REPORT ON THE CONSERVATION STATUS OF *Silene spaldingii*, A CANDIDATE THREATENED SPECIES

Taxon Name:	*Silene spaldingii* Wats.
Common Name:	Spalding's catchfly
Family:	Caryophyllaceae
States Where Taxon Occurs:	U.S.A., Montana, Idaho, Washington, Oregon; Canada, British Columbia
Current Federal Status:	USFWS Notice of Review, Category 2
Recommended Federal Status:	USFWS Notice of Review, Category 2
Author of Report:	Lisa Ann Schassberger
Original Date of Report:	22 December, 1988
Date of Most Recent Revision:	N/A
Individual to Whom Further Information and Comments Should be Sent:	J. Stephen Shelly Montana Natural Heritage Program State Library Building 1515 E. 6th Avenue Helena, MT 59620

This is an abridged report

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I. SPECIES INFORMATION

1. **Classification and nomenclature.**

A. **Species.**

1. **Scientific name.**

a. **Binomial:** Silene spaldingii Wats.

b. **Full bibliographic citation:** Watson, S. 1875. Revision of the genus Ceanothus, and descriptions of new plants, with a synopsis of the western species of Silene. Proc. Am. Acad. 10: 333-350.

c. **Type specimens:** United States, probably from near Clearwater, Idaho Co., Idaho. Watson stated the type came from "on Clearwater in central Idaho, Spalding." The type itself bears the label "Clearwater, Oregon, Rev. Mr. Spalding." GH (Hitchcock and Maguire, 1947).

2. **Pertinent synonyms:** None.

3. **Common name:** Spalding's catchfly

4. **Taxon codes:** PDCAR0U1S0 (Montana, Oregon and Idaho Natural Heritage programs); JN.L76 (Washington Natural Heritage Program); 5044 SILSPA, (U.S.Forest Service, Region 1)

5. **Size of genus:** Over 400 species, mostly of the North Temperate Zone, and especially abundant in Eurasia (Hitchcock et al., 1964).

B. **Family classification.**

1. **Family name:** Caryophyllaceae.

2. **Pertinent family synonym:** None.

3. **Common names for the family:** Pink Family, Carnation Family.

C. **Major plant group:** Dicotyledoneae.

D. **History of knowledge of taxon:** Silene spaldingii was first collected by Rev. Mr. Spalding prior to 1875. The exact location of collection is not known. The label states "Clearwater, Oregon";

however, authorities believe its origin to be on the Clearwater River in central Idaho (Hitchcock and Maguire, 1947). Populations are now known from Montana, Idaho, Oregon, and Washington. Also, one plant was observed in British Columbia, Canada in 1988.

Silene spaldingii was first collected in Montana by R.S. Williams (995) in 1894. The label reads "Columbia Falls." This site has been searched for, but has never been relocated, and it is likely that the population was lost as much of this area has been converted for agricultural use. A second collection by D. Lau (74-63) was made in the vicinity of Niarada in 1974. This site has also never been relocated (using the directions on the collection label), and the specimen is thought to be mislabeled.

In 1983, Peter Lesica, working under contract with the Montana Field Office of The Nature Conservancy, located a population on Wild Horse Island in Flathead Lake, and three populations in the vicinity of Niarada. In 1985 two additional populations were located in the Tobacco Valley. These latter sites are 160 miles to the north of the Wild Horse Island/Niarada populations.

In 1988, the Montana Natural Heritage Program was contracted by the U.S. Fish and Wildlife Service to conduct a status survey of Silene spaldingii in Montana (Project Agreement No. SE-5-P-1). Under subcontract, the author conducted field surveys on 18-29 July, 1988 in appropriate habitats from the Canadian border (Tobacco Valley) south to Arlee, Montana. Two new populations were discovered along the flanks of the Hog Heaven Range, ca. 5 miles east of Niarada. Additionally, a small subpopulation was added to the Tobacco Plains North site (008), and one plant was observed in Canada.

E. **Comments on current alternative taxonomic treatments:** There are no known current alternative taxonomic treatments.

2. **Present legal or other formal status.**

A. **International:** None.

B. **National.**

1. **United States.**

   a. **Present designated or proposed legal protection or regulation:** Currently, Silene spaldingii is under notice of review for potential listing as a threatened species under the U.S. Endangered Species Act of 1973 (U.S. Department of Interior, 1985). Specifically, it is included in Category 2 (taxa for which information now in possession of the Service indicates that listing as a threatened or endangered species is possibly appropriate, but for which substantial data on biological vulnerability and threats are not currently known or on file to support listing).

   b. **Other current formal status recommendations:** Silene spaldingii is currently listed as "endangered throughout range" (global rank = G2) by The Nature Conservancy.

   c. **State.**

      1. **Montana.**

         a. **Present designated or proposed legal protection or regulation:** None.

         b. **Other current formal status recommendations:** Silene spaldingii is currently listed as "critically endangered" in Montana (state rank = S1) by the Montana Natural Heritage Program (Shelly, 1988).

         c. **Review of past status:** The Montana Rare Plant Project (Lesica et al., 1984) recommended the status of S. spaldingii as threatened because of its limited distribution, and the threats posed by agricultural and grazing activities in the areas where the plant is located.

2. **Idaho.**

   a. **Present designated or proposed legal protection or regulation:** None.

   b. **Other current formal status recommendations:** Silene spaldingii is currently listed as "critically endangered" in Montana (state rank = S1) by the Idaho Natural Heritage Program. The Idaho Native Plant Society, in the Region 4, Sensitive Plant Program Handbook (U.S. Dept. of Agriculture, 1988), lists S. spaldingii as threatened or endangered throughout all or a significant part of its range.

   c. **Review of past status:** The Rare and Endangered Plants technical committee of the Idaho Natural Areas Council recommended the status of S. spaldingii as "treat as threatened" (= a status given where the taxon lacks adequate field study and data) (U.S. Dept. of Agriculture, 1981).

3. **Oregon.**

   a. **Present designated or proposed legal protection or regulation:** None.

   b. **Other current formal status recommendations:** Silene spaldingii is currently listed as "critically endangered" in Oregon (state rank = S1) by the Oregon Natural Heritage Program.

   c. **Review of past status:** Silene spaldingii was listed by the Oregon Natural Area Preserves Advisory Committee as 11b (= threatened or endangered throughtout its range; known from only a few widely disjunct

populations) (Siddal et al., 1979).

4. **Washington.**

a. **Present designated or proposed legal protection or regulation:** None.

b. **Other current formal status recommendations:** Silene spaldingii is currently listed as "endangered" in Washington (state rank = S2) by the Washington Natural Heritage Program.

c. **Review of past status:** None known.

3. Description.

A. **General nontechnical description:** Silene spaldingii is a tall, herbaceous perennial. From one to several stems arise from a woody caudex. These stems reach 8-24 inches in height, and bear 4-7 pairs of cauline leaves. The leaves are broadly lance-shaped, 2-3 inches in length and up to 0.5 inch in width. The foliage is lightly to densely covered with sticky hairs. Several to many flowers form the inflorescence. Flowers are arranged in a spiral, and positioned at right angles along the tips of stems. The outer floral leaves, which are fused for most of their length, form a flaring tube about 0.5 inch long. Ten distinctive veins run along the length of this tube. The claws of the petals are also about 0.5 inch long, with the actual petal blades only 0.08 inch long. Both the claw and blade are white with a greenish tinge. Four, and sometimes up to 6 very short petal-like appendages are attached inside and just below each blade. These are also greenish-white in color. This species blooms in Montana in July and early August. Later, small light brown, wrinkled seeds ripen within a capsule.

B. **Technical description:** Villous-tomentose and more or less viscid-pubescent perennial from a simple or branched caudex, 2-6 dm. tall; cauline leaves 4-7 pairs, oblanceolate below to lanceolate above, 6-7 cm. long, 0.5-1.5 cm. broad, sessile and slightly connate; flowers several to many in a leafy and

usually compact cyme; calyx tubular-campanulate, about 15 mm. long at anthesis, becoming more nearly clavate-campanulate in fruit, 10-nerved; corolla white, the claw of the petals about 15 mm. long, not auriculate above, the blade very short, ovate, about 2 mm. long, entire to shallowly emarginate; appendages 4 (5 or 6), ovate-lanceolate, about 0.5 mm. long; carpophore about 2 mm. long, glabrous; styles 3; capsule 1-celled; seeds light brown, about 2 mm. long, corrugate-wrinkled and inflated. Chromosome number 2N=24 (adapted from Hitchcock et al., 1964).

C. **Local field characters:** In Montana this species is usually found in swales or draws, often on north- to east-facing slopes. Similar in appearance to many of the more common Silene species, it is distinct from them by its sticky villous hairs, long calyx tube, and bilobate petals with 4-6 appendages. Vegetatively, Silene scouleri is similar to S. spaldingii; however, it has bilobate petals with only two appendages. Silene cseri also overlaps in range with S. spaldingii, however it is an annual species with long petal blades and the foliage is not often sticky pubescent. Silene douglasii is similar in appearance to this species but has more slender stems and leaves, and is rarely sticky pubescent (Dorn, 1984). According to Hitchcock and Maguire (1947), S. oregana is quite similar to S. spaldingii with respect to the flowers; however, the petal blade is deeply 4 lobed and much longer and narrower in this species.

D. **Identifying characteristics of material which is in interstate or international commerce or trade:** No interstate or international commerce or trade is known.

E. **Photographs and line drawings:** Figure 1, p. 7, is a copy of illustrations that accompanied the descriptions of this species Hitchcock et al., (1964), and Hitchcock and Maguire, (1947). The color slides are duplicates of those taken at the sites indicated by the three-digit occurrence numbers, p. 8. Additional slides of S. spaldingii and its habitat are housed at the office of the Montana Natural Heritage Program, Helena, Montana.

4. **Significance.**

A. **Natural:** In the words of Hitchcock and Maguire (1947), "(t)he viscidity of the plant, the long

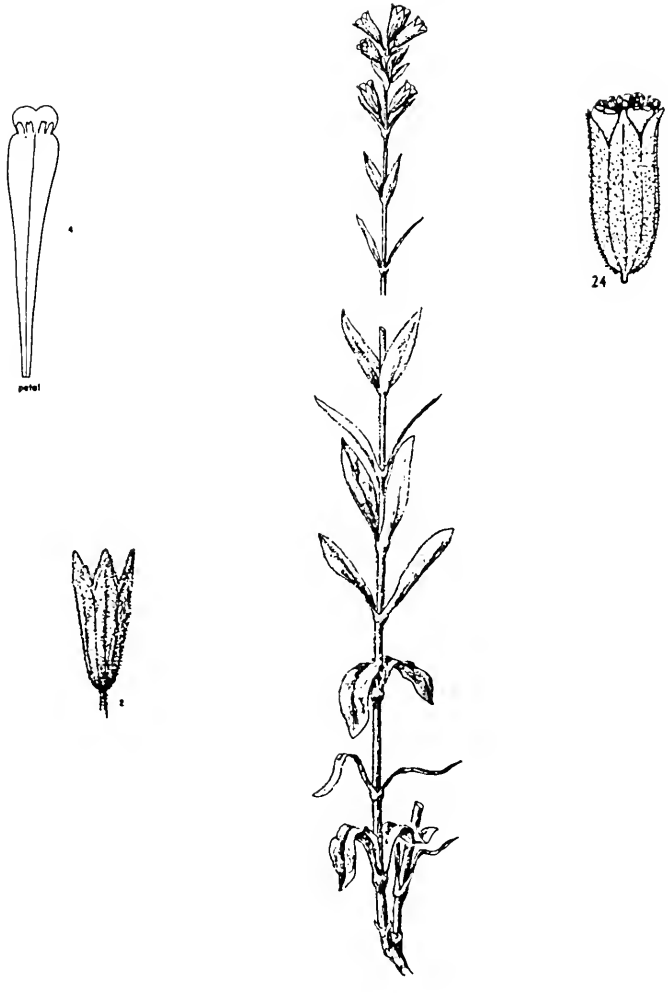

Figure 1. Line drawing of Silene spaldingii . Taken from Hitchcock et al. (1964) and Hitchcock and Maguire (1947).

calyx lobes, short blades of the petals, 4 shorter appendages, and large inflated seeds are almost peculiar to the species. All in all it is one of our most distinct plants ... ." This taxonomically distinct species is associated with the few remnants of Palouse prairie left intact in the states of Montana, Idaho, Oregon, and Washington.

B. **Human:** According to Hitchcock et al. (1964), this family contains several genera of ornamental value, including Dianthus (carnation), Gypsophila (baby's breath), Arenaria (sandwort), Silene (catchfly), and Lychnis (campion). This species may have horticultural potential; however, currently it has no known agricultural, economic or other human uses or significance.

5. **Geographical distribution.**

A. **Geographical range:** Silene spaldingii is currently known in Montana from sites in the Tobacco Valley, Lincoln County; Wild Horse Island, Lake County; and the area around Niarada in Sanders and Flathead counties. A distribution map of Silene spaldingii populations in Montana is found on p. 10. In Idaho it is known from sites in Lewiston County; and in Washington from sites in Whitman, Spokane, and Asotin counties. In 1988, a single plant was observed in British Columbia, Canada.

Silene spaldingii is historically known from two locations in Oregon in Umatilla and Wallowa counties.

B. **Precise occurrences.**

1. **Populations currently known to be extant.**

a. **Montana:** Populations are listed in Table 1, pp. 11-18. Exact locations are provided on USGS quadrangle maps, pp. 19-25.

Dancing Prairie-Tobacco Plains South (001)
Wild Horse Island State Park (002)
Black Bear Ranch (003)
Mill Pocket Ridge (004)
Crosson Valley (005)
Tobacco Plains North (008)
Cromwell Creek (009)
Hog Heaven Range (010)

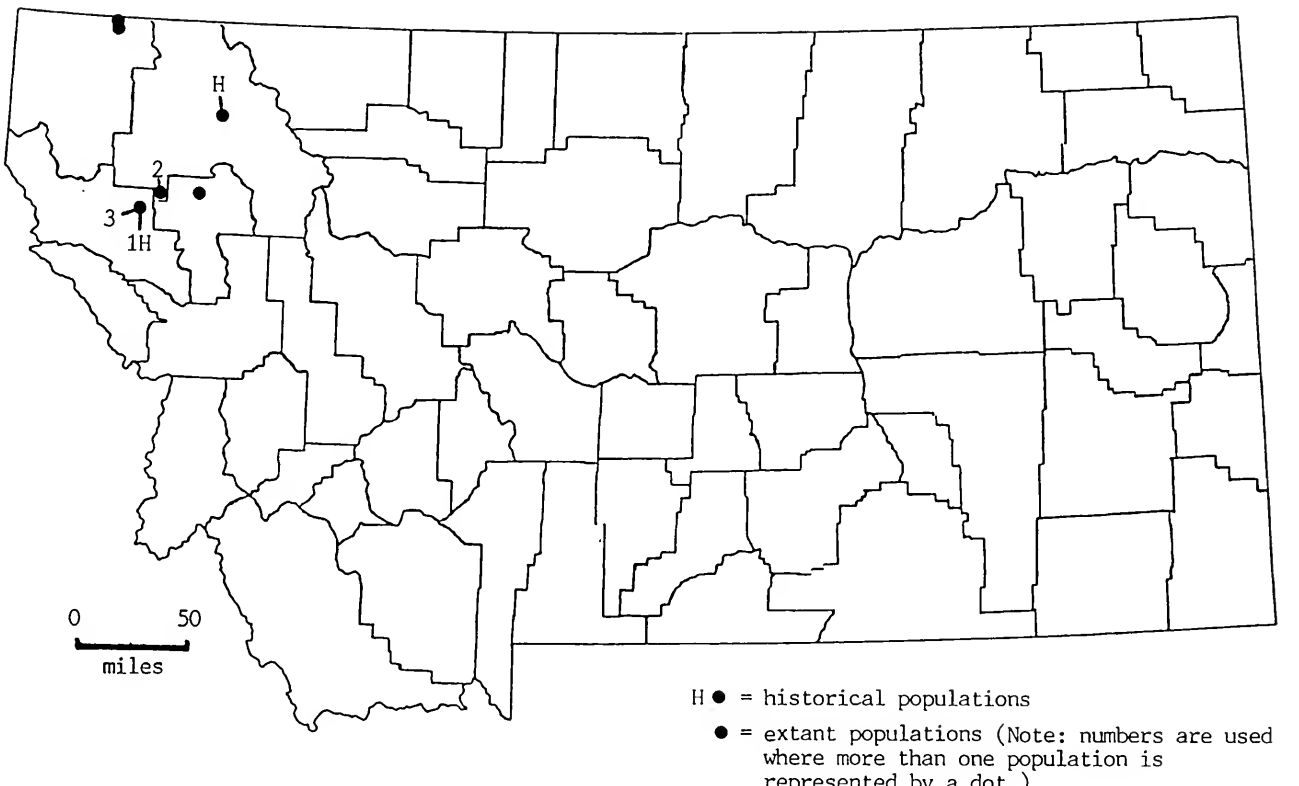

Figure 2. Distribution of Silene spaldingii populations in Montana.

Montana

ELEMENT OCCURRENCE RECORD

EOCODE: PDCAR0U150.001
NAME: SILENE SPALDINGII
COMNAME: SPALDING CAMPION
MARGNUM: 1 TENTEN: 4,4 IDENT: Y EORANK: A
SURVEYSITE: DANCING PRAIRIE-TOBACCO PLAINS SOUTH
EORANKCOMM:
SURVEYDATE: 1985-07-16 LASTOBS: 1988-07-18 FIRSTOBS: 1985 GRANK: G2
SRANK: S1 STATE: MT COUNTYNAME: MTLINC
QUADCODE: 4811581
QUADNAME: EUREKA NORTH PRECISION: SC
LAT: 485643 LONG: 1150440 S: 485627 N: 485733 E: 1150343 W: 1150458
TOWNRANGE: 037N027W SECTION: 26 MERIDIAN: PR TRSCOMM: N2,N2SW4,23E 2,24W2
PHYSPROV: NR WATERSHED: 17010101 RIVERREACH:
DIRECTIONS: TOBACCO PLAINS, CA. 3.5 AIR MILES NNW. OF EUREKA.

GENDESC: GENTLY ROLLING, GLACIATED PLAINS; UNIQUE GRASSLAND COMMUNITY DOMINATED BY STIPA COMATA & FESTUCA SCABRELLA, WITH POA SECUNDA; POA PRATENSIS IN SWALES; SILTY SOILS.
ELEV: 2720 SIZE: 200
EODATA: EST. 10,000 INDIVIDUALS, TWO SUBPOPULATIONS; "PERHAPS LARGEST POPULATION IN THE WORLD"; PRAIRIE IS IN VERY GOOD CONDITION, WITH LITTLE EVIDENCE OF SEVERE DISTURBANCE; SILENE OCCURS IN SWALES WHICH HAVE DEEPER, LESS GRAVELLY SOILS.
COMMENTS:

MACODE1: PRIVATEOWNMTUS CONTAINED1: MACODE2: CONTAINED2:

MACODE3: CONTAINED3: ADLMAS: MORELAN: MOREPROT:
MOREMGMT: Z SITECODE:
SITENAME: DANCING PRAIRIE
OWNER:
OWNERCOMM:
PROTCOMM:
MGMTCOMM:
MONITOR: MONITORNUM: -
BESTSOURCE: LESICA, P. DEPT. OF BOTANY, UNIV. OF MONTANA, MISSOULA, MT; VOUCHER-LESICA, P. (3541), 1985, MONTU.
SOURCECODE: PNDLES01MTUS S85LESUMMTUS U85LES02MTUS PNDSHE01MTUS PNDSCH02MTUS

DATASENS: N BOUNDARIES: Y PHOTOS: N OWNERINFO:
TRANSCRIBR: 86-01-24 JSS CDREV: Y MAPPER: 86-01-24 JSS QC: Y
UPDATE: 88-12-02 LAS

Table 1. Occurrence records for extant populations in Montana.

Montana

ELEMENT OCCURRENCE RECORD

EOCODE: PDCAR0U1S0.002
NAME: SILENE SPALDINGII
COMNAME: SPALDING CAMPION
MARGNUM: 4 TENTEN: 3,3 IDENT: Y EORANK: A
SURVEYSITE: WILD HORSE ISLAND STATE PARK
EORANKCOMM:
SURVEYDATE: 1983-07-21 LASTOBS: 1983-07-21 FIRSTOBS: 1983 GRANK: G2
SRANK: S1 STATE: MT COUNTYNAME: MTLAKE
QUADCODE: 4711472
QUADNAME: WILD HORSE ISLAND PRECISION: SC
LAT: 475024 LONG: 1141309 S: 475013 N: 475036 E: 1141247 W: 1141318
TOWNRANGE: 024N020W SECTION: 18 MERIDIAN: PR TRSCOMM: W2

PHYSPROV: NR WATERSHED: 17010208 RIVERREACH:
DIRECTIONS: WILD HORSE ISLAND, IN FLATHEAD LAKE.

GENDESC: IN FESTUCA SCABRELLA/F. IDAHOENSIS/PSEUDOROEGNERIA SPICATA (AGSP) BUNCHGRASS PRAIRIE, WITH SCATTERED PINUS PONDEROSA; NW-FACING SLOPES, GRAVELLY SILT-LOAM SOILS.
ELEV: 3200 SIZE: 10
EODATA: CA. 125-250 MATURE INDIVIDUALS IN 3 SUBPOPULATIONS; ISLAND SUBJECT TO LIGHT GRAZING BY DEER, WILD HORSES (4), AND BIGHORN SHEEP; ALSO, LIMITED RECREATION (HIKING).

COMMENTS: SEE EF FOR MAPS AND SITE SURVEY SUMMARY.

MACODE1: SFWSPWILD1MTUS CONTAINED1: Y MACODE2: FBIIRFLAT1MTUS CONTAINED2: Y
MACODE3: CONTAINED3: ADLMAS: N MORELAN: MOREPROT:
MOREMGMT: Z SITECODE:
SITENAME: WILDHORSE ISLAND
OWNER:
OWNERCOMM:
PROTCOMM:
MGMTCOMM:
MONITOR: MONITORNUM: -
BESTSOURCE: LESICA, P. DEPT. OF BOTANY, UNIV. OF MONTANA, MISSOULA, MT; VOUCHER-LESICA, P. (2755), 1983, MONTU.
SOURCECODE: PNDLES01MTUS S83LESUMMTUS U85LES02MTUS

DATASENS: BOUNDARIES: Y PHOTOS: N OWNERINFO:
TRANSCRIBR: 86-01-23 JSS CDREV: Y MAPPER: 86-01-24 JSS QC: Y
UPDATE: 88-12-02 LAS

Table 1. (cont.)

Montana
ELEMENT OCCURRENCE RECORD

EOCODE: PDCAR0U1S0.003
NAME: SILENE SPALDINGII
COMNAME: SPALDING CAMPION
MARGNUM: 1 TENTEN: 7,7 IDENT: Y EORANK: C
SURVEYSITE: BLACK BEAR RANCH
EORANKCOMM:
SURVEYDATE: 1983-07-28 LASTOBS: 1983-07-28 FIRSTOBS: 1983 GRANK: G2
SRANK: S1 STATE: MT COUNTYNAME: MTSAND
QUADCODE: 4711476
QUADNAME: MILL POCKET CREEK PRECISION: SC
LAT: 474716 LONG: 1143953 S: 474711 N: 474720 E: 1143945 W: 1144000
TOWNRANGE: 023N024W SECTION: 03 MERIDIAN: PR TRSCOMM: NW4NW4

PHYSPROV: NR WATERSHED: 17010212 RIVERREACH: 17010212061500.00
DIRECTIONS: BLACK BEAR RANCH; W. FROM NIARADA CA. 2 MI.; HEAD W. AT CEMETERY; RD. TURNS S. IN 1/2 MI. AND FOLLOWS LITTLE BITTERROOT RIVER-GO 1 MI. S., SITE IS W. OF ROAD.
GENDESC: N. AND E.-FACING MESIC SLOPES & BOTTOMS OF DRAWS; SCATTERED PINUS PONDEROSA PRESENT, SLOPES DOMINATED BY FESTUCA IDAHOENSIS & F. SCABRELLA; BOTTOMS HAVE POA PRATENSIS.
ELEV: 2960 SIZE: 10
EODATA: 30 FLOWERING STEMS; AREA HAS BEEN DISTURBED, AND MANY EXOTIC SPECIES ARE PRESENT.

COMMENTS: SEE EF FOR MAPS AND SITE PRESERVE SUMMARY. VOUCHER-LESICA, P. (2766), 1983, MONTU.
MACODE1: PRIVATEOWNMTUS CONTAINED1: ? MACODE2: PNCRSBLAC1MTUS CONTAINED2: ?
MACODE3: FBIIRFLAT1MTUS CONTAINED3: Y ADLMAS: N MORELAN: MOREPROT:
MOREMGMT: Z SITECODE:
SITENAME: BLACK BEAR RANCH SITE
OWNER: GEIGER
OWNERCOMM: BLACK BEAR RANCH, NIARADA, MT.
PROTCOMM: TNC REGISTERED SITE NO.309
MGMTCOMM:
MONITOR: MONITORNUM: -
BESTSOURCE: LESICA, P. DEPT. OF BOTANY, UNIV. OF MONTANA, MISSOULA, MT.

SOURCECODE: PNDLES01MTUS S83LESUMMTUS U85LES02MTUS

DATASENS: BOUNDARIES: Y PHOTOS: N OWNERINFO:
TRANSCRIBR: 86-01-23 JSS CDREV: Y MAPPER: 86-01-24 JSS QC: Y
UPDATE: 87-02-05 JSS

Table 1. (cont.)

Montana

ELEMENT OCCURRENCE RECORD

EOCODE: PDCARØU1SØ.ØØ4
NAME: SILENE SPALDINGII
COMNAME: SPALDING CAMPION
MARGNUM: 2 TENTEN: 7,6 IDENT: Y EORANK: C
SURVEYSITE: MILL POCKET RIDGE
EORANKCOMM:
SURVEYDATE: 1983-Ø7-27 LASTOBS: 1983-Ø7-27 FIRSTOBS: 1983 GRANK: G2
SRANK: S1 STATE: MT COUNTYNAME: MTSAND
QUADCODE: 4711476
QUADNAME: MILL POCKET CREEK PRECISION: SC
LAT: 474758 LONG: 1143958 S: 474752 N: 474804 E: 1143948 W: 1144009
TOWNRANGE: Ø24NØ24W SECTION: 34 MERIDIAN: PR TRSCOMM: NW4,33NE4

PHYSPROV: NR WATERSHED: 17010212 RIVERREACH: 17010212Ø6500.00
DIRECTIONS: MILL POCKET RIDGE; HWY. 28 E. FROM ELMO TO NIARADA; E. FROM NIARADA ON DIRT RD., 2 MILES, AND TAKE L. FORK; GO 1 MI., TAKE L. FORK TO FIRST RANCH HOUSE ON RIGHT.
GENDESC: NE-FACING SLOPE; PALOUSE GRASSLAND DOMINATED BY FESTUCA IDAHOENSIS, F. SCABRELLA, AND PSEUDOROEGNERIA SPICATA (AGSP);LOWER SLOPE IS PINUS PONDEROSA/PSEUDOTSUGA MENZIESII.
ELEV: 3040 SIZE: 20
EODATA: SEVEN FLOWERING PLANTS; ROSA WOODSII IS INVADING THE SITE.

COMMENTS: SEE EF FOR MAPS AND SITE PRESERVE SUMMARY. VOUCHER-LESICA, P. (2764), 1983, MONTU.
MACODE1: FBIIRFLAT1MTUS CONTAINED1: Y MACODE2: CONTAINED2:

MACODE3: CONTAINED3: ADLMAS: MORELAN: MOREPROT:
MOREMGMT: Z SITECODE:
SITENAME:
OWNER: CONF. SALISH & KOOTENAI TRIBES
OWNERCOMM: BOX 278, PABLO, MT 59855
PROTCOMM:
MGMTCOMM:
MONITOR: MONITORNUM: -
BESTSOURCE: LESICA, P. DEPT. OF BOTANY, UNIV. OF MONTANA, MISSOULA, MT.

SOURCECODE: PNDLESØ1MTUS S83LESUMMTUS U85LESØ2MTUS

DATASENS: BOUNDARIES: Y PHOTOS: N OWNERINFO:
TRANSCRIBR: 86-Ø1-23 JSS CDREV: Y MAPPER: 86-Ø1-24 JSS QC: Y
UPDATE: 87-Ø2-Ø5 JSS

Table 1. (cont.)

Montana

ELEMENT OCCURRENCE RECORD

EOCODE: PDCAR0U150.005
NAME: SILENE SPALDINGII
COMNAME: SPALDING CAMPION
MARGNUM: 3 TENTEN: 8,1 IDENT: Y EORANK: A
SURVEYSITE: CROSSON VALLEY
EORANKCOMM:
SURVEYDATE: 1983-07-29 LASTOBS: 1988-07-21 FIRSTOBS: 1983 GRANK: G2
SRANK: S1 STATE: MT COUNTYNAME: MTSAND
QUADCODE: 4711476 4711486
QUADNAME: MILL POCKET CREEK, HUBBART RESERVOIR PRECISION: M
LAT: 475158 LONG: 1143850 S: 475117 N: 475232 E: 1143816 W: 1143948
TOWNRANGE: 024N024W SECTION: 03 MERIDIAN: PR TRSCOMM: SE4,2NW4,11N W4,10
PHYSPROV: NR WATERSHED: 17010212 RIVERREACH: 170102120670O.00
DIRECTIONS: CROSSON VALLEY; DIRT RD. 1/4 MI. W. FROM NIARADA; TURN N. ON DIRT ROAD FOR CA. 1.25 MILES; TURN W. 1/2 MI.; TURN N., FOLLOWING RD. OVER SULLIVAN HILL FOR CA. 4-5 MILES.
GENDESC: IN SWALES, ON MODERATELY DEEP SILTY TO SILT LOAM SOILS; N. AND E. ASPECTS ON BOTTOMS AND LOWER SLOPES; WITH FESC/FEID, POA PRATENSIS, STIPA OCCIDENTALIS/FEID.
ELEV: 3350 SIZE: 30
EODATA: MORE THAN 100 FLOWERING PLANTS, IN AT LEAST FIVE DIFFERENT SUBPOPULATIONS (SEE EF). IN 1988, SUBPOPULATIONS WERE MUCH REDUCED IN SIZE - LIKELY DUE TO DROUGHT CONDITIONS.

COMMENTS: SEE EF FOR SITE PRESERVE SUMMARY, SP SURVEY FORM, AND MAPS. VOUCHER - LESICA, P. (2767), 1983, MONTU.
MACODE1: PRIVATEOWNMTUS CONTAINED1: ? MACODE2: FBIIRFLATIMTUS CONTAINED2: Y
MACODE3: CONTAINED3: ADLMAS: MORELAN: MOREPROT:
MOREMGMT: Z SITECODE:
SITENAME: CROSSON VALLEY
OWNER: GEORGE TRIPP
OWNERCOMM: NIARADA, MT.
PROTCOMM:
MGMTCOMM:
MONITOR: MONITORNUM: -
BESTSOURCE: LESICA, P. DEPT. OF BOTANY, UNIV. OF MONTANA, MISSOULA, MT.

SOURCECODE: PNDLES01MTUS S83LESUMMTUS U85LES02MTUS PNDSCH02MTUS

DATASENS: BOUNDARIES: Y PHOTOS: N OWNERINFO:
TRANSCRIBR: 86-01-23 JSS CDREV: Y MAPPER: 86-01-31 JSS QC: Y
UPDATE: 88-12-02 LAS

Table 1. (cont.)

Montana

ELEMENT OCCURRENCE RECORD

EOCODE: PDCARØU1SØ.ØØ8
NAME: SILENE SPALDINGII
COMNAME: SPALDING CAMPION
MARGNUM: 1Ø TENTEN: 4,2 IDENT: Y EORANK: B
SURVEYSITE: TOBACCO PLAINS NORTH
EORANKCOMM: 1988, DRY YEAR - POPULATION MAY BE LARGER
SURVEYDATE: 1986-Ø7-17 LASTOBS: 1988-Ø7-18 FIRSTOBS: 1986 GRANK: G2
SRANK: S1 STATE: MT COUNTYNAME: MTLINC
QUADCODE: 4811581
QUADNAME: EUREKA NORTH PRECISION: SC
LAT: 485928 LONG: 1150454 S: 485926 N: 485930 E: 1150445 W: 1150501
TOWNRANGE: Ø37NØ27W SECTION: 11 MERIDIAN: PR TRSCOMM: NW4

PHYSPROV: NR WATERSHED: 17Ø1Ø1Ø1 RIVERREACH:
DIRECTIONS: TOBACCO PLAINS, ABOUT 8 MILES N.OF EUREKA. 2ND SUBPOPULATION NORTH OF ROAD EXTENDING UP TO AND OVER CANADIAN BORDER.

GENDESC: IN GRASSLANDS ON LOW, NORTH-FACING SLOPES; WITH FESTUCA IDAHOENSIS, FESTUCA SCABRELLA.

ELEV: 2700 SIZE: 3
EODATA: LOCALLY COMMON. 2ND SUBPOPULATION WITH 6 PLANTS, FLOWERING IN 1988.

COMMENTS: NONE.

MACODE1: PRIVATEOWNMTUS CONTAINED1: MACODE2: CONTAINED2:

MACODE3: CONTAINED3: ADLMAS: MORELAN: MOREPROT:
MOREMGMT: Z SITECODE:
SITENAME:
OWNER:
OWNERCOMM:
PROTCOMM:
MGMTCOMM:
MONITOR: MONITORNUM:
BESTSOURCE: LESICA, P. (3978). 1986. SPECIMEN #1Ø4445 UM. SCHASSBERGER L.A. 1988. SPECIMEN # 249 MONTU.
SOURCECODE: S86LESUMMTUS PNDLESØ1MTUS F88SCHØ6MTUS PNDSCHØ2MTUS S88SCHUMMTUS

DATASENS: N BOUNDARIES: Y PHOTOS: Y OWNERINFO:
TRANSCRIBR: 87-Ø8-17 JEG CDREV: Y MAPPER: 87-Ø8-19 JEG QC: Y
UPDATE: 88-12-Ø2 LAS

Table 1. (cont.)

Montana
ELEMENT OCCURRENCE RECORD

EOCODE: PDCARØU1SØ.ØØ9
NAME: SILENE SPALDINGII
COMNAME: SPALDING CAMPION
MARGNUM: 2 TENTEN: 8,1Ø IDENT: Y EORANK: C
SURVEYSITE: CROMWELL CREEK
EORANKCOMM: HEAVILY GRAZED PASTURE
SURVEYDATE: 1988-Ø7-22 LASTOBS: 1988-Ø7-22 FIRSTOBS: 1988 GRANK: G2
SRANK: S1 STATE: MT COUNTYNAME: MTFLAT
QUADCODE: 4711485
QUADNAME: KOFFORD RIDGE PRECISION: SC
LAT: 475233 LONG: 1143056 S: Ø N: Ø E: Ø W: Ø
TOWNRANGE: Ø25NØ23W SECTION: 35 MERIDIAN: PR TRSCOMM: SE4

PHYSPROV: NR WATERSHED: 17Ø1Ø212 RIVERREACH: 17Ø1Ø212Ø64ØØ.ØØ
DIRECTIONS: CA. 4.1 AIR MILES NE OF NIARADA; TRAVEL CA. 4.3 MILES N OF HIGHWAY 28 ON CROMWELL CREEK ROAD, SE OF ROAD ON HILLSIDE JUST BELOW TREELINE.
GENDESC: PROTECTED DRAW ON SLOPE IN GRAVELLY SILT LOAM WITH FESTUCA SCABRELLA AND ROSA SPP.

ELEV: 3420 SIZE: 1
EODATA: 1Ø PLANTS FLOWERING, BUT DRYING OUT FROM THE BOTTOM UP.

COMMENTS: VOUCHER - SCHASSBERGER, L.A. (25Ø), 1988, MONTU.

MACODE1: PRIVATEOWNMTUS CONTAINED1: Y MACODE2: CONTAINED2:

MACODE3: CONTAINED3: ADLMAS: MORELAN: MOREPROT:
MOREMGMT: B SITECODE:
SITENAME:
OWNER: ELSIE BROWN
OWNERCOMM:
PROTCOMM:
MGMTCOMM:
MONITOR: MONITORNUM:
BESTSOURCE: SCHASSBERGER, L.A. 1988. FIELD SURVEYS IN LAKE, SANDERS, FLATHEAD AND LINCOLN COUNTIES OF 18-29 JULY.
SOURCECODE: F88SCH06MTUS PNDSCH02MTUS S88SCHUMMTUS

DATASENS: BOUNDARIES: Y PHOTOS: Y OWNERINFO:
TRANSCRIBR: 88-Ø8-Ø4 LAS CDREV: Y MAPPER: 88-Ø8-Ø4 LAS QC: Y
UPDATE: 88-Ø8-18 MEZ

Table 1. (cont.)

Montana

ELEMENT OCCURRENCE RECORD

EOCODE: PDCARØU1SØ.Ø1Ø
NAME: SILENE SPALDINGII
COMNAME: SPALDING CAMPION
MARGNUM: 4 TENTEN: 7,2 IDENT: Y EORANK: C
SURVEYSITE: HOG HEAVEN RANGE
EORANKCOMM: HEAVILY GRAZED PASTURE
SURVEYDATE: 1988-Ø7-27 LASTOBS: 1988-Ø7-27 FIRSTOBS: 1988 GRANK: G2
SRANK: S1 STATE: MT COUNTYNAME: MTFLAT
QUADCODE: 4711475
QUADNAME: NIARADA PRECISION: SC
LAT: 475104 LONG: 1143144 S: 475101 N: 475111 E: 1143135 W: 1143146
TOWNRANGE: Ø24NØ23W SECTION: 1Ø MERIDIAN: PR TRSCOMM: SE4

PHYSPROV: NR WATERSHED: 17Ø1Ø212 RIVERREACH: 17Ø1Ø212Ø64ØØ.ØØ
DIRECTIONS: CA. 3.8 AIR MILES NE OF NIARADA, CA. 1.2 MILES N OF HIGHWAY 28 ON BROWNS MEADOW ROAD, CA. 1.5 MILES E OF BROWN RANCH, ON HILLSIDE BELOW TREELINE.
GENDESC: PROTECTED DRAWS AND SLOPES IN GRAVELLY SILT LOAM WITH FESTUCA SCABRELLA AND ROSA SP.

ELEV: 35ØØ SIZE: 1
EODATA: TWELVE PLANTS IN TWO SUBPOPULATIONS, FLOWERING.

COMMENTS: NO SPECIMEN. SEE GMF BASE MAP SHOWING SUBPOPULATIONS. LOCATED NEAR BOUNDARY OF FLATHEAD INDIAN RESERVATION.
MACODE1: PRIVATEOWNMTUS CONTAINED1: Y MACODE2: CONTAINED2:

MACODE3: CONTAINED3: ADLMAS: MORELAN: MOREPROT:
MOREMGMT: Z SITECODE:
SITENAME:
OWNER: ELSIE BROWN
OWNERCOMM:
PROTCOMM:
MGMTCOMM:
MONITOR: MONITORNUM:
BESTSOURCE: SCHASSBERGER, L.A. 1988. FIELD SURVEYS IN LAKE, SANDERS, FLATHEAD AND LINCOLN COUNTIES OF 18-29 JULY.
SOURCECODE: F88SCHØ6MTUS PNDSCHØ2MTUS S88SCHUMMTUS

DATASENS: BOUNDARIES: Y PHOTOS: Y OWNERINFO:
TRANSCRIBR: 88-Ø8-Ø4 LAS CDREV: Y MAPPER: 88-Ø8-Ø4 LAS QC: Y
UPDATE: 88-Ø8-18 MEZ

Table 1. (cont.)

b. **Idaho:** See Table 2, pp. 27-28, for occurrence records on the following sites.

Cold Spring Creek (001)
Lawyers Creek (004)

c. **Washington:** See Table 3, pp. 29-34, for occurrence records on the following sites.

Sites:		
	(005)	(013)
	(006)	(014)
	(007)	(015)
	(008)	(016)
	(009)	(017)
	(010)	(018)
	(011)	(019)
	(012)	

2. **Populations known or assumed extirpated.**

a. **Oregon:** The population at Darr Flat (002), listed in Table 4, p. 35, was discovered in 1983, but a survey of the site in 1986 revealed no plants. The population is presumed to have been lost to the heavy grazing that occurs in the area.

b. **Washington:** Site (002) in Whitman County was surveyed in 1981 and believed to be extirpated; Table 4, p. 36.

3. **Historically known populations where current status is not known:** See Table 5, pp. 37-39, for occurrence records on the following sites.

a. **Montana:** A collection was made by R.S. Williams in 1894 (Columbia Falls (006)). The collection label only refers to a general location: "Columbia Falls." The area in the vicinity of the town has been searched, but much of this land has been converted for agricultural use and the population has not been relocated (Peter Lesica, pers. comm.; Lisa A. Schassberger pers. obs.).

b. **Idaho:** Daubie's Stand 162 (002) has not been recently revisited; therefore current information is not available on its condition.

ELEMENT OCCURRENCE CODE: PDCAR0U1S0.001
NAME: SILENE SPALDINGII
COMNAME: SPALDING'S CAMPION, SPALDING'S SILENE
MARGNUM: 3 TENTEN: IDENT: Y EORANK: BC
EORANKCOMM: MORE THAN THREE DOZEN INDIVIDUALS
SURVEYDATE: 1985-08-06 LASTOBS: 1985-08-06 FIRSTOBS: 1964 GRANK: G2
SURVEYSITE: COLD SPRING CREEK
SRANK: S1 STATE: ID COUNTYNAME: IDLEWI
QUADCODE: 4611625
QUADNAME: WINCHESTER EAST PRECISION: SC
LAT: 461415 LONG: 1163019 S: 461400 N: 461430 E: 1163015 W: 1163130
TOWNRANGE: 033N002W SECTION: 01 MERIDIAN: BO
TRSCOMM: NW4NE4 WATERSHED: 17060306
DIRECTIONS: TURN NORTH ON GRAVEL ROAD JUST WEST OF WHERE U.S. HWY 95 CROSSES OVER COLD SPRING CREEK ABOUT TWO MILES WEST OF CRAIGMONT. SITE IS IN LOOP OF ROAD ALONG WEST SLOPE CANYON.
GENDESC: A SMALL TRACT OF CANYON WALL PRAIRIE PRESERVED BETWEEN A LOOP OF THE ROAD AND A FENCELINE.

ELEV: 3750 SIZE: 2
EODATA: DAUBENMIRE'S FESTUCA IDAHOENSIS-ROSA SPP. ASSOCIATION. ABOUT THREE DOZEN INDIVIDUALS WERE FLOWERING WHEN LAST OBSERVED; MOST ARE ADJACENT TO SHRUB PATCH TO EAST OF LARGE PINE TREE; OTHERS ARE SCATTERED ABOUT THE VICINITY OF THE TREE.
COMMENTS: DAUBENMIRE 6429; HEIDEL BLM REPORT 1979.

MACODE1: CONTAINED1: MACODE2: CONTAINED2:
MACODE3: CONTAINED3: ADDLMAS:
MORELAND: MOREPROT: MOREMGMT: SITECODE:
SITENAME:
OWNER:
OWNERCOMM: PRIVATE
PROTCOMM:
MGMTCOMM:
MONITOR: MONITORNUM:
BESTSOURCE: CAICCO, STEVE

SOURCECODE: PNDCAI01IDUS PNDJOH01IDUS PNDHEI01IDUS

DATASENS: N BOUNDARIES: Y PHOTOS: N OWNERINFO: N
TRANSCRIBR: 84-10-18 SLC CDREV: Y MAPPER: 84-10-18 SLC QC: Y
UPDATE: 85-09-15 SLC

Table 2. Occurrence records for extant populations in Idaho.

11/07/88 Idaho Occurrence Record

ELEMENT OCCURRENCE CODE: PDCAR0U1S0.004
NAME: SILENE SPALDINGII
COMNAME: SPALDING'S CAMPION, SPALDING'S SILENE
MARGNUM: 2 TENTEN: 07,04 IDENT: Y EORANK: D
EORANKCOMM:
SURVEYDATE: LASTOBS: 1980-09-11 FIRSTOBS: 1980 GRANK: G2
SURVEYSITE: LAWYERS CREEK
SRANK: S1 STATE: ID COUNTYNAME: IDLEWI
QUADCODE: 4611624
QUADNAME: CRAIGMONT PRECISION: M
LAT: 461214 LONG: 1162510 S: 461100 N: 461300 E: 1162500 W: 1162530
TOWNRANGE: 033N001W SECTION: 14 MERIDIAN: BO
TRSCOMM: WATERSHED: 17060306031
DIRECTIONS: Lawyers Creek; pull-off road about 500 yds from the "slower traffic turn-off ahead" sign.

GENDESC: E & NE slope of 5-10%; clay/loam; at edge of CRDO/Alnus thicket.

ELEV: 3600 SIZE: 1
EODATA: only 2 individuals in 1980.

COMMENTS:

MACODE1: CONTAINED1: MACODE2: CONTAINED2:
MACODE3: CONTAINED3: ADDLMAS:
MORELAND: Y MOREPROT: Y MOREMGMT: ? SITECODE:
SITENAME:
OWNER: private
OWNERCOMM:
PROTCOMM:
MGMTCOMM:
MONITOR: MONITORNUM:
BESTSOURCE: Hurd, M. 1980. Threatened or Endangered Plant Report. Cottonwood RA, BLM.
SOURCECODE: U80HUR01IDUS

DATASENS: N BOUNDARIES: N PHOTOS: N OWNERINFO: N
TRANSCRIBR: 87-03-11 SLC CDREV: Y MAPPER: 87-03-11 SLC QC: Y
UPDATE: 88-11-07 PJP

Table 2. (cont.)

WASHINGTON NATURAL HERITAGE DATA SYSTEM
SILENE SPALDINGII RECORDS
DATA CURRENT AS OF NOVEMBER 1988

NAME: SILENE SPALDINGII 005 — TRS: T25N R45E S34
INDEX CODE: JN.L76 — QUADCODE: 4711751
OWNERSHIP CODE: PVTUUU — DATE: 198208 — QUADNAME: MICA PEAK 7.5
NUMBER OF OWNERS: . — SITE REVISITATION: — LATLONG: 473726N1170537W
NAME OF OWNER: — PRECISION: C — COUNTY: SPOKANE
FEDERAL STATUS: C2 — THREAT: — PROVINCE: CB
STATE STATUS: SPT — SIZE: . — SPECIAL STATUS:
STATE RANK: S2 — EO RANK: DC — PROTECTION STATUS: .
NAME OF AREA:
AGENCY SUBSECTION:
SOURCE OF LEAD: SCHULLER R & S EVANS 1982 (2 PREV COL 1978-1979)
GENERAL DESCRIPTION: AUG 04, 10 PLS (6 FLWRNG) OVER 40 ACRES, PARTIALLY DEGRADED SYMPHORICARPOS ALBUS FESTUCA IDAHOENSIS HABITAT TYPE, ALSO W LACTUCA SERRIOLA, SPIRAEA BETUIFOLIA, LUPINUS, AGROPYRON SPICATUM, SYAL, FEID, EPILOBIUM PANICULATUM, POSA 3, ROSA SP
DATA POINT: 2 — ELEVATION: — WDG REGION: 1 — DIRECTIONS: — PHOTOS: B — VERIFICATION: V
DATE OF ENTRY: 8241 — ASPECT: — DNR REGION: — BOUNDARIES: B — SURVEY: B — REFERENCES: A

NAME: SILENE SPALDINGII 005 — TRS: T25N R45E S35
INDEX CODE: JN.L76 — QUADCODE: 4711751
OWNERSHIP CODE: PVTUUU — DATE: 198208 — QUADNAME: MICA PEAK 7.5
NUMBER OF OWNERS: . — SITE REVISITATION: — LATLONG: 473726N1170537W
NAME OF OWNER: — PRECISION: C — COUNTY: SPOKANE
FEDERAL STATUS: C2 — THREAT: — PROVINCE: CB
STATE STATUS: SPT — SIZE: . — SPECIAL STATUS:
STATE RANK: S2 — EO RANK: DC — PROTECTION STATUS: .
NAME OF AREA:
AGENCY SUBSECTION:
SOURCE OF LEAD: SCHULLER R & S EVANS 1982 (2 PREV COL 1978-1979)
GENERAL DESCRIPTION: AUG 04, 10 PLS (6 FLWRNG) OVER 40 ACRES, PARTIALLY DEGRADED SYMPHORICARPOS ALBUS FESTUCA IDAHOENSIS HABITAT TYPE, ALSO W LACTUCA SERRIOLA, SPIRAEA BETUIFOLIA, LUPINUS, AGROPYRON SPICATUM, SYAL, FEID, EPILOBIUM PANICULATUM, POSA 3, ROSA SP
DATA POINT: 2 — ELEVATION: — WDG REGION: 1 — DIRECTIONS: — PHOTOS: B — VERIFICATION: V
DATE OF ENTRY: 8834 — ASPECT: — DNR REGION: — BOUNDARIES: B — SURVEY: B — REFERENCES: A

NAME: SILENE SPALDINGII 006 — TRS: T13N R44E S25
INDEX CODE: JN.L76 — QUADCODE: 4611752
OWNERSHIP CODE: ST UAA — DATE: 198108 — QUADNAME: COLTON 7.5
NUMBER OF OWNERS: 1 — SITE REVISITATION: 81E — LATLONG: 463502N1171238W
NAME OF OWNER: WSU — PRECISION: C — COUNTY: WHITMAN
FEDERAL STATUS: C2 — THREAT: — PROVINCE: CB
STATE STATUS: SPT — SIZE: . — SPECIAL STATUS: BSAPPS
STATE RANK: S2 — EO RANK: AB — PROTECTION STATUS: 2
NAME OF AREA: KRAMER PALOUSE BSA
AGENCY SUBSECTION:
SOURCE OF LEAD: BARRETT J 1981B MJAB036 001 (1 PREV COL, 1979)
GENERAL DESCRIPTION: AUG 30. KRAMER RESEARCH AREA. 147 PLS ON CA 30 ACRES. MOST COMMON IN NE PART, ESP ON A LOW RIDGE COMING OFF THE MAIN RIDGE. OCCURS ONLY ON THE N FACE OF THE MAIN RIDGE, WIDESPREAD ON THIS FACE. EL 2700-2800FT, SL 10-45DEG, ASP NW-N-E.
DATA POINT: 4 — ELEVATION: — WDG REGION: 1 — DIRECTIONS: — PHOTOS: — VERIFICATION: V
DATE OF ENTRY: 8150 — ASPECT: — DNR REGION: — BOUNDARIES: B — SURVEY: — REFERENCES: A

Table 3. Occurrence records for extant populations in Washington.

WASHINGTON NATURAL HERITAGE DATA SYSTEM
SILENE SPALDINGII RECORDS
DATA CURRENT AS OF NOVEMBER 1988

NAME: SILENE SPALDINGII 007
INDEX CODE: JN.L76
OWNERSHIP CODE: PVTUUU
NUMBER OF OWNERS: .
NAME OF OWNER:
FEDERAL STATUS: C2
STATE STATUS: SPT
STATE RANK: S2
NAME OF AREA:
AGENCY SUBSECTION:
SOURCE OF LEAD: BARRETT J 1981B MJAB244 002 (1 PREV COL 1979)
GENERAL DESCRIPTION: AUG 24. CA 1.5 MI SW OF LAMONT, JUST PAST JCT OF 2 GRAVEL RDS. ON SMALL PATCH OF VEG AMONG PLOWED LAND, ON HILLSIDE ADJ TO PLAIN. EL 2050, SL 30DEG, ASP NW. 23 PLTS ON 3 ACRES. SOIL BROWN, DEEP, FINE. VEG: ARTR 2/FEID IN FAIRLY GOOD SHAPE,
DATA POINT: 3
DATE OF ENTRY: 8204
DATE: 19810B
SITE REVISITATION: 81E
PRECISION: C
THREAT:
SIZE: .
EO RANK: CD
ELEVATION:
ASPECT:
MDG REGION: 1
DNR REGION:
DIRECTIONS:
BOUNDARIES:
TRS: T20N R39E S32
QUADCODE: 4711728
QUADNAME: LAMONT NW 7.5
LATLONG: 471047N1175550W
COUNTY: WHITMAN
PROVINCE: CB
SPECIAL STATUS:
PROTECTION STATUS: .
PHOTOS:
SURVEY:
VERIFICATION: V
REFERENCES: A

NAME: SILENE SPALDINGII 008
INDEX CODE: JN.L76
OWNERSHIP CODE: ST WSU
NUMBER OF OWNERS: .
NAME OF OWNER:
FEDERAL STATUS: C2
STATE STATUS: SPT
STATE RANK: S2
NAME OF AREA: CAMPUS PRAIRIE BSA
AGENCY SUBSECTION:
SOURCE OF LEAD: AUGENSTEIN, EJ (MJAB250,001)1983 (2 PREV COLL 1979,81)
GENERAL DESCRIPTION: WSU PRAIRIE STRIP. 33 PLTS SCATTERED OVER 3 ACRES, UP FROM 9 COUNTED IN 1981. IN W HALF OF STRIP, MOSTLY ON S SLOPE, BUT SOME ON TOP OF RIDGE. IN FEID/SYAL HT , MOSTLY IN GRASSIER AREAS. PLTS APPEAR HEALTHY: 1 W 5 STEMS. IN LATE BLOOM.
DATA POINT: 11
DATE OF ENTRY: 8528
DATE: 19830830
SITE REVISITATION: 81E83E
PRECISION: C
THREAT:
SIZE: .
EO RANK: C
ELEVATION:
ASPECT:
MDG REGION: 1
DNR REGION:
DIRECTIONS:
BOUNDARIES:
TRS: T15N R45E S33 SEOFSE
QUADCODE: 4611762
QUADNAME: PULLMAN 7.5
LATLONG: 464420N1170820W
COUNTY: WHITMAN
PROVINCE: CB
SPECIAL STATUS: BSAPRS
PROTECTION STATUS: 2
PHOTOS:
SURVEY:
VERIFICATION: V
REFERENCES: A

NAME: SILENE SPALDINGII 009
INDEX CODE: JN.L76
OWNERSHIP CODE: PVTPIN
NUMBER OF OWNERS: .
NAME OF OWNER: NYGREEN,EATON
FEDERAL STATUS: C2
STATE STATUS: SPT
STATE RANK: S2
NAME OF AREA:
AGENCY SUBSECTION:
SOURCE OF LEAD: BARRETT J 1981B MJAB041,010 (1 PREV COL 1980)
GENERAL DESCRIPTION: GEN VERY SPARSE, EXCEPT FOR A CLUSTER OF 9 PLS. 21 PLS TOTAL ON CA 50 ACRES. UPPER PART OF WAWAWAI CYN, S SIDE. FROM 0.25MI TO 1MI SW OF RD JCT. O N N TO NW-FACING SL ABOVE THE CYN RD. EL 2300-2600FT, SL 15-45DEG. (SEE GMF-03 SITE REVIS)
DATA POINT: 15
DATE OF ENTRY: 8204
DATE: 19810830
SITE REVISITATION: 81E83?
PRECISION: C
THREAT:
SIZE: .
EO RANK: DC
ELEVATION:
ASPECT:
MDG REGION: 1
DNR REGION:
DIRECTIONS:
BOUNDARIES: B
TRS: T13N R44E S16
QUADCODE: 4611753
QUADNAME: GRANITE POINT 7.5
LATLONG: 463637N1171637W
COUNTY: WHITMAN
PROVINCE: CB
SPECIAL STATUS:
PROTECTION STATUS: .
PHOTOS:
SURVEY:
VERIFICATION: V
REFERENCES: A

Table 3. (cont.)

WASHINGTON NATURAL HERITAGE DATA SYSTEM
SILENE SPALDINGII RECORDS
DATA CURRENT AS OF NOVEMBER 1988

NAME: SILENE SPALDINGII 010
TRS: T15N R42E S35 SE
INDEX CODE: JN.L76
QUADCODE: 4611764
OWNERSHIP CODE: PVTPIN
DATE: 19830904
QUADNAME: ALMOTA 7.5
NUMBER OF OWNERS: 1
SITE REVISITATION: 81E83E
LATLONG: 464420N1172904W
NAME OF OWNER: AESCHLIMAN, ARNOLD
PRECISION: C
COUNTY: WHITMAN
FEDERAL STATUS: C2
THREAT:
PROVINCE: CB
STATE STATUS: SPT
SIZE: .
SPECIAL STATUS: FRS
STATE RANK: S2
EO RANK: C
PROTECTION STATUS: .
NAME OF AREA:
AGENCY SUBSECTION:
SOURCE OF LEAD: AUGENSTEIN, EJ (MJAB336,001 & MBLH054) 1983 (2 PREV COLL, 1980,81)
GENERAL DESCRIPTION: SPAULDING RD, CA 50 PLTS IN OPEN FEID/SYAL BETWEEN CRDO THICKETS, W AGSP,KOCR, ROMO, BASA, GEVI, ACMI, GENTIANA AFFINIS, GEUM TRIFLORUM, HAPLOPAPPUS LIATRIFORM IS, ASTER JESSICAE. VEG UNGRAZED AT PRESENT. THREAT: SPREAD OF CRDO; HERBICIDE
DATA POINT: 31
ELEVATION:
MDG REGION: 1
DIRECTIONS:
PHOTOS:
VERIFICATION: V
DATE OF ENTRY: 8528
ASPECT:
DNR REGION:
BOUNDARIES:
SURVEY:
REFERENCES: A

NAME: SILENE SPALDINGII 011
TRS: T13N R45E S32 NEQFNW
INDEX CODE: JN.L76
QUADCODE: 4611752
OWNERSHIP CODE: PVTPIN
DATE: 19830904
QUADNAME: COLTON 7.5
NUMBER OF OWNERS: 1
SITE REVISITATION: 81E83E
LATLONG: 463415N1171049W
NAME OF OWNER: SCHULTHEIS, GENE
PRECISION: C
COUNTY: WHITMAN
FEDERAL STATUS: C2
THREAT:
PROVINCE: CB
STATE STATUS: SPT
SIZE: .
SPECIAL STATUS: REG
STATE RANK: S2
EO RANK: C
PROTECTION STATUS: 2
NAME OF AREA:
AGENCY SUBSECTION:
SOURCE OF LEAD: AUGENSTEIN, EJ(MBLH057,084) 1983 (KEMP FARM RS 75-6)
GENERAL DESCRIPTION: .25 MI LONG EYEBROW OF NATIVE VEGETATION, S OF HAWAHAI RD. 51 PLTS COUNTED, GROWING ON LOWER PTS OF 2 CONVEX SLOPES(WHERE MORE MOIST).WITH FEID, ROSA, SYAL,PRVI LUPINUS, GENTIAN, BRTE IN PATCHES. SLIGHT DAMAGE FROM HERBICIDE DRIFT ON W END.
DATA POINT: 15
ELEVATION:
MDG REGION: 1
DIRECTIONS:
PHOTOS:
VERIFICATION: V
DATE OF ENTRY: 8528
ASPECT:
DNR REGION:
BOUNDARIES:
SURVEY:
REFERENCES: A

NAME: SILENE SPALDINGII 012
TRS: T12N R45E S15
INDEX CODE: JN.L76
QUADCODE: 4611752
OWNERSHIP CODE: PVTUUU
DATE: 198108
QUADNAME: COLTON 7.5
NUMBER OF OWNERS: .
SITE REVISITATION: 81E
LATLONG: 463137N1170952W
NAME OF OWNER:
PRECISION: C
COUNTY: WHITMAN
FEDERAL STATUS: C2
THREAT:
PROVINCE: CB
STATE STATUS: SPT
SIZE: .
SPECIAL STATUS: REG
STATE RANK: S2
EO RANK: C
PROTECTION STATUS: .
NAME OF AREA:
AGENCY SUBSECTION:
SOURCE OF LEAD: BARRETT J 1981B MJAB038 004 (1 PREV COL, 1980)
GENERAL DESCRIPTION: AUG 31. UPPER STEPTOE CYN DRAINAGE, JUST OFF THE SCHLEE RD, AROUND LARGE BEND IN ROAD, S SIDE OF RD, ON SLOPE. 34 PLS ON CA 10 ACRES. RANGE EXTENDS CA 0.4MI OF RD. EL 2600-2700FT, ASP NE TO NW, SL 20-35DEG. VEG: CRDO THICKETS PRESENT. SISP2
DATA POINT: 16
ELEVATION:
MDG REGION: 1
DIRECTIONS:
PHOTOS:
VERIFICATION: V
DATE OF ENTRY: 8150
ASPECT:
DNR REGION:
BOUNDARIES: B
SURVEY:
REFERENCES: A

Table 3. (cont.)

WASHINGTON NATURAL HERITAGE DATA SYSTEM
SILENE SPALDINGII RECORDS
DATA CURRENT AS OF NOVEMBER 1988

NAME: SILENE SPALDINGII 013
INDEX CODE: JN.L76
OWNERSHIP CODE: PVTUUU
NUMBER OF OWNERS: .
NAME OF OWNER:
FEDERAL STATUS: C2
STATE STATUS: SPT
STATE RANK: S2
NAME OF AREA:
AGENCY SUBSECTION:
SOURCE OF LEAD: BARRETT J 1981B MJAB038 003 (1 PREV COL,1980)
GENERAL DESCRIPTION: AUG 31. UPPER STEPTOE CYN, JUST NNE OF THE NESTERBANK RANCH, ON E SLOPE OF CYN. 12 PLS ON 3 ACRES, STRIP OF VEG JUST BELOW WHEAT FIELD. RANGE EXTENDS CA 0.2MI. EL CA 2700 FT, ASP W, SL 30DEG. VEG: CRDO THICKETS COMMON. SISP2 OCCURS IN FEID-
DATA POINT: 13
DATE OF ENTRY: 8150
DATE: 198108
SITE REVISITATION: 81E
PRECISION: C
THREAT:
SIZE: .
EO RANK: DC
ELEVATION:
ASPECT:
WDG REGION: 1
DNR REGION:
DIRECTIONS:
BOUNDARIES: B
TRS: T12N R45E S09
QUADCODE: 4611752
QUADNAME: COLTON 7.5
LATLONG: 463210N1171010W
COUNTY: WHITMAN
PROVINCE: CB
SPECIAL STATUS:
PROTECTION STATUS: .
PHOTOS:
SURVEY:
VERIFICATION: V
REFERENCES: A

NAME: SILENE SPALDINGII 014
INDEX CODE: JN.L76
OWNERSHIP CODE: PVTPIN
NUMBER OF OWNERS: .
NAME OF OWNER:
FEDERAL STATUS: C2
STATE STATUS: SPT
STATE RANK: S2
NAME OF AREA:
AGENCY SUBSECTION:
SOURCE OF LEAD: AUSENSTEIN, EJ (MJAB177,002) 1983 (1 PREV COLL, 1980)
GENERAL DESCRIPTION: PITTS CEMETARY. 29 PLS SEEN IN SE & N PTS OF AREA, UP FROM 12 IN 1981. PLS SCATT ERED, 1-2 STEMS EA, SEEM HEALTHY. FEID-SYAL HT, W INTRO SHRUBS & TREES,&SOME AREAS QUITE WEEDY. SISP MOSTLY OCCURS IN NON-WEEDY VEG,BUT 1 GROUP IN INTRO EUPH
DATA POINT: 25
DATE OF ENTRY: 8528
DATE: 19830831
SITE REVISITATION: 81E83E
PRECISION: C
THREAT:
SIZE: .
EO RANK: C
ELEVATION:
ASPECT:
WDG REGION: 1
DNR REGION:
DIRECTIONS: D
BOUNDARIES: B
TRS: T16N R45E S32 NEQFNE
QUADCODE: 4611772
QUADNAME: ALBION 7.5
LATLONG: 465013N1170935W
COUNTY: WHITMAN
PROVINCE: CB
SPECIAL STATUS: REG
PROTECTION STATUS: 2
PHOTOS:
SURVEY:
VERIFICATION: V
REFERENCES: A

NAME: SILENE SPALDINGII 015
INDEX CODE: JN.L76
OWNERSHIP CODE: PVTUUU
NUMBER OF OWNERS: .
NAME OF OWNER:
FEDERAL STATUS: C2
STATE STATUS: SPT
STATE RANK: S2
NAME OF AREA:
AGENCY SUBSECTION:
SOURCE OF LEAD: BARRETT J 1981B MJAB244 001 (1 PREV COL, 1980)
GENERAL DESCRIPTION: AUG 24. 15 PLS , CA 3 ACRES. ON HILLSIDE E OF BERRY L, 2MI SW OF LAMONT. PLAIN TO THE E IS WEEDY, UNCULT; HILLTOP CULT. EL 2100-2200FT, ASP W-NW, SL 30DEG. SLOPE HAS MOSAIC OF WEEDY VEG AND GOOD VEG. SILENE GROWS MOSTLY IN GOOD VEG,
DATA POINT: 5
DATE OF ENTRY: 8150
DATE: 198108
SITE REVISITATION: 81E
PRECISION: C
THREAT:
SIZE: .
EO RANK: CD
ELEVATION:
ASPECT:
WDG REGION: 1
DNR REGION:
DIRECTIONS:
BOUNDARIES: B
TRS: T15N R39E S06
QUADCODE: 4711728
QUADNAME: LAMONT NW 7.5
LATLONG: 471032N1175630W
COUNTY: WHITMAN
PROVINCE: CB
SPECIAL STATUS:
PROTECTION STATUS: .
PHOTOS:
SURVEY:
VERIFICATION: V
REFERENCES: A

Table 3. (cont.)

WASHINGTON NATURAL HERITAGE DATA SYSTEM
SILENE SPALDINGII RECORDS
DATA CURRENT AS OF NOVEMBER 1988

NAME: SILENE SPALDINGII 016
INDEX CODE: JN.L76
OWNERSHIP CODE: DNRPVTSP
NUMBER OF OWNERS: 2
NAME OF OWNER: E HARLAND HOOD
FEDERAL STATUS: C2
STATE STATUS: SPT
STATE RANK: S2
NAME OF AREA:
AGENCY SUBSECTION:
SOURCE OF LEAD: KRATZ A GOOSENECK STEPPE
GENERAL DESCRIPTION: ON STEEP N-FACING SLOPE OVERLOOKING CONNER GULCH, AGROPYRON SPICATUM-FESTUCA IDAHOENSIS HT. GRAZED: HYPERICUM PERFOLIATUM,BROMUS TECTORUM,SISYNDRIUM ALTISSIMUM,EPILOBIUM PANICULATUM. NO HAPLOPAPPUS LIATRIFORMIS. HEUCHERA,CETR. SEP01
DATA POINT: 8
DATE OF ENTRY: 8115
ELEVATION:
ASPECT:
DATE: 198009
SITE REVISITATION:
PRECISION: C
THREAT:
SIZE: .
EO RANK: BC
WDG REGION: 1
DNR REGION:
DIRECTIONS: D
BOUNDARIES: B
TRS: T10N R44E S15
QUADCODE: 4611733
QUADNAME: POTTER HILL 7.5
LATLONG: 462022N1171725W
COUNTY: ASOTIN
PROVINCE: CB
SPECIAL STATUS: REG
PROTECTION STATUS: 2
PHOTOS: P
SURVEY: E
VERIFICATION: V
REFERENCES:

NAME: SILENE SPALDINGII 017
INDEX CODE: JN.L76
OWNERSHIP CODE: DNRPVTSP
NUMBER OF OWNERS: 2
NAME OF OWNER: E HARLAND HOOD
FEDERAL STATUS: C2
STATE STATUS: SPT
STATE RANK: S2
NAME OF AREA:
AGENCY SUBSECTION:
SOURCE OF LEAD: KRATZ A GOOSENECK STEPPE
GENERAL DESCRIPTION: ON STEEP N-FACING SLOPE OVERLOOKING CONNER GULCH, APPEARS TO BE MUCH HABITAT FOR S SPALDINGII BCSE OF LG AREA OF STEEP N SLOPES, ASPECT N-SLIGHTLY NW, MOST CONNO N WITH FESTUCA (& GEUM HEUCHERA BESSEYA HIERACIUM), ALSO OCCURS WHERE... SEP01
DATA POINT: 9
DATE OF ENTRY: 8115
ELEVATION:
ASPECT:
DATE: 198009
SITE REVISITATION:
PRECISION: C
THREAT:
SIZE: .
EO RANK: BC
WDG REGION: 1
DNR REGION:
DIRECTIONS: D
BOUNDARIES: B
TRS: T10N R44E S21
QUADCODE: 4611733
QUADNAME: POTTER HILL 7.5
LATLONG: 462013N1171752W
COUNTY: ASOTIN
PROVINCE: CB
SPECIAL STATUS: REG
PROTECTION STATUS: 2
PHOTOS: P
SURVEY: E
VERIFICATION: V
REFERENCES:

NAME: SILENE SPALDINGII 018
INDEX CODE: JN.L76
OWNERSHIP CODE: ST UAA
NUMBER OF OWNERS: 1
NAME OF OWNER: WSU
FEDERAL STATUS: C2
STATE STATUS: SPT
STATE RANK: S2
NAME OF AREA: SMOOT HILL BSA
AGENCY SUBSECTION:
SOURCE OF LEAD: BARRETT J 1981B MJAB177 003
GENERAL DESCRIPTION: AUG 26. SMOOT HILL BIOLOGICAL PRESERVE, N-SLOPE OF SMOOT HILL, ABOVE FOURMILE CR, NEAR JCT OF FOURMILE CR AND ROSE CR. 4 PLTS IN SMALL GROUP, SEVERAL SQ METER S. EL 2500FT, SL 30DEG, ASP N. SOIL DEEP, DARK, FINE, 0.5IN LITTER. VEG: SOME-
DATA POINT: 28
DATE OF ENTRY: 8144
ELEVATION:
ASPECT:
DATE: 198108
SITE REVISITATION:
PRECISION: C
THREAT:
SIZE: .
EO RANK: BC
WDG REGION: 1
DNR REGION:
DIRECTIONS:
BOUNDARIES:
TRS: T16N R44E S35
QUADCODE: 4611772
QUADNAME: ALBION 7.5
LATLONG: 464942N1171322W
COUNTY: WHITMAN
PROVINCE: CB
SPECIAL STATUS: BSAPRS
PROTECTION STATUS: 2
PHOTOS:
SURVEY:
VERIFICATION: V
REFERENCES: A

Table 3. (cont.)

WASHINGTON NATURAL HERITAGE DATA SYSTEM
SILENE SPALDINGII RECORDS
DATA CURRENT AS OF NOVEMBER 1988

NAME: SILENE SPALDINGII 019
INDEX CODE: JN.L76
OWNERSHIP CODE: PVTUUU
NUMBER OF OWNERS: .
NAME OF OWNER:
FEDERAL STATUS: C2
STATE STATUS: SPT
STATE RANK: S2
NAME OF AREA:
AGENCY SUBSECTION:
SOURCE OF LEAD: BARRETT J 1981B MJAB250,005
GENERAL DESCRIPTION: AUG 27. 9 PLTS ON 0.5 ACRES. ON LOW SLOPE JUST ABOVE THE JOHNSON-PULLMAN RD, ON VERY SMALL PATCH OF PRAIRIE VEG, NEXT TO GRAVEL PIT. CA 3MI S OF PULLMAN. SL 20 DEG, ASP NE, EL 2440FT. SOIL MOD DEEP, OVER BASALT, DARK, FINE. FEID-SYAL HT,...
DATA POINT: 27
DATE OF ENTRY: 8217
ELEVATION:
ASPECT:
DATE: 198108
SITE REVISITATION:
PRECISION: C
THREAT:
SIZE: .
EO RANK: DC
MDG REGION: 2
DNR REGION:
DIRECTIONS:
BOUNDARIES:
TRS: T14N R45E S21
QUADCODE: 4611762
QUADNAME: PULLMAN 7.5
LATLONG: 464102N1170823W
COUNTY: WHITMAN
PROVINCE: CB
SPECIAL STATUS:
PROTECTION STATUS: .
PHOTOS:
SURVEY:
VERIFICATION: V
REFERENCES: A

Table 3. (cont.)

Oregon Occurrence Record

NAME: SILENE SPALDINGII
COMMON NAME: SPALDING'S CAMPION
EO-CODE: PDCAR0U150.002 LAST OBS: 1983-06-28
COUNTY NAMES: UMAT FIRST OBS: 1983
T-R-S: 002S030E 36 LAT: 453032
TRS COMM: SE4SE4 LONG: 1190132
QUAD NAMES: GURDANE SIZE: 1
FEDERAL STAT: C2 STATE STAT: ELEVATION: 3220
COMMUNITY: ORCUSGASF0A1 PHYS PROV: 08
ID RANK/COMM: :
DIRECTIONS: DARR FLAT. 7 MI. S OF JUNCTION OF 395 & 74 (NYE JUNCTION), ON W SIDE OF 395. JUST W OF ROAD LEADING IN THE SW SIDE OF DARR FLAT.
DESCRIPTION: NORTH FACING HILLSIDE, DOMINATED BY FEID, HICY, KOCR IN EXCELLENT CONDITION. A FEW AGSP & POSA2 PLANTS PRESENT ON SLOPE.
EO DATA: 8 PLANTS OBSERVED IN FLOWER. PLANTS APPEARED HEALTHY, BUT NO OTHER PLANTS WERE LOCATED. HAS SMALL WHITE PETALS, BUT THESE WERE SLIGHTLY LARGER THAN TYPICAL S. SPALDINGII (SMALLER THAN S. OREGONA). BLOOMED EARLIER THAN IS TYPICAL.
COMMENTS: K. CHAMBERS ANNOTATED COLLECTION AT OSC (#6288301-PART OF 1. PLANT). TO S. SPALDINGII. KAGAN FEELS THIS MAY BE A HYBRID.
OWNER: CUNNINGHAM SHEEP COMPANY (PVT)
OWNER COMM:
PROT COMM: SITE IS HIGH PRIORITY FOR TNC PROTECTION
MANAGE COMM:
BEST SOURCE: J. KAGAN, TNC FIELD SURVEY. COLLECTION #: 6288301, OSC

Table 4. Populations known or assumed extirpated.

Washington Occurrence Record

WASHINGTON NATURAL HERITAGE DATA SYSTEM
SILENE SPALDINGII RECORDS
DATA CURRENT AS OF NOVEMBER 1988

NAME: SILENE SPALDINGII 002
INDEX CODE: JN.L76
OWNERSHIP CODE: PVTUAAPS
NUMBER OF OWNERS: .
NAME OF OWNER: WSU
FEDERAL STATUS: C2
STATE STATUS: SPT
STATE RANK: S2
NAME OF AREA:
AGENCY SUBSECTION:
SOURCE OF LEAD: DAUBENMIRE RE 5118
GENERAL DESCRIPTION: W EDGE PULLMAN IN THICKET OF CRATAGEUS:SYMPHORICARPUS.

DATE: 195109
SITE REVISITATION: 81C
PRECISION: G
THREAT:
SIZE: .
EO RANK:

TRS: T14N R45E S05
QUADCODE: 4611762
QUADNAME: PULLMAN 7.5
LATLONG: 464350N1171035W
COUNTY: WHITMAN
PROVINCE: CB
SPECIAL STATUS: UAA
PROTECTION STATUS: 3

200654 WS

DATA POINT: 3
DATE OF ENTRY: 7940
ELEVATION: SEP
ASPECT:
WDG REGION: 1
DNR REGION:
DIRECTIONS:
BOUNDARIES:
PHOTOS:
SURVEY:
VERIFICATION: V
REFERENCES:

Table 4. (cont.)

Montana

ELEMENT OCCURRENCE RECORD

EOCODE: PDCAR0U1S0.006
NAME: SILENE SPALDINGII
COMNAME: SPALDING CAMPION
MARGNUM: 2 TENTEN: 7,1 IDENT: Y EORANK:
SURVEYSITE: COLUMBIA FALLS
EORANKCOMM:
SURVEYDATE: 1894-08-10 LASTOBS: 1894-08-10 FIRSTOBS: 1894 GRANK: G2
SRANK: S1 STATE: MT COUNTYNAME: MTFLAT
QUADCODE: 4811432 4811442
QUADNAME: COLUMBIA FALLS S., COLUMBIA FALLS N. PRECISION: G
LAT: 482230 LONG: 1141020 S: 0 N: 0 E: 0 W: 0
TOWNRANGE: 030N020W SECTION: 09 MERIDIAN: PR TRSCOMM: SW4

PHYSPROV: NR WATERSHED: 17010208 RIVERREACH: 17010208001600.00
DIRECTIONS: COLUMBIA FALLS.

GENDESC:

ELEV: 3000 SIZE: 0
EODATA:

COMMENTS: OLD COLLECTION, NOT RELOCATED; RM SPECIMEN VERIFIED BY B. MAGUIRE & C.L. HITCHCOCK, 1942-03-24.
MACODE1: PRIVATEOWNMTUS CONTAINED1: ? MACODE2: CONTAINED2:

MACODE3: CONTAINED3: ADLMAS: MORELAN: MOREPROT:
MOREMGMT: Z SITECODE:
SITENAME:
OWNER:
OWNERCOMM:
PROTCOMM:
MGMTCOMM:
MONITOR: MONITORNUM: -
BESTSOURCE: WILLIAMS, R.S. (995), 1894, MONTU, RM(24349).

SOURCECODE: S94WILUMMTUS S94WILRMMTUS

DATASENS: BOUNDARIES: N PHOTOS: N OWNERINFO: N
TRANSCRIBR: 86-02-06 JSS CDREV: Y MAPPER: 86-02-06 JSS QC: Y
UPDATE: 86-02-24 LWS

Table 5. Historically known poulations where current status is not known.

ELEMENT OCCURRENCE CODE: PDCAR0U1S0.002
NAME: SILENE SPALDINGII
COMNAME: SPALDING'S CAMPION, SPALDING'S SILENE
MARGNUM: 1 TENTEN: IDENT: Y EORANK:
EORANKCOMM:
SURVEYDATE: LASTOBS: FIRSTOBS: GRANK: G2
SURVEYSITE: DAUBIE'S STAND 162
SRANK: S1 STATE: ID COUNTYNAME: IDLEWI
QUADCODE: 4611626
QUADNAME: WINCHESTER WEST PRECISION: M
LAT: 461435 LONG: 1163803 S: 461400 N: 461530 E: 1163700 W: 1163830
TOWNRANGE: 034N002W SECTION: 31 MERIDIAN: BO
TRSCOMM: WATERSHED: 17060306
DIRECTIONS: SOMEWHERE NEAR TOWN OF WINCHESTER, ABOUT 2 MILES WEST OF U.S. HWY 95.

GENDESC: NO DATA

ELEV: 4000 SIZE: 0
EODATA: DAUBENMIRES'S FESTUCA IDAHOENSIS-ROSA SPP. ASSOCIATION. STAND 162: PRESENT WITH 2% FREQUENCY.

COMMENTS: TABLE B-5 IN B70DAU01.

MACODE1: CONTAINED1: MACODE2: CONTAINED2:
MACODE3: CONTAINED3: ADDLMAS:
MORELAND: MOREPROT: MOREMGMT: SITECODE:
SITENAME:
OWNER:
OWNERCOMM: PRIVATE, PERHAPS NEZ PERCE INDIAN RESERVATION
PROTCOMM:
MGMTCOMM:
MONITOR: MONITORNUM:
BESTSOURCE: Daubenmire, R. 1970. Steppe Vegetation of Washington. Exp Tech Bull 62.
SOURCECODE: B70DAU01IDUS PNDCAI01IDUS

DATASENS: N BOUNDARIES: N PHOTOS: N OWNERINFO: N
TRANSCRIBR: 84-10-18 SLC CDREV: Y MAPPER: 84-10-18 SLC QC: Y
UPDATE: 88-11-07 PJP

Table 5. (cont.)

NAME: SILENE SPALDINGII 003
INDEX CODE: JN.L76
OWNERSHIP CODE: PVTUUU
NUMBER OF OWNERS: .
NAME OF OWNER:
FEDERAL STATUS: C2
STATE STATUS: SPT
STATE RANK: S2
NAME OF AREA:
AGENCY SUBSECTION:
SOURCE OF LEAD: EASTWOOD A H ST JOHN 13222
GENERAL DESCRIPTION: HILL S WINONA.

DATE: 192506
SITE REVISITATION:
PRECISION: G
THREAT:
SIZE: .
EO RANK:

TRS: T17N R40E S32
QUADCODE: 4611737
QUADNAME: WINONA 7.5
LATLONG: 465505N1174800W
COUNTY: WHITMAN
PROVINCE: CB
SPECIAL STATUS:
PROTECTION STATUS: .

48799 WS

DATA POINT: 2
DATE OF ENTRY: 7940
ELEVATION: JUN
ASPECT:
WDG REGION: 1
DNR REGION:
DIRECTIONS:
BOUNDARIES:
PHOTOS:
SURVEY:
VERIFICATION: V
REFERENCES:

NAME: SILENE SPALDINGII 004
INDEX CODE: JN.L76
OWNERSHIP CODE: PVTUUU
NUMBER OF OWNERS: .
NAME OF OWNER:
FEDERAL STATUS: C2
STATE STATUS: SPT
STATE RANK: S2
NAME OF AREA:
AGENCY SUBSECTION:
SOURCE OF LEAD: TUCKER
GENERAL DESCRIPTION: TUCKER PRAIRIE, 12MI W CHENEY.

DATE: 1900
SITE REVISITATION:
PRECISION: G
THREAT:
SIZE: .
EO RANK:

TRS: T24N R40E S28
QUADCODE: 4711757
QUADNAME: WAUKON 7.5
LATLONG: 473255N1174625W
COUNTY: SPOKANE
PROVINCE: CB
SPECIAL STATUS:
PROTECTION STATUS: .

9534 WCW

DATA POINT: 1
DATE OF ENTRY: 7940
ELEVATION: NONE
ASPECT:
WDG REGION: 1
DNR REGION:
DIRECTIONS:
BOUNDARIES:
PHOTOS:
SURVEY:
VERIFICATION: V
REFERENCES:

Table 5. (cont.)

c. **Washington:** Sites (003) and (004) are old records that have not been revisited; their current status is not known (p. 39).

4. **Locations not yet investigated believed likely to support additional natural populations.** A majority of the appropriate habitat in Montana has been surveyed for this species. However, a study of population sizes (see Appendix A, p. 68, (Lesica, 1988) and the 1988 surveys have revealed much-reduced plant numbers for several known populations, and no plants apparent at some of the small subpopulations. This trend may be due to natural fluctuations in populations of this plant, and/or to the current drought conditions. It is possible that sites were not found during 1988 owing to these conditions.

5. **Reports having ambiguous or incomplete locality information:** See Table 6, pp. 41-42, for detailed occurrence records on the following sites.

   a. **Montana:** The Niarada (007) site has never been relocated. The specimen has been verified but the site description on the label does not describe a habitat where S. spaldingii is usually found in Montana. This label is believed to be incorrect, and the site may actually be one of the known populations in the vicinity of Niarada.

   b. **Oregon:** Collections were first made at the Wallowa Lake site (001) in 1898 by Cusick. In 1980, Bonnie Heidel recorded the presence of this species and took photographs. No collection was made at the time (Bonnie Heidel, pers. comm.). Subsequently, this area was searched but the population was not relocated (Jimmy Kagan, pers. comm.).

   It is also possible that this species is hybridizing in this area, as collections reveal certain morphological disparities with descriptions in the literature (Jimmy Kagan, pers. comm.). The status of this population is currently in question.

Montana
ELEMENT OCCURRENCE RECORD

EOCODE: PDCARØU1SØ.ØØ7
NAME: SILENE SPALDINGII
COMNAME: SPALDING CAMPION
MARGNUM: 1 TENTEN: 2,9 IDENT: Y EORANK:
SURVEYSITE: NIARADA
EORANKCOMM:
SURVEYDATE: 1974-Ø6-26 LASTOBS: 1974-Ø6-26 FIRSTOBS: 1974 GRANK: G2
SRANK: S1 STATE: MT COUNTYNAME: MTSAND
QUADCODE: 4711475
QUADNAME: NIARADA PRECISION: G
LAT: 474556 LONG: 1143632 S: Ø N: Ø E: Ø W: Ø
TOWNRANGE: Ø23NØ24W SECTION: 12 MERIDIAN: PR TRSCOMM:

PHYSPROV: NR WATERSHED: 17Ø1Ø212 RIVERREACH: 17Ø1Ø212Ø6ØØØ.ØØ
DIRECTIONS: FLATHEAD INDIAN RESERVATION, 11 MI. N. OF HOT SPRINGS JCT.
ON HWY. 28, CA. 40 AIR MI. S-SW OF KALISPELL.

GENDESC: BASIC SILTY CLAY SOIL; MIXED ARTEMISIA GRASSLAND, WITH STIPA
COMATA THE DOMINANT GRASS.

ELEV: 2850 SIZE: Ø
EODATA: UNKNOWN; THIS LOCATION HAS BEEN SEARCHED FOR, BUT NOT FOUND;
ACCORDING TO P. LESICA, SPECIMEN MAY BE MISLABELED, SINCE
HABITAT DESCRIPTION IS UNUSUAL FOR THE SPECIES.

COMMENTS: SPECIMEN VERIFIED BY P.F. STICKNEY, 1979.

MACODE1: FBIIRFLAT1MTUS CONTAINED1: Y MACODE2: CONTAINED2:

MACODE3: CONTAINED3: ADLMAS: MORELAN: MOREPROT:
MOREMGMT: Z SITECODE:
SITENAME:
OWNER:
OWNERCOMM:
PROTCOMM:
MGMTCOMM:
MONITOR: MONITORNUM: -
BESTSOURCE: LAN, D. (74-63), 1974, MONTU (Ø76172), MISSOULA, MT.

SOURCECODE: S74LANUMMTUS PNDLESØ1MTUS

DATASENS: BOUNDARIES: PHOTOS: N OWNERINFO: N
TRANSCRIBR: 86-Ø3-12 JSS CDREV: Y MAPPER: 86-Ø3-12 JSS QC: Y
UPDATE: 86-Ø4-Ø4 LWS

Table 6. Reports having ambiguous or incomplete locality information.

Oregon Occurrence Record

```
        NAME: SILENE SPALDINGII
 COMMON NAME: SPALDING'S CAMPION
     EO-CODE: PDCAR0U1S0.001                          LAST OBS: 1980
 COUNTY NAMES: WALL                                   FIRST OBS: 1886
        T-R-S: 002S04E  32                                LAT: 452035
     TRS COMM: SW4 SE4 S32                               LONG: 1171300
   QUAD NAMES: JOSEPH 15                                 SIZE:          0
FEDERAL STAT: C2             STATE STAT:              ELEVATION:  4600
    COMMUNITY:                                        DAYS PROV: 05
EO-RANK/COMM:     :
  DIRECTIONS: NE OF WALLOWA LAKE; DRY LANDS OF THE WALLOWA REGION; WALLOWA
               VALLEY AND IMNAHA; WALLOWA VALLEY NEAR THE LAKE.

 DESCRIPTION: GRAZED HILLSIDE WITH FESTUCA, AGROPYRON.


     EO DATA: BONNIE HEIDEL 1980 SIGHTING NE OF WALLOWA LAKE. OTHER COLLEC
              TIONS IN THIS GENERAL AREA INCLUDE CUSICK 8/28/98 ORE,
              CUSICK 8/22/98 OSC #2084, CUSICK 8/86 NEV #970.

    COMMENTS: HEIDEL SIGHTING AT WALLOWA LAKE IS ONE OF ONLY TWO RECENT ON
              ES IN OREGON FOR SPECIES. MORE SEARCHING NEEDED NEAR LAKE.
       OWNER: PRIVATE
  OWNER COMM: EXACT LOCATIONS OF OLDER COLLECTIONS BY CUSICK UNKNOWN.
   PROT COMM:
MANAGE COMM:
 BEST SOURCE: HEIDEL B. 1980. USFWS END SPECIES STATUS REPORT; HEIDEL NOW
              WORKS WITH NORTH DAKOTA NATURAL HERITAGE PROGRAM.
```

Table 6. (cont.)

6. **Locations known or suspected to be erroneous reports:** See Table 7, pp. 44-46, for detailed occurrence records and information on the following site.

   a. **Idaho:** Although not yet verified, the Rock Flats (003) site is believed to actually be located near Macall in Adams County, Washington. The original specimen label appears to have been misinterpreted.

C. **Biogeographical and phylogenetic history:** Silene spaldingii is associated with Palouse prairie. The soils supporting these communities were deposited approximately 15,000 years ago through multiple flood releases of Glacial Lake Missoula and Glacial Lake Kootenai (Alt and Hyndman, 1986). Soils and debris were deposited from Montana across Idaho and into Washington and Oregon. It is possible that this species evolved after the soils were deposited or it may have migrated into these areas after the waters had receded.

6. **General environment and habitat description.**

A. **Concise statement of general environment and habitat:** Silene spaldingii is restricted to Festuca idahoensis habitat types and phases throughout its range (Heidel, 1980). These areas are also often referred to as Palouse prairie. Populations in Montana occur most often on north- to east-facing slopes, in or along small drainages (without running water) or in swales. Soils are silty loams, moderately deep and sometimes gravelly. These sites often occur along the lower treeline, or near scattered trees. The vegetation is dominated by grasses (Festuca scabrella (rough fescue) and Festuca idahoensis (Idaho fescue)) with scattered shrubs (Rosa woodsii (woods rose)). In Montana, S. spaldingii occurs at elevations of 2,700-3,500 feet. The slopes where it occurs are likely to catch and maintain snow throughout the winter.

B. **Physical characteristics.**

   1. **Climate.**

      a. **Koppen climate classification:** Type Dfb, a Canadian climate with snowy winters and moderately warm summers, with needle-leaved trees in the north (Visher, 1954).

ELEMENT OCCURRENCE CODE: PDCAR0U1S0.003
NAME: SILENE SPALDINGII
COMNAME: SPALDING'S CAMPION, SPALDING'S SILENE
MARGNUM: 1 TENTEN: IDENT: Y EORANK:
EORANKCOMM:
SURVEYDATE: LASTOBS: 1946-06-24 FIRSTOBS: 1946 GRANK: G2
SURVEYSITE: ROCK FLATS
SRANK: S1 STATE: ID COUNTYNAME: IDADAM
QUADCODE: 4411682
QUADNAME: MEADOWS PRECISION: M
LAT: 445600 LONG: 1161000 S: 445500 N: 445700 E: 1160930 W: 1161100
TOWNRANGE: 018N002E SECTION: 01 MERIDIAN: BO
TRSCOMM: OR ADJACENT SECTIONS WATERSHED: 17060210
DIRECTIONS: 2 MILES WEST OF MACALL (SIC).

GENDESC: IN DEEP GRASS

ELEV: 5120 SIZE: 0
EODATA:

COMMENTS: R.G. JEFFREY S.N. (LABEL SAYS WA, BUT NO MACALL IN ADAMS CO, WA; MAPPED AT ROCK FLATS TO MINUTES, MAYBE BETTER AS GENERAL
MACODE1: CONTAINED1: MACODE2: CONTAINED2:
MACODE3: CONTAINED3: ADDLMAS:
MORELAND: MOREPROT: MOREMGMT: SITECODE:
SITENAME:
OWNER:
OWNERCOMM: PRIVATE AS MAPPED
PROTCOMM:
MGMTCOMM:
MONITOR: MONITORNUM:
BESTSOURCE: JOHNSON, FRED

SOURCECODE: PNDJOH01IDUS PNDCAI01IDUS

DATASENS: N BOUNDARIES: N PHOTOS: N OWNERINFO: N
TRANSCRIBR: 84-10-18 SLC CDREV: Y MAPPER: 84-10-18 SLC QC: Y
UPDATE:

Table 7. Location known or suspected to be an erroneous report. (See also information on next page.)

Washington

NATURAL HERITAGE DATA SYSTEM
LCD ELEMENT OCCURRENCE FORM

☐ DUP ☐ CAN'T MAP ☐ OUT OF STATE

WASHINGTON NATURAL HERITAGE PROGRAM
WASHINGTON DEPT OF GAME, NONGAME PROGRAM

GMI ☐
EMI ☒

INDEX CODE: class / element / seq # — subclass / occurrence / quad code: 41

ARD 1 — ELEMENT NAME & NUMBER: SILENE SPALDINGII

ARD 2 — LATITUDE & LONGITUDE: 4 N1 W — STATE: WA — COUNTY CODE: Ø1 — USGS QUAD NAME:

ARD 3 — DATE OF INFORMATION (year, mo, day): 19460624 — SOURCE OF LEAD: JEFFREY, R6 1946

ARD 4 — # OWNERS — NAME OF PRINCIPAL OWNER — AREA NAME

ARD 5 — AGENCY SUBSECTION — OWNER CODE — PROTECTION STATUS — SPECIAL STATUS — SIZE

ARD 6 — GENERAL DESCRIPTION: 2 MI N OF MACALL, IN SEED GRASS, 6 DM TALL.

ARD 7

ARD 8

ARD 9 — ENTRY UPDATE (yr, wk) — SITE REVISITATION (YEAR CODE) (yr, cd, yr, cd, yr, cd, yr, cd, yr, cd) — DATA POINT # — WDG Reg — PLAN ELEMENT PROV Rank DC need — 2nd PROV PLAN ELEMENT OF FED ST STATUSES — BANK — Township: T — Range: N R — Section: S — Fractions of Section Qtrs or Halves

ARD 10 — CONTENTS OF MANUAL FILES. VERIFICATION OF DATA

CODE	DIRECTIONS	BOUNDARIES	PHOTOS	FIELD SURVEY	DESTRUCTION	REFERENCES	ELEMENT	COORDINATES
	1	2	3	4	5	6	7	8
	D	B	P & B	E I B S	B D T	B A B	VU	C U N G
							U	

SUBCLASS (Family, Order, etc.)
COUNTY: Adams 1 8 5
DIRECTIONS TO SITE: Almost Jones says locale doesn't exist. "Cook Harder" at intersection — make location of ranch — East-central Adams Co, N. of Lasty

HABITAT
+1958 - Found Morell in Adams Co W/ T18N R35E S10 and S15, making occurrence probably in section 3

NOTES

ACCESSION NUMBER(S)

SUBMITTED BY

CHART / MAP / DOI / QC / UPDT / Transcriber / Mapper

PLEASE USE NO 2 PENCIL

Table 7. (cont.).

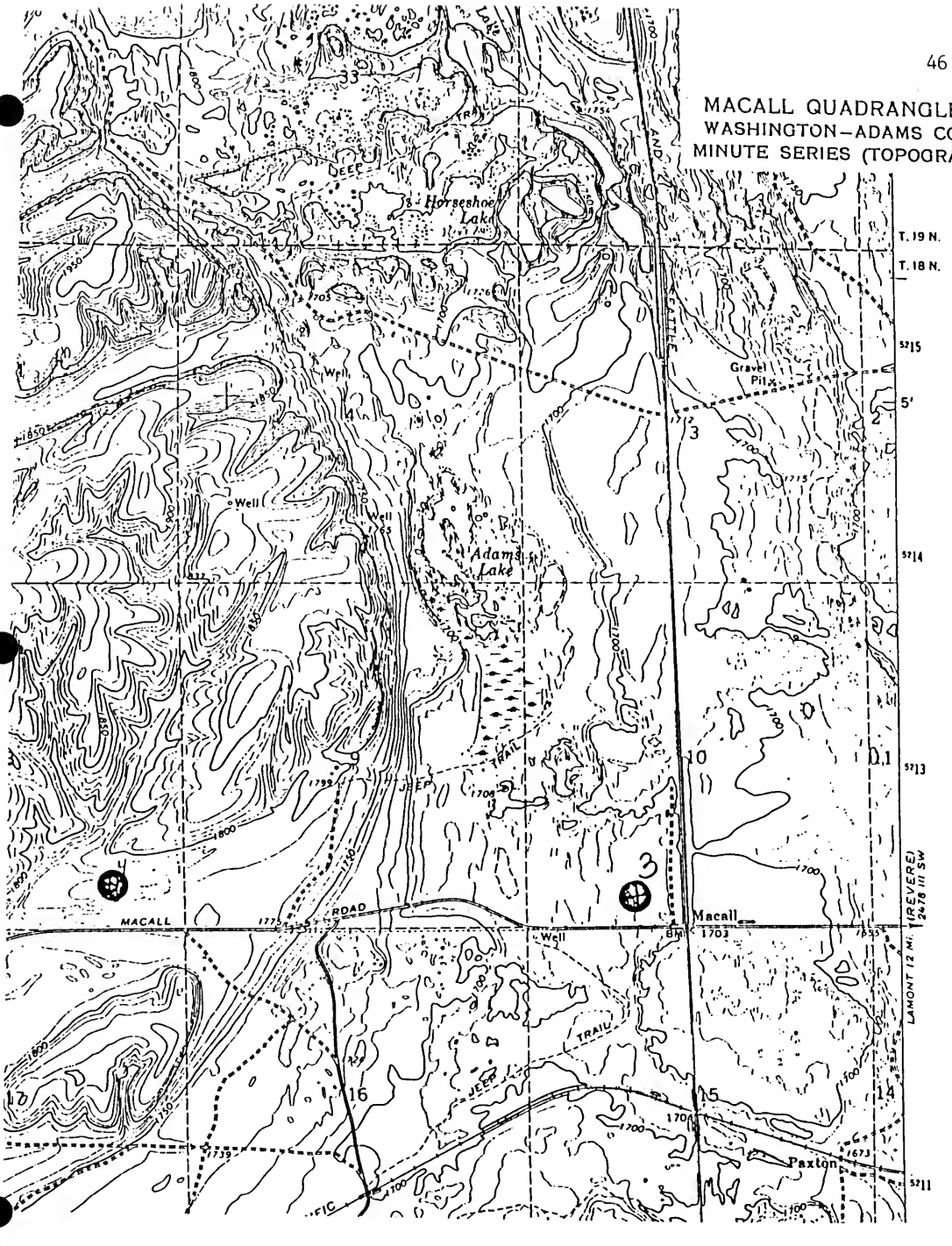
MACALL QUADRANGLE
WASHINGTON–ADAMS CO.
MINUTE SERIES (TOPOGRAPHIC)
Horseshoe Lake
Adams Lake
Gravel Pit
Well
Macall
1703
MACALL ROAD
JEEP TRAIL
T. 19 N.
T. 18 N.
5215
5214
5213
5211
5'
LAMONT 12 MI. (REVERE) 2478 III SW
Paxton
1673

Table 7. (cont.)

b. **Regional macroclimate:** The climatic recording station nearest to the Tobacco Valley sites is located at Fortine, at an elevation of 2,951 feet, approximately 17 miles south of the sites. For the 30-year period ending in 1980, mean July maximum and mean January minimum temperatures were 82.2°F and 11.5°F, respectively. Mean annual precipitation was 17.25 inches. Polson Kerr Dam, at an elevation of 2,931 feet, is approximately 23 mile south and east of the sites near Niarada, and approximately 12 miles south of the Wild Horse Island site. For the 30-year period ending in 1980, mean July maximum and mean January minimum temperatures were 82.3°F and 17.9°F, respectively. Mean annual precipitation was 14.98 inches (U.S. Department of Commerce, 1982).

c. **Local microclimate:** Silene spaldingii appears to occur on north- to east-facing slopes and in swales, in areas where snow deposition is likely. These sites may hold moisture longer into the spring.

2. **Air and water quality requirements:** Unknown.

3. **Physiographic province:** Hunt (1974) places the range of S. spaldingii in Montana in the Rocky Mountains of Montana and Canada Province, within the Rocky Mountain System.

4. **Physiographic and topographic characteristics:** In Montana, S. spaldingii occurs on alluvial or eolian soils. These soils were deposited by Glacial Lake Missoula, which formed during the advance of the Cordilleran ice sheet that blocked several major drainages in northwest Montana. Repeated breaking of the ice dam caused numerous catastrophic floods (Alt and Hyndman, 1986). Depositional materials extend across Idaho and into Washington and Oregon, and are likely to underlie the S. spaldingii populations in these states as well.

Populations often occur on moderate slopes in swales and drainages. In Montana, the known sites occur from 2,700-3,500 feet in elevation.

5. **Edaphic factors:** Silene spaldingii occurs on loamy soils which are sparsely gravelly. These soils are very productive, and much of the area in Montana, Idaho, Oregon, and Washington where they occur has been converted for agricultural uses or grazing.

6. **Dependence of this taxon on natural disturbance:** None known.

7. **Other unusual physical features:** None observed.

C. **Biological characteristics.**

1. **Vegetation physiognomy and community structure:** In Montana, S. spaldingii occurs mostly in well-preserved grasslands, at the edges of the lower treeline or near scattered trees. These forested areas are composed principally of Pinus ponderosa (ponderosa pine) and/or Pseudotsuga menziesii (Douglas fir). The most common shrub associate was Rosa woodsii (woods rose). Festuca idahoensis (Idaho fescue), Festuca scabrella (rough fescue) and Stipa occidentalis (western needlegrass) are the primary grass associates; however, in areas that have been grazed Poa pratensis (Kentucky bluegrass) has become dominant.

2. **Regional vegetation types:** Ross and Hunter (1976) place the Tobacco Valley sites in the Foothills and Mountains Silty Range Site, 15-19 inch precipitation zone, and list as dominants rough fescue, Idaho fescue, Columbia needlegrass etc. They place the Niarada site in the Foothills and Mountains Silty Range Sites, 10-14 inch precipitation zone, and list as dominants bluebunch wheatgrass, rough fescue, needle-and-thread etc.. Kuchler (1964) places both the Tobacco Valley sites and the Niarada sites in the Western Ponderosa Forest, described as medium to open forest of tall needleleaf evergreen trees with a fairly open ground cover of grasses and occasional shrubs. The Mueggler and Stewart (1980) grassland classification scheme places the S. spaldingii sites in the Festuca scabrella / Festuca idahoensis habitat type.

3. **Frequently associated species:** In Montana, associated species include:

Agropyron smithii Rydb.
Agropyron spicatum (Pursh) Scrib. & Smith
Festuca idahoensis Torrey ex Hook.
Festuca scabrella Elmer
Lithospermum ruderale Dougl. ex Lehm.
Pinus ponderosa Dougl. ex Laws. & Laws.
* Poa pratensis L.
Poa secunda Presl.
Pseudotsuga menziesii (Mirb.) Franco
Rosa woodsii Lindl.
Stipa comata Thurb. ex Wats.
Stipa occidentalis Trin. & Rupr.

* = introduced species

4. **Dominance and frequency of the taxon:** In Montana, populations are variable in size, and range from 10 plants up to 10,000 plants. The mean population size is ca. 1300; however, of the eight currently known sites, six have 100 or fewer plants. Canopy coverage of this species is generally quite low except in very localized areas. Most populations consist of scattered individual plants.

5. **Successional phenomena:** Silene spaldingii is associated with successionally advanced fescue grasslands. The species appears to tolerate moderate grazing that results in an increase of Poa pratensis at some sites in Montana (Peter Lesica, pers. comm.). However, it is suspected that a population has been extirpated in the state of Oregon as a result of overgrazing (Jimmy Kagan, pers. comm.).

6. **Dependence on dynamic aspects of biotic associations and ecosystem features:** Unknown.

7. **Other endangered, threatened, rare, or vulnerable species occurring in habitat of this taxon:** The following species is found in the vicinity of the Tobacco Valley sites. This bird is known to have a limited distribution in Montana, but is more widespread elsewhere.

Tympanuchus phasianellus columbianus (Columbian sharp-tailed grouse) - listed as "critically endangered" in Montana (S1) by The Montana Natural Heritage Program.

Nests of the following species are found on Wild Horse Island near the S. spaldingii sites.

Haliaeetus leucocephalus (bald eagle) - listed as "endangered" in Montana (S2) by The Montana Natural Heritage Program.

7. Population biology of the taxon.

A. **General summary:** Ten populations of Silene spaldingii occur in northwest Montana in Palouse prairie areas. Populations are separated by approximately 88 miles. The largest population occurs in the Tobacco Valley, and consists of 10,000 plants in two subpopulations. The largest population in the Niarada/Flathead Lake vicinity contains 250 plants. Other populations have less than 100 plants, and most have less than 30. Silene spaldingii is thought to be an obligate or near-obligate outcrossing species (Lesica, 1988); see Appendix C, p. 70, for more detailed information. Bumblebees (Bombus sp.) are among the known pollinators (Lesica, 1988); see Appendix C.

B. **Demography.**

1. **Known populations:** There are currently eight known populations of S. spaldingii in Montana: two populations in the Tobacco Valley (Lincoln County), five in the vicinity of Niarada, Montana (Sanders and Flathead counties), and one on Wild Horse Island in Flathead Lake (Lake County). This species is also currently known from fifteen sites in Washington and two in Idaho.

2. **General demographic details (Montana):**

a. **Dancing Prairie-Tobacco Plains South (001)**
   1. **Area occupied by population:** ca. 200 acres.
   2. **Estimated number of individuals:** ca. 10,000 plants in three subpopulations.
   3. **Density:** Very localized areas have a fairly dense cover of plants; however most are scattered individuals.
   4. **Presence of dispersed seeds:** Unknown.
   5. **Evidence of reproduction:** Flowering and fruiting plants and seed production; see (Lesica, 1988), Appendix B, p. 69.

6. **Evidence of population expansion or decline:** Population has declined over the one-year period 1987-1988 (Lesica, 1988); Appendix B, p. 69.

b. **Wild Horse Island State Park (002)**
   1. **Area occupied by population:** ca. 10 acres.
   2. **Estimated number of individuals:** ca. 125-250 plants in three subpopulations.
   3. **Density:** Scattered.
   4. **Presence of dispersed seeds:** Unknown.
   5. **Evidence of reproduction:** Flowering and fruiting plants; see (Lesica, 1988), Appendix A, p. 68.
   6. **Evidence of population expansion or decline:** Population has declined over the two-year period 1986-1988 (Lesica, 1988); Appendix A, p. 68.

c. **Black Bear Ranch (003)**
   1. **Area occupied by population:** ca. 10 acres.
   2. **Estimated number of individuals:** ca. 30 plants.
   3. **Density:** Scattered.
   4. **Presence of dispersed seeds:** Unknown.
   5. **Evidence of reproduction:** Flowering plants observed.
   6. **Evidence of population expansion or decline:** None.

d. **Mill Pocket Ridge (004)**
   1. **Area occupied by population:** ca. 20 acres.
   2. **Estimated number of individuals:** Seven flowering plants observed in 1983.
   3. **Density:** Scattered.
   4. **Presence of dispersed seeds:** Unknown.
   5. **Evidence of reproduction:** Flowering plants observed.
   6. **Evidence of population expansion or decline:** None.

e. **Crosson Valley (005)**
   1. **Area occupied by population:** ca. 30 acres.
   2. **Estimated number of individuals:** 100+ plants in 5 subpopulations.
   3. **Density:** Scattered.

4. **Presence of dispersed seeds:** Unknown.
5. **Evidence of reproduction:** Flowering plants observed.
6. **Evidence of population expansion or decline:** Site was revisited in 1988, but subpopulations were not found or were much reduced in size.

f. Eureka North (008)
1. **Area occupied by population:** ca. 2+ acres.
2. **Estimated number of individuals:** 10 + plants in two subpopulations.
3. **Density:** Scattered.
4. **Presence of dispersed seeds:** Unknown.
5. **Evidence of reproduction:** Flowering plants observed.
6. **Evidence of population expansion or decline:** None.

g. Cromwell Creek (009)
1. **Area occupied by population:** ca. 1 acre.
2. **Estimated number of individuals:** 10 plants observed in 1988.
3. **Density:** Scattered.
4. **Presence of dispersed seeds:** Unknown.
5. **Evidence of reproduction:** Flowering plants observed.
6. **Evidence of population expansion or decline:** None.

h. Hog Heaven Range
1. **Area occupied by population:** ca. 1 acre.
2. **Estimated number of individuals:** 12 plants in two subpopulations in 1988.
3. **Density:** Scattered.
4. **Presence of dispersed seeds:** Unknown.
5. **Evidence of reproduction:** Flowering plants observed.
6. **Evidence of population expansion or decline:** None.

C. **Phenology.**

1. **Patterns:** In Montana, the peak flowering period for S. spaldingii is during the third and fourth weeks in July. Depending on climatic conditions, flowers may open in early July, and on steeper north-facing slopes plants may extend their flowering period into early

August. Fruit and seed maturation occurs in August, with seed dispersal likely in late August or early September. Senescence of flowering stems was observed even as flowers were opening in the draughty 1988 field season. It is likely that the basal rosettes normally senesce as fruits and seeds mature. Seeds of this species may require cold stratification. germination (although further studies are needed), and germination is likely to occur in spring (Lesica, 1988); see Appendix C, p. 70.

2. **Relation to climate and microclimate:** Most of the known sites for S. spaldingii in Montana occur on north to east-facing slopes or draws, often near pine trees, where snow accumulations are likely to remain later into the spring. Silene spaldingii flowers in late July, and it is hypothesized that it is dependent on the extended moisture provided by the microclimate of these sites.

D. **Reproductive ecology.**

1. **Types of reproduction:** Silene spaldingii does not reproduce vegetatively; new individuals arise from seeds.

2. **Pollination.**

a. **Mechanisms:** Silene spaldingii is apparently dependent on insects for pollination. Results of pollination studies suggest that it is an obligate or near-obligate outcrossing species (Lesica, 1988); see Appendix D, p. 71.

b. **Specific known pollinators:** One known pollinator of S. spaldingii is the bumblebee (Bombus sp.), and there are likely to be others (Lesica, 1988); see Appendix D, p. 71.

c. **Other suspected pollinators:** Silene spaldingii has flowers characteristic of those pollinated by moths; however, none were ever documented as visitors (Peter Lesica, pers. comm.).

d. **Vulnerability of pollinators:** Bumblebees are relatively ubiquitous; however, overgrazing or pesticide use might be

locally detrimental to their populations (Lesica, 1988); see Appendix D, p. 71.

3. **Seed dispersal.**

   a. **General mechanisms:** Silene spaldingii has no apparent specialized mechanisms for long-distance seed dispersal. However, the seeds are very small and somewhat inflated, which might allow them to be easily dispersed by wind (Peter Lesica, pers. comm.).

   b. **Specific agents:** Possibly wind. The fruit develops holes through which seeds may be ejected when wind causes stem movement (Peter Lesica, pers. comm.).

   c. **Vulnerability of dispersal agents and mechanisms:** Unknown.

   d. **Patterns of propagule dispersal:** Unknown.

4. **Seed biology.**

   a. **Amount and variation of seed production:** Details unknown. Mature fruits appear to produce large numbers of seed (Lesica, 1988); see Appendix D, p. 71.

   b. **Seed viability and longevity:** Unknown.

   c. **Dormancy requirements:** Unknown.

   d. **Germination requirements:** Seeds of S. spaldingii might require a period of cold stratification for germination (Lesica, 1988); see Appendix C, p. 70, for the results of this study.

   e. **Percent germination:** Although the germination study emphasized cold stratification, the percentages given above indicate that most of the seeds produced are viable (Lesica, 1988); see Appendix C, p. 70.

5. **Seedling ecology:** Lesica (1988) found that seedlings began growth immediately, and after 60 days had rosettes with 6-14 leaves. These leaves then senesced, but after approximately 45 days most individuals put out new leaves.

It is hypothesized that this senescent period could correspond with the dry summer months; with new growth appearing in the fall after the onset of cool, moist weather, and a shortening of the photoperiod. See Appendix C, p. 70, for complete details of the study.

6. **Survival and mortality:** Populations of S. spaldingii, that in previous years were quite large, had declined in size range-wide in Montana according to monitoring studies (Lesica, 1988) and field surveys in 1988. This change in abundance is thought to be due at least in part to current drought conditions. See Appendices A and B, pp. 68 and 69, for more complete details.

7. **Overall assessment of taxon's reproductive success:** Fluctuations in population sizes have been attributed to the prevailing drought conditions in Montana. No juvenile plants were observed in 1987; however, new adult plants were observed in 1988. It is possible that these plants were overlooked the first year, but it is more likely that the juvenile plants loose their leaves during the warm, dry summer months and are thus missed when the transects are read (Lesica, 1988). Silene spaldingii appears to have good reproductive potential where there is a stable native habitat, but it is likely to be affected by drought conditions.

8. **Population ecology of the taxon.**

A. **General summary:** Silene spaldingii occurs on north- to east-facing slopes and draws, in rough fescue (Festuca scabrella) grasslands. Cover of grasses at these sites is generally quite high, and the species thus appears to tolerate competition and some shading. Much of the suitable habitat in the vicinity of the Niarada populations is on private land that has been heavily grazed. The result has been a conversion of native grasslands to vast tracts covered by stands composed of five or six exotic weedy species. No S. spaldingii populations were found in these areas. Thus it may be that grazing alters the native habitat so as to eliminate or prevent establishment of the species.

B. **Positive and neutral interactions:** None known.

C. **Negative interactions.**

1. **Herbivores, predators, pests, parasites and diseases:** Predation of flowers and fruits by caterpillars was observed during pollination studies, and is likely to be a source of seed loss (Lesica, 1988); see Appendix D, p. 71. Also, although not apparently directly grazed by cattle, populations of S. spaldingii appear to be influenced by them indirectly through the loss of native grasslands.

2. **Competition.**

   a. **Intraspecific:** Individual plants of S. spaldingii appear to be widely distributed within populations, and there is no evidence of competition between plants.

   b. **Interspecific:** Populations of S. spaldingii have not been found in otherwise suitable habitats where the native vegetation has been displaced by exotic weedy species. This species may be unable to compete with aggressive weedy species which have supplanted the native vegetation; alternatively, the lowered moisture content of the soils where the native grasses have been supplanted may hinder seed germination and establishment of S. spaldingii plants.

D. **Hybridization.**

1. **Naturally occurring:** This species has been described as an "unquestionably well-marked species" (Hitchcock et al., 1964). However, several collections at sites in Oregon, on the edge of its range, have larger flowers and petal blades, and later flowering dates; overall, they appear more similar to S. oregana. There is the possibility that hybridization is occurring in these peripheral populations (Jimmy Kagan, Oregon Natural Heritage Program, pers. comm.).

2. **Artificially induced:** None known.

3. **Potential in cultivation:** Plants are currently being maintained in a greenhouse at the University of Montana, Missoula (Peter Lesica, pers. comm.).

E. **Other factors of population ecology:** None known.

9. **Current land ownership and management responsibility.**

A. **General nature of ownership:** State of Montana, Department of Fish, Wildlife and Parks; Confederated Salish and Kootenai Tribes; private land.

B. **Specific landowners (Montana):**

1. State of Montana
Department of Fish, Wildlife and Parks
1420 E. 6th Ave.
Helena, MT 59620

2. Confederated Salish and Kootenai Tribes
P.O. Box 278
Pablo, MT 59855

3. Mr. Geiger
Black Bear Ranch
Niarada (Hot Springs), MT 59845

4. George Tripp
Crosson Valley
Niarada (Hot Springs), MT 59845

5. Elsie Brown
Browns Meadow Rd.
Niarada (Hot Springs), MT 59845

6. The Nature Conservancy
Big Sky Field Office
Power Block Building
Box 258
Helena, MT 59824

C. **Management responsibility:** Same as ownership given above.

D. **Easements, conservation restrictions, etc.:** The Black Bear Ranch (003) site is registered with The Nature Conservancy. A registered site does not have any legal protection; however, it does signify that the owner is aware of the rare element, and will notify The Nature Conservancy of any proposed alteration of the habitat, or existing management practices.

10. Management practices and experience.

A. Habitat management.

1. Review of past management and land use experiences.

a. The following sites in Montana incur some grazing during parts of the year:

Wild Horse Island (002) (002; horses)
Black Bear Ranch (003)
Mill Pocket Ridge (004)
Crosson Valley (005)
Tobacco Plains North (008)
Cromwell Creek (009)
Hog Heaven Range (010)

b. **Related taxa:** None known.

c. **Other ecologically similar taxa:** Not applicable.

2. **Performance under changed conditions:** Not applicable.

3. **Current management policies and actions:** Current management is the same as outlined under past management.

4. **Future land use:** Proposed areas for a new airport in the vicinity of Eureka are near the Dancing Prairie (001) site. When a final site is picked, a detailed inventory of the area should be conducted to determine if there are populations of S. spaldingii in the area, and to mitigate habitat destruction where possible.

B. Cultivation.

1. **Controlled propagation techniques:** Seeds of S. spaldingii are apparently easily germinated, and plants grow well under greenhouse conditions (Lesica, 1988); see Appendix C, p. 70.

2. **Ease of transplanting:** Not known.

3. **Pertinent horticultural knowledge:** Not reviewed.

4. **Status and location of presently cultivated material:** Plants are being maintained in the greenhouse at the University of Montana, Missoula (Peter Lesica, pers. comm.).

11. **Evidence of threats to survival.**

A. **Present or threatened destruction, modification, or curtailment of habitat or range:** Silene spaldingii occupies habitats in Montana that are threatened by grazing. Pristine or near-pristine stands of Palouse prairie are easily lost to overgrazing and the resultant invasion of exotic weed species. In other states (Idaho, Oregon and Washington) most of the suitable habitat has been lost through conversion of lands to agriculture and to overgrazing. Much of the habitat where this species occurs in Montana is privately owned, and thus without use restrictions. Populations in these areas may be in danger of extirpation. Only a small portion of the habitat supporting the largest population (Dancing Prairie (001)) is secure (owned and managed by The Nature Conservancy, while the rest of the area is owned by private individuals.

B. **Overutilization for commercial, sporting, scientific, or educational purposes:** No threats known.

C. **Disease, predation, or grazing:** In Montana, only the Wild Horse Island site (002) is not threatened by overgrazing. All the other sites are lightly to heavily grazed. In conjunction with the extended drought, grazing may be even more detrimental to populations of Silene spaldingii.

D. **Inadequacy of existing regulatory mechanisms:** None known.

E. **Other natural or man-made factors:** None known.

II. **ASSESSMENT AND RECOMMENDATIONS**

12. **General assessment of vigor, trends, and status:** In Montana, Silene spaldingii is presently known from ten sites in Lincoln, Sanders and Flathead counties. Populations have declined over the past two years, probably owing to prevailing drought conditions. Populations may be in danger from livestock grazing.

13. **Recommendations for listing or status change.**

A. **Recommendation to U.S. Fish and Wildlife Service:** On the basis of current information summarized in this status report, it is recommended that Silene spaldingii be retained in Category 2. Populations in Montana may be threatened by current grazing practices occurring on private lands. The current distribution, abundance and condition of populations in Oregon and Idaho is not well known. Although there are currently 15 known sites in Washington, population sizes are low and there are only approximately 448 plants in the state. Final status recommendations should be made upon completion of survey work in Idaho, Oregon and Washington. If substantial numbers of populations are not located in the other states, it should be placed in Category 1.

B. **Recommendations to other U.S. federal agencies:** In Montana Silene spaldingii is not currently found on federal lands.

C. **Other status recommendations.**

1. **Counties and local areas:** No recommendations.

2. **States:** Silene spaldingii is currently listed as S1 ("critically state endangered") in Montana, by the Montana Natural Heritage Program. No change in status is recommended.

3. **Other nations:** It is recommended that the Confederated Salish and Kootenai Tribes monitor the status of S. spaldingii populations on tribal lands. An evaluation of past and present grazing regimes, with subsequent adjustments, would aid in maintenance of populations and available habitat.

4. **International:** No recommendations.

14. **Recommended critical habitat:** The complete status of Silene spaldingii is not yet known in portions of its range. Thus, critical habitat is not being recommended at this time.

15. **Conservation/recovery recommendations.**

A. **General conservation recommendations.**

1. **Recommendations regarding present or anticipated activities:** The potential effects

of development (Eureka airport) and grazing pressures should be assessed before any of these activities are implemented.

2. **Areas recommended for protection:** Although currently registered with The Nature Conservancy, the Wild Horse Island site (002) should be nominated as a natural area, and should be given protection since, all other known sites are on private land.

3. **Habitat management recommendations:** No recommendations are being made at this time.

4. **Publicity sensitivity:** Low.

5. **Other recommendations:** None.

B. **Monitoring activities and research needs:** Ongoing demographic studies to monitor two populations of S. spaldingii were started, and the results to date are included in Appendices A and B, pp. 68 and 69. These studies should be continued indefinitely. Lesica (1988) suggests that this species is an obligate or near-obligate outcrosser. Further insect exclusion studies are needed to clarify these results (Lesica, 1988); see Appendix D, p. 71. Genetic and taxonomic studies might be helpful, to determine if this species is hybridizing at the edge of its range as theorized.

Detailed field surveys are needed in Idaho, Oregon, and Washington to assess the status of populations and determine any threats to them.

16. **Interested parties:**

Office of Endangered Species
ATTN: Dr. James Miller
U.S. Fish and Wildlife Service
P.O. Box 25486
Denver Federal Center
Denver, CO 80225

U.S. Fish and Wildlife Service
ATTN: Carol Taylor
Federal Building, 301 S. Park
P.O. Box 10023
Helena, MT 59626

Office of Endangered Species
ATTN: Dr. John Fay
U.S. Fish and Wildlife Service
Washington, D.C. 20240

U.S. Forest Service, Region One
ATTN: Angela Evenden
Federal Building
P.O. Box 7669
Missoula, MT 59807

The Nature Conservancy
ATTN: Dr. Larry Morse
1815 North Lynn Street
Arlington, VA 22209

The Nature Conservancy
ATTN: Dr. Joan Bird and Bernie Hall
Montana/Wyoming Field Office
P.O. Box 258
Helena, MT 59624

Confederated Salish & Kootenai Tribes
Box 278
Pablo, MT 59855

Montana Department of Fish Wildlife and Parks
ATTN: Terry Knupp
P.O. Box 67
Kalispell, MT 59903

Montana Natural Heritage
State Library Building
1515 E. 6th Ave.
Helena, MT 59620

Idaho Natural Heritage Program
Department of Fish and Game
600 S. Walnut Street, Box 25
Boise, ID 83707

Oregon Natural Heritage Program
1205 NW 25th Ave.
Portland, Or 97210

Washington Natural Heritage Program
Department of Natural Resources
Mail Stop EX-13
Olympia, WA 98504

British Columbia Rare Plant Program
Botanical Garden
The University of British Columbia
6501 N.W. Marine Dr.
Vancouver, B.C. V6T 1W5

III. INFORMATION SOURCES

17. Sources of Information.

A. Publications.

1. References cited in report: See Literature Cited (pp. 66-67).

2. Other publications/sources: None known.

B. Museum collections: Specimens from all but one Montana population are deposited at the University of Montana Herbarium in Missoula (MONTU). The following list of known herbarium specimens from Montana is organized by occurrence number:

001 - Lesica, P. (3541)

002 - Lesica, P. (2755)

003 - Lesica, P. (2766)

004 - Lesica, P. (2764)

005 - Lesica, P. (2767)

006 - Williams, R.S. (995)

007 - Lau, D. (74-63)

008 - Lesica, P. (3978)
Schassberger, L.A. (249)

009 - Schassberger, L.A. (250)

C. Fieldwork.

1. Surveys conducted:

21-29 July 1983, Lesica, P.
16 July 1985, Lesica, P.
17 July 1986, Lesica, P.

18-29 July 1988, Schassberger, L.A.

Areas surveyed included suitable habitat from the Tobacco Valley near the Canadian border, south to Arlee, Montana.

D. **Knowledgeable individuals:**

Bernie Hall
The Nature Conservancy
Montana/Wyoming Field Office
Power Block Bldg.
Box 258
Helena, MT 59824

Peter Lesica
Division of Biology
University of Montana
Missoula, MT 59812

Lisa A. Schassberger
Montana Natural Heritage Program
State Library Building
1515 E. 6th Ave.
Helena, MT 59620

J. Stephen Shelly
Montana Natural Heritage Program
State Library Building
1515 E. 6th Ave.
Helena, MT 59620

E. **Other information sources:** Color slides and field forms are on file at the office of the Montana Natural Heritage Program, and the Montana/Wyoming Field Office of The Nature Conservancy (see section II.16. for addresses).

18. **Summary of materials on file:** All detailed field forms, maps and color slides are on file at the office of the Montana Natural Heritage Program. Herbarium vouchers for Montana populations are deposited at the University of Montana Herbarium (MONTU).

IV. AUTHORSHIP

19. **Initial authorship:**

Lisa A. Schassberger
Montana Natural Heritage Program
State Library Building
1515 E. 6th Ave
Helena, MT 59620
Phone: 406-444-3009

20. **Maintenance of status report:** The Montana Natural Heritage Program will maintain current information and update the status report as needed. Should the taxon be listed as an endangered or threatened species by the U.S. Fish and Wildlife Service, the Service, through its Office of Endangered Species (Region 6), should maintain the primary file of information, encourage others to provide new information, and distribute new findings, as received, to the interested parties (section II.16.).

V. NEW INFORMATION

21. **Record of revisions:** Not currently applicable.

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Hitchcock, C.L., Cronquist, A., Ownbey, M., and J.W. Thompson. 1964. Vascular Plants of the Pacific Northwest. Univ. of Washington Press, Seattle, Washington.

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APPENDIX A.

MONITORING SILENE SPALDINGII ON WILD HORSE ISLAND: 1988 PROGRESS REPORT

Introduction and Methods

On August 18, 1986, two permanent transects were established on Wild Horse Island in order to monitor a population of Silene spaldingii and begin to gather data on the life history of this rare plant (see Lesica, 1986 for details on the location of the transects). On August 2, 1988, Bernie Hall and I reread these transects following methods outlined in Lesica (1987). Codes used in recording life history data are as follows:

S	Seedling	Only a basal rosette present
J	Juvenile	A non-reproductive individual with only sterile stems
I	Inflorescence	Records the number of flowering stems per mature individual
S	Sterile	Records the number of sterile stems per mature individual
P	Predated	Records the number of flowers suffering predation
A	Aborted	Records the number of unpredated flowers that did not produce a mature fruit
F	Fruit	Records the number of flowers that produced a mature fruit recognized by the presence of a large, swollen ovary

Results and Discussion

Fecundity data for the two years are presented in Table 1. The number of plants in the transects decreased by 1/3 from 1986 to 1988. In addition, the total number of flowers and fruits produced also declined dramatically. Part of this decline is due to the presence of fewer mature plants, and part is due to a decrease in the number of flowers produced by individual plants. The mean rate of abortion stayed approximately the same.

A comparison of individual plant performance between the two years are presented in Table 2. Thirteen plants present in 1986 could not be located in 1988, and four plants not recorded in 1986 were present in 1988. As measured by flower and fruit production, all plants decreased in vigor.

Much of the decline in plant vigor indicated by these

results can probably be attributed to the dry 1987 fall, and hot dry conditions during the summer of 1988. The loss of 13 individuals from the transects is reason for concern if these plants have actually died; however, it is possible that above ground parts senesced and were blown away by the wind before the transects were read. The four new plants may be the result of recruitment, or may be individuals that were missed when the transects were read in 1986. Seedlings could have been missed if rosette leaves senesce in early or mid-summer; perhaps before the transects were read. Continued monitoring will help answer these questions.

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Table 1. Summary of fecundity data for Silene spaldingii in the Wild Horse Island monitoring transects in 1986 and 1988.

	1986	1988
Total number of plants	23	14
Number of non-reproductive plants	0	7
Number of seedlings	0	0
Total number of unpredated flowers	145	19
Total number of fruits	78	0
Mean number fruits/mature plant	3.4	0
Mean number predated flowers/mature plant	1.4	0.1
Mean number aborted flowers/mature plant	2.9	2.7
Mean number of flowers/mature plant	6.5	2.9

Table 2. Performance of individual Silene spaldingii plants in the monitoring transects between 1986 and 1988.

Transect 1

Plot	1986	1988
2	I1-F6-A8	I1-A3
16	I1-F1	I1-A3
17	I2-P6	I1-A3
18	----	I1-A3
34	I2-F1-A6	J
35	I1-F1-A4	----
41	I1-F2-A2	----
45	I1-F15	----
48	I1-F9-A5	J
49	I2-F5-A1	----
50	I1-F2-A3	J

Transect 2

2	I2-F5-A5	J
26	I1-F5-A7	----
27	I1-F7-A3	----
28	I2-P2	----
30	I1-F3-A2	----
31	I1-F2-A6	----
32	----	I1-A3
32	I1-F2-A4	J
34	----	I1-A2
35	I1-F1	I1-P1-A2
36	I1-F4-A1	----
36	----	J
41	I2-F3-A6	----
44	I1-F2-A2	J
45	I1-F2-A2	----
46	I1-P1	----

APPENDIX B.

MONITORING SILENE SPALDINGII ON DANCING PRAIRIE PRESERVE: 1988 PROGRESS REPORT

Introduction and Methods

On July 23, 1987 four permanent transects were established on the proposed Dancing Prairie Preserve in order to monitor a population of Silene spaldingii and begin to gather data on the life history of this rare plant. On August 1, 1988, Bernie Hall and I reread these transects following the methods outlined in Lesica (1987). Codes used in recording life history data are as follows:

S	Seedling	Only a basal rosette present
J	Juvenile	A non-reproductive individual with only sterile stems
I	Inflorescence	Records the number of flowering stems per mature individual
S	Sterile	Records the number of sterile stems per mature individual
P	Predated	Records the number of flowers suffering predation
A	Aborted	Records the number of unpredated flowers that did not produce a mature fruit
F	Fruit	Records the number of flowers that produced a mature fruit recognized by the presence of a large, swollen ovary

Results and Discussion

Fecundity data for the two years are presented in Table 1. The number of plants in the transects decreased by nearly 1/2 from 1987 to 1988. In addition the total number of flowers and fruits produced declined by nearly an order of magnitude. Part of this decline is due to the presence of fewer mature plants, and part is due to a decrease in the number of mature fruit produced per mature plant. The mean number of flowers per mature plant stayed approximately the same.

A comparison of individual plant performance between the two years are presented in Table 2. Twenty-seven plants present in 1987 could not be located in 1988, and nine plants not recorded in 1987 were present in 1988. As measured by flower and fruit production, nearly all the plants declined in vigor.

Much of the decline in plant vigor indicated by these results can probably be attributed to the dry 1987 fall, and hot,

dry conditions during the summer of 1988. The loss of 27 individuals from the transects is reason for concern if these plants have actually died; however, it is possible that above-ground parts senesced and were blown away by the wind before the transects were read. The nine new plants may be the result of recruitment, or may be individuals that were missed when the transects were read in 1986. Seedlings could have been missed if the rosette leaves senesced in early or late summer; perhaps before the transects were read. Continued monitoring will help answer these questions.

Literature Cited

Lesica, P. 1987. A technique for monitoring nonrhizomatous perennial plant species in permanent belt transects. Natural Areas Journal 7: 65-68.

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Table 1. Summary of fecundity data for Silene spaldingii in the Dancing Prairie monitoring transects in 1987 and 1988.

	1987	1988
Total number of plants	37	19
Number of non-reproductive plants	4	11
Number of seedlings	2(?)	0
Total number of unpredated flowers	226	37
Total number of fruits	212	21
Mean number fruits/mature plant	6.4	2.6
Mean number predated flowers/mature plant	0	0.6
Mean number aborted flowers/mature plant	0.2	2.6
Mean number flowers/mature plant	6.8	5.2

Table 2. Performance of individual Silene spaldingii plants in the monitoring transects between 1987 and 1988.

	Transect 1	
10	I1-F4	----
14	I1-F12	----
29	I1-A3	----
31	J	----
33	I1-F12	----
37	I1-F2	----
44	S(?)	---?
45	I1-F7	I1-A5
47	I1-F5	----
	Transect 2	
1	----	J
5	----	J
7	I1-F3	----
8	----	J
10	----	J
41	I1-F3	----
41	I1-F10	----
42	J	----
45	I1-F1	I1-P3
46	I1-F6	----
46	----	I1-A1
47	J	J
47	---	I1-A3-F2
48	I1-F3	J
48	I1-F1	----
49	I1-F10	J
50	I1-F5	----

Transect 3

1	I1-F4	J
5	I1-F5	----
10	I1-F5	----
15	I1-F8	----
15	I1-A3	----
16	J	----
23	I1-F8	J
26	I1-F22	----
26	I1-F3	----
27	I1-F12	I1-P3
30	----	J
37	S(?)	---?

Transect 4

5	I1-F11	----
9	J	----
10	I1-F5	J
16	I1-F6	----
18	I1-A2	----
23	I1-F5	----
23	I1-F12	----
24	----	I1-A7-P1-F8
31	----	I1-P2-F3
40	I2-F22	I2-A5-P1-F8

APPENDIX C.

Germination Requirements and Seedling Biology of Spalding's Catchfly (*Silene spaldingii*)

In order to properly manage for the continued existence of a rare plant, it is essential to understand the entire life history of the species. The objectives of this study were to determine the germination requirements and seedling life history of Spalding's catchfly (*Silene spaldingii*).

Methods

I collected seed from populations of Spalding's catchfly at Wild Horse Island in Lake County and the Tobacco Valley in Lincoln County, Montana. Seed was taken from ripe fruits, dried in paper envelopes and stored at room temperature. I sterilized seeds in a solution of 20% laundry bleach for 15 minutes, rinsed them thoroughly in distilled water and placed them on saturated filter paper in petri dishes. Each petri dish contained 50-100 seeds. Two dishes were placed in the dark in a refrigerator at ca. 3 C, and two dishes were kept at room temperature with a 10-hour light regime. After 30 days I took the dishes from the refrigerator and kept them at room temperature for five days. At the end of this time I counted the germinated seeds and estimated percent germination in all the dishes.

I placed germinated seeds in small pots of garden soil and raised the seedlings in the University of Montana, Botany greenhouse. Potted plants were placed in the greenhouse in late January, watered at regular intervals and observed through September of the same year.

Results and Discussion

Less than 5% of the *Silene* seed in the room temperature treatment had germinated at the end of the 35-day period, while 60-70% germination was achieved with the 30-day cold stratification treatment. These results suggest that Spalding's catchfly requires cold stratification for germination, and under normal circumstances would germinate in early spring.

Seedlings began growth immediately, and within 30 days most rosettes had 4-6 leaves. At 60 days most rosettes had 6-14 leaves. After this two-month period, the rosettes ceased to grow. The leaves remained green for another 60 days, and then the rosettes senesced. After approximately 45 days many of the senesced individuals put out new leaves. This occurred in late September after the weather had cooled. Results of this study suggest that, under field conditions, seedlings of Spalding's catchfly germinate in the spring and grow while the soil is moist and the weather is relatively cool. Plants are senescent during the warm, dry, summer months and then revive with the onset of

cool, moist weather and/or with a change in photoperiod in the early fall.

The results of these studies may explain why seedlings of Spalding's catchfly have never been detected in the permanent monitoring transects on Wild Horse Island and at Dancing Prairie when they have been read in late July or early August. Young plants may spend the summer months hidden underground. These results also suggest that if fire is to be used as a management tool, burning during the summer months would have the least impact on seedlings of Spalding's catchfly.

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APPENDIX D.

A Preliminary Study of the Pollination Biology of Spalding's Catchfly in the Tobacco Valley, Lincoln County, Montana

INTRODUCTION

Conservation of rare species is one of the principle goals of The Nature Conservancy. Frequently, this requires more than simply protecting populations of a species. In the case of plants that are obligate outcrossers, it is also necessary to protect or enhance the habitat of the plant's pollinators in order to ensure continued recruitment.

Spalding's catchfly (Silene spaldingii Wats.) is a perennial herb that is potentially threatened or endangered throughout its range in the Pacific Northwest. It does not reproduce vegetatively; all new individuals must start from seed. It occurs in relatively pristine bunchgrass grasslands in the Palouse Region of eastern Washington, northeastern Oregon, adjacent Idaho and northwestern Montana (Heidel 1980, Lesica, field observations). Flowers of Spalding's catchfly are relatively large (ca. 2 cm long) and inconspicuously colored with white petals that are mostly enclosed by the green, broadly cylindrical calyx. At anthesis the flowers are presented horizontally in an open cyme. These characteristics suggest that Spalding's catchfly is adapted for pollination by bees or hovering moths (Faegri and van der Pijl 1971); however, the pollinators of this species are not currently known. In addition, it is not known to what extent Spalding's catchfly is capable of self-fertilization.

The purpose of this study is to determine the pollinators of Spalding's catchfly on The Nature Conservancy's proposed Dancing Prairie Preserve in northwestern Montana and to discover the extent to which this species is capable of setting seed in the absence of pollinators.

METHODS

I observed pollinators of Spalding's catchfly at the proposed Dancing Prairie Preserve in northeastern Lincoln County, Montana on July 12-14, 1988. I spent a total of 28 hours watching a large patch (ca. 30 plants) of Spalding's catchfly in the north-central area of section 26. Part of this time was also spent making observations at other patches in the area. Since many moth pollinators are crepuscular, on all three days I made observations during the early mornings and at dusk. Weather during this three-day period was cold, rainy and windy.

In order to determine whether Spalding's catchfly can set seed in the absence of pollinators, I excluded insects from the inflorescences of 21 plants in four colonies in the north-central area of section 26. For each experimental plant, I removed all flowers that had already opened as well as all insect predators that I detected. I then placed a fine-mesh nylon bag around the inflorescence and tied it closed at the base. These bags allow flowers to open and develop in partial sunlight while excluding any insects larger than 1 mm wide. Plants were bagged on July 14, 1988. Seventeen days later on August 1, I collected the bagged inflorescences

and recorded the total number of flowers, the number that had been predated and the number that had matured fruit. I recognized mature fruit by the presence of a large, swollen ovary. I collected this same information for 25 randomly selected controls (unbagged plants) growing in the same area. Inflorescences of both the bagged plants and the controls were placed in paper bags to allow complete ripening of fruit and an estimation of seed production. I dissected and examined flowers at different stages after anthesis in order to determine the relative ripening times of anthers and stigmata.

On numerous occasions during the course of the study I observed caterpillars (presumably lepidopteran larvae) feeding on the flowers of Spalding's catchfly. These 2 cm-long larvae enter the base of a flower and consume the ovary and other flower parts and then move to another flower on the same inflorescence. I believe that these larvae are responsible for most or all of the flower predation recorded in this study. I attempted to remove all of these predators from the experimental plants at the beginning of the study.

RESULTS AND DISUSSION

Presumably due to the inclement weather, I observed only three pollination episodes during the three days of the study. On these occasions I observed bumblebees (Bombus sp.) sequentially enter the flowers of at least three plants of Spalding's catchfly. I did not observe any other flying insects visiting the flowers. I collected one of these bees and returned it to the laboratory. Pollen collected from the body of this bee matched well with pollen taken from herbarium specimens of Spalding's catchfly. These results suggest that bumblebees can be effective pollinators of Spalding's catchfly. Further studies during periods of good weather are needed to confirm and extend these results.

Examination of numerous flowers indicates that Spalding's catchfly is protandrous. Anthers mature and dehisce pollen first. After which the styles expand in length, and the stigmas spread apart and become receptive.

The nylon mesh bags of seven of the 21 experimental plants were chewed open during the course of the study. I found the exoskeleton of a grasshopper in one of the opened bags, and I suspect that they were responsible for the damage. Since the inflorescences of these plants were open to pollinators for part of the experiment, they have not been included in the following analyses.

Fruit production data for the remaining 14 experimental plants and the 25 controls are presented in Table 1. There were a total of 161 flowers on the 25 control plants. Of these, 40 (25%) were lost to predation. Of the remaining 121 flowers, 91 (75%) produced mature fruit. There were a total of 77 flowers produced by the experimental plants. Of these, 3 (4%) were lost to predation. Of the remaining 74 flowers, 12 (17%) developed mature fruits. Only one or two of the "mature" fruits collected from the experimental plants actually contained ripened seed after they had been stored in a paper bag for 1 month. Mature fruits from control plants contained copious seed. These results suggest that Spalding's catchfly is

an obligate or near-obligate outcrosser; however, I feel that an expanded study specifically examining seed set of bagged plants is necessary to confirm these results.

The results of this study suggest that Spalding's catchfly is an obligate or near-obligate outcrossing species capable of being pollinated by bumblebees. Although bumblebees are common and ubiquitous, overgrazing by livestock can have a detrimental effect on bee populations and consequently on the reproductive effort of the plants they pollinate (Sugden 1985). In the absence of severe overgrazing and pesticide use, seed production by Spalding's catchfly will probably not be curtailed by pollinator limitation.

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Table 1. Fruit maturation for bagged and control plants of Spalding's catchfly. The fourth column is the percent of unpredated flowers that developed into fruit.

# flowers aborted	# flowers predated	# mature fruit	# Mature fruit/ # unpredated flowers
		CONTROL PLANTS	
1	2	2	67
0	3	2	100
0	3	3	100
1	6	5	83
2	2	4	67
2	0	4	100
0	1	9	100
3	1	0	0
0	0	5	100
0	0	8	100
0	1	4	100
2	0	2	50
1	2	0	0
0	0	7	100
1	0	5	83
4	0	5	56
1	1	3	75
2	0	2	50
3	6	4	57
0	1	4	100
0	1	2	100
2	0	1	33
4	2	6	75
0	6	1	100
1	2	3	75
		BAGGED PLANTS	
3	0	3	50
4	1	0	0
3	1	2	40
7	0	0	0
3	1	0	0
3	0	2	40
6	0	1	14
5	0	0	0
3	0	1	25
6	0	0	0
5	0	0	0
3	0	0	0
6	0	3	33
5	0	0	0

Table 2. Fruit set and flower predation of fruits for bagged and control plants of Spalding's catchfly.

	Bagged	Control
Total number of flowers	77	161
Number of predated flowers	3 (4%)	40 (25%)
Number of flowers producing fruit	12	91
% unpredated flowers producing fruit	17%	75%