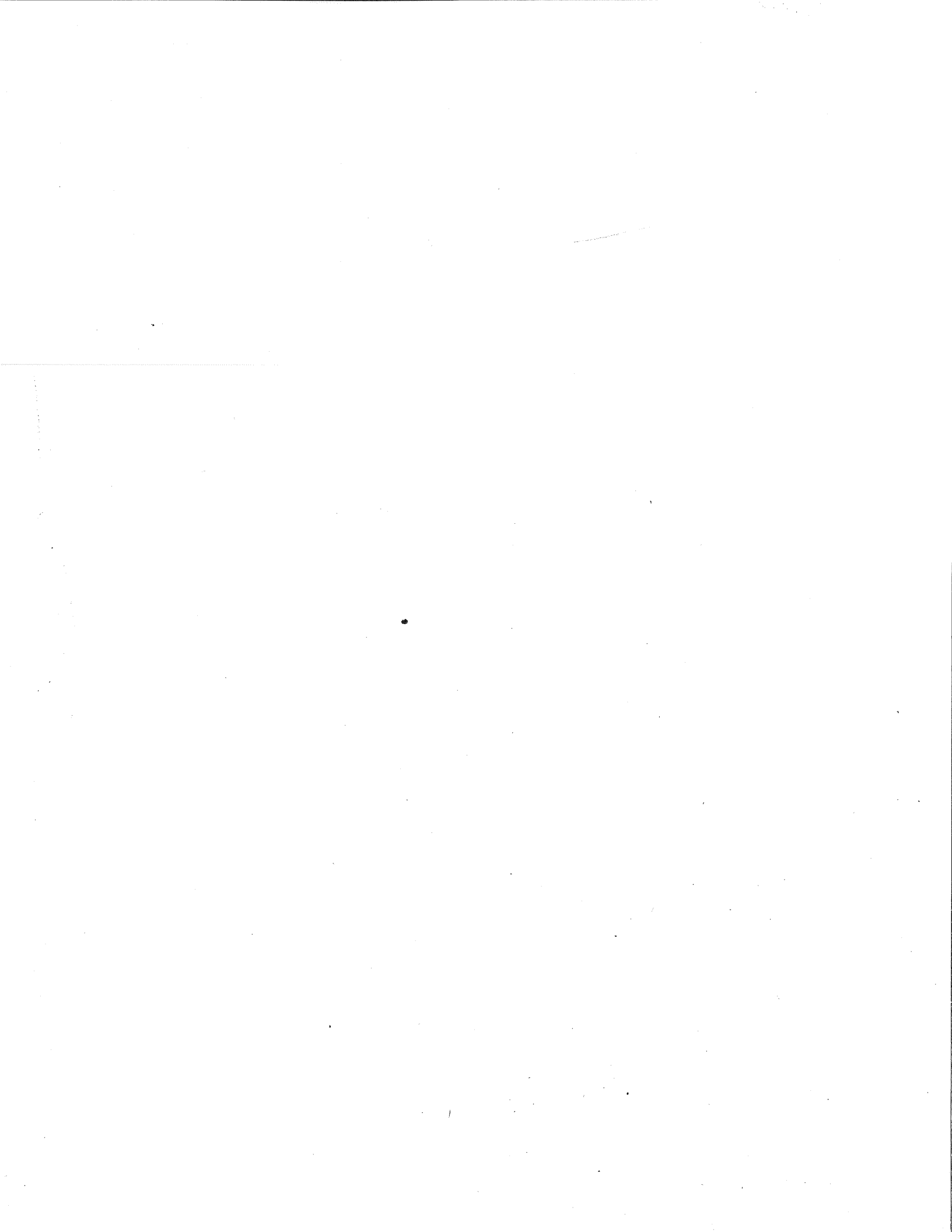
#### IV. Authorship

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Minnesota Natural Heritage Program  
Minnesota Department of Natural Resources  
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500 Lafayette Road  
St. Paul, MN 55155-4007  
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Appendix I. Locations searched for Polemonium occidentale var. lacustre during the 1988 field season.

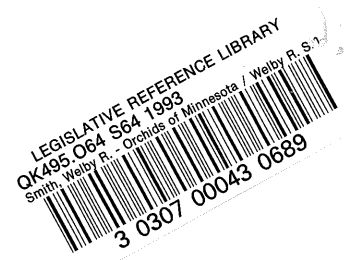
Legal Description	Community Type	Date(s)	County
1. NW SW Sec 34, T61N R21W	cedar	6/29/88	St. Louis
*2. SE Sec 33, T61N R21W	cedar	6/30 - 7/1&2/88	St. Louis
3. SESE Sec 34, T60N R21W	black spruce	7/3/88	St. Louis
4. Sec 36, T60N R21W	old growth cedar (alder, ash)	7/3/88	St. Louis
5. SE1/4 Sec 33, T60N R21W	black spruce	7/5/88	St. Louis
6. NENESE Sec 3 & NWNWSW Sec 2, T60N R21W	black spruce	7/5/88	St. Louis
7. NWSW Sec 6, T59N R20W & E1/2 NENESE Sec 1 T59N R21W		7/5/88	St. Louis
8. NWSENE Sec 36, T60N R20W	fir, ash, alder	7/5/88	St. Louis
9. NWNW Sec 26, T60N R21W	black spruce	7/5/88	St. Louis
10. SENE Sec 36, T60N R21W	offsite cedar	7/6/88	St. Louis
11. SESWSE Sec 2, T59N R20W	open alder-birch-spruce	7/6/88	St. Louis
12. SESESE Sec 28, T60N R20W	black spruce, alder	7/6/88	St. Louis
13. S1/2 SW1/4 SW1/4 Sec 22 T60N R21W	black spruce	7/6/88	St. Louis
14. SWSE Sec 20, T60N R21W	black spruce	7/7/88	St. Louis
15. NESE Sec 16, T61N R21W	black spruce	7/7/88	St. Louis
16. SE1/4 Sec 28, T62N R22W	cedar	7/7/88	Itasca
17. SESE Sec 10, T61N R22W	spruce	7/7/88	Itasca
18. SWSW & NESW Sec 35, T63N R20W	old growth cedar	7/8/88	St. Louis
19. SESE Sec 26, T62N R21W	leatherleaf spruce	7/8/88	St. Louis
20. SWNE Sec 15, T61N R21W	black spruce	7/8/88	St. Louis
21. SENE Sec 28, T61N R21W	black ash	7/8/88	St. Louis
22. SESW Sec 11, T63N R24W	old growth cedar	7/9/88	Itasca
23. SE Sec 24, T62N R24W	cedar	7/9/88	Itasca

\* = Polemonium occidentale found



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7. Status Report on Chrysplenium iowense (Golden saxifrage) in Minnesota



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