

FIELD INVESTIGATIONS OF  
ERIGERON SALMONENSIS AND HACKELIA DAVISII  
ON THE SALMON NATIONAL FOREST,

WITH NOTES ON  
EPIPACTIS GIGANTEA,  
HALIMOLOBOS PERPLEXA VAR. LEMHIENSIS,  
AND RIBES VELUTINUM VAR. NOVUM

by

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## ABSTRACT

Field investigations of Erigeron salmonensis (Salmon River fleabane) and Hackelia davisii (Davis' stickseed) were carried out on the Salmon National Forest by the Idaho Department of Fish and Game's Natural Heritage Program. The investigations were a cooperative Challenge Cost-share project between the Department and the Salmon NF. Both plants are endemic to canyons of the Middle Fork and main Salmon River in central Idaho. Davis' stickseed is on the Intermountain Region's Sensitive Plant Species List.

Data gathered during this investigation reveal that Salmon River fleabane is restricted to two small populations on one, north-facing rock outcrop, adjacent to the Salmon River, between Pine Creek and Panther Creek. A thorough search of accessible outcrops in the main Salmon River and Panther Creek canyons was unsuccessful in finding additional populations. Salmon River fleabane should be added to the Regional Sensitive Species List.

New populations of Davis' stickseed were found along the main Salmon River, but it is restricted to small, north-facing outcrops. It is known to occur between Pine and Bear Basin creeks on the main Salmon and from about Marble Creek downstream on the Middle Fork, probably to its confluence. Since it has a restricted range and habitat, I recommend that it remain a Regional Sensitive Species. Road and trail maintenance and construction were the only threats observed to the habitats of either species.

Three other rare plants were encountered during these investigations, Epipactis gigantea (giant helleborine), Halimolobos perplexa var. lemhiensis (puzzling halimolobos), and Ribes velutinum var. novum (new variety of gooseberry). Puzzling halimolobos is endemic to the canyons of the Middle Fork and main Salmon River drainages in central Idaho. It is widespread and abundant within that range on a habitat that is not rare. Giant helleborine is restricted to hot or cold springs in desert and montane areas of the west, a habitat that is commonly destroyed or disturbed. Salmon NF populations occur at hot springs and it is recommended that further inventory and possibly a management plan be developed for this species. The new variety of gooseberry is a narrow endemic to the Salmon River canyon in this area, but was found to be abundant within this range.

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## INTRODUCTION

The National Forest Management Act and Forest Service policy require that Forest Service land be managed to maintain populations of all existing native animal and plant species at or above the minimum viable population level. A minimum viable population consists of the number of individuals, adequately distributed throughout their range, necessary to perpetuate the existence of the species in natural, genetically stable, self-sustaining populations.

The Forest Service, along with other Federal and State agencies, has recognized the need for special planning considerations in order to protect the flora and fauna on the lands in public ownership. Species recognized by the Forest Service as needing such considerations are those that (1) are designated under the Endangered Species Act as endangered or threatened, (2) are under consideration for such designation, or (3) appear on a regional Forest Service sensitive species list.

Erigeron salmonensis (Salmon River fleabane) and Hackelia davisii (Davis' stickseed) are endemic to low elevations in the canyons of the Middle Fork Salmon River and the main Salmon around the confluence of the Middle Fork. Davis' stickseed has been on the Intermountain Region Sensitive Species List for the Salmon and Challis NF for some time (USDA Forest Service 1988). Salmon River fleabane was only recently discovered and described (Brunsfeld and Nesom 1989). It is a Category 2 candidate for federal listing and warrants inclusion on the Sensitive Species List for the Salmon NF. Field investigations of these species were conducted on the Salmon NF by the Idaho Department of Fish and Game's Natural Heritage Program through the Cooperative Challenge Cost-share Program.

The primary objectives of this investigation were as follows:

- 1) Survey known populations of Salmon River fleabane and Davis' stickseed and search potential habitats for new populations on the Salmon NF.
- 2) Characterize habitat conditions for known populations on the Salmon NF.
- 3) Assess population trends and threats to existing populations and make management recommendations to the forest based on these assessments.

## RESULTS

During late May 1989, I surveyed suitable-appearing habitats for Salmon River fleabane and Davis' stickseed along the main Salmon River, Panther Creek, Camas Creek, and their tributaries on the Salmon NF (Appendix 3).

I relocated six previously-known populations of Davis' stickseed and discovered four new populations. All populations are relatively small and restricted to a narrow range of habitat conditions. I relocated the two known populations of Salmon River fleabane, but after a thorough search of accessible habitat found no new populations. Following is a detailed discussion of each species, including information on its taxonomy and identification, range and habitat, conservation status, and recommendations concerning its status in Idaho, to the Regional Forester and Salmon NF.

In addition, I encountered three other rare taxa during the survey, Halimolobos perplexa var. lemhiensis (puzzling halimolobos), Epipactis gigantea (giant helleborine), and Ribes velutinum var. novum (new variety of gooseberry). The first two are Region 4 Sensitive Species. A brief discussion of my encounters and recommendations for each species can be found at the end of the report.

Erigeron salmonensis Brunsfeld and Nesom

CURRENT STATUS    USFS - None  
                      USFWS - C2  
                      Idaho Native Plant Society - None  
                      Heritage Rank - G1 S1

TAXONOMY

Family: Asteraceae [Compositae (Aster)]

Common Name: Salmon River fleabane

Citation: Brittonia 41(4), in press. 1989.

Technical Description: Perennial from taproot that bear thick (4-7 mm wide), erect caudex branches with adherent, chaffy leaf bases. Stems glabrous, 15-35 cm long. Basal leaves entire, 1-nerved, linear-oblongate (3) 6-11 cm long, the blade 2-4 mm wide, gradually tapering to a petiolar base, the lamina glabrous or nearly so, the margins sparsely appressed-ciliate with hairs 0.1-0.3 mm long; cauline leaves similar to the basal, not clasping, very gradually diminishing in size upwards. Heads terminal, hemispheric, 5-6 mm wide (pressed), on naked or minutely bracteate peduncles 2-7 cm long; phyllaries thin, greenish, with scarious margins, densely and minutely granular-glandular, otherwise glabrous, in 2-3 series, the linear 3-3.5 mm long, the outermost about half as long. Rays 11-15 in 1 series, 8-9 mm long, the ligules 1.5-2 mm wide, white, drying prominently lilac, often with a midstripe, not coiling or reflexing with maturity. Disc corollas glabrate, funnellform, not indurate or inflated, 2.1-2.5 mm long, the throat sharply constricted, ca 0.5 mm long. Style appendages shallowly deltate to shallowly or very shallowly triangular, 0.1-0.2 mm long. Achenes oblong-obovate, 1.5-2.2 mm long, 0.4-0.6 mm wide, 2-nerved, compressed, very sparsely strigose; pappus of 12-15 barbellate bristles 1.8-2 mm long, with a few outer setae 0.1-0.2 mm long. 2n=18 (Brunsfield and Nesom 1989).

Nontechnical Description: Salmon River fleabane has thick branches immediately above the taproot, with old leaf bases persistent on these branches. Stems are thin and lax, with 1-nerved, linear to linear-oblongate leaves that are largely glabrous. Involucre bracts are minutely granular-glandular, but otherwise glabrous. Flowering heads are erect in bud. The white rays stay flat as they mature. See Appendix 1 for line drawing of Salmon River fleabane.

Distinguishing Features and Similar Species: Salmon River fleabane is unlike any other Erigeron in our area. It is most closely related to a species endemic to central Utah (Brunsfield and Nesom 1989). The long, linear, dark green leaves and white flowers on long thin stems are distinctive. These characters, when used in combination with its vertical cliff-face habitat, make Salmon River fleabane easy to distinguish from other members of the Asteraceae in our area.

DISTRIBUTION

Range: Salmon River fleabane was discovered in mid-June 1981, by Pam and Steve Brunsfeld of the University of Idaho, on a north-facing rock-outcrop along the Salmon River Road between Pine Creek and Panther Creek. Searches by the Brunsfeld's in 1981, 1982, and 1983, yielded only two small populations on one rock outcrop (Brunsfeld and Nesom 1989; Steve Brunsfeld, personal communication).

Results of my field inventory in 1989, were similar to the Brunsfeld's; I found no additional populations. The two populations cover less than 20 acres along a 0.5 mile section of very steep to vertical canyon side on the south side of the Salmon River, between Halfway Gulch and Panther Creek. Individuals of the downstream population extend up a very steep gully for about 1,000 feet above the river. Less than 500 plants were observed in 1989. See Appendix 2 for a map of the population.

Habitat and Associated Species: Brunsfeld and Nesom (1989) give an excellent description of the habitat:

Salmon River fleabane is restricted to steep, north-facing cliffs where it grows on mossy crevices and ledges. The rock outcrop consists of Precambrian gneiss and schist belonging to the Yellowjacket Formation. The site, perennially free from direct sunlight, provides moist conditions in an otherwise dry, scarcely timbered canyon. Associated species include: Pseudotsuga menziesii, Glossopetalon nevadense, Acer glabrum, Cercocarpus ledifolius var. intercedens, Philadelphia lewisii, Heuchera grossulariifolia, Cystopteris fragilis, Sedum leibergii, and Arabis microphylla. Also directly associated are Bolandra oregana, a coastal disjunct reaching its known eastern limit at this site, and Hackelia davisii, a narrow endemic to this portion of the canyon.

#### CONSERVATION STATUS

Conservation Status - Idaho: The existence of Salmon River fleabane was only recently brought to my attention by Steve Brunsfeld, who noted that it may warrant special status. Brunsfeld and Nesom (1989) state that Salmon River fleabane may deserve Federal Endangered or Threatened status unless additional populations are discovered. It was recommended for Category 2 candidate status at the annual Idaho Rare Plant Meeting in March 1989, which is how it will appear on the new Federal Register list of candidate plants when it is published within the next couple of months.

Since it is a federal candidate species, no Idaho Native Plant Society category applies to Salmon River fleabane.

The Idaho Natural Heritage Program currently ranks Salmon River fleabane as G1 S1 (G1 =critically imperiled throughout its range because of extreme rarity or because of some factor of its biology making it especially vulnerable to extinction, S1 = since it is endemic to Idaho, the State (S) rank is the same as the Global (G) rank).

Conservation Status - Elsewhere: Salmon River fleabane is endemic to Idaho.

Ownership: The two small populations of Salmon River fleabane occur on land administered by the North Fork RD, Salmon NF.

Threats: Part of the lower edge of the downstream population occurs on an outcrop that was blasted during construction of the Salmon River Road. Several individuals come close to the edge of the road cut, but none were on the cut itself. Some individuals were probably destroyed during construction, and it appears that, for unknown reasons, it is unable to colonize the newly exposed surfaces. A small part of the population is next to the road, however, and a few individuals would be potentially threatened by future construction and maintenance. Drift from herbicide spraying for noxious weeds may pose a threat to some individuals in the population. The remainder of this population appears well-removed from human-related disturbances. The upstream population has its lower limits about 200 feet above the road.

Management Implications: Careful consideration should be given to the two known populations of Salmon River fleabane during planning of future maintenance and construction of the Salmon River Road. The populations are small, and the loss of even a few individuals would be significant. I checked all other outcrops along the road between Pine Creek and Panther Creek, but found no other populations of Salmon River fleabane (Appendix 3).

#### ASSESSMENT AND RECOMMENDATIONS

Summary: Results of my field investigation in 1989, revealed that the populations discovered by the Brunsfeld's in 1981, remain the only two known. Thorough searches of accessible outcrops along the main Salmon River between North Fork and Horse Creek, and its major tributaries, were unsuccessful at finding any new populations. The population consists of widely scattered individuals, on a north-facing rock outcrop, covering about 20 acres. I saw less than 500 individuals in 1989.

Recommendation to the U.S. Fish and Wildlife Service: Only two small populations of Salmon River fleabane are known, restricted to a small area of the Salmon River canyon. Thorough field investigations by myself in 1989, and Steve and Pam Brunsfeld in 1981-1983, were unable to locate additional populations. We found that it is restricted to a narrow range of habitat conditions. Further searches in the Middle Fork Salmon River may reveal the presence of additional populations. Based on these data, I recommend that Salmon River fleabane, remain a Category 2 candidate.

Recommendation to the Regional Forester: Based on data discussed in this report, it appears that Salmon River fleabane warrants Category 2 candidate status, under the Endangered Species Act, and will appear as such when the new Federal Register list of candidate plants is published soon. Therefore, it also meets criteria necessary for inclusion on the Regional Forester's List of Sensitive Species for the Intermountain Region.

Recommendation to Salmon National Forest: In light of data gathered during this and other investigations, Salmon River fleabane appears



restricted to one rock outcrop along the Salmon River road, between Pine Creek and Panther Creek. Road maintenance and construction and noxious weed spraying along a short stretch of this road pose a threat to some individuals of the population. Careful consideration should be given to this species during planning of these activities.

I searched all accessible outcrops along the Salmon River Road between North Fork and Horse Creek, including most major tributaries. One area where additional searches may prove fruitful is along the lower Middle Fork Salmon River, an area inaccessible to me in May 1989. An inventory should be conducted in this canyon as soon as practicable.

Land managers and field personnel on the Salmon NF should be informed of the occurrence of this species in their area. Possible sightings of this plant should be documented by specimens (if the size of the population warrants collecting), and should be sent to Steve Brunfeld, Department of Forest Resources, University of Idaho, for verification of their identity. Confirmed sightings of this species should be reported to the Idaho Natural Heritage Program for entry into their permanent data base on sensitive species.

Hackelia davisii Cronquist

CURRENT STATUS USFS Region 4 Sensitive Species  
(Challis and Salmon NFs)  
USFWS - 3c  
Idaho Native Plant Society - Monitor  
Heritage Rank - G3 S3

TAXONOMY

Family: Boraginaceae (Borage)

Common Name: Davis' stickseed

Citation: Vasc. Pl. Pac. N.W. 4:208. 1959.

Technical Description: Slender perennial with several lax, curved stems 2-3 dm tall, stems 1-2 mm thick toward the base, evidently spreading-hirsute, becoming more strigose above the middle or in the inflorescence; leaves hirsute, the basal one oblanceolate, petiolate, up to about 10 cm long and nearly 1.5 cm wide; cauline leaves mostly sessile, the middle and upper ones broad-based and strongly clasping, 2-5 cm long, 6-15 mm wide, 2-4 times as long as wide; flowers relatively few and long-pedicellate, blue with a yellow eye, the limb 10-12 mm wide, the fornicies evidently papillate-puberulent; marginal prickles of the nutlets free to the base or nearly so; intramarginal prickles several, much shorter than the marginal ones (Cronquist 1959).

Nontechnical Description: Slender perennial herb with several arching to nearly prostrate stems. Herbage very hairy. Basal leaves with petioles; cauline leaves sessile and clasping at the base (Henderson 1982). See Appendix 1 for line drawing of Davis' stickseed.

Distinguishing Features and Similar Species: This is the only species of the genus having clasping stem leaves, blue flowers with a yellow center, and apparently restricted to north-facing cliffs (Henderson 1982). Gentry and Carr (1976) and Cronquist (1959) all state that Davis' stickseed is a striking plant, most closely related to a species endemic to the Columbia River Gorge in Oregon and Washington.

DISTRIBUTION

Range: Davis' stickseed is known from the drainages of the main Salmon River from Pine Creek to Bear Basin Creek, and the Middle Fork Salmon River from Little Creek downstream to the confluence with the main Salmon, Lemhi, Valley, and Custer counties.

In 1989, I relocated four populations on the main Salmon and two on Camas Creek, and discovered four new populations along the main Salmon. A total of 25 sites are known within the range described above, 19 from the Salmon NF and six from the Challis NF. All populations, except three on Camas Creek and one on Loon Creek, occur within the Wild and Scenic River corridors of the main and Middle Fork Salmon rivers. See Appendix 2 for maps of Davis' stickseed populations visited in 1989 on the Salmon NF.

The Middle Fork Salmon River was inaccessible to me in May 1989. A survey of habitat in the Middle Fork drainage, by Janie Civille and Glen Dennis in 1982, as part of the rare plant inventory of the Challis NF, revealed the presence of eight populations along the Middle Fork on the Salmon NF and one along lower Camas Creek (Henderson 1982). Their data are incorporated into my assessment of Davis' stickseed on the Salmon NF. See Appendix 2 for general location of Davis' stickseed populations along the Middle Fork.

Habitat and Associated Species: Davis' stickseed is apparently restricted to northerly-facing rock outcrops and cliffs, or in talus immediately below the cliffs, where it is moist and partly shaded. Elevations of locations in the Heritage data base range from about 3100 to 4900 feet. It is known from three different substrates: Limestone (marble?), volcanic, and granitic (quartz monzonite). Associated species include Pinus ponderosa, Pseudotsuga menziesii, Cystopteris fragilis, Heuchera cylindrica, H. grossulariifolia, Montia perfoliata, and Poa secunda (Henderson 1982; 1983a). Two rare species are also associated with Davis' stickseed on rock outcrops in parts of its range, Ribes velutinum var. novum and Erigeron salmonensis.

#### CONSERVATION STATUS

Conservation Status - Idaho: For many years after its description in 1959, Davis' stickseed was known only from the type locality on Long Tom Creek. In their monograph of Hackelia, Gentry and Carr (1976) reported only one additional location for this distinctive species. Because of that, it was made a Category 2 candidate for listing as endangered (Steele 1977; Packard 1979; Charlesworth and Atwood 1987). In his evaluation of Davis' stickseed for the Idaho rare plant project of the Idaho Natural Areas Council, Steele (1981) recommended a status of threatened, due to its rarity. Field work by botanists in the Middle Fork Salmon River drainage in the early 1980's, as part of rare plant inventories of the Challis NF, discovered many new populations (Henderson 1982; 1983a). Based on these discoveries, Henderson (1983b), recommended that it be downgraded to the Federal Watch List for Idaho, and from a C2 candidate to 3c on the federal list. Davis' stickseed is on the Region 4 Sensitive Species List (USDA Forest Service 1988).

Davis stickseed is currently on the Idaho Native Plant Society Monitor list (Idaho Native Plant Society 1989). The Monitor category of the Idaho Native Plant Society list refers to taxa "that are common within a limited range as well as those taxa which are uncommon, but have no identifiable threats."

The Idaho Natural Heritage Program currently ranks Davis' stickseed as G3 S3 (G3 = either very rare and local throughout its range or found locally in a restricted range or because of other factors making it vulnerable to extinction, S3 = since it is endemic to Idaho, the State (S) rank is the same as the Global (G) rank).

Conservation Status - Elsewhere: Davis' stickseed is endemic to Idaho.

Ownership: All known populations occur on National Forest land. Six sites occur on the Challis NF and 19 on the Salmon NF. All populations,

except three on Camas Creek and one on Loon Creek, occur within the Wild and Scenic River corridors of the main and Middle Fork Salmon rivers.

Threats: Road and trail construction and maintenance appear to be the only threats to Davis' stickseed populations. Of the populations I visited in 1989, only three appeared threatened by Forest management activities. The populations along the Camas Creek Trail, below the mouth of Forge Creek and across from the mouth of Woodtick Creek, occur on outcrops that were extensively blasted during trail construction. Across from Little Sheepeater Creek on the main Salmon, Davis' stickseed occurs on an outcrop next to the Salmon River Road and could be impacted by maintenance and future construction. The remaining populations along the main Salmon River and Panther Creek were well removed from the road and trails in the area.

I do not know the status of populations along the lower Middle Fork Salmon River, but Henderson (1982; 1983a) recommended that extensive trail maintenance and construction be avoided near known populations.

Management Implications: Careful consideration should be given to populations and potential habitats of Davis' stickseed during future maintenance and construction of trails and roads within the range of Davis' stickseed. All populations are small, isolated from each other, and restricted to narrow habitat conditions, and the loss of even a part of a population would be significant.

#### ASSESSMENT AND RECOMMENDATIONS

Summary: Results of my field investigation along the main Salmon River, Panther Creek, and Camas Creek in 1989, and along the Middle Fork Salmon River by botanists from the University of Idaho Herbarium in the early 1980's, revealed that Davis' stickseed is a narrow endemic, occurring in small populations in a habitat that is relatively restricted and uncommon. Few populations are threatened, and most are removed from human-related disturbances.

Recommendation to the Regional Forester: Based on data discussed in this report, it appears that Davis' stickseed is sufficiently rare and restricted to narrow habitat conditions that it would be sensitive to inappropriate Forest management activities. I recommend that it remain on the Regional Forester's List of Sensitive Species for the Intermountain Region.

Recommendation to Salmon National Forest: In light of data gathered during this and other investigations, Davis' stickseed appears restricted to small, north-facing outcrops in the main Salmon and Middle Fork Salmon River drainages. Road and trail maintenance and construction and possibly noxious weed spraying in the vicinity of known populations could pose significant threats to population viability. Careful consideration should be given to this species during planning of these activities.

I searched all accessible outcrops along the Salmon River, between and North Fork and Horse Creek, including most of the major tributaries. One area where additional searches may prove fruitful is along the lower Middle Fork Salmon River, an area inaccessible to me in May 1989. An

inventory and assessment of populations discovered by Civile and Dennis should be conducted in this canyon as soon as practicable.

Land managers and field personnel on the Salmon NF should be informed of the occurrence of this species in their area. Possible sightings of this plant should be documented by specimens (if the size of the population warrants collecting), and should be sent to the University of Idaho Herbarium for verification of their identity. Confirmed sightings of this species should be reported to the Idaho Natural Heritage Program for entry into their permanent data base on sensitive species.

NOTES ON THREE OTHER RARE TAXA ON THE SALMON NF

During my field investigations for Salmon River fleabane and Davis' stickseed in May 1989, I encountered three additional rare taxa worthy of mention.

Epipactis gigantea (giant helleborine)

Giant helleborine, a Region 4 Sensitive Species, is distributed from southern British Columbia, south to Baja California, and in most of the western U.S. to the Rocky Mountains and south to northern Mexico. It is considered rare, threatened or endangered in seven states and Canadian provinces, including Idaho. In Idaho, giant helleborine is known from 23 sites, with all but one occurring in the central and southern part of the state. It is generally associated with hot or cold springs, where a constant flow and water temperature regime are maintained year-round. In the mountainous part of Idaho, it occurs near hot springs, while its desert habitats are generally cold springs. Habitat at almost all known Idaho sites has been altered, and several populations are known to be extirpated or at critically low levels.

I discovered two populations on the Salmon NF in May 1989; Owl Creek Hot Springs and Hot Spring Creek hot springs (Panther Creek). I also found a population at the hot spring on Warm Spring Creek near Elk Bend in 1986. Habitats in the vicinity of all these sites has been altered to some degree, with a portion of the giant helleborine population destroyed at Owl Creek and Hot Spring Creek hot springs, at least. A status inventory should be conducted on the Salmon NF as soon as practicable, followed by the preparation and implementation of a habitat management plan soon afterward.

Halimolobos perplexa var. lemhiensis (puzzling halimolobos)

This variety of puzzling halimolobos is endemic to northwestern Custer and northern and western Lemhi counties in the following areas: the Middle Fork Salmon River drainage and major tributaries, below about Marble Creek; lower Panther Creek, below about Napias Creek; the lower portion of the North Fork Salmon River drainage; and the main Salmon River and tributaries from at least North Fork, downstream to below Corn Creek. Within that area it occurs on dry, generally steep and gravelly or sandy slopes, roadcuts, and similar, mostly disturbed sites on quartzitic, granitic, or volcanic substrates, generally where open and in full sun (Henderson 1983a).

During May 1989, I encountered numerous populations in the habitats described above. Although it has a relative narrow range, I recommend that it be removed from the Region 4 Sensitive Species List, due to the fact that it is abundant in a widespread habitat, and appears to favor recently disturbed areas, such as road- and trailcuts.

Ribes velutinum var. novum (new variety of gooseberry)

During a comprehensive inventory of Idaho's woody flora by Steve Brunsfeld and Fred Johnson, dendrologists from the University of Idaho,

an undescribed taxon was discovered in the Salmon River canyon, centered around the mouth of Panther Creek. They have tentatively classified this new taxon as a variety of Ribes velutinum. Ongoing studies by Steve Brunsfeld, University of Idaho, and Pat Holmgren, New York Botanical Garden, will properly describe this taxon as new to science.

Ribes velutinum occurs throughout the lower and middle portions of the Salmon River canyon and tributaries, from its mouth upstream to at least Salmon. Throughout this region, Ribes velutinum is represented largely by var. goodingii. Variety goodingii is interrupted, however, by this new taxon in the vicinity of Panther Creek. Variety novum is easily separated from var. goodingii in the field by its long (>5 mm), very glandular pubescence on the stems and especially the fruits. The fruits of var. goodingii are glabrous.

I encountered var. novum from Pine Creek, downstream to above the mouth of the Middle Fork, and on lower canyon of Panther Creek, up to about Hot Spring Creek. A more intensive inventory may further expand its range. Variety goodingii occurs immediately above and below the range described above, but does not appear to be sympatric with var. novum.

Variety novum is a sprawling shrub, with long prickles and small, deeply divided leaves. The narrow stems can be quite long; 15 to 20 foot stems were seen hanging from overhanging cliffs. It has a nearly continuous distribution, within a narrow range, on northerly-facing rock outcrops and cliffs. This habitat is similar to Davis' stickseed and Salmon River fleabane, with which it occurs at some sites, but appears to have a wider ecological amplitude than these two endemics. No threats were apparent, other than new road construction at some sites, and does not warrant inclusion on the Regional Sensitive species list. It is sufficiently rare, however, to be included on the Idaho Native Plant Society's Monitor List.

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## Appendix 1

Line drawings of Erigeron salmonensis and Hackelia davisii

1. Erigeron salmonensis (from Brunsfeld and Nesom 1989)
2. Hackelia davisii (from Cronquist 1959)

## Appendix 2

Locations of Erigeron salmonensis and Hackelia davisii  
on the Salmon National Forest.

- Map 1. Erigeron salmonensis - overview of distribution (from Brunsfeld and Nesom 1989)
- Map 2. Erigeron salmonensis - population near Sheepeater Historical Site. Portion of Shoup SE 7.5' orthophoto quadrangle.
- Map 3. Hackelia davisii - overview of distribution (from Henderson 1983).
- Map 4. Hackelia davisii - populations across from Little Sheepeater Creek and near Sheepeater Historical Site. Portion of Shoup SE 7.5' orthophoto quadrangle.
- Map 5. Hackelia davisii - population along Panther Creek. Portion of Blackbird Mtn NE 7.5' orthophoto quadrangle.
- Map 6. Hackelia davisii - 3 small populations along lower Owl Creek. Portion of Shoup SW 7.5' orthophoto quadrangle.
- Map 7. Hackelia davisii - small population across and upstream from Ebenezer Bar near old Cable Car Crossing. Portion of 1962 Long Tom Mtn 7.5' quadrangle.
- Map 8. Hackelia davisii - populations on lower Long Tom Creek and upstream from Long Tom Rapids. Portion of 1962 Long Tom Mtn 7.5' quadrangle.
- Map 9. Hackelia davisii - population along lower Bear Basin Creek. Portion of 1962 Butts Creek Point 7.5' quadrangle.
- Map 10. Hackelia davisii - population along Camas Creek Trail, downstream from the mouth of Forge Creek. Portion of 1963 Yellowjacket 7.5' quadrangle.
- Map 11. Hackelia davisii - population along Camas Creek Trail, across and downstream from the mouth of Woodtick Creek. Portion of 1963 Apareja Point 7.5' quadrangle.
- Map 12. Hackelia davisii - Salmon NF populations along lower Camas Creek and lower Middle Fork Salmon River. Portion of 1979 Salmon National Forest Map.

APPENDIX 3

List of areas searched for  
Erigeron salmonensis and Hackelia davisii  
on the Salmon National Forest in 1989.

Salmon River canyon between Shoup and Horse Creek

1. Outcrops across river from road between Shoup and Pine Creek (with binoculars)
2. Pine Creek
3. Outcrops between Pine Creek and Panther Creek\*
4. Outcrops between Panther Creek and Cove Creek Bridge
5. Outcrops across river from road between Cove Creek Bridge and Middle Fork Salmon River (with binoculars)\*
6. Owl Creek\*
7. Long Tom Creek\*
8. Stoddard Creek Pack Bridge area
9. Cramer Creek
10. Fountain Creek
11. Bear Basin Creek\*
12. Draws between Bear Basin Creek and Corn Creek
13. Corn Creek
14. Wheat Creek
15. Gunbarrel Creek
16. Horse Creek

Panther Creek

1. Lower Panther Creek Canyon (mouth to Hot Springs Creek)
2. Trail Creek
3. Beaver Creek
4. Panther Creek between Trail Creek and Big Deer Creek (no habitat above this)\*

Camas Creek

1. Along road and trail between Meyers Cove and Woodtick Creek\*

\* Denotes sites where Hackelia davisii populations were found on the Salmon NF.

APPENDIX 4

Slides of Erigeron salmonensis and Hackelia davisii  
on the Salmon National Forest and their habitats.

1. Erigeron salmonensis - close-up of flowers; note flat, white ray flowers (photo by Dick Wenger).
2. Erigeron salmonensis - close-up of plant on rock outcrop; note narrow, drooping leaves with upright flowering-stems.
3. Erigeron salmonensis - habitat on rock in protected areas below canopy and at base of outcrop.
4. Hackelia davisii - close-up of light blue flowers.
5. Hackelia davisii - close-up of plant; note clasping leaf bases.
6. Hackelia davisii - Habitat along lower Owl Creek; north-facing and vertical.