

REPORT ON THE CONSERVATION STATUS OF
ASTER JESSICAE,
IN IDAHO AND WASHINGTON

by

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Nongame/Endangered Wildlife Program
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ABSTRACT

Available data on the abundance, distribution, and conservation status of Aster jessicae (Jessica's aster) is compiled in this Status Survey Report. This report is based on data gathered from an inventory survey conducted during the late summer and fall of 1990 by the Idaho and Washington Natural Heritage Programs and additional data from Dr. Geraldine Allen, University of Victoria.

Jessica's aster is a robust perennial endemic to the Palouse region of Idaho and Washington. In Idaho, a total of 58 extant sites are documented from Clearwater, Latah, Lewis, and Nez Perce Counties. Nine confirmed sites occur in Whitman County, Washington. Virtually all populations are relatively small (<20 plants) and are located on privately-owned property or in road right-of-ways. All known populations inhabit remnant Palouse Prairie communities or forest-prairie margins. Significant portions of this region have been altered by extensive cultivation and grazing, which has undoubtedly resulting in a drastic decline in the distribution of Jessica's aster.

Aster jessicae currently is a Category 2 candidate. Current information indicates that the species is tolerant and adaptable to disturbance and has a much wider ecological amplitude than originally believed. However, little is known about the population dynamics and ecology of Jessica's aster and few or no regulatory mechanisms presently provide for the species survival. Based on this information, it is recommended that Aster jessicae be reclassified as a Category 1 species.

REPORT ON THE CONSERVATION STATUS OF
ASTER JESSICAE IN IDAHO

Taxon Name: Aster jessicae Piper
Common Name: Jessica's aster
Family: Asteraceae or Compositae
(Sunflower)
States Where Taxon Occurs: U.S.A.; Idaho and Washington
Current Federal Status: Category 2
Recommended Federal Status: Category 1 - Threatened
Author of Report: Christine C. Lorain
Original Date of Report: 30 May 1991
Date of Most recent Revision: N/A
Individual to Whom Further
Information and Comments
Should be Sent: Idaho Natural Heritage Program
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Boise, Idaho 83707

I. Species Information.

1. Classification and nomenclature.

A. Species.

1. Scientific name.

- a. Binomial: Aster jessicae Piper
- b. Full bibliographic citation: Piper, C.V. 1898. New species of Washington plants. *Erythea* 6:29-32.
- c. Type specimen: Piper 1604, "Pullman, Wash. Aug. 1893", the only collection cited in the original description. Another specimen, Piper 2663, also from Pullman, and deposited at the U.S. National Herbarium, is apparently marked as the type in Piper's own hand. Jones (1984), therefore, designated Piper 2663 as the lectotype and referred to Piper 1604 as a syntype. Bates (1986) rejects this designation and argues that Piper 1604, deposited at Washington State University, is the appropriate lectotype.

2. Pertinent synonym(s): Aster latahensis Henderson (L.F. Henderson. 1899. Two new species of plants from the northwestern United States. *Contrib. to the U.S. National Herbarium*, 5:201.)

3. Common name(s): Jessica's aster
Pullman aster

4. Taxon codes: PDASTOT1MO (Idaho Natural Heritage Program); SPNX.L84 (Washington Natural Heritage Program).

5. Size of genus: A large genus of some 250 species found mostly in North America, but extending into South America and also widely distributed in the Old World (Cronquist 1955).

B. Family classification.

1. Family name: Asteraceae
2. Pertinent family synonym: Compositae
3. Common name(s) for family: Sunflower

C. Major plant group: Dicotyledonae (Class Magnoliopsida)

D. History of knowledge of taxon: Apparently first collected in Washington by C.V. Piper in 1893 in the vicinity of Pullman, Washington. The specimens were initially identified as Aster integrifolius Nutt. In 1898, the taxon was described by C.V. Piper from a specimen collected in 1897 along the Palouse River in or near Pullman. Over the next 90 years very few specimens were collected and little was known about this species.

Prior to 1990, confirmed specimens from Washington were documented from nine extant sites, all within a close proximity to the type locality in Whitman County. Other collections of Aster jessicae from Columbia, Walla Walla, Chelan, and Whatcom Counties were later determined to be misidentifications or erroneous reports (Johnson 1981, Allen 1991, Kennison and Taylor 1979, Gamon 1990).

Aster jessicae was first collected in Idaho by L. Constance in 1936 "1 mile south of Troy", Latah County. Three later collections, from 1936, 1958, and 1962, were made in the same vicinity. In 1979, Bonnie Heidel (1979) working for the Bureau of Land Management, located two populations, again, just south of Troy and possibly a historical relocation. An additional Idaho population was discovered in 1980 (near Ruebens, Nez Perce Co.) and another in 1982 (near Greer, Idaho Co.). A collection from Boundary County was determined to be a misidentification.

Dr. Geraldine Allen, an Aster researcher at the University of Victoria, discovered three new populations in 1984, nine populations in 1985, and 23 population in 1986. Unfortunately, the 1985 and 1986 collection located by Dr. Allen were not forwarded to Idaho sources until 1990. Idaho records, therefore, indicated that as of 1989 Jessica's aster was known from seven extant populations and four historical sites.

In 1990, the Idaho and Washington Natural Heritage Program were contracted by the U.S. Fish and Wildlife Service to conduct a status survey of Aster jessicae in Idaho and Washington. Field surveys were conducted during August and September to relocate extant and historical sites and search for additional populations. Twenty-three new populations were discovered in Idaho, and six of the seven extant sites were relocated. Three of these "new" Idaho populations were subsequently found to overlap with 1985-86 collections by Dr. Allen. In Washington, surveys successfully relocated nine extant populations in Whitman County.

E. Comments on current alternative taxonomic treatment(s):
None.

2. Present legal or other formal status.

A. International: None.

B. National.

1. Present designated or proposed legal protection or regulation: Jessica's aster is a Category 2 species (U.S. Fish and Wildlife Service 1990)
2. Other current formal status recommendation:
Jessica's aster is currently ranked as "imperiled throughout its range because of rarity or because of other factors demonstrably making it very vulnerable to extinction" (global rank = G2) by the Nature Conservancy.

Jessica's aster is also listed as a Sensitive Plant Species with the Coeur d'Alene District of the Bureau of Land Management.

3. Review of past status: In 1975, Jessica's aster was listed as a Candidate Threatened species (Federal Register, 1 July 1975). In 1980, the species was listed as a Category 2 Candidate species (Federal Register, 15 December 1980).

C. State.

1. Idaho

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

b. Other current formal status recommendation:
Jessica's aster is currently listed as "critically imperiled in Idaho because of rarity or because of other factors making it vulnerable to extirpation" (state rank = S2) by the Idaho Natural Heritage Program (Moseley and Groves 1990).

c. Review of past status: Johnson (1977, 1981) recommended Jessica's aster for Federal Status as Endangered, mostly because of the species rarity in the state and because all populations were known from private land.

1. Washington

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

b. Other current formal status recommendation: Jessica's aster is currently listed as Threatened in Washington by the Washington Natural Heritage Program (1990). That is, "a threatened plant taxon likely to become endangered within the near future in Washington if factors contributing to its population decline or habitat degradation or loss continue".

c. Review of past status: Listed with "Taxa Threatened in Washington" (Washington Natural Heritage Program 1987) and with "Taxa Endangered in Washington" (Washington Natural Heritage Program 1981).

3. Description.

A. General nontechnical description: Jessica's aster is a robust, extensively rooting perennial that tends to grow in large clumps. Plants grow to 1.5 meters tall, but average about 1 meter. The herbage, particularly the upper portion, is covered with a dense, uniform, soft pubescence. Leaves are abundant and broadly lance-shaped. Middle stem leaves generally partially clasp the stem at attachment and lower leaves tend to dry up and wither as the season progresses. Flowers are generally numerous, lavender in color, 1-1.5 inches in diameter, and form a broad cluster at the top of the plant. Plants flower from late July through September (see Appendix 2 for line drawings).

B. Technical description: A robust, erect, perennial herb with thick creeping rhizomes. Plants tend to grow in large clumps and range from 0.4-1.5 meters tall, averaging ca. 1 meter. Upper herbage is densely and uniformly soft-pubescent or puberulent. Leaves are ample, broadly lanceolate, 6-13 cm long and 1.5-3.5 cm wide, and gradually reducing in size upward. Lower leaves abruptly petiolate and often deciduous. Middle cauline leaves are sessile, clasping and somewhat auricled based. Inflorescence paniculiform, usually with numerous radiate flower heads. Ray flowers are lavender/blue, 18-30 in number, and 12-20 mm long. Phyllaries typically graduated in (4)5-6 imbricated series, strongly pubescent, appressed to somewhat loose, but not squarrose. Pappus tawny, soft, and about as long as the disk corollas. Achenes purple, slightly compressed, and pubescent.

- C. Local field characters: Jessica's aster is generally found in remnant prairie communities and the prairie/forest margins near canyon edges. Similar in general appearance to many other Aster species, it is distinct in its unusually robust nature, dense pubescence, and cordate leaf bases. Jessica's aster is a particularly large, showy plant averaging 1 meter tall and tending to grow in large clumps of 10-50 stems or more. The upper portion the plants are covered with short, dense, uniform hairs. This trait is quite distinct and relatively uncommon in the genus. Additionally, the middle stem leaves are sessile, clasping, and partially surround the stem. This combination of characters help distinguish Aster jessicae from other Aster species (see Appendix 2 for line drawing).

The only other aster found in the general vicinity of Jessica's aster is Aster occidentalis var. intermedius A. Gray (Jones 1984). Compared to Jessica's aster, this second species generally inhabits more mesic microhabitats, has smaller flowers (ca. 1/2 the size), is less robust (ca. 0.5 meters tall), possesses few to no hairs, and lacks the cordate leaf bases. Possible hybrids between these two taxa have been documented (Arnett 1990, Allen 1991).

- D. Identifying characteristics of material which is in interstate or international commerce or trade: No interstate or international trade is known. See above section for identifying characteristics.
- E. Photographs and/or line drawings: Line drawings of Jessica's aster appear in Cronquist (1955). See Appendix 2 for a reproduction of this drawing. Photographs of Jessica's aster and its habitat in Idaho are located in the slide collection of the Idaho and Washington Natural Heritage Programs. Several have been reproduced in Appendix 3.

4. Significance.

- A. Natural: Jessica's aster is a regional endemic to the Palouse country of southeastern Washington and adjacent Idaho. Much of this habitat has been lost due to cultivation and grazing, which has left only small, scattered remnant parcels of native prairie throughout this region.
- B. Human: None known, however, due to the size and showy nature of Jessica's aster, the species may have

horticultural potential.

5. Geographical distribution.

A. Geographical range: Most of the documented populations of Jessica's aster are in Idaho. The species occurs in Clearwater, Latah, Lewis, and Nez Perce Counties. In Washington, confirmed locations are known only from Whitman County, within an area approximately 15 miles by 12 miles (see Appendix 4 for distribution map). Populations inhabit remnant Palouse Prairie communities or forest-prairie transition zones.

B. Precise occurrences.

1. Populations currently or recently known extant.

a. Idaho. Jessica's aster is documented from 58 extant sites; 23 of which were located during a 1990 survey. The specific localities in Idaho include the Troy vicinity (Latah Co.); upper Potlatch River and tributaries (Latah Co.); Central Ridge, Reubens vicinity, and Golden Ridge (Lewis Co.); Potlatch Ridge, Angel Ridge, Nez Perce, and Gifford/Melrose vicinity (Nez Perce Co.); and Orofino/Gilbert vicinity (Clearwater Co.). Populations are listed under Appendix 5 by occurrence record. Exact locations are provided on U.S.G.S. quadrangle maps in Appendix 4 for all populations except Allen's 1985-86 sightings since this data arrived late.

1. Troy Southeast (001)

- a. USA, Idaho, Latah County
- d. Troy 7.5 minute U.S.G.S. topographic map quadrangle, 1960.
- e. First observed in 1979 by Bonnie Heidel.
- f. Most recently observed by in 1990 by Christine Lorain.

2. West Fork Little Bear Creek (002)

- a. USA, Idaho, Latah County
- d. Kendrick 15 minute U.S.G.S. topographic map quadrangle, 1960.
- e. First observed in 1979 by Bonnie Heidel
- f. Most recently observed in 1990 by C. Lorain.

3. Southwick (006)

- a. USA, Idaho, Nez Perce County
- d. Ahsahka 15 minute U.S.G.S. topographic map quadrangle, 1961
- e. First observed in 1984 by Dr. Geraldine Allen

- f. Most recently observed in 1990 by Christine Lorain.
- 4. Emmanuel Lutheran Cemetery Site (007)
 - a. USA, Idaho, Nez Perce County
 - d. Kendrick 15 minute U.S.G.S. topographic map quadrangle, 1960.
 - e. First observed in 1984 by Dr. Geraldine Allen
 - f. Most recently observed in 1990 by Christine Lorain.
- 5. Kendrick (008)
 - a. USA, Idaho, Nez Perce County
 - d. Kendrick 15 minute U.S.G.S. topographic map quadrangle, 1960.
 - e. First observed in 1984 by Dr. Geraldine Allen
 - f. Most recently observed in 1990 by Christine Lorain.
- 6. Reubens Railroad (010)
 - a. USA, Idaho, Lewis County
 - d. Reubens 7.5 minute U.S.G.S. topographic map quadrangle, 1984.
 - e. First observed in 1980
 - f. Most recently observed in 1990 by Christine Lorain.
- 7. Central Ridge (012)
 - a. USA, Idaho, Lewis County
 - d. Orofino West 7.5 minute U.S.G.S. topographic map quadrangle, 1967, photorevised 1984.
 - e. First observed in 1990 by Christine Lorain
 - f. Most recently observed in 1990 by C. Lorain.
- 8. Steele Townsite (013)
 - a. USA, Idaho, Lewis County
 - d. Orofino West 7.5 minute U.S.G.S. topographic map quadrangle, 1967, photorevised 1984.
 - e. First observed in 1990 by Christine Lorain
 - f. Most recently observed in 1990 by C. Lorain.
- 9. Melrose (014)
 - a. USA, Idaho, Nez Perce County
 - d. Peck 7.5 minute U.S.G.S. topographic map quadrangle, 1967.
 - e. First observed in 1990 by Christine Lorain
 - f. Most recently observed in 1990 by C. Lorain.
- 10. Angel Ridge Cemetery (015)
 - a. USA, Idaho, Nez Perce County
 - d. Peck 7.5 minute U.S.G.S. topographic map quadrangle, 1967.

- e. First observed in 1990 by Christine Lorain
 - f. Most recently observed in 1990 by C. Lorain.
11. Gold Ridge South (016)
- a. USA, Idaho, Lewis County
 - d. Reubens 7.5 minute U.S.G.S. topographic map quadrangle, 1984.
 - e. First observed in 1990 by Christine Lorain
 - f. Most recently observed in 1990 by C. Lorain.
12. Reubens East (017)
- a. USA, Idaho, Lewis County
 - d. Reubens 7.5 minute U.S.G.S. topographic map quadrangle, 1984.
 - e. First observed in 1990 by Christine Lorain
 - f. Most recently observed in 1990 by C. Lorain.
13. Reuben Cemetery (018)
- a. USA, Idaho, Lewis County
 - d. Reubens 7.5 minute U.S.G.S. topographic map quadrangle, 1984.
 - e. First observed in 1990 by Christine Lorain
 - f. Most recently observed in 1990 by C. Lorain.
14. Clicks North (019)
- a. USA, Idaho, Lewis County
 - d. Reubens 7.5 minute U.S.G.S. topographic map quadrangle, 1984.
 - e. First observed in 1990 by Christine Lorain
 - f. Most recently observed in 1990 by C. Lorain.
15. Southwick West (020)
- a. USA, Idaho, Nez Perce County
 - d. Kendrick 15 minute U.S.G.S. topographic map quadrangle, 1960.
 - e. First observed in 1990 by Christine Lorain
 - f. Most recently observed in 1990 by C. Lorain.
16. Mouth of Wauncher Gulch (021)
- a. USA, Idaho, Nez Perce County
 - d. Kendrick 15 minute U.S.G.S. topographic map quadrangle, 1960.
 - e. First observed in 1990 by Christine Lorain
 - f. Most recently observed in 1990 by C. Lorain.
17. Wauncher Gulch (022)
- a. USA, Idaho, Nez Perce County
 - d. Kendrick 15 minute U.S.G.S. topographic map quadrangle, 1960.
 - e. First observed in 1990 by Christine Lorain
 - f. Most recently observed in 1990 by C. Lorain.

18. Cedar Creek Gulch (023)
 - a. USA, Idaho, Latah County
 - d. Kendrick 15 minute U.S.G.S. topographic map quadrangle, 1960.
 - e. First observed in 1990 by Christine Lorain
 - f. Most recently observed in 1990 by C. Lorain.
 19. Pine Creek East (024)
 - a. USA, Idaho, Latah County
 - d. Kendrick 15 minute U.S.G.S. topographic map quadrangle, 1960.
 - e. First observed in 1990 by Christine Lorain
 - f. Most recently observed in 1990 by C. Lorain.
 20. Gold Hill Cemetery (025)
 - a. USA, Idaho, Latah County
 - d. Kendrick 15 minute U.S.G.S. topographic map quadrangle, 1960.
 - e. First observed in 1990 by Christine Lorain
 - f. Most recently observed in 1990 by C. Lorain.
 21. South end Texas Ridge (026)
 - a. USA, Idaho, Latah County
 - d. Kendrick 15 minute U.S.G.S. topographic map quadrangle, 1960.
 - e. First observed in 1990 by Christine Lorain
 - f. Most recently observed in 1990 by C. Lorain.
 22. Texas Ridge Powerline (027)
 - a. USA, Idaho, Latah County
 - d. Kendrick 15 minute U.S.G.S. topographic map quadrangle, 1960.
 - e. First observed in 1990 by Christine Lorain
 - f. Most recently observed in 1990 by C. Lorain.
 23. Green Knob NW (028)
 - a. USA, Idaho, Latah County
 - d. Moscow 15 minute U.S.G.S. topographic map quadrangle, 1961.
 - e. First observed in 1990 by Christine Lorain
 - f. Most recently observed in 1990 by C. Lorain.
- NOTE: Site 029 is actually a relocation of 010.
24. Chesley N and NE (030)
 - a. USA, Idaho, Nez Perce County
 - d. Reubens 7.5 minute U.S.G.S. topographic map quadrangle, 1984.
 - e. First observed in 1990 by Christine Lorain
 - f. Most recently observed in 1990 by C. Lorain.
 25. Gifford (031)

- a. USA, Idaho, Nez Perce County
 - d. Culdesac 15 minute U.S.G.S. topographic map quadrangle, 1958.
 - e. First observed in 1990 by Christine Lorain
 - f. Most recently observed in 1990 by C. Lorain.
26. Gifford Southeast (032)
- a. USA, Idaho, Nez Perce County
 - d. Culdesac 15 minute U.S.G.S. topographic map quadrangle, 1958.
 - e. First observed in 1990 by Christine Lorain
 - f. Most recently observed in 1990 by C. Lorain.
27. Bovard West - Ridgeline (033)
- a. USA, Idaho, Latah County
 - d. Kendrick 15 minute U.S.G.S. topographic map quadrangle, 1960.
 - e. First observed in 1990 by Christine Lorain
 - f. Most recently observed in 1990 by C. Lorain.
28. Head of Brady Gulch (034)
- a. USA, Idaho, Latah County
 - d. Kendrick 15 minute U.S.G.S. topographic map quadrangle, 1960.
 - e. First observed in 1990 by Christine Lorain
 - f. Most recently observed in 1990 by C. Lorain.
29. Brady Gulch (035)
- a. USA, Idaho, Latah County
 - d. Kendrick 15 minute U.S.G.S. topographic map quadrangle, 1960.
 - e. First observed in 1990 by Christine Lorain
 - f. Most recently observed in 1990 by C. Lorain.

The following are 29 additional sites located by G. Allen in 1985 and 1986. This data arrived late and has been incorporated into this report as best as possible.

30. Site 85-1 (Spring Valley Creek)
- a. USA, Idaho, Latah County
 - c. Kendrick 15 minute U.S.G.S. topographic map quadrangle, 1960.
 - d. First observed in 1985 by Geraldine Allen
 - e. Most recently observed in 1985 by G. Allen.
31. Site 85-2 (Nora Creek)
- a. USA, Idaho, Latah County
 - c. Kendrick 15 minute U.S.G.S. topographic map quadrangle, 1960.
 - d. First observed in 1985 by Geraldine Allen
 - e. Most recently observed in 1985 by G. Allen.
32. Site 85-3 (Little Bear Ridge Rd)

- a. USA, Idaho, Latah County
 - c. Kendrick 15 minute U.S.G.S. topographic map quadrangle, 1960.
 - d. First observed in 1985 by Geraldine Allen
 - e. Most recently observed in 1985 by G. Allen.
- 33.Site 85-4 (Little Bear Ridge Cemetery)
- a. USA, Idaho, Latah County
 - c. Kendrick 15 minute U.S.G.S. topographic map quadrangle, 1960.
 - d. First observed in 1985 by Geraldine Allen
 - e. Most recently observed in 1985 by G. Allen.
- 34.Site 85-5 (Little Bear Ridge Road South)
- a. USA, Idaho, Latah County
 - c. Kendrick 15 minute U.S.G.S. topographic map quadrangle, 1960.
 - d. First observed in 1985 by Geraldine Allen
 - e. Most recently observed in 1985 by G. Allen.
- 35.Site 85-6 (Greer #1)
- a. USA, Idaho, Clearwater County
 - c. Orofino East 7.5 minute U.S.G.S. topographic map quadrangle, 1967.
 - d. First observed in 1985 by Geraldine Allen
 - e. Most recently observed in 1985 by G. Allen.
- 36.Site 85-7 (Greer #2)
- a. USA, Idaho, Clearwater County
 - c. Orofino East 7.5 minute U.S.G.S. topographic map quadrangle, 1967.
 - d. First observed in 1985 by Geraldine Allen
 - e. Most recently observed in 1985 by G. Allen.
- 37.Site 85-8 (Fraser Cemetery)
- a. USA, Idaho, Clearwater County
 - c. Rudo 7.5 minute U.S.G.S. topographic map quadrangle, 1967.
 - d. First observed in 1985 by Geraldine Allen
 - e. Most recently observed in 1985 by G. Allen.
- 38.Site 85-9 (Eureka Ridge)
- a. USA, Idaho, Clearwater County
 - c. Ahsahka SE 7.5 minute U.S.G.S. topographic map quadrangle or Ahsahka 15 minute quad, 1967.
 - d. First observed in 1985 by Geraldine Allen
 - e. Most recently observed in 1985 by G. Allen.
- 39.Site 86-1 (Canyon Road)
- a. USA, Idaho, Latah County
 - c. Troy 7.5 minute U.S.G.S. topographic map quadrangle, 1960.

- d. First observed in 1986 by Geraldine Allen
 - e. Most recently observed in 1986 by G. Allen.
40. Site 86-2 (Driscoll Ridge #1)
- a. USA, Idaho, Latah County
 - c. Troy 7.5 minute U.S.G.S. topographic map quadrangle, 1960.
 - d. First observed in 1986 by Geraldine Allen
 - e. Most recently observed in 1986 by G. Allen.
41. Site 86-3 (Driscoll Ridge #2)
- a. USA, Idaho, Latah County
 - c. Troy 7.5 minute U.S.G.S. topographic map quadrangle, 1960.
 - d. First observed in 1986 by Geraldine Allen
 - e. Most recently observed in 1986 by G. Allen.
42. Site 86-4 (Driscoll Ridge #3)
- a. USA, Idaho, Latah County
 - c. Troy 7.5 minute U.S.G.S. topographic map quadrangle, 1960.
 - d. First observed in 1986 by Geraldine Allen
 - e. Most recently observed in 1986 by G. Allen.
43. Site 86-5 (Wilson Rd)
- a. USA, Idaho, Latah County
 - c. Kendrick 15 minute U.S.G.S. topographic map quadrangle, 1960.
 - d. First observed in 1986 by Geraldine Allen
 - e. Most recently observed in 1986 by G. Allen.
- Site 86-6 (Texas Ridge #1)
= #22 Texas Ridge Powerline (027)
- Site 86-7 (Texas Ridge #2)
= #21 South end Texas Ridge (026)
44. Site 86-8 (Sperry Grade)
- a. USA, Idaho, Nez Perce County
 - c. Kendrick 15 minute U.S.G.S. topographic map quadrangle, 1960.
 - d. First observed in 1986 by Geraldine Allen
 - e. Most recently observed in 1986 by G. Allen.
45. Site 85-9 (N Southwick Rd)
- a. USA, Idaho, Nez Perce County
 - c. Kendrick 15 minute U.S.G.S. topographic map quadrangle, 1960.
 - d. First observed in 1986 by Geraldine Allen
 - e. Most recently observed in 1986 by G. Allen.
- Site 86-10 (W of Southwick)

= #15 Southwick West (020)

46. Site 86-11 (Jacks Canyon Rd #1)
 - a. USA, Idaho, Nez Perce County
 - c. Culdesac 15 minute U.S.G.S. topographic map quadrangle, 1958.
 - d. First observed in 1986 by Geraldine Allen
 - e. Most recently observed in 1986 by G. Allen.
47. Site 86-12 (Jack's Canyon Rd #2)
 - a. USA, Idaho, Nez Perce County
 - c. Culdesac 15 minute U.S.G.S. topographic map quadrangle, 1958.
 - d. First observed in 1986 by Geraldine Allen
 - e. Most recently observed in 1986 by G. Allen.
48. Site 86-13 (Jacks Canyon Rd #3)
 - a. USA, Idaho, Nez Perce County
 - c. Culdesac 15 minute U.S.G.S. topographic map quadrangle, 1958.
 - d. First observed in 1986 by Geraldine Allen
 - e. Most recently observed in 1986 by G. Allen.
49. Site 86-14 (Teakean #1)
 - a. USA, Idaho, Clearwater County
 - c. Ahsahka SE 7.5 minute U.S.G.S. topographic map quadrangle or Ahsahka 15 minute quad, 1967.
 - d. First observed in 1986 by Geraldine Allen
 - e. Most recently observed in 1986 by G. Allen.
50. Site 86-15 (Teakean #2)
 - a. USA, Idaho, Clearwater County
 - c. Dent 7.5 minute U.S.G.S. topographic map quadrangle, 1969.
 - d. First observed in 1986 by Geraldine Allen
 - e. Most recently observed in 1986 by G. Allen.
51. Site 86-16 (Gilbert Grade)
 - a. USA, Idaho, Clearwater County
 - c. Orofino East 7.5 minute U.S.G.S. topographic map quadrangle, 1967.
 - d. First observed in 1986 by Geraldine Allen
 - e. Most recently observed in 1986 by G. Allen.
52. Site 86-17 (Russell Ridge #1)
 - a. USA, Idaho, Clearwater County
 - c. Orofino West 7.5 minute U.S.G.S. topographic map quadrangle, 1967 (photorevised 1984).
 - d. First observed in 1986 by Geraldine Allen
 - e. Most recently observed in 1986 by G. Allen.

- 53. Site 86-18 (Russell Ridge #2)
 - a. USA, Idaho, Nez Perce County
 - c. Orofino West 7.5 minute U.S.G.S. topographic map quadrangle, 1967 (photorevised 1984).
 - d. First observed in 1986 by Geraldine Allen
 - e. Most recently observed in 1986 by G. Allen.

- 54. Site 86-19 (Russell Ridge #3)
 - a. USA, Idaho, Nez Perce County
 - c. Orofino West 7.5 minute U.S.G.S. topographic map quadrangle, 1967 (photorevised 1984).
 - d. First observed in 1986 by Geraldine Allen
 - e. Most recently observed in 1986 by G. Allen.

- 55. Site 86-20 (Russell Ridge #4)
 - a. USA, Idaho, Nez Perce County
 - c. Orofino West 7.5 minute U.S.G.S. topographic map quadrangle, 1967 (photorevised 1984).
 - d. First observed in 1986 by Geraldine Allen
 - e. Most recently observed in 1986 by G. Allen.

- 56. Site 86-21 (Russell Ridge #5)
 - a. USA, Idaho, Lewis County
 - c. Orofino West 7.5 minute U.S.G.S. topographic map quadrangle, 1967 (photorevised 1984).
 - d. First observed in 1986 by Geraldine Allen
 - e. Most recently observed in 1986 by G. Allen.

- 57. Site 86-22 (Greer Grade #1)
 - a. USA, Idaho, Lewis County
 - c. Sixmile Creek 7.5 minute U.S.G.S. topographic map quadrangle, 1967.
 - d. First observed in 1986 by Geraldine Allen
 - e. Most recently observed in 1986 by G. Allen.

- 58. Site 86-23 (Greer Grade #2)
 - a. USA, Idaho, Lewis County
 - c. Sixmile Creek 7.5 minute U.S.G.S. topographic map quadrangle, 1967.
 - d. First observed in 1986 by Geraldine Allen
 - e. Most recently observed in 1986 by G. Allen.

- b. Washington. Jessica's aster is documented from 9 extant sites, all revisited in 1990 and all found within Whitman County. See Appendix 4 for maps of exact locations and Appendix 5 for occurrence records.

- 1. Albion Cemetery (008)
 - a. USA, Washington, Whitman County
 - d. Colfax South 7.5 minute U.S.G.S. topographic map quadrangle, 1964.

- e. First observed in 1980 by Bonnie Heidel.
 - f. Most recently observed in 1990 by John Gamon and Joe Arnett.
2. Ewartsville (009)
 - a. USA, Washington, Whitman County
 - d. Ewarstville 7.5 minute U.S.G.S. topographic map quadrangle, 1964.
 - e. First observed in 1980 by Bonnie Heidel.
 - f. Most recently observed in 1990 by John Gamon and Joe Arnett.
 3. Spaulding Road (010)
 - a. USA, Washington, Whitman County
 - d. Almota 7.5 minute U.S.G.S. topographic map quadrangle, 1964, photorevised in 1975.
 - e. First observed in 1980 by Bonnie Heidel.
 - f. Most recently observed in 1990 by Joe Arnett.
 4. Pullman Drive-in (012)
 - a. USA, Washington, Whitman County
 - d. Pullman 7.5 minute U.S.G.S. topographic map quadrangle, 1964.
 - e. First observed in 1918 by F.L. Pickett.
 - f. Most recently observed in 1990 by John Gamon and Joe Arnett.
 5. Bobo's (Armstrong) (013)
 - a. USA, Washington, Whitman County
 - d. Albion 7.5 minute U.S.G.S. topographic map quadrangle, 1964.
 - e. First observed in 1952 by J.R. King.
 - f. Most recently observed in 1990 by John Gamon and Joe Arnett.
 6. SE of Armstrong Bridge (014)
 - a. USA, Washington, Whitman County
 - d. Albion 7.5 minute U.S.G.S. topographic map quadrangle, 1964.
 - e. First observed in 1981 by Jim Barrett.
 - f. Most recently observed in 1990 by John Gamon and Joe Arnett.
 7. Yecha Road (Albion) (015)
 - a. USA, Washington, Whitman County
 - d. Albion 7.5 minute U.S.G.S. topographic map quadrangle, 1964.
 - e. First observed in 1981 by Jim Barrett.
 - f. Most recently observed in 1990 by Joe Arnett.
 8. N of Albion (Shawnee-Parvin Rd) (022)
 - a. USA, Washington, Whitman County

- d. Colfax South 7.5 minute U.S.G.S. topographic map quadrangle, 1964.
- e. First observed in 1983 by Elise Augenstein.
- f. Most recently observed in 1990 by Joe Arnett.

9. Rose Creek (023)

- a. USA, Washington, Whitman County
- d. Albion 7.5 minute U.S.G.S. topographic map quadrangle, 1964.
- e. First observed in 1983 by Laura Smith.
- f. Most recently observed in 1990 by Joe Arnett.

2. Populations known or assumed extirpated.

- a. Idaho. One extant site collected in 1982 from Lolo Creek (009), about 10 miles SSE of Orofino, was not relocated in 1990. Surveys were conducted in the general vicinity, but the precise location may have been bypassed. The associated habitat, however, does not appear suitable for Jessica's aster (Lorain pers. obs.). This site may have been extirpated due to forest succession and increased canopy cover or recent logging activity in the area. Site 009 should be resurveyed using the new information acquired by the author from the original collector following the 1990 field season (see occurrence record and mapped locality in Table 1; see also "Reports having ambiguous or incomplete locality information").

- b. Washington. None in Washington.

3. Historically known populations where current status not known. It is quite possible that some of the historical Piper collections from the vicinity of Pullman, Washington and Troy, Idaho are represented by some of the extant sites. However, exact location of these historical sites is unknown (see also "Reports having ambiguous or incomplete locality information".)

4. Locations not yet investigated believed likely to support additional natural populations. Potentially suitable habitat for Jessica's aster in Idaho includes tributaries of the Palouse River drainage and the Greer vicinity along the Clearwater River. Many of the creek canyons that feed into the various forks of the Palouse River are quite inaccessible. A considerable amount of time and energy would be needed to fully survey these areas.

In 1986, an unusual A. jessicae-like plant was

discovered near Grangeville in Idaho County by G. Allen (Allen 1991). This plant was later determined to have an incorrect chromosome number for *A. jessicae*, however, its presence raises the possibility the Jessica's aster could extend much farther south than we presently think. For documentation this site is:

Idaho Co., between Mount Idaho (E of Grangeville) and S Fk Clearwater River, on Rd 17 (Mt. Idaho Grade Rd), ca. 4 km from jct with Hwy 14. SW-facing Slope above hwy, at top of road cut along old fence line. T30N, R3E, sec. 25. (Allen 1177)

In Washington, additional populations may occur within the known range of Jessica's aster. Potential areas include, but are not limited to, Union Flat Creek, Almota Creek, Little Almota Creek, South Fork Palouse River, and Rose Creek.

5. Reports having ambiguous or incomplete locality information. (see Table 1)

- a. Idaho. Four historical collection sites in Idaho have vague location data, making precise relocated impossible. Two of the collects were made in the 1930's (003, 004) and one in 1958 (011) and one in 1962 (005). All are located in the Troy vicinity where extant populations exist. It is possible that the extant populations from this same area represent relocations of these historical sites.

One extant site from 1982 (009) from the Greer, Idaho vicinity also gave vague location information. The author has since contacted the original collector (F.D. Johnson 1990) and gathered more precise information. This site should be resurveyed.

- b. Washington. Seven historical collection sites in Washington were considered unmappable due to vague location data. Five of the collections were made by C.V. Piper between 1893 and 1899 in Pullman. One collection was from 1915 (Pickett 355) and another from 1923 (Warren 126) also from the Pullman area. It is possible that extant populations from this same vicinity represent relocations of these historical sites.

6. Locations known or suspected to be erroneous reports.

- a. Idaho. A single report from Boundary County is believed to be erroneous.

- b. Washington. Collections from Walla Walla County (001, 016, 018, 020), Columbia County (011, 017, 019, 021), Chelan County (002), and Whatcom County (006, 007) were misidentified as Aster jessicae.

- C. Biogeographical and phylogenetic history: Jessica's aster is an element of the Palouse Prairie grassland. The wind-blown soils (loess) that supports these communities was carried via the prevailing westerly winds off the Columbia Basin and deposited some 15,000 years ago. It is possible that this species evolved or migrated into these areas after the soils were deposited.

Jones (1984) points out that phylogenetic affinities for Aster jessicae lie with Aster cusickii A. Gray, A. suspicatus Nees, and A. laevis L. The chromosome number for Jessica's aster is $2n = 80$ (Dean 1966, Jones 1984, Allen 1991). It is suggested that Aster jessicae may be of allopolyploid origin as a result of hybridization between a tetraploid of A. cusickii ($2n = 4x = 16_{II}$) and a hexaploid of A. suspicatus or A. laevis ($2n = 6x = 24_{II}$), with subsequent doubling of the chromosomes (Dean 1966, Jones 1984).

Allen (1991) suspects the two most likely parents of A. jessicae are A. foliaceus var. cusickii (from the Wallowa, Seven Devils and Clearwater Mts.) and A. occidentalis. She is in the process of writing a paper on the affinities and probable origins of A. jessica.

6. General environment and habitat description.

- A. Concise statement of general environment and habitat:

In Idaho, Jessica's aster occupies Palouse Prairie grassland communities and the prairie/forest transition zones. Within these communities, Jessica's aster grows on shoulders, banks, slopes, and tops of draws. The most frequently encountered situation was a population consisting of scattered clumps of 5-10 individuals growing in a small disturbed vegetation strip between the road and adjacent cultivated field. Such habitats have open or partially open exposures with variable slopes (flat to 35%) and occurred on a crest or upper slope position. Aspects vary, but most populations occur on western or southwestern aspects (none faced due east). Elevations range between 1600 and 3850 feet, though the species is generally found between 2500-2800 feet. Substrates are almost exclusively productive silt/loams (loess), moderately deep and sometimes gravelly.

Jessica's aster usually grows in the vicinity of streams or small intermittent drainages, but some distance above water level on drier ground. In Washington, Jessica's aster was most frequently associated with Crataegus douglasii (black hawthorn) communities. Other sites typically occurred along the prairie/forest treeline, or near scattered trees, typically ponderosa pine.

B. Physical characteristics.

1. Climate.

- a. Koppen climate classification: Habitat for Jessica's aster is classified as Koppen's unit Dfb: cold climate with humid winters. The average temperature of warmest month is under 22^o C (71^o F). (Trewartha and Horn 1980).
- b. Regional macroclimate: The regional macroclimates for areas that support Jessica's aster are extrapolated from the Moscow (Palouse Prairie) and Winchester (Camas Prairie and crest of canyonlands) weather stations. Moscow is 2750 ft (838 m) in elevation and Winchester is 3968 ft (1209 m) in elevation.

At Moscow, the mean annual temperature is 47.5^o F (8.6^o C) and the mean annual precipitation is 23.37 inches (593.7 mm). The annual temperature range averages between 27.8^o F (-2.3^o C) to 66.6^o F (19.3^o C), with highest temperatures occurring in July and the lowest occurring in January. Mean annual precipitation peaks in the winter months (November, December, and January) with 38.7% of the total annual precipitation. July and August mark the dry season when an average of less than 1 inch of precipitation occurs.

At Winchester, the mean annual temperature is 42.5^o F (5.8^o C) and the mean annual precipitation is 26.11 inches (663.2 mm). The annual temperature range averages between 24.9^o F (-4.0^o C) to 61.2^o F (16.2^o C), with the highest temperatures occurring in July and the lowest occurring in January. Mean annual precipitation peaks in the spring months (March, April, and especially May) with 33.8% of the total annual precipitation. July and August mark the dry season when an average of 1.3 inches of precipitation occurs.

- c. Local microclimate: Typical habitats for Jessica's aster includes shallow ditches, tops of

roadcuts, partially shaded slopes, shrubby fencerows, and roadsides. Such situation create a slightly more mesic microclimate than found in the surrounding "typical" Palouse prairie community. Additionally, habitats at the forest margins within the prairie/forest ecotone also exhibit a slightly more mesic microclimate condition.

2. Air and water quality requirements: Unknown.
3. Physiographic provinces: Populations of Jessica's aster lie within the Palouse Hills section and the Tri-State Uplands section of the Northern Rocky Mountain Province (Ross and Savage 1967). The Palouse Hills section is mostly found in eastern Washington and projects into western Idaho. The Tri-State Uplands section, as the name implies, includes parts of Idaho, Oregon and Washington (Ross and Savage 1967).
4. Physiographic and topographic characteristics: The Palouse Hills region consists of rolling, asymmetrical hills that commonly rise 20-80 feet. These hills are actually dunes of loess (wind blown material), which overlies basalts. Hills are constantly reshaped by winds, snow, mass wasting, and runoff. The Tri-State section consists of a large, gently undulating plateau or rolling plain at a rather high elevation (averaging some 3000-4000 feet in elevation) and underlain by Columbia River basalts. At the edge of these two productive grasslands, the topography abruptly changes near the canyon edges to steeper slopes that support slightly wetter forested communities (Ross and Savage 1967).
5. Edaphic factors: Soil substrates are almost exclusively productive silt/loams (loess) with occasional loams and skeletal silt/loams. The fertile soils and relatively moist climate have resulted in an almost complete conversion of the original prairie into cultivated fields or grazing lands.
6. Dependence of this taxon on natural disturbance: Jessica's aster does not appear to require disturbance, however, most populations were found in disturbed habitats, indicating that the species can tolerate and potentially benefit from a certain amount of natural or man-caused disturbances.

The past role of fire in the Palouse grasslands and ponderosa pine communities is well known and documented. Fire suppression over the last 100 years has altered the natural community structure and composition. How this

may have effected Jessica's aster is unknown, however, since the species tolerates disturbance, it may have benefitted from fires in the past. Recent fire suppression may be another factor responsible for reducing the range and habitat of Jessica's aster.

7. Other unusual physical features: None known.

C. Biological characteristics.

1. Vegetation physiognomy and community structure:

Habitats that support Jessica's aster fall into five classified communities based on the dominant or characteristic species in the climax community. Most of these sites, especially the forested habitats, have undergone past disturbance and are in secondary succession. Listed below are the five habitat types in order of their association with Jessica's aster (Cooper *et al.* 1987, Daubenmire 1970):

Pinus ponderosa/Symphoricarpos albus habitat type
(ponderosa pine/snowberry) - by far the most common

Festuca idahoensis/Symphoricarpos albus h.t.
(Idaho fescue/snowberry)

Crataegus douglasii/Symphoricarpos albus h.t.
(Black hawthorn/snowberry)

Festuca idahoensis/Rosa nutkana h.t.
(Idaho fescue/Nootka rose)

Pseudotsuga menziesii/Physocarpus malvaceus h.t.
(Douglas-fir/ninebark)

2. Regional vegetation type: Kuchler (1964) places this portion of Idaho and Washington into the potential vegetation types of Fescue-wheatgrass (Festuca-Agropyron) and Ponderosa Shrub Forest (Pinus).

3. Frequently associated species: Jessica's aster occupies habitats of Palouse Prairie vegetation and prairie/forest transition zones. Typical native species associated with the Palouse Prairie communities that supported Jessica's aster are: Festuca idahoensis, Symphoricarpos albus, Rosa nutkana, Geum triflorum, Agropyron spicatum, Achillea millefolium, Potentilla gracilis, Rosa woodsii, and Crataegus douglasii. Often times these communities would support scattered Pinus ponderosa trees or occur on the edge of ponderosa pine habitats. Species associated with the prairie/forest margins near the canyon edges and on lower slopes are: Pinus ponderosa, Symphoricarpos ablus, Rosa nutkana, Prunus virginiana, Pseudotsuga menziesii, Physocarpus malvaceus, Holodiscus discolor, Amelanchier alnifolia,

Berberis repens, and Crataegus douglasii. Two of the associated species, Symphoricarpos albus and Rosa nutkana, were very consistent associates that were fairly easy to distinguish from a distance as an indicator of suitable habitat.

Non-native weeds were frequently associated with Jessica's aster. This list commonly included Hypericum perforatum, Phalaris arundinacea and Phleum pratense. Some sites were quite degraded and very weedy, supporting high densities of Dipsacus sylvestris, Cirsium spp., and Dactylus glomerata.

4. Dominance and frequency: Populations of Jessica's aster tended to consist of scattered clumps of individuals and occasionally dense patches. Typically, clumped plants were found scattered along several miles of roadside in a vegetation strip located between the road and a cultivated field. Most populations supported less than 20 large plants, with 10-50 stems, and averaging ca. 1 plant per meter². Occasional sites supporting very dense stands of 3-4 large plants per meter², with 100-200 stems per plant.
5. Successional phenomena: Although some populations of Jessica's aster occur in natural, undisturbed habitats, the vast majority of habitats supporting the species have undergone some type of disturbance, as is evidenced by the presence of many non-native weedy plant species (Hypericum perforatum - goatweed, Phleum pratense - common timothy, and Phalaris arundinacea - reed-canarygrass). This would indicate that Jessica's aster is fairly hardy species that can tolerate or adapt to disturbance. Additionally, most forested communities that supported Jessica's aster were mid-seral.
6. Dependence on dynamic biotic features: None known.
7. Other endangered species: The Palouse Prairie communities that support Jessica's aster often supports two other Category 2 taxa, Silene spaldingii and Haplopappus liatrifolius. Since all three of these species occur in similar habitats and flower during the late summer and early fall, they can be surveyed for simultaneously. Although Jessica's aster appears to prefer slightly more mesic conditions than the other two, some sites discovered in 1990 supported all three taxa.

7. Population biology.

A. General summary: Jessica's aster is known from 58 extant sites in Idaho and 9 extant sites in Washington (Appendices 4 and 5). In 1990, 23 new populations were documented with most of these supporting scattered large, clumped individuals located along roadsides in the Palouse Prairie or prairie/forest ecotone. Most populations consisted of 20 or so individuals. The four largest populations (Wash. 008, 013 and Idaho 015, 033, 86-18) consisted of ca 100 plants with 500 to 1000+ flowering stems. Jessica's aster blooms in late summer and early fall. Pollination by variety of long tongued insects, especially Lepidopterans and Hymenoptera is documented. Jessica's aster reproduces by seed and vegetatively by extensive rhizomes. Little else is known about the reproductive biology of Aster jessicae.

B. Demography.

1. Known populations: Fifty-eight populations, occurring in Clearwater, Latah, Nez Perce, and Lewis County, Idaho; nine populations documented from Whitman County, Washington. Populations range in size from as few as 1 individual to several hundred individuals.

2. Demographic details (Idaho). Demographic details for the 1985-86 Allen collections are presented in Appendix 5. Additional data for the sites listed below are also found in Appendices 4 and 5.

1. Troy Southeast (001)
 - a. Location:
 - b. Area: 5-10 yd²
 - c. Number and size of plants: 11-50 plants in 1990
 - d. Density: Moderate
 - e. Presence of dispersed seeds: Unknown
 - f. Evidence of reproduction: No evidence
 - g. Evidence of expansion/contraction: None

2. West Fork Little Bear Creek (002)
 - a. Location:
 - b. Area: 5-10 yds²
 - c. Number and size of plants: 11-50 plants in 1990
 - d. Density: Moderate
 - e. Presence of dispersed seeds: Unknown
 - f. Evidence of reproduction: No evidence
 - g. Evidence of expansion/contraction: None

3. Southwick (006)
 - a. Location:)
 - b. Area: 5-10 yds²
 - c. Number and size of plants: 2-3 clumps in 1990
 - d. Density: Low
 - e. Presence of dispersed seeds: Unknown
 - f. Evidence of reproduction: No evidence
 - g. Evidence of expansion/contraction: approx.
200 stems in 1984, perhaps 75 stems in 1990.
4. Emmanuel Lutheran Cemetery Site (007)
 - a. Location:
 - b. Area: 5-10 yds²
 - c. Number and size of plants: ca. 5 large clumps
in 1990
 - d. Density: Low
 - e. Presence of dispersed seeds: Unknown
 - f. Evidence of reproduction: No evidence
 - g. Evidence of expansion/contraction: several
large clumps with ca. 300 stems in 1984,
perhaps 100 stems in 1990.
5. Kendrick (008)
 - a. Location:
 - b. Area: 5-10 yds²
 - c. Number and size of plants: 11-50 plants in
1990
 - d. Density: Low
 - e. Presence of dispersed seeds: Unknown
 - f. Evidence of reproduction: No evidence
 - g. Evidence of expansion/contraction: scattered
small clumps with ca. 150-200 stems in 1984,
same in 1990.
6. Reubens Railroad (010)
 - a. Location:
 - b. Area: 100 yd² - 2 acres
 - c. Number and size of plants: ca. 100 plants in
1990
 - d. Density: Moderate
 - e. Presence of dispersed seeds: Unknown
 - f. Evidence of reproduction: Flowering in 1990
 - g. Evidence of expansion/contraction: only a few
plants noted in 1980, ca. 100 in 1990
7. Central Ridge (012)
 - a. Location:
 - b. Area: 10-100 yds²
 - c. Number and size of plants: scattered clumps of
1-5 plants along roadsides (ca. 50 plants in
total) in 1990
 - d. Density: Low to Moderate
 - e. Presence of dispersed seeds: Unknown

- f. Evidence of reproduction: Flowering in 1990
 - g. Evidence of expansion/contraction: None
8. Steele Townsite (013)
- a. Location:
 - b. Area: $<1 \text{ yd}^2$
 - c. Number and size of plants: 2 plants in 1990
 - d. Density: Low
 - e. Presence of dispersed seeds: Unknown
 - f. Evidence of reproduction: Flowering in 1990
 - g. Evidence of expansion/contraction: None
9. Melrose (014)
- a. Location:
 - b. Area: 5-10 yds²
 - c. Number and size of plants: 1-10 plants in 1990
 - d. Density: Low
 - e. Presence of dispersed seeds: Unknown
 - f. Evidence of reproduction: Flowering in 1990
 - g. Evidence of expansion/contraction: None
10. Angel Ridge Cemetery (015)
- a. Location:
 - b. Area: 10-100 yd²
 - c. Number and size of plants: 2 populations, one with 11-50 plants and another with 51-100 plants (1000+ stems) in 1990
 - d. Density: High
 - e. Presence of dispersed seeds: Unknown
 - f. Evidence of reproduction: Flowering in 1990
 - g. Evidence of expansion/contraction: None
11. Gold Ridge South (016)
- a. Location:
 - b. Area: 1-5 yds²
 - c. Number and size of plants: ca. 25 plants with some 50 short (3-4 dm tall) stems in 1990
 - d. Density: Low
 - e. Presence of dispersed seeds: Unknown
 - f. Evidence of reproduction: Flowering in 1990
 - g. Evidence of expansion/contraction: None
12. Reubens East (017)
- a. Location:
 - b. Area: 10-100 yd²
 - c. Number and size of plants: ca. 50 plants in 1990
 - d. Density: Moderate
 - e. Presence of dispersed seeds: Unknown
 - f. Evidence of reproduction: Flowering in 1990
 - g. Evidence of expansion/contraction: None

13. Reuben Cemetery (018)
 - a. Location:
 - b. Area: 10-100 yds²
 - c. Number and size of plants: ca. 10 scattered plants in 1990
 - d. Density: Low
 - e. Presence of dispersed seeds: Unknown
 - f. Evidence of reproduction: Flowering in 1990
 - g. Evidence of expansion/contraction: None

14. Clicks North (019)
 - a. Location:
 - b. Area: 1-5 yds²
 - c. Number and size of plants: 3 plants in 1990
 - d. Density: Low
 - e. Presence of dispersed seeds: Unknown
 - f. Evidence of reproduction: Flowering in 1990
 - g. Evidence of expansion/contraction: None

15. Southwick West (020)
 - a. Location:
 - b. Area: 10 yds²
 - c. Number and size of plants: ca. 50 plants with some 500 stems in 1990
 - d. Density: Low to Moderate
 - e. Presence of dispersed seeds: Unknown
 - f. Evidence of reproduction: Flowering in 1990
 - g. Evidence of expansion/contraction: None

16. Mouth of Wauncher Gulch (021)
 - a. Location:
 - b. Area: 5-10 yds²
 - c. Number and size of plants: 25-50 plants with some 200 stems in 1990
 - d. Density: Moderate
 - e. Presence of dispersed seeds: Unknown
 - f. Evidence of reproduction: Flowering in 1990
 - g. Evidence of expansion/contraction: None

17. Wauncher Gulch (022)
 - a. Location:
 - b. Area: 5-10 yds²
 - c. Number and size of plants: 1-10 scattered small plants in 1990
 - d. Density: Low
 - e. Presence of dispersed seeds: Unknown
 - f. Evidence of reproduction: Flowering in 1990
 - g. Evidence of expansion/contraction: None

18. Cedar Creek Gulch (023)
 - a. Location:
 - b. Area: 2 acres +

- c. Number and size of plants: scattered clumps of 1-5 plants along ca. 5 mi of road (ca. 100 plants total) in 1990
 - d. Density: Low
 - e. Presence of dispersed seeds: Unknown
 - f. Evidence of reproduction: Flowering in 1990
 - g. Evidence of expansion/contraction: None
19. Pine Creek East (024)
- a. Location:
 - b. Area: 2 acres +
 - c. Number and size of plants: ca. 50 scattered plants along roadside in 1990
 - d. Density: Low
 - e. Presence of dispersed seeds: Unknown
 - f. Evidence of reproduction: Flowering in 1990
 - g. Evidence of expansion/contraction: None
20. Gold Hill Cemetery (025)
- a. Location:
 - b. Area: 5-10 yds²
 - c. Number and size of plants: 11-50 plants in 1990
 - d. Density: Moderate
 - e. Presence of dispersed seeds: Unknown
 - f. Evidence of reproduction: Flowering in 1990
 - g. Evidence of expansion/contraction: None
21. South end Texas Ridge (026)
- a. Location:
 - b. Area: 1-5 yds²
 - c. Number and size of plants: ca. 15 small clumps in 1990
 - d. Density: Moderate
 - e. Presence of dispersed seeds: Unknown
 - f. Evidence of reproduction: Flowering in 1990
 - g. Evidence of expansion/contraction: None
22. Texas Ridge Powerline (027)
- a. Location:
 - b. Area: 10-100 yds²
 - c. Number and size of plants: 1-10 plants in 1990 with some 100-200 stems
 - d. Density: Low
 - e. Presence of dispersed seeds: Unknown
 - f. Evidence of reproduction: Flowering in 1990
 - g. Evidence of expansion/contraction: None
23. Green Knob NW (028)
- a. Location:
 - b. Area: 5-10 yds²
 - c. Number and size of plants: 2 pops, one ca. 30

- clumps and another of 2 small clumps in 1990
- d. Density: Moderate
- e. Presence of dispersed seeds: Unknown
- f. Evidence of reproduction: Flowering in 1990
- g. Evidence of expansion/contraction: None

NOTE: Site 029 is actually a relocation of 010.

- 24. Chesley N and NE (030)
 - a. Location:
 - b. Area: 100 yds² - 2 acres
 - c. Number and size of plants: 11-50 plants scattered in roadbank in 1990
 - d. Density: Low
 - e. Presence of dispersed seeds: Unknown
 - f. Evidence of reproduction: Flowering in 1990
 - g. Evidence of expansion/contraction: None

- 25. Gifford (031)
 - a. Location:
 - b. Area: 5-10 yds²
 - c. Number and size of plants: ca. 25 plants in 1990
 - d. Density: Moderate
 - e. Presence of dispersed seeds: Unknown
 - f. Evidence of reproduction: Flowering in 1990
 - g. Evidence of expansion/contraction: None

- 26. Gifford Southeast (032)
 - a. Location:
 - b. Area: 5-10 yds²
 - c. Number and size of plants: 11-25 clumps in 1990
 - d. Density: Low
 - e. Presence of dispersed seeds: Unknown
 - f. Evidence of reproduction: Flowering in 1990
 - g. Evidence of expansion/contraction: None

- 27. Bovard West - Ridgeline (033)
 - a. Location:
 - b. Area: 100 yds² - 2 acres
 - c. Number and size of plants: 51-100 scattered plants along 1 mile of roadside in 1990.
 - d. Density: Moderate
 - e. Presence of dispersed seeds: Unknown
 - f. Evidence of reproduction: Flowering in 1990
 - g. Evidence of expansion/contraction: None

- 28. Head of Brady Gulch (034)
 - a. Location:
 - b. Area: 1-5 yds²
 - c. Number and size of plants: 2 large clumps in

1990

- d. Density: Low
- e. Presence of dispersed seeds: Unknown
- f. Evidence of reproduction: Flowering in 1990
- g. Evidence of expansion/contraction: None

- 29. Brady Gulch (035)
 - a. Location:
 - b. Area: 5-10 yds²
 - c. Number and size of plants: ca. 10 plants in 1990
 - d. Density: Low
 - e. Presence of dispersed seeds: Unknown
 - f. Evidence of reproduction: Flowering in 1990
 - g. Evidence of expansion/contraction: None

(see Appendix 5 for Allen's 1985-86 collections)

- 3. Demographic details (Washington): (see also Appendices 4 and 5)

- 1. Albion Cemetery (008)
 - a. Location:
 - b. Area: Population extends for ca. 0.3 miles by 50 meter along hillside
 - c. Number and size of plants: No counts made in 1990, but population described as "abundant." In 1981, 22 "groups" were noted, ranging from 4 to ca. 200 stems.
 - d. Density: Moderate
 - e. Presence of dispersed seeds: Unknown
 - f. Evidence of reproduction: Flowering in 1990
 - g. Evidence of expansion/contraction: Recent work on a county road has apparently destroyed some plants at this site.
- 2. Ewartsville (009)
 - a. Location:
 - b. Area: Population extends for about 2 miles along hillside; total area ca. 100 acres.
 - c. Number and size of plants: No counts made in 1990. Previous estimates range from 50-100 individuals with few to ca. 35 stems.
 - d. Density: Low
 - e. Presence of dispersed seeds: Unknown
 - f. Evidence of reproduction: Flowering in 1990
 - g. Evidence of expansion/contraction: No evidence
- 3. Spaulding Road (010)
 - a. Location:
 - b. Area: ca. 4 acres
 - c. Number and size of plants: 5 plants in 1990 -

- smaller and having fewer stems than typical for this taxon.
- d. Density: Low
 - e. Presence of dispersed seeds: Unknown
 - f. Evidence of reproduction: Flowering in 1990
 - g. Evidence of expansion/contraction: 7 plants observed in 1981.
4. Pullman Drive-in (012)
 - a. Location:
 - b. Area: 5-10 yds²
 - c. Number and size of plants: At least 10 clumps w/ several stems each + several single stems.
 - d. Density: Low
 - e. Presence of dispersed seeds: Unknown
 - f. Evidence of reproduction: Flowering in 1990
 - g. Evidence of expansion/contraction: No direct evidence, but seems likely that pop. may be a remnant of a larger pop. which was present prior to road construction.
 5. Bobo's (Armstrong) (013)
 - a. Location:
 - b. Area: Several groups scattered over ca. 3/4 mile, occupying ca. 25 acres
 - c. Number and size of plants: Population estimates and terms used to express size have varied. In 1983, 37 groups in 4 separate areas were noted. In 1990, at least 3 distinct groups of plants were found - 2 small groups, and one consisting of hundreds (perhaps thousands) of stems.
 - d. Density: Moderate to High
 - e. Presence of dispersed seeds: Unknown
 - f. Evidence of reproduction: Flowering in 1990
 - g. Evidence of expansion/contraction: No evidence
 6. SE of Armstrong Bridge (014)
 - a. Location:
 - b. Area: along less than 1/4 mile and within a few meters of a dirt/gravel road.
 - c. Number and size of plants: 7 groups in 1990
 - d. Density: Low to Moderate
 - e. Presence of dispersed seeds: Unknown
 - f. Evidence of reproduction: Flowering in 1990
 - g. Evidence of expansion/contraction: Apparent population increase from 1981 to 1983. Construction of a new house has resulting in some loss of habitat and likely individual plant.
 7. Yecha Road (Albion) (015)

- a. Location:
 - b. Area: ca. 3 acres, scattered in a narrow strip about .15 miles long.
 - c. Number and size of plants: In 1990, the population was described as "abundant" and in 1983 a total of ca. 500 stems was noted.
 - d. Density: Moderate to High
 - e. Presence of dispersed seeds: Unknown
 - f. Evidence of reproduction: Flowering in 1990
 - g. Evidence of expansion/contraction: Apparent increase from 1981 to 1983. Construction of a new house has resulted in some loss of habitat and likely some individuals.
8. N of Albion (Shawnee-Parvin Rd) (022)
- a. Location:
 - b. Area: scattered in a narrow strip for ca. 4 miles.
 - c. Number and size of plants: In 1983, ca. 100 clumps, with from 1 to 30 stems per clump.
 - d. Density: Moderate
 - e. Presence of dispersed seeds: Unknown
 - f. Evidence of reproduction: Flowering in 1990
 - g. Evidence of expansion/contraction: No evidence
9. Rose Creek (023)
- a. Location:
 - b. Area: ca. 50 meters X 2 meters
 - c. Number and size of plants: two dense patches
 - d. Density: Moderate
 - e. Presence of dispersed seeds: Unknown
 - f. Evidence of reproduction: Flowering in 1990
 - g. Evidence of expansion/contraction: No evidence

C. Phenology.

1. Patterns: Flowering of Jessica's aster occurs in late summer and early fall from late July through mid September (Cronquist 1955). Plants on exposed southerly slopes flower first, while semi-shaded sites on north and northwest aspects generally begin flowering in late August. Fruit and seed maturation occurs in September and early October, with seed dispersal likely in mid to late October.
2. Relation to climate and microclimate: Specific details are unknown, but severe drought may likely effect the overall plant vigor and reduce flowering.

D. Reproductive ecology.

1. Type of reproduction: Jessica's aster reproduces by seed and vegetatively by rhizomes.
2. Pollination.
 - a. Mechanisms: Specifics unknown, but probably outcrossing with the capability of selfing.
 - b. Specific known pollinators: Specifics unknown. Since the flowers of Jessica's aster are not specialized for any particular pollinator, a variety of long-tongued insects, especially Lepidopterans and Hymenopterans are suspected and have subsequently been observed. During a 1981 field survey, Jim Barrett documented a number of pollinators including Lepidopterans (ochre ringlet, orange skippers, and sulphurs), small wasps, bees, and rove beetles. During the 1990 field season the author collected two insects from Jessica's aster, which were later identified as a meloid beetle (*Epicauta pucticollis* (Mannerheim)) and a non-metallic halictid (J. Johnson 1990).
 - c. Other suspected pollinators: See above.
 - d. Vulnerability of pollinators: Specifics unknown, however, overgrazing or pesticide use may be locally detrimental to pollinator populations.
3. Seed dispersal.
 - a. General mechanisms: Specific details unknown, but the pappus of the achene is well developed and adapted for wind dispersal.
 - b. Specific agents: Probably wind.
 - c. Vulnerability of dispersal agents and mechanisms: Unknown.
 - d. Dispersal patterns: Specific details unknown, but plants appear to occur commonly scattered along roadsides and near the tops of canyon draws indicating wind movement and possibly dispersal via vehicle tires.
4. Seed biology.
 - a. Amount and variation of seed production: Specific details unknown, however, in 1990 numerous flowers

were present on almost all plants observed and there was every indication that numerous seeds would be produced as well.

b. Seed viability and longevity: Unknown.

c. Dormancy requirements: Unknown.

d. Germination requirement: Unknown. Seeds may require a period of cold stratification for germination.

e. Percent germination: Unknown.

5. Seedling ecology: Specific details unknown and no seedlings were observed during 1990.

6. Survival and mortality: Unknown.

7. Overall assessment of reproductive success: Specific details unknown, however, almost all plants observed in 1990 were flowering prolifically and would likely produce a plentiful seed crop. Asexual reproduction from extensive rhizomes has produced numerous large, healthy clumps in most populations. The ability to reproduce vegetatively (asexually) or sexually (by seed) is an evolutionary advantage that likely aids in the species reproductive success, provided suitable habitat is available for seedling establishment. No seedlings have been reported to date.

8. Population ecology.

A. General summary: Jessica's aster occurs in a variety of habitats within the Palouse prairie and the prairie/forest margins. Virtually all known populations occur on privately-owned lands that have undergone cultivation, grazing, timber harvest and/or construction. While no populations of Jessica's aster are known to occur in land presently under cultivation or heavily grazed, plants frequently occur at the edge of cultivated fields and pastures. Jessica's aster has also been found in old, overgrown cemeteries and selectively logged forest communities. The cover of introduced and native vegetation at these sites is generally quite high, indicating a tolerance to competition and partial shading. While it appears that a great deal of the original prairie habitat has been lost due to land conversion, Jessica's aster appears to be adapting fairly successfully to these altered conditions. The species has managed to persist as small populations in what meager suitable habitat remains.

B. Positive and neutral interactions: See above.

C. Negative interactions.

1. Herbivores, predators, pests, parasites and diseases:

In Idaho during the 1990 field season, grasshopper herbivory was observed. Although plants were probably weakened by such activity, they appeared to be flowering and fruiting successfully. Previous observations have noted plant hoppers on stems, galls (flat, cream-colored, 1 cm long) on leaves, and caterpillar herbivory (Barrett 1981).

2. Competition.

a. Intraspecific: Possibly significant in drought years for the few dense populations of Jessica's aster. In years of low precipitation, intraspecific competition may limit recruitment of young age classes into the population. Most populations, however, are not so dense and intraspecific competition is probably not a problem.

b. Interspecific: Appears significant, particularly for introduced, invasive weeds on disturbed sites. This was specifically evident with four introduced species, Phalaris arundinacea (reed canarygrass), Hypericum perforatum (goatweed or Klamath weed), Dipsacus sylvestris (teasel), and Cirsium spp. (thistles). At most sites, however, Jessica's aster appears to be doing well despite the presence of these weedy species.

3. Toxic and allelopathic interactions with other organisms: None known.

D. Hybridization.

1. Naturally occurring: Details unknown. In many of the Washington populations and some in Idaho, Aster jessicae and A. occidentalis are sympatric. Putative hybrids and intergradation between the two species has been reported (Barrett 1981, Arnett 1990, Allen 1991). Allen (1991) has reviewed specimens of possible hybrids and confirms that they appear to be hybrids. She also comments that, "It makes sense to me that jessicae and occidentalis might hybridize, since they grow together and are members of the same general species group".

In 1986, Allen (1991) located an A. jessicae-like plant near Grangeville, Idaho between Mount Idaho and the S. Fork Clearwater River (T30N, R3E, sec. 25). This plant

was later found to be a tetraploid ($2n = 32$), unlike all the other A. jessicae plants, which were decaploid ($2n = 80$). She suspects this plant is a hybrid, perhaps between A. cusickii and A. occidentalis (Allen 1991).

2. Artificially induced: Unknown.

3. Potential in cultivation: Plants of Aster jessicae have been grown in a greenhouse at the University of Illinois, Urbana (Jones 1984) and the University of Victoria, British Columbia (Allen 1991). Additional information unknown.

E. Other factors of population ecology: None known.

9. Current land ownership and management responsibility.

A. General nature of ownership: Populations of Jessica's aster in Idaho and Washington are almost exclusively located on privately-owned land or County road right-of-ways. A few populations are also located on Nez Perce Indian land.

B. Specific landowners (Idaho):

1. Idaho: Of the 58 extant populations in Idaho, 55 are on privately-owned land or County road right-of-ways and 3 are on Indian-owned land within the Nez Perce Indian Reservation.

2. Washington: Of the 9 extant populations in Washington, 8 occur on privately-owned property and one is partially within a county road right-of-way managed by the Whitman County Highway Department.

C. Management responsibility: Same as above.

D. Easements, conservation restrictions, etc.: Two of the Washington sites (008 and 013) are within the Washington Register of Natural Areas, a voluntary landowner protection program.

Aster jessicae is listed presently as "Sensitive" for the Coeur d'Alene District of the Bureau of Land Management. Land administered by the BLM that supports Jessica's aster populations would be managed according to BLM regulations for sensitive species. At present, no extant populations are known from BLM lands in Idaho or Washington.

10. Management practices and experience.

A. Habitat management.

1. Review of past management and land-use experiences.

a. This taxon: Habitats that support Jessica's aster have been and are being managed for crop cultivation, livestock grazing, timber harvest, and road/housing construction. Substantial habitat loss and subsequent range reduction of Jessica's aster can be attributed to these activities, particularly agricultural conversion.

b. Related taxa: Unknown.

c. Other ecologically similar taxa: Other Palouse Prairie endemic taxa, such as Silene spaldingii and Haplopappus liatrifomis, are also suffering from habitat loss and are considered rare.

2. Performance under changed conditions: Jessica's aster has likely been extirpated from sites that have undergone extensive grazing and/or any cultivation. The species is intolerant of cultivation, however, it appears to tolerate or adapt to certain altered conditions. Light or moderate grazing seems to have no observable deleterious effects and Jessica's aster has adapted quite well to disturbed roadside habitats. Moreover, most roadside habitats receive chemical sprays early in the year, which appears to have no observable effect on Aster jessicae. Despite this, Jessica's aster only persists today in small, remnant populations, which presents several long-term viability concerns for the taxon.

3. Current management policies and actions: Adjacent cultivation and/or grazing are currently taking place on much of the land presently inhabited by Jessica's aster. Properties along County roads or railroad right-of-ways are likely managed to reduce visual obstructions and noxious weeds. Such management generally utilizes chemical sprays and mowing equipment. Some habitat is also undergoing road and housing construction in Washington.

4. Future land use: Specifics unknown. Future land use is likely to be the same as past management throughout most of the species range.

B. Cultivation.

1. Controlled propagation techniques: Unknown.

2. Ease of transplanting: Unknown.

3. Pertinent horticultural knowledge: Unknown.
4. Status and location of presently cultivated material: Unknown.

11. Evidence of threats to survival.

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

1. Past threats: Cultivation, grazing, chemical sprays, and road construction/maintenance were the principle threats to Jessica's aster in the past. Substantial habitat loss and subsequent range reduction of Jessica's aster can be attributed to these activities, particularly agricultural conversion. The habitat that this species prefers tends to be the Palouse Prairie communities. These habitats possess very rich soils that are highly desirable for cultivation. Wheat cultivation has dominated the Palouse grassland region for many decades and Jessica's aster does not do well under such conditions. Agricultural consequences, including the application of chemical herbicides and the invasion of exotic weeds, has likely resulted in further habitat/range losses.

2. Existing threats: Most of the land which will be converted to agricultural uses has already been converted. However, grazing pressure is present at several sites and the proximity to fields and roads subjects some sites to chemical spray and invasion of weedy species. Road and home construction has also been occurring within areas known to support Jessica's aster. Moreover, since this taxon only persists in small remnant populations, considerable uncertainty exists concerning the species long-term viability.

3. Potential threats: Road improvement and/or maintenance, home construction, continued grazing and herbicides pose the most significant threats. Most of the habitat that supports Jessica's aster is privately-owned, and thus without use restrictions. Populations in these areas may be in danger of extirpation.

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

1. Past threats: Minimal to no past threats.

2. Existing threats: Minimal to no existing threats.

3. Potential threats: Minimal to no potential threats.

C. Disease, predation, or grazing.

1. Past threats: No direct past threats to population viability of Jessica's aster due to disease or predation are known. Although it is unknown if livestock herbivory takes place on Jessica's aster, light to heavy grazing has occurred on most of sites at one time or another. Heavy grazing tends to alter the species composition, resulting in the invasion of weeds and the extirpation of Jessica's aster. Light to moderate grazing appears to have a negligible effect on the species.
2. Existing threats: No direct existing threats to population viability of Jessica's aster due to disease, predation, or grazing are known. Grasshopper herbivory was evident in 1990, although plants continued to flower and fruit successfully. Previous observations have noted plant hoppers on stems, galls (flat, cream-colored, 1 cm long) on leaves, and caterpillar herbivory (Barrett 1981).
3. Potential threats: No direct potential threats to population viability of Jessica's aster due to disease, predation, or moderate grazing are known.

D. Inadequacy of existing regulatory mechanisms.

1. Past threats: None known.
2. Existing threats: Virtually all the known populations of Jessica's aster in Idaho and Washington occur on privately-owned land. At present no regulatory mechanisms exist to provide any protection or insure the survival of this taxon.
3. Potential threats: Same as above.

E. Other natural or manmade factors.

1. Past threats: Coincident with cultivation is the application of chemical sprays and invasion of exotic weeds. Many sites are near or adjacent to cultivated fields or roads and undoubtedly received annual applications of chemical spray, or at least drift. It is unknown how many populations may have been lost due to these factors. Road maintenance and road/housing construction has occurred in Jessica's aster habitat and has likely reduced or extirpated populations in the past.
2. Existing threats: Chemical sprays, road construction

or maintenance, and invasion of exotic weeds continue to pose threats to populations of Jessica's aster throughout its range. Population reduction of some revisited Washington populations was noted in 1990 due to road work and housing construction.

3. Potential threats: Same as above.

II. Assessment and Recommendations.

12. General assessment of vigor, trends and status: As of 1990, 58 populations of Jessica's aster are known in Idaho, from Latah, Lewis, and Nez Perce Counties and 9 populations are documented from Whitman County, Washington. In Idaho, four historical sites and one previously extant site were not relocated due to vague location data or unsuitable habitat.

Jessica's aster occurs in the Palouse Prairie community and the prairie/forest transition zone. Significant portions of this region has been altered by extensive cultivation and grazing, leaving only a few remnant areas of native grassland. Jessica's aster is quite limited in overall distribution and has undoubtedly drastically declined in the last 100 to 150 years.

A number of new populations of Jessica's aster were located in 1990. The majority of these populations consist of some 20 plants scattered in large clumps along roadsides or slopes. A total estimate of the number of individuals seen in Idaho during the 1990 field season ranges between 750 and 1200. It appears that Jessica's aster can tolerate or adapt to fairly disturbed conditions. Virtually all of the extant populations have undergone past disturbance by grazing, construction, or timber harvest and many occur in very close proximity to cultivation and roads. Most populations appeared vigorous in 1990, however, very little is known about the population dynamics and ecology of Aster jessicae.

13. Recommendations for listing or status change.

A. Recommendation to U.S. Fish and Wildlife Service:

Jessica's aster is listed presently as a Category 2 species with the U.S. Fish and Wildlife Service (1990). This listing includes taxa for which information now in possession of the Service indicates that proposing to list them as endangered or threatened species is possibly appropriate, but for which substantial data on biological vulnerability and threat(s) are not currently known or on file to support the immediate preparation of rules.

Data collected during the 1990 field season provides additional information regarding the distribution,

ecology, and conservation status of Aster jessicae. Although Jessica's aster is a regional endemic, current information indicates that it is tolerant and adaptable to disturbance. The species also appears to have a much wider ecological amplitude than originally believed. However, virtually all populations are relatively small (<20 plants) and are located on privately-owned property or in road right-of-ways that have no or little regulatory mechanisms by which to provide for the species survival. Based on this information, it is recommended that Aster jessicae be reclassified to a Category 1 species with a priority listing of 11. This indicates that a listing of Threatened is advisable, but that the magnitude of threat is moderate to low and non-imminent.

B. Recommendations to other U.S. Federal Agencies: No populations of Jessica's aster were located on lands administered by any federal agency. However, there exists a very good possibility that suitable habitat and populations of Jessica's aster may occur on lands within Bureau of Land Management jurisdiction. Therefore, it is recommended that Aster jessicae be maintained on the Sensitive species list for the Coeur d'Alene District of the BLM.

C. Other status recommendations.

1. Counties and local areas: County governments should be informed about the existence of Jessica's aster populations along County road right-of-ways. Counties with known populations likely within the jurisdiction of County Highway Departments include Clearwater, Latah, Nez Perce, and Lewis Counties in Idaho and Whitman County in Washington.

2. State.

a. Idaho: Currently, Jessica's aster is ranked S2 by the Idaho Natural Heritage Program (1990); based on our current knowledge, it is recommended that Aster jessicae be maintained at an S2 status ranking.

b. Washington: Based on the limited number of populations of Jessica's aster known to occur in Washington it is recommended that Aster jessicae be maintained as a "Threatened Washington Taxa" list of the Washington Natural Heritage Program.

3. Other Nations: It is recommended that the Nez Perce Indian Tribe monitor the status of the three Jessica's

aster populations on tribal reservation lands.

4. International: No recommendations.

14. Recommended critical habitat.

A. Concise statement of recommended critical habitat: No critical habitat is recommended at this time.

B. Legal description of boundaries: Not applicable.

C. Latitude and longitude: Not applicable.

D. Publicity/sensitivity of critical habitat area: Not applicable.

15. Conservation/recovery recommendations.

A. General conservation recommendations.

1. Recommendations regarding present or anticipated activities: County governments should be informed about the existence of Jessica's aster populations along County road right-of-ways where spraying of chemical herbicides and road improvement/maintenance may take place. The following is a list of sites by County that likely occur in County road right-of-ways:

Clearwater County	-	85-6, 85-7, 85-8, 85-9, 86-14, 86-15, 86-16, 86-17, 86-19, 86-20
Latah County	-	023, 024, 026, 027, 028, 034, 035, 85-2, 85-3, 85-5, 85-5, 86-1, 86-2, 86-3, 86-4, 86-5
Nez Perce County	-	006, 007, 008, 014, 015, 020, 021, 022, 030, 031, 032, 86-8, 86-9, 86-11, 86-12, 86-13
Lewis County	-	012, 013, 016, 017, 019, 86-21, 86-23
Whitman County	-	008, 009, 010, 012, 014, 015, 022,

2. Areas recommended for protection: A conservation strategy for Aster jessicae should be to preserve as much genetic variation (although currently unmeasured) as possible in the minimum number of protected populations. Until further information on the genetic architecture of Jessica's aster is available, the best populations (largest and most viable) should be protected across the range of the

species.

All sites in Washington should be considered for inclusion within the Washington Register of Natural Areas.

In Idaho, a minimum of six sites are recommended for protection, as follows:

001 - Troy SE
010 - Reubens Railroad
015 - Angel Ridge Cemetery
020 - Southwick West
023 - Cedar Creek Gulch
033 - Bovard West - Ridgeline
(no EOR) - Site 86-18 (Russell Ridge #2)

These sites were selected based on population size and quality of habitat. Sites 001, 010 and 033 are moderate sized populations, but the habitat quality is more pristine. Sites 015, 020, 023, and 86-18 are the largest and most viable populations, although their habitat is lower quality. This combination of sites appears to represent the overall distribution and genetic diversity of Jessica's aster in Idaho.

3. Habitat management recommendations: Habitats should be managed to reduce impacts from man-caused disturbances that may destroy habitat, reduce population size/numbers, or extirpate populations.
4. Publicity sensitivity: Low.
5. Other recommendations: None.

- B. Monitoring activities and further studies recommended:
At present, very little is known about the ecology of Aster jessicae. It appears that Jessica's aster can tolerate or adapt to modified habitats, however, Allen (1991) indicates that most of the populations contain only a small number of genetic individuals. Low genetic variability could play an important role in the long-term viability of the species on an evolutionary time scale. Therefore, collection of further biological data are necessary to correctly assess the conservation status of Jessica's aster. Fruitful topics for investigation may include reproductive biology, population dynamics, role of the seed bank, seed dispersal mechanisms, determination of genetic variation, and the effect of exotic weeds, fire

suppression, and chemical sprays on population levels.

16. Interested parties:

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III. Information Sources.

17. Sources of information.

A. Publications.

1. References cited in report: See Appendix 1.
2. Other pertinent publications.
 - a. Technical: None known.
 - b. Popular: None.

B. Herbaria consulted: Specimens of Aster jessicae from Idaho and Washington are known to be deposited at the following herbaria:

University of Idaho (ID),
University of Washington (WTU)
Washington State University (WS)
Forest, Wildlife and Range Science, U of I (IDF)
Gray Herbarium, Harvard Univ. (GH)
University of Oregon (ORE)
U.S. National Herbarium (US)
New York Botanical Garden (NY)
University of Washington (WTU)
University of Montana (MONTU)
Dudley Herbarium of Stanford University (DS)
University of Illinois at Urbana-Champaign (ILL)
University of Wisconsin at Madison (WISC)
University of Victoria (UVIC)

The following is a list of known herbarium specimens. Idaho collections are indexed by their corresponding population number (Kennison and Taylor 1979, Johnson 1981, Jones 1984, Allen 1991):

1. Idaho:

002 - B. Heidel 79395 (IDF, WS)
003 - Christ & Ward 9084 (?)
004 - L. Constance 1811 (WS, GH)
 L. Constance 1812 (WS, WTU)
005 - Aller s.n. (?)
009 - F.D. Johnson s.n. (IDF)
011 - Baker 15485 (MONTU)
013 - C.C. Lorain 2151 (ID)
015 - C.C. Lorain 2152 (ID)
016 - C.C. Lorain 2145 (ID)
018 - C.C. Lorain 2147 (ID)
020 - C.C. Lorain 2136 (ID)
021 - C.C. Lorain 2134 (ID)
023 - C.C. Lorain 2140 (ID)
024 - C.C. Lorain 2141 (ID)
028 - C.C. Lorain 2132 (ID)
033 - C.C. Lorain 2137 (ID)
035 - C.C. Lorain 2133 (ID)
85-2 - G.A. Allen 1127 (UVIC)
85-4 - G.A. Allen 1131 (UVIC)
85-7 - G.A. Allen 1133 (UVIC)
85-8 - G.A. Allen 1134 (UVIC)
86-2 - G.A. Allen 1158 (UVIC)
86-14 - G.A. Allen 1162 (UVIC)
86-17 - G.A. Allen 1163 (UVIC)
86-18 - G.A. Allen 1164 (UVIC)
86-22 - G.A. Allen 1165 (UVIC)
L.F. Henderson 2987 (Aster latahensis s.n.)
 (US, ORE)

2. Washington:

King 52-153 (WS)
Mastrogiuseppe 2506 (WS)
Mastrogiuseppe 2507 (WS)
Mastrogiuseppe 3401 (WS, ILL)
Mastrogiuseppe 3402 (WS, ILL)
Pickett 355 (WS, WTU)
Pickett 1302 (WS, WTU)
C.V. Piper 1604 (WS, WTU, DS, GH, US, WIS)
C.V. Piper 2663 (US, WTU, NY)
Warren 126 (WS)
C.V. Piper - no numbers, but 3 different
 collection dates - 5/1898, 8/1898, 8/1899
 (WS - all 3, GH - 8/1898, US - 8/1899, NY -
 8/1898 and 8/1899)
Semple and Brouillet 4390 (NY)

C. Fieldwork:

- 1979 - Bonnie Heidel (BLM)
- 1980 - Bonnie Heidel
(contract - Wash. Natural Heritage Program)
- 1981 - Jim Barrett
(contract - Wash. Natural Heritage Program)
- 1983 - Elise Augenstein
(Washington Natural Heritage Program)
- 1984/85/86 - Dr. Geraldine Allen (Univ. of Victoria)
- 1990 - Christine Lorain
(Idaho Natural Heritage Program)
- Joe Arnett and John Gamon
(Washington Natural Heritage Program)

During the late summer and fall of 1990, the Idaho and Washington Natural Heritage Programs conducted inventory surveys for Jessica's aster. These surveys focused on relocating historical and extant sites, documenting potential habitats and new populations, delineating the overall distribution of the taxon, characterizing habitat conditions, gathering population data, and assessing population threats. Areas of focus included the Prairie communities located in Idaho, Latah, Nez Perce, and Lewis Counties, Idaho and Whitman County, Washington.

Dr. G.A. Allen (University of Victoria) conducted several field surveys independently from 1984-1986. Unfortunately, the data from 1985 and 1986 was not forwarded to Idaho sources until 1991. The data is being presently entered into the Idaho database.

D. Knowledgeable individuals:

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Bonnie Heidel
North Dakota Natural Heritage Inventory
North Dakota Parks and Recreation Department
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E. Other information sources: None.

18. Summary of materials on file: Color slides, field forms, maps, and all published and unpublished references pertaining to Jessica's aster in Idaho or Washington are on file at the Idaho Natural Heritage Program Office, Boise, ID or the Washington Natural Heritage Program Office, Olympia, WA.

IV. Authorship.

19. Initial authorship:

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20. Maintenance of status report: The Idaho Natural Heritage

Program will maintain current information on Idaho and the Washington Natural Heritage Program will maintain Washington information. Both Heritage Programs will update the status report as needed.

V. New Information.

21. Record of revisions: Not applicable.

APPENDIX 1
References Cited.

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APPENDIX 2

Line drawings of Aster jessicae
(from Cronquist 1955)

APPENDIX 3

Slides of Aster jessicae and its habitat.

APPENDIX 4

Precise map location of Aster jessicae populations
in Idaho and Washington

Map A. Overall distribution of known populations of
Aster jessicae.

Idaho (site #)

Map B.	Portion of Troy 7.5' quad	(001)
Map C.	Portion of Ahsahka 15' quad	(006)
Map D.	Portion of Kendrick 15' quad	(007, 008)
Map E.	Portion of Orofino West 7.5' quad	(012, 013)
Map F.	Portion of Peck 7.5' quad	(014)
Map G.	Portion of Peck 7.5' quad	(015)
Map H.	Portion of Reubens 7.5' quad	(016)
Map I.	Portion of Reubens 7.5' quad	(017, 018, 019)
Map J.	Portion of Kendrick 15' quad	(020 - 027)
Map K.	Portion of Moscow 7.5' quad	(028)
Map L.	Portion of Reubens 7.5' quad	(009/029, 030)
Map M.	Portion of Culdesac 15' quad	(031, 032)
Map N.	Portion of Kendrick 15' quad	(002, 033, 034, 035)

(mapped locations of Allen's 1985-86 collections are not on
topographic maps)

Washington (site #)

Map O.	Portion of Colfax South 7.5' quad	(008, 022)
Map P.	Portion of Ewartsville 7.5 quad	(009)
Map Q.	Portion of Almota 7.5' quad	(010)
Map R.	Portion of Pullman 7.5' quad	(012)
Map S.	Portion of Albion 7.5' quad	(013, 014, 015)
Map T.	Portion of Albion 7.5' quad	(023)

APPENDIX 5

Occurrence records for extant populations of
Aster jessicae in Idaho and Washington