

REPORT ON THE CONSERVATION STATUS OF  
DOUGLASIA IDAHOENSIS, IN IDAHO

by

Robert K. Moseley  
Natural Heritage Section  
Nongame/Endangered Wildlife Program  
Bureau of Wildlife

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Idaho Department of Fish and Game  
600 South Walnut, P.O. Box 25  
Boise, Idaho 83707  
Jerry M. Conley, Director

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DOUGLASIA IDAHOENSIS IN IDAHO

Taxon Name: Douglasia idahoensis D. Henderson

Common Name: Idaho douglasia

Family: Primulaceae

States Where Taxon Occurs: U.S.A.; Idaho

Current Federal Status: Category 2 Candidate

Recommended Federal Status: Category 1 Candidate

Author of Report: Robert K. Moseley

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Individual to Whom Further  
Information and Comments  
Should be Sent:

Robert K. Moseley  
Idaho Natural Heritage Program  
Idaho Dept. Fish and Game  
P.O. Box 25  
Boise, ID 83707

## ABSTRACT

Available data on the abundance, distribution, and conservation status of *Douglasia idahoensis* (Idaho douglasia) is compiled in this Status Survey Report. Even after relatively thorough surveys of potential habitats, beginning in 1976, Idaho douglasia remains a very rare species. South of the Salmon River, seven populations are known from six sites on the Boise National Forest. North of the Salmon River, five populations are known from two areas of the Nez Perce National Forest. Although many tens of thousands of individuals are known, with most occurring in only four populations, the entire known extent of these populations covers only about 330 acres.

Throughout its range, populations are small in extent and isolated, occurring in widely separated areas of the central Idaho mountains. Despite this apparent narrow distribution, however, no serious human-related threats are foreseen, although many of the populations have incurred some level of human-caused disturbance in the past and some will be minimally impacted by planned projects on the Nez Perce National Forest.

Idaho douglasia is currently a category 2 candidate. Although a few areas remain to be inventoried, data presented here suggest that our knowledge of the distribution and conservation status of Idaho douglasia is relatively well-known. A status change to category 1 is recommended.

In coordination with the U.S. Fish and Wildlife Service, the Boise and Nez Perce National Forests should develop and implement a Conservation Agreement for Idaho douglasia that outlines conservation strategies for the species. Recommendations regarding population monitoring are also made.

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I. Species Information.

1. Classification and nomenclature.

A. Species.

1. Scientific name.

a. Binomial: Douglasia idahoensis D. Henderson

b. Full bibliographic citation: Henderson, D.M. 1981. A new Douglasia (Primulaceae) from Idaho. *Brittonia* 33:52-56.

c. Type specimen: Idaho County, summit ridge and east-facing slope of Square Mountain, elevation 2408 m, Gospel Peak area, Nez Perce National Forest, 28 July 1976, D.M. Henderson, R.T. Bingham, and C.A. Wellner 3403 (holotype: ID; isotypes NY,UC,WS,WTU)

2. Pertinent synonym(s): None.

3. Common name(s): Idaho douglasia, Idaho mountain primrose

4. Taxon codes: PMPRI04070 (Idaho Natural Heritage Program).

5. Size of genus: Seven species of northwestern and arctic North America and also in Eurasia (Hitchcock 1959).

B. Family classification.

1. Family name: Primulaceae

2. Pertinent family synonyms: None

3. Common name for family: Primrose

C. Major plant group: Dicotyledonea

D. History of knowledge of taxon: During the preparation of the Primulaceae for the Vascular Plants of the Pacific Northwest, Hitchcock (1959) examined a fragmentary specimen of Douglasia at NY from Idaho County, near Red River Ranger Station (1936, J.H.Christ 13992). In Hitchcock's treatment, he stated that this specimen appeared to be more closely allied to D. laevigata than to any other of the northwestern species, and was believed to represent a new variety of this taxon. He further stated that attempts to recollect this plant were unsuccessful and some doubt was expressed about its Idaho origin (Henderson 1981a).

In the summer of 1976, Henderson, R. Bingham, and C. Wellner discovered a population of Douglasia on the summit of Square Mountain, Idaho County. These plants were judged to match very well with three specimens on file in the University of Idaho Herbarium (ID) from Elk Mountain, Idaho County: Christ

51-593, 51594, and Baker 12597. Elk Mountain is 19 miles northeast of Red River Ranger Station and, since subsequent examination of likely habitats in the vicinity of Red River disclosed none nearer than Elk Mountain, it is likely that this is the site of the original collection by Christ deposited at NY (Henderson 1981a).

Constance (1938), in a revision of the genus *Douglasia*, cited a specimen of *D. montana* collected by J.W. Thompson in 1937 from Gold Fork Lookout, which is nearly 100 miles west of the western edge of the more typical *D. montana* in Lemhi County. Henderson found this to be Idaho douglasia (Henderson 1981a).

Two collections of Idaho douglasia are deposited in the Boise National Forest Herbarium, Boise, as *Douglasia montana* (1914, L.O.M. s.n.; and 1915, W.N. Sparhawk s.n.). Unfortunately there is no location information on the herbarium sheets.

In 1979, A. Steele collected Idaho douglasia from Scott Mountain, Boise County, which was mentioned by Henderson (1981a) as an unconfirmed sighting because he had not seen the specimen. Investigations by Steve Caicco, Idaho Natural Heritage Program, and personnel of the Boise National Forest found this population to be quite extensive.

During field investigations on the Payette and Boise National Forests in 1988, Moseley (1988) discovered two new, small populations on the Boise National Forest in southern Valley County. In 1989, during field investigations on the Nez Perce National Forest Moseley (1989) discovered three new populations in eastern Idaho County.

- E. Comments on current alternative taxonomic treatment(s): None, although, as mentioned in the preceding section, several old and/or fragmentary collections have been interpreted either as *D. laevigata* or *D. montana*. As more populations became known and older collections were carefully examined, however, there is no doubt that Idaho douglasia is a distinct taxon (Henderson 1981a).

2. Present legal or other formal status.

A. International: None.

B. National.

1. Present designation of proposed legal protection or regulation: Idaho douglasia is a category 2 candidate (U.S. Fish and Wildlife Service 1990).

2. Other current formal status recommendation: Idaho douglasia is currently considered "imperiled globally because of rarity or because of other factors demonstrably making it vulnerable to extinction" (global rank = G2) by The Nature Conservancy.

Idaho douglasia is currently a Forest Service Sensitive

Species in Region 1 (USDA Forest Service 1988a) and Region 4 (USDA Forest Service 1988b).

3. Review of past status: Idaho douglasia first appeared as a category 1 candidate in the 1980 Notice of Review, as Douglasia idahoensis /sp. nov. ined. (Federal Register, 45(242):82495, December 15, 1980). In 1983, Idaho douglasia was listed as a category 2 candidate (Federal Register, 48(229):53648, November 28, 1983). In 1985, is was listed as a category 2 candidate (Federal Register, 50(188):10, November 20, 1985).

C. State.

1. Idaho.

- a. Present designation or proposed legal protection or regulation: None.
- b. Other current formal status recommendation:  
Idaho douglasia is currently considered "imperiled in Idaho because of rarity or because of other factors demonstrably making it vulnerable to extinction" (state rank = S2) by the Idaho Natural Heritage Program (Moseley and Groves 1990).
- c. Review of past status: Henderson (1981b) recommended a federal status of endangered, noting the small populations sizes of the two populations then known and the potential for deleterious recreational impacts.

3. Description.

- A. General nontechnical description: Idaho douglasia forms a low, spreading cushion or mat on the soil surface. The leaves are small, green and succulent, forming a terminal rosette on the short stems. Stems are terminated by a cluster of 3 to 5, relatively large, pink to magenta flowers. Flowering takes place from late June to mid-July. See Appendix 2 for detailed line drawings of Idaho douglasia and Appendix 3 for slides of its habit and habitat.
- B. Technical Description: Perennial herbs, cushion- to more often mat-forming, loosely caespitose from a slender tap root; stems prostrate to ascending, minutely pubescent, terminating in rosettes of entire leaves; leaves succulent, oblong to oblanceolate, obtuse to acute, 7-11 mm long, 1-1.7 mm wide, puberulent, becoming glabrous and strongly reflexed in age; inflorescence umbellate, (2)3-5(7)-flowered, involucrate; bracts 5-9, lanceolate to lance-ovate, acute to acuminate, 2.5-3.7(5) mm long, 0.7-1.5 mm wide, with scattered simple white hairs, the margins ciliate; peduncles 1-6 mm long with simple to forked hairs throughout; pedicels 3-7(10) mm long at anthesis, the length variable within the inflorescence, densely covered with simple to branched white hairs; calyx 4-7 mm long, the lobes 1-2 mm wide, the margins ciliate, the



apices acute, the tube 2.4-3 mm with short, simple white hairs at least proximally; corolla salverform, (5)6-10(11) mm long, glabrous, the lobes broadly flared, 5-6 mm long, 3-4 mm wide in fresh specimens, 3-5 mm long, 1.8-3 mm wide in pressed ones, the apex emarginate to retuse (entire), the limb pink to magenta, the throat yellow with 5 fornicies, the tube 3.5-6 mm long, exceeding the calyx, lighter in hue than the limb; stamens 5, included; anthers oblong, 0.8-1.1 mm long, yellow; style 1-1.8 mm long, the stigma small, capitate; capsules ovate, 5-valved, 1.4-2.6 mm long; seeds 1-several per capsule, dark reddish-brown to nearly black, minutely pitted, 0.9-2.5 mm long; n=18 (Henderson 1981a).

- C. Local field characters: Idaho douglasia is a distinctive member of the high elevation flora in central Idaho and is easily recognized when in flower by its profuse display of bright pink flowers, occurring as a mat on the ground. Idaho douglasia is also distinctive in a vegetative state. The leaves become suffused with anthocyanin (turn red) soon after flowering, turning the mat/cushion distinctive dark red/green. This feature can be used to identify it well into September.

No other species of Douglasia are known to occur within the range of Idaho douglasia. It should be noted, however, that Douglasia montana occurs in the Bitterroot Mountains, Montana, approximately 40 miles east, across the Selway River valley from the Elk Mountain - Wylies Peak populations. The following key can be used to distinguish the two species (from Henderson 1981a):

Involucral bracts (0)1-3; inflorescence of 1-2 (3) flowers, often one of these sessile.... D. montana

Involucral bracts 5-7; inflorescence of 3-5 flowers, the pedicels well-developed.....  
..... D. idahoensis

Arenaria aculeata is a common cushion plant of the central Idaho mountains and occurs with Idaho douglasia at most sites. It superficially resembles Idaho douglasia in a vegetative state. It is easily distinguished, however, by its narrow, sharply-pointed, nonsucculent leaves.

- 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 differences with closely related species.
- E. Photographs and/or line drawings: Line drawings of Idaho douglasia appear in Henderson (1981a) and USDA Forest Service (1988a; n.d.). See Appendix 2 for a reproduction of the line drawings from Henderson (1981a). Photographs appear in USDA Forest Service (n.d.). In addition, numerous color slides of Idaho douglasia and its habitat are on file at the Idaho Natural Heritage Program. See Appendix 3 for a

selection of slides of Idaho douglasia and its habitat.

#### 4. Significance.

- A. Natural: Of evolutionary and biogeographical significance, Constance (1938) noted that the species of Douglasia can be viewed as a series of closely related, allopatric endemics. Henderson (1981a) noted that the discovery of Idaho douglasia does not alter the pattern. The Idaho batholith of central Idaho is not noted for large numbers of endemics, although some are present. Synthyris platycarpa, Dasynotus daubenmirei, and Waldsteinia idahoensis, occurring in the northern part of the batholith, are considered to be paleoendemics (Crawford 1980), while endemics (of unknown origin) of the southern part of the batholith include Draba argyraea, D. sphaerocarpa, and Haplopappus aberrans. Henderson (1981a) speculated that Idaho douglasia represents another paleoendemic.
- B. Human: Although no uses of Idaho douglasia are known, it has potential for ornamental use. Hitchcock (1959) states that the northwestern species of Douglasia are prized rock garden subjects, with D. laevigata being the most suitable for areas west of the Cascades. It is propagated by cuttings and layers as well as by seed.

#### 5. Geographical distribution.

- A. Geographical range: Idaho douglasia is known from 11, high elevation sites in three, apparently disjunct areas of central Idaho: six sites occur in the South Fork Salmon River/South Fork Payette River drainages of northern Boise County and southern Valley County; one site in the Gospel Peak area of central Idaho County; and four sites in the upper Selway River drainage of eastern Idaho County (see Appendix 4 for an overview of the distribution of Idaho douglasia).
- B. Precise occurrences in Idaho.
1. Populations currently or recently known extant: The following 11 sites encompass 13 populations of Idaho douglasia (see Appendix 4 for maps of precise locations and Appendix 5 for Heritage Program occurrence records for each site):
  2. Populations known or assumed extirpated: None.
  3. Historically known populations where current status not known: None.
  4. Locations not yet investigated believed likely to support additional natural populations: Potential, unsurveyed habitat for Idaho douglasia occurs in the following areas:
    - o upper Selway River drainage, primarily on the Bitterroot National Forest, and to a lesser extent on

the Nez Perce National Forest.

- o Vermillion Peak - Indian Peak - Grave Meadow Peak area in the Meadow Creek drainage of the Nez Perce National Forest.
- o Bear Valley Creek drainage of the Boise National Forest.
- o ridge system between Rice Peak and Scott Mountain, which forms the divide between the Middle Fork Payette River - South Fork Salmon River and Deadwood River - Johnson Creek divide.

See Moseley (1988; 1989) for areas searched unsuccessfully for Idaho douglasia on the Nez Perce, Payette, and Boise National Forests.

5. Reports having ambiguous or incomplete locality information: Three reports of Idaho douglasia have ambiguous or incomplete location information, as follows:

- o As discussed previously and in Henderson (1981a), a fragmentary specimen of Idaho douglasia at NY, collected by Christ (13992) in 1936, simply states that it is from Red River Ranger Station, Idaho County. A search of likely habitats in the vicinity of Red River disclosed no populations of Idaho douglasia nearer than Elk Mountain, ca. 19 miles northeast of Red River. Henderson (1981a) believes that Elk Mountain is the likely site of Christ's collection.
- o On July 9, 1937, J.W. Thompson collected Idaho douglasia from "Valley Co: near crest of Gold Fork Lookout, Sawtooth Mountains; 8100 feet." Gold Fork Lookout in Valley County is in the Salmon River Mountains, about 50 miles northwest of the Sawtooth Range. It should be noted, however, that in the early part of this century, the mass of mountains north of the Snake River Plain were often referred to collectively as the "Sawtooth Mountains."

Soon after the proper taxonomic disposition of this specimen was determined (Henderson 1981a), attempts to relocate it near Gold Fork Lookout were unsuccessful (Charles Wellner, Moscow, Idaho, personal communication). As it turns out, the Gold Fork Lookout searched by Wellner and others is relatively new (although now torn down) and occurs at a lower elevation than that specified by Thompson. The Gold Fork Lookout they searched, as indicated on the 1954 USGS Gold Fork 15' topographic quadrangle, is in the center of the north half of section 3, T15N, R5E, and occurs at an elevation of 7,790 feet.

Searches of the area in 1988 by Moseley (1988) also found no Idaho douglasia around the Gold Fork Lookout site, but two

small populations were discovered around Gold Fork Rock, about two miles east of Gold Fork Lookout. Gold Fork Rock once had a crow's-nest lookout stand bolted to the summit (remnants still remain), and is 8,100' in height; most likely it is the site of Thompson's 1937 collection.

o Two collections of Idaho douglasia are deposited in the Boise National Forest Herbarium, Boise, originally identified as Douglasia montana:

1. L.O.M. s.n.; 1914
2. W.N. Sparhawk s.n.; 1915

Unfortunately there is no location information on the herbarium sheets, and the their collection sites are unknown.

6. Locations known or suspected to be erroneous reports: None.

C. Biogeographical and phylogenetic history: Constance (1938) noted that the species of Douglasia can be viewed as a series of closely related, allopatric endemics. Henderson (1981a) states that the discovery of Idaho douglasia does not alter the pattern. The Idaho batholith of central Idaho is not noted for large numbers of endemics, although some are present. Synthyris platycarpa, Dasynotus daubenmirei, and Waldsteinia idahoensis, occurring in the northern part of the batholith, are considered to be paleoendemics (Crawford 1980), while endemics (of unknown origin) of the southern part of the batholith include Draba argyraea, D. sphaerocarpa, and Haplopappus aberrans. Henderson (1981a) speculated that Idaho douglasia represents another paleoendemic.

Henderson (1981a) states that while Idaho douglasia is obviously closely related to Douglasia laevigata and D. nivalis, he agrees with Constance (1938) that its closest affinities lie with D. montana. Henderson (1981a) points out that, morphologically, the much longer peduncles of D. nivalis and D. laevigata provide for reliable separation from Idaho douglasia and D. montana, while the number of bracts and flowers per umbel can be used to distinguish between the latter two species. Another morphological trait that sets Idaho douglasia off from the rest of the Western Cordilleran species of Douglasia is that its leaves are more succulent in living condition than any of the others. Although this trait is readily observed in the field, it unfortunately is indiscernible in pressed specimens (Henderson 1981a).

Henderson (1981a) obtained a chromosome count of  $n = 18$ , however, he found it difficult to evaluate relationships with other members of the genus because of the lack of chromosome numbers reported. The somatic number of  $2n = 36$  is not uncommon in other genera of Primulaceae.

6. General environment and habitat description.

A. Concise statement of general environment: Idaho douglasia occurs on ridges and summits in central Idaho, largely on granitics of the Idaho batholith. Elevations range from about 7,200' to 8,200'. It occurs in subalpine vegetation characterized by open forb-dominated communities and woodlands dominated by Pinus albicaulis and Abies lasiocarpa. Precipitation falls predominantly in the winter as snow, with relatively little precipitation falling during the late summer and early fall.

B. Physical characteristics.

1. Climate.

a. Koppen climate classification: Habitat for Idaho douglasia is classified as Koppen's unit Dfb, which is a cold-snowy climate of humid winters, with an average temperature of the coldest month below 26.6° F and the average temperature of the warmest month above 50° F. The climate is characterized by frozen ground and a snow cover of several months duration (Trewartha 1954).

b. Regional macroclimate: Populations north of the Salmon River have a somewhat different climatic setting than those south of the Salmon. The Boise National Forest populations occur in the Southern Idaho Section of the Northern Rocky Mountain physiographic province, while the Nez Perce National Forest populations occur the Salmon Uplands Section (Steele et al. 1981). The following characterization of the climate of the two areas is largely from Steele et al. (1981), although Ross and Savage (1967) and Finklin (1983) were also consulted.

The Southern Batholith Section generally has dry summers and a wet season from November through March. Most precipitation during this period is delivered by cyclonic storms from the Pacific Ocean. Precipitation records show average monthly totals of less than 0.5 inches during July and August, the driest months of the year. Average annual precipitation for the entire section is 32.1 inches but varies widely; the southern portion averages less than 15 inches a year, while some high mountains receive more than 60 inches. Average annual air temperatures for this section at median elevation are: maximum, 46° F; mean, 36° F; minimum 22° F. The maximum-minimum variation is 24° F. This relatively wide temperature variation is due partly to reduced influence of Pacific Ocean air masses as compared to more northern sections of the state.

In the Salmon Uplands Section, low-altitude storms from the Pacific Ocean create wet winters from November through January. High-altitude storms from the Gulf of Mexico and California Coast provide moisture during May and June. The latter wet season often averages greater

monthly precipitation than the former; however, the higher elevations probably receive slightly more precipitation during the winter. Annual precipitation for the section averages 31.2 inches and ranges from less than 10 inches to more than 50 inches, depending on elevation. Average annual temperatures for this section at median elevation: maximum, 50.7<sup>o</sup> F; mean, 33.0<sup>o</sup> F; and minimum, 22.4<sup>o</sup> F. Maximum-minimum variation is 28.3<sup>o</sup> F.

- c. Local microclimate: Although the three centers of distribution of Idaho douglasia are widely separated, the local microclimate appears remarkably similar in all areas. Populations generally occur on northerly-facing slopes; they are rarely found on southerly-facing slopes, and when they do, population densities are relatively low. The northerly-facing sites are moister and cooler than adjacent south slopes. Without exception, Idaho douglasia populations occur on well-drained substrates, generally of rapidly decomposing, granitic scree.

Several populations appear to be restricted to the lee sides of ridges, where wind-deposited snow accumulates and lies later into the summer than adjacent areas. The Square Mountain (003) and Rice Peak (006) populations are the clearest examples of this type of distribution.

2. Air and water quality requirements: Unknown

3. Physiographic provinces: The distribution of Idaho douglasia lies entirely within the Northern Rocky Mountain physiographic province, a complex of high, massive mountains dissected by deep valleys (Ross and Savage 1967). The three disjunct populations lie in two sections of the province: the Boise National Forest populations occur in the Southern Batholith Section and the Nez Perce National Forest populations occur in the Salmon Uplands Section (Steele et al. 1981). The following characterization of the two sections is from Steele et al. (1981).

The Southern Batholith Section delineates the southern lobe of the Idaho batholith. This section is drained to the north chiefly by the South and Middle Forks of the Salmon River and to the south by the Boise and Payette Rivers. Elevations range from about 3,000 feet to over 10,000 feet with a median elevation of about 6,500 feet. While the southern batholith contains several rather flat basins and some rolling uplands, most of the area has a mountainous relief between 5,000 and 9,000 feet.

The Salmon Uplands section is roughly bisected by the Salmon River Canyon. About 75% of the area drains into the Main Salmon River. Less than 5% drains into the Bitterroot River and about 20% into the Selway River. Elevations range from

2,000 to over 10,000 feet. The canyonlands have relief in excess of 5,000 feet.

4. Physiographic and topographic characteristics: All populations of Idaho douglasia occur on ridgeline habitats between 7,200 and 8,200 feet. These ridges tend to be of relatively rounded character, although many border steep, north-facing cirque headwalls. The densest populations occur on the rounded ridges and diminish in density on adjacent slopes. Slope aspects are predominantly northerly, although sparse portions of some populations occur on south-facing slopes.
5. Edaphic factors: With the exception of the Square Mountain (003) population, Idaho douglasia occurs on substrates best characterized as recently decomposed granitic bedrock. As explained below, the Square Mountain population is underlain by quartzite. On all sites there is little to no soil development, and, due to this characteristic and their topographic position, they are very unstable.

The Elk Mountain (004), Bilk Mountain (011), and Goat Lake (010) populations occur on quartz monzonite of the Cretaceous Idaho batholith. The Wylies Peak (009) population occurs on Tertiary rocks mapped as undifferentiated pink granite and quartz monzonite, hornblende granite and granophyre (Greenwood and Morrison 1973; Mitchell and Bennett 1979). The Boise National Forest populations also occur on rocks of the Idaho batholith, primarily muscovite-biotite grandiorite, biotite grandiorite, and granite (Fisher et al. 1983). Soils of these granitic substrates are thin and moderately coarse to coarse textured throughout their profiles and generally stony. Thin soils overlying well-weathered granitics are among the highest producers of sediment on the Idaho batholith when subjected to runoff (Steele et al. 1981).

The Square Mountain (003) population lies on the contact between two geologic substrates. The contact appears to coincide with the ridge crest over Square Mountain. The northeast slope, where the highest population density occurs, is underlain by undifferentiated rocks of the Precambrian Hoodoo Quartzite formation. The southwest slope of the mountain is underlain by igneous and metamorphic rocks of the Cretaceous Idaho batholith (Mitchell and Bennett 1979). Steele et al. (1981) found the soils derived from quartzitic parent material have loamy sand to sandy loam textures.

6. Dependence of this taxon on natural disturbance: Without exception, Idaho douglasia occurs in open subalpine communities, in which little inter- and intraspecific competition is evident. These communities are kept open by substrate instability caused by several different types of disturbance. The highest population densities of Idaho douglasia occur in areas of moderate instability, such as erosion channels created by snow runoff, wind blowouts on ridgelines, and trail cuts. Portions of populations occur in chutes and channels on relatively steep slopes, although the

density of plants in this habitat is low.

7. Other unusual physical features: None known.

C. Biological characteristics.

1. Vegetation physiognomy and community structure: Vegetation encompassing populations of Idaho douglasia differ between areas and fall into three different types:

- o Juncus drummondii is the dominant species on the steep northeast-facing slope at Square Mountain (003), where Idaho douglasia population density is highest, although there is considerable bare ground in the community. Associated species include Antennaria lanata, Pedicularis contorta, Phyllodoce empetrififormis, Hieracium gracile, Arnica latifolia, Vaccinium scoparium, Pinus albicaulis, Xerophyllum tenax, Phlox diffusa, and Luzula hitchcockii.

A few plants can be found on the adjacent ridgetop and gentle southwest-facing slope of Square Mountain, generally in bare-soil areas between Xerophyllum tenax bunches. These microsites are runoff channels for spring and early summer snow melt. Open woodlands dominated by Pinus albicaulis and Abies lasiocarpa occur on these sites and are classified as the Abies lasiocarpa/ Xerophyllum tenax - Vaccinium scoparium habitat type (Cooper et al. 1987).

- o Idaho douglasia in the Elk Mountain - Wylies Peak area occurs on north-, northwest-, and northeast-facing, open-grown whitebark pine - subalpine fir woodlands and open scree slopes on ridgelines and in avalanche chutes. Communities in which Idaho douglasia occurs are undescribed, but would fall within the Pinus albicaulis - Abies lasiocarpa complex of habitat types sensu Cooper et al. (1987).
- o Idaho douglasia on the Boise National Forest occurs in north- and northeast-facing, open-grown whitebark pine - subalpine fir woodlands and scree slopes in avalanche chutes. The understory is very depauperate in these stands, consisting of 5-10 species. Ground cover is low. It was difficult to determine with a high degree of confidence the forest habitat type(s) occurring at these sites, because few of the indicator species were present in some areas. Abies lasiocarpa/ Carex geyeri-Carex geyeri appeared to be the predominant habitat type (Steele et al. 1981). The Abies lasiocarpa/Vaccinium scoparium - Pinus albicaulis habitat type was also represented and possibly Abies lasiocarpa/Luzula hitchcockii - Vaccinium scoparium.

2. Regional vegetation type: Kuchler (1964) places the subalpine



vegetation of Idaho in the potential vegetation type of Western Spruce-Fir Forest (Picea - Abies).

3. Frequently associated species: Frequently associated species at the Square Mountain (003) site include Antennaria lanata, Pedicularis contorta, Phyllodoce empetrififormis, Hieracium gracile, Arnica latifolia, Vaccinium scoparium, Pinus albicaulis, Xerophyllum tenax, Phlox diffusa, and Luzula hitchcockii.

Associated species of the Elk Mountain - Wylies Peak area include Carex geyeri, Vaccinium scoparium, Luzula hitchcockii, Arenaria aculeata, Polygonum phytolaccaefolium, Poa gracillima, Pedicularis contorta, Eriogonum pyrolifolium, Phlox diffusa, Antennaria lanata, Juncus drummondii, Festuca viridula, Arenaria congesta, Anemone occidentalis, Campanula parryi, and Xerophyllum tenax. A rare plant, Ivesia tweedyi, occurs with Idaho douglasia in two small areas around Elk Mountain.

The depauperate understory of woodlands containing Idaho douglasia on the Boise National Forest include Arenaria aculeata, Polygonum phytolaccaefolium, Poa nervosa, Penstemon ellipticus, Penstemon fruiticosus, Polytrichum juniperinum, Pedicularis contorta, Draba sphaerocarpa, Oryzopsis exigua, Eriogonum pyrolifolium, Arabis microphylla, and Chionophylla tweedyi.

4. Dominance and frequency: In most areas, Idaho douglasia occurs as widely spaced individuals that are in no way a dominant member of the community. In some portions of the Elk Mountain (004) population, however, especially on ridgelines exposed to wind scouring, Idaho douglasia can form relatively dense stands, with individual cushions being as much as one foot in diameter. The vegetation is sparse here, however, and the bare ground separates the cushions.
5. Successional phenomena: Most populations of Idaho douglasia occur in communities that are maintained in an early successional state due to chronic physical instability of the site. Although no data is available, the smallest populations occur in mature whitebark pine woodlands, while the largest and densest populations occur in communities that are nonforested and relatively unstable.
6. Dependence on dynamic biotic features: None known.
7. Other endangered species: Ivesia tweedyi, a rare species in Idaho, disjunct by several hundred miles from its main distribution in the Wenatchee Mountains of central Washington. Ivesia tweedyi is on the Idaho Native Plant Society's Monitor List (Idaho Native Plant Society 1989), which includes taxa that are common within a limited range as well as those taxa which are uncommon, but have no identifiable threats. The populations of Ivesia tweedyi on Elk Mountain represent the southern known extent of its range

in Idaho.

## 7. Population biology.

A. General summary: Thirteen populations of Idaho douglasia occur at 11 sites in the mountains of central Idaho. There are three, apparently disjunct centers of distribution: six sites occur in the South Fork Salmon River/South Fork Payette River drainages of northern Boise County and southern Valley County; one site on Square Mountain in the Gospel Peak area of central Idaho County; and four sites in the upper Selway River drainage of eastern Idaho County (see Appendix 4 for an overview of the distribution of Idaho douglasia).

The largest populations occur in eastern Idaho County, where three populations consist of 10,000 or more plants. Most populations, however, average much less than that, containing several hundred to 1,000 individuals. Several populations in Valley County contain less than 100 plants. Nothing is known of the reproductive biology of Idaho douglasia.

### B. Demography.

1. Known populations: Thirteen populations are known extant, occurring at eleven sites. See Section I.5.B.1 for list of populations and their location. See Appendix 4 for maps showing the distribution of sites.

2. Demographic details: (see also Appendix 5)

#### a. Scott Mountain 1 (001)

1. Location:
2. Area: 40 acres
3. Number of plants: several hundred in 1988
4. Density: moderate
5. Presence of dispersed seeds: unknown
6. Evidence of reproduction: all size classes present in population; probably indicates recruitment of younger age classes.
7. Evidence of expansion/contraction: no evidence, although site is grazed by sheep.

#### b. Gold Fork Rock (002)

1. Location:
2. Area: .
3. Number of plants: population in S1 - 93 in 1988; population in S2 - 95 in 1988; two isolated plants north of Gold Fork Rock.
4. Density: low
5. Presence of dispersed seeds: unknown
6. Evidence of reproduction: variety of size classes in population possibly indicates recruitment of younger age classes.
7. Evidence of expansion/contraction: no evidence.

c. Square Mountain (003)

1. Location:
2. Area: 11 acres
3. Number of plants: ca. 1500 in 1989
4. Density: mostly high; low on edges of population.
5. Presence of dispersed seeds: unknown
6. Evidence of reproduction: all size classes present in population; probably indicates recruitment of younger age classes.
7. Evidence of expansion/contraction: road and lookout have been constructed within the population; some habitat has been lost.

d. Elk Mountain (004)

1. Location:
2. Area: 163 acres
3. Number of plants: 10,000+ in 1989
4. Density: mostly high
5. Presence of dispersed seeds: unknown
6. Evidence of reproduction: all size classes present in population; probably indicates recruitment of younger age classes.
7. Evidence of expansion/contraction: trail #517 traverses population.

e. Scott Mountain 2 (005)

1. Location:
2. Area: 50-60 acres
3. Number of plants: approximately several hundred in 1984.
4. Density: low
5. Presence of dispersed seeds: unknown
6. Evidence of reproduction: unknown
7. Evidence of expansion/contraction: no evidence.

f. Rice Peak (006)

1. Location:
2. Area: 150' x 200'
3. Number of plants: 400 to 500 in 1988
4. Density: moderate.
5. Presence of dispersed seeds: unknown
6. Evidence of reproduction: all size classes present in population; probably indicates recruitment of younger age classes.
7. Evidence of expansion/contraction: no evidence.

g. Peace Rock 1 (007)

1. Location:
2. Area: 40-60 acres
3. Number of plants: approximately 2,000 in 1988
4. Density: moderate to high

5. Presence of dispersed seeds: yes
6. Evidence of reproduction: all size classes present in population; probably indicates recruitment of younger age classes.
7. Evidence of expansion/contraction: no evidence.

h. Peace Rock 2 (008)

1. Location:
2. Area: 100' x 50'
3. Number of plants: approximately 300 in 1988
4. Density: low
5. Presence of dispersed seeds: yes
6. Evidence of reproduction: all size classes present in population; probably indicates recruitment of younger age classes.
7. Evidence of expansion/contraction: no evidence.

i. Wylies Peak (009)

1. Location:
2. Area: 19 acres
3. Number of plants: several thousand in 1989
4. Density: moderate to high
5. Presence of dispersed seeds: unknown
6. Evidence of reproduction: all size classes present in population; probably indicates recruitment of younger age classes.
7. Evidence of expansion/contraction: trail traverses population and lookout has been constructed within it.

j. Bilk Mountain (010)

1. Location:
2. Area: 75 acres
3. Number of plants: 10,000+ individuals in 1989
4. Density: moderate to high
5. Presence of dispersed seeds: unknown
6. Evidence of reproduction: all size classes present in population; probably indicates recruitment of younger age classes.
7. Evidence of expansion/contraction: trail #517 traverses population.

k. Goat Lake (011)

1. Location:
2. Area: 5 acres
3. Number of plants: ca. 1000 individuals in 1989
4. Density: moderate
5. Presence of dispersed seeds: unknown
6. Evidence of reproduction: all size classes present in population; probably indicates recruitment of younger age classes.
7. Evidence of expansion/contraction: trail #602 traverses population.

C. Phenology.

1. Pattern: Many details are unknown, but I speculate that Idaho douglasia begins growth just prior to or immediately after release from snow cover, which usually takes place in late June or early July, depending on snow accumulation and melt patterns. Flowering takes place soon after, usually in early July, although some plants are still flowering in late July. Fruit maturation takes place in August and seeds are usually dispersed by early September.
2. Relation to climate and microclimate: The amount of snow accumulation the previous winter and spring is the major factor affecting the timing of growth for Idaho douglasia; the lower the snow pack the sooner it will be released from snow cover and begin growth, and visa versa. Also important is the late spring weather, which affects the rate of snowmelt; e.g., clear, warm weather will melt the pack sooner.

D. Reproductive ecology.

1. Type of reproduction: Apparently both by sexual reproduction and vegetative propagation. I have observed both mature fruits and dispersing seeds. I also observed a few cushions that were weakly rooted at the nodes as they spread across the ground, although I saw no evidence that the cushions actually fragment and form "new" cushions.
2. Pollination.
  - a. Mechanisms: Details unknown, but insect pollination is the likely mechanism.
  - b. Specific known pollinators: Unknown.
  - c. Other suspected pollinators: None.
  - d. Vulnerability of pollinators: Unknown.
3. Seed dispersal.
  - a. General mechanisms: Specific details unknown, but wind and gravity dispersal is suspected.
  - b. Specific agents: Unknown, but probably wind and/or gravity.
    - c. Vulnerability of dispersal agents and mechanisms: Probably none.
  - d. Dispersal patterns: Specific details unknown, but probably not far from parent plant, although downslope dispersal by water and gravitational movement of scree is also likely in certain situations.

4. Seed biology.
  - a. Amount and variation of seed production: Unknown.
  - b. Seed viability and longevity: Unknown.
  - c. Dormancy requirements: Unknown.
  - d. Germination requirements: Unknown.
  - e. Percent germination: Unknown.
5. Seedling ecology: Unknown.
6. Survival and mortality: Unknown.
7. Overall assessment of reproductive success: There is not enough data available to make an accurate assessment of reproductive success. I observed, however, that most populations had a wide variety of size classes represented in the population, probably indicating good age class distribution. In other words, there appears to be adequate recruitment into the population, although this aspect of the biology of Idaho douglasia needs to be studied further.

#### 8. Population ecology.

- A. General summary: Idaho douglasia occurs on predominantly northerly-facing slopes on high elevation ridges in open, non-forest and whitebark pine woodland vegetation. Vegetative cover at all populations is relatively low. Six of the 11 sites have had some disturbance, either by trail, road, or fire lookout construction. At least one population is subjected to sheep grazing.
- B. Positive and neutral interactions: Unknown.
- C. Negative interactions.
  1. Herbivores, predators, pests, parasites and diseases: I observed no evidence of herbivory on Idaho douglasia plants in 1988 or 1989.
  2. Competition.
    - a. Intraspecific: Unknown, but probably minimal due to the wide spacing of individuals in populations.
    - b. Interspecific: Unknown, but probably also minimal. The communities in which Idaho douglasia occurs have little ground cover and plants are widely spaced.
  3. Toxic and allelopathic interactions with other organisms: Unknown.
- D. Hybridization.

1. Naturally occurring: None known and probably nonexistent. No other species of Douglasia are known to occur within 40 miles of Idaho douglasia.
  2. Artificially induced: None known.
  3. Potential in cultivation: Hitchcock (1959) states that the northwestern species of Douglasia are prized rock garden subjects, with D. laevigata being the most suitable for areas west of the Cascades. It is propagated by cuttings and layers as well as by seed.
- E. Other factors of population ecology: Unknown.

9. Current land ownership and management responsibility:

- A. General nature of ownership: All populations of Idaho douglasia are on public lands managed by the U.S. Forest Service.
- B. Specific landowners: Following are the specific jurisdictional units of the U.S. Forest Service that are responsible for management of Idaho douglasia populations:

Scott Mountain 1 (001):

Boise National Forest  
Lowman Ranger District

Gold Fork Rock (002):

Boise National Forest  
Cascade Ranger District

Square Mountain (003):

Nez Perce National Forest  
Salmon River Ranger District

Elk Mountain (004):

Nez Perce National Forest  
Red River Ranger District

Scott Mountain 2 (005):

Boise National Forest  
Emmett Ranger District

Rice Peak (006):

Boise National Forest  
Cascade Ranger District

Peace Rock 1 (007):

Boise National Forest  
Lowman Ranger District

Peace Rock 2 (008):

Boise National Forest  
Lowman Ranger District

Wyllies Peak (009):  
Nez Perce National Forest  
Moose Creek Ranger District

Bilk Mountain (010):  
Nez Perce National Forest  
Moose Creek Ranger District and  
Red River Ranger District

Goat Lake (011):  
Nez Perce National Forest  
Moose Creek Ranger District

C. Management responsibility: Same as in above section.

D. Easements, conservation restrictions, etc.: Several populations occur in areas with special management designations that have landscape conservation as their primary goal. The populations and applicable designations are as follows:

Square Mountain (003):  
- partially within Gospel-Hump Wilderness  
- partially within proposed Square Mountain  
Creek Research Natural Area

Wyllies Peak (009):  
- entirely within Selway-Bitterroot Wilderness

Bilk Mountain (010):  
- partially within Selway-Bitterroot Wilderness

Goat Lake (011):  
- entirely within Selway-Bitterroot Wilderness

#### 10. Management practices and experience.

##### A. Habitat management.

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

- a. This taxon: Idaho douglasia responds favorably to moderate levels of disturbance, including both natural processes such as sheet and gully erosion, and man-caused events such as road and trail construction, where it establishes on cut banks and fill slopes.

It does not appear to reestablish in areas where historical habitat has been completely destroyed, such as by road, trail, and lookout construction.

- b. Related taxa: Unknown.

- c. Other ecologically similar taxa: Unknown

##### 2. Performance under changed conditions: Idaho douglasia has



become established on areas where moderate levels of human disturbance has occurred: at Square Mountain (003) several plants occur on the fill slope of the access road to Square Mountain Lookout; at Elk Mountain (004) and Bilk Mountain (011) it occasionally inhabits old cut slopes of heavily used pack trails.

3. Current management policies and actions: Management responsibility of all Idaho douglasia populations lies with two regions of the U.S. Forest Service: the Nez Perce National Forest is in Region 1 and the Boise National Forest is in Region 4. Idaho douglasia is listed on the Sensitive Plant Species lists of both Regions (USDA Forest Service 1988a; 1988b).

The Secretary of Agriculture's Policy on Fish and Wildlife (Department Regulation 9500-4) directs the Forest Service to manage habitats of all existing plants and animals in order to maintain at least viable populations and to avoid actions which may cause species to become federally listed. The Chief, Forest Service, through Forest Service Manual 2670, has directed the Regional Foresters to establish programs to identify threatened, endangered and sensitive species occurring in the Regions and to provide special management emphasis that will ensure their viability. For Sensitive Species, the Forest Service is directed to develop and implement management practices to insure that these species do not become threatened and endangered.

4. Future land use: Unknown.

B. Cultivation.

1. Controlled propagation techniques: Unknown.
2. Ease of transplanting: Unknown.
3. Pertinent horticultural knowledge: None.
4. Status and location of presently cultivated material:  
None known.

11. Evidence of threats to survival.

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

1. Past threats: The Gold Fork Rock (002), Peace Rock 1 (007), Peace Rock 2 (008), Scott Mountain 2 (005) and Rice Peak (006) sites on the Boise National Forest are currently remote from roads, established trails and many other management activities. They were probably grazed by domestic livestock in the past, however.

A portion of the Scott Mountain 1 (001) site is close to the road that runs along the ridge to the lookout. Although the

road is in close proximity to the population it does not appear to have been constructed in suitable habitat. Increased activity due to increased access caused by the road may have had an indirect impact in the past, however. Sheep grazing has taken place in the past along the ridge; the effect of this disturbance on the population is unknown.

A portion of the Square Mountain (003) population was destroyed during construction of Square Mountain Lookout and associated access road. This site has also been grazed by sheep for many years, the effect of which is unknown.

Forest Service pack trails traverse all populations on the Nez Perce National Forest in eastern Idaho County: Elk Mountain (004), Bilk Mountain (011), Goat Lake (010) and Wylies Peak (009). A fire lookout was also constructed on the summit of a rock outcrop in the Wylies Peak population. While there was some habitat destruction associated with each disturbance, these four populations are all large and the loss was relatively minor.

2. Existing threats: The Gold Fork Rock (002), Peace Rock 1 (007), Peace Rock 2 (008), Scott Mountain 2 (005) and Rice Peak (006) sites on the Boise National Forest are currently remote from roads, established trails and other current management activities. I foresee no immediate threats to the long-term viability of these populations.

A portion of the Scott Mountain 1 (001) site is close to the road that runs along the ridge to the lookout. At present, the road, and vehicle and foot traffic associated with it, do not appear to threaten the integrity of the population. Sheep grazing takes place along the ridge, but the populations appear unaffected.

Forest Service pack trails traverse all populations on the Nez Perce National Forest in eastern Idaho County: Elk Mountain (004), Bilk Mountain (011), Goat Lake (010) and Wylies Peak (009). With the exception of the trail to Wylies Peak, all are heavily used by recreationists. The trails largely traverse marginal habitats of these populations. In the portion of the trail that traverses a high density part of the Bilk Mountain population, the tread is narrow and the impacts minor.

3. Potential threats: Exploration for molybdenum has taken place on Scott Mountain and may be a potential threat to populations there. A Canadian company recently walked away from an exploration project there without stabilizing or restoring disturbed areas (Evans 1984).

As recognized by Henderson (1981b), recreational impacts represent a potential long-term threat to some populations on the Nez Perce National Forest. The Nez Perce National Forest is currently implementing a project to improve Forest Road 444, which terminates at the lookout on Square Mountain. A

sensitive plant clearance was done on the project by the Idaho Natural Heritage Program and the Forest Service. It was determined that about 25 plants would be impacted by the development (Moseley 1989).

A project to reconstruct/relocate the Bilk Mountain Trail #517 is also planned. The Bilk Mountain Trail traverses both the Elk Mountain (004) and Bilk Mountain (011) populations. A sensitive plant clearance conducted by the Idaho Natural Heritage Program found that the trail largely traversed marginal habitats of these two populations. In the section that traverses a high density part of the population, on the summit of Bilk Mountain, little reconstruction will have to be done because of the relatively gentle slope. All in all, it was determined that the project would not significantly impact these extensive populations (Moseley 1989).

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

1. Past threats: Unknown.
2. Existing threats: Unknown.
3. Potential threats: Unknown.

C. Disease, predation, or grazing.

1. Past threats: All Idaho douglasia populations have probably been grazed by domestic livestock in the past, primarily by sheep. The long-term effect of livestock grazing on the populations is unknown. I observed no disease or predation on Idaho douglasia in 1988 or 1989.
2. Existing threats: Sheep graze several populations on the Boise National Forest and possibly the Square Mountain population on the Nez Perce National Forest. I observed no effect on long-term population viability from this activity, but the populations should be monitored to confirm this.
3. Potential threats: See above.

D. Inadequacy of existing regulatory mechanisms.

1. Past threats: Unknown.
2. Existing threats: Unknown.
3. Potential threats: Unknown.

E. Other natural or manmade factors.

1. Past threats: Unknown.
2. Existing threats: The populations at Gold Fork Rock (002) are extremely small, both in area and number, and are vulnerable

to chance natural habitat-destroying events. Several other populations that occupy a small area and contain less than 500 individuals, such as Peace Rock 2 (008) and Rice Peak (006), are also vulnerable. Human-caused habitat-destroying activities could have a similar effect.

3. Potential threats: See above.

## II. Assessment and Recommendations.

12. General assessment of vigor, trends, and status: Even after thorough field searches resulting from Forest Service sensitive species projects (Moseley 1988; 1989) and this Section 6 Status Survey, Idaho douglasia remains a very rare species.

South of the Salmon River, seven populations are known from six sites on the Boise National Forest. The entire known extent of these populations covers less than 150 acres, with an estimated 5,500 individuals. Small areal extent, combined with low numbers, make several of these populations inherently prone to extirpation.

North of the Salmon River, five populations are known from two areas of the Nez Perce National Forest. These populations cover approximately 273 acres, and consist of many thousands of individuals.

Throughout its range, populations are small in extent and isolated, occurring in widely separated areas of the central Idaho mountains. Despite this apparent narrow distribution, however, no serious human-related threats are foreseen, although many of the populations have incurred some level of human-caused disturbance in the past. There does not appear to be any immediate concern for the vigor or conservation status of the species. All populations appear to be comprised of individuals of various size (age?) classes. On the basis of limited information available, there appear to be no reproductive problems.

Three populations of the Nez Perce National Forest will be impacted by road and trail reconstruction/relocation projects. Sensitive plant clearances conducted for these projects determined that they will not significantly affect the long-term viability of the populations, however monitoring should be established to quantitatively determine population trends.

13. Recommendations for listing or status change.

A. Recommendations to U.S. Fish and Wildlife Service: Idaho douglasia is currently a category 2 candidate (U.S. Fish and Wildlife Service 1990). Based on field surveys conducted by the Idaho Natural Heritage Program since 1984, and Henderson, Wellner and others since 1976, I believe our knowledge of the distribution and conservation status of Idaho douglasia is relatively well-known. A few areas remain to be searched, as outlined in Section I.5.B.4.

Idaho douglasia is a relatively rare species, with the

populations or groups of populations occurring in widely separated areas. Since most of them are small, the species as a whole remains vulnerable. Based on these data, I recommend that the status of Idaho douglasia be changed from category 2 to category 1.

The Fish and Wildlife Service should coordinate the development of a Conservation Agreement with the Boise and Nez Perce National Forests that outlines long-term conservation strategies for the species.

B. Recommendations to other U.S. Federal Agencies.

1. U.S. Forest Service: All known sites of Idaho douglasia north of the Salmon River occur on public lands administered by the Nez Perce National Forest. Idaho douglasia should be maintained on the Region 1 Sensitive Species List as a Sensitive Species. It should, however, be added to the Sensitive Species list for the Bitterroot National Forest, in addition to the Nez Perce, since potential habitat exists in the upper Selway River drainage.

The Nez Perce National Forest should carefully consider the impacts of its current and future management activities on the conservation status of the species. Results of the sensitive plant clearances done for the Square Mountain road and Bilk Mountain trail projects indicate certain measures can be taken to minimize the impacts of those projects on the species.

I conducted a relatively thorough survey of potential habitat in the Gospel Peak, Buffalo Hump and Elk Mountain - Wylies Peak areas. I recommend that a search be conducted of the Vermillion Peak - Indian Peak - Grave Meadow Peak area, west of Elk and Bilk Mountains.

Formal monitoring of the Square Mountain population would be desirable, since it is small, and has an increased potential to be negatively impacted by vehicle and foot traffic after the road is reconstructed.

All known sites of Idaho douglasia south of the Salmon River occur on public lands administered by the Boise National Forest. The species should be maintained on the Region 4 Sensitive Species List for the Boise National Forest. The Forest should carefully consider the impacts of its current and future management activities on the conservation status of the species. A clearance survey should be conducted for any management activities taking place in potential Idaho douglasia habitat in the South Fork Salmon - Johnson Creek, Middle Fork Payette - Deadwood River, and upper Bear Valley Creek areas.

Quantitative monitoring of small populations, such as Gold Fork Rock (002), should be implemented to determine the long-term population trends. Land managers should be aware of all

locations of the known populations. In particular, the potential for negative impacts to the Scott Mountain 1 (001) population should be considered.

In coordination with the U.S. Fish and Wildlife Service, the Boise and Nez Perce National Forests should develop and implement a Conservation Agreement for Idaho douglasia that outlines conservation strategies for the species.

Land managers and field personnel on the Boise and Nez Perce National Forests should be informed of the occurrence of Idaho douglasia in their areas. Possible sightings of this plant should be documented by specimens (if the size of the population warrants collecting), and should include flowers/fruits, stems, and roots. Specimens should be sent to the University of Idaho Herbarium (Department of Biological Sciences, University of Idaho, Moscow, 83843) 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.

- C. Other status recommendations.
  - 1. Counties and local areas: No recommendations.
  - 2. State: Currently Idaho douglasia is ranked S2 by the Idaho Natural Heritage Program (Moseley and Groves 1990); based on data presented here, it should remain as S2
  - 3. Other Nations: No recommendations.
  - 4. International: No recommendations.
- 14. Recommended critical habitat: Recommended critical habitat includes all habitats with known Idaho douglasia populations (see Section I.5.B.1 and Appendix 4). Only minimal buffer zones are needed around the populations because most are isolated from major habitat-disturbing activities and all occur on ridges or summits, topographic positions not prone to disturbance-related inputs from the surrounding landscape.
- 15. Conservation/recovery recommendations.
  - A. General conservation recommendations.
    - 1. Recommendations regarding present or anticipated activities: Habitat destruction represents the greatest threat to Idaho douglasia, especially to small populations. It is extremely important that land-managers be aware of the occurrence of Idaho douglasia and avoid these areas in planning future habitat-altering projects. In addition, sensitive plant clearances should be performed in areas with potential habitat, as outlined in previous sections of this report.

2. Areas recommended for protection: Square Mountain Creek proposed Research Natural Area should be established in a timely manner. This proposed area was chosen to represent a wide range of natural values, including the presence of Idaho douglasia. All populations containing less than 2,000 individuals [Scott Mountain 1 (001), Gold Fork Rock (002), Square Mountain (003), Rice Peak (006), Peace Rock 1 (007), Peace Rock 2 (008), and Goat Lake (011)] should be protected to the highest degree possible, as these are especially vulnerable to extirpation. While strict protection is less critical for larger populations [Elk Mountain (004), Scott Mountain 2 (005), Wylies Peak (009), and Bilk Mountain (010)], their viability should be monitored, and protection measures implemented if a decline is detected.
3. Habitat management recommendations: No direct habitat manipulation is currently needed.
4. Publicity sensitivity: Probably none.
5. Other recommendations: None.
- B. Monitoring activities and further studies recommended:  
Quantitative, long-term population monitoring should be implemented on the Square Mountain (003) population, since it is small, and has an increased potential to be negatively impacted by vehicle and foot traffic after the road is reconstructed. Long-term monitoring of small populations, such as Gold Fork Rock (002), should also be implemented to determine the long-term population trends.

Since viability of all known populations are important to the conservation of the species, the remaining populations should be monitored in a less rigorous manner (such as simple population estimates and area occupied) on a regular basis (biannual or greater) to determine trends.

16. Interested parties:

Idaho Natural Heritage Program  
Idaho Fish and Game  
600 S. Walnut St.  
P.O. Box 25  
Boise, ID 83707

Boise Field Office  
U.S. Fish and Wildlife Service  
4696 Overland Road  
Boise, ID 83705

Doug Henderson  
University of Idaho Herbarium  
Department of Biological Sciences  
University of Idaho  
Moscow, ID 83843

Boise National Forest  
1750 Front Street  
Boise, ID 83702

Nez Perce National Forest  
Rt. 2, Box 475  
Grangeville, ID 83530

Regional Forester  
Region 1, USFS  
Box 7669  
Missoula, MT 59807

Regional Forester  
Region 4, USFS  
324 25th Street  
Ogden, UT 84401

Idaho Native Plant Society  
P.O. Box 9451  
Boise, ID 83707

The Nature Conservancy  
P.O. Box 64  
Sun Valley, ID 83353

### III. Information Sources.

#### 17. Sources of information.

##### A. Publications.

1. References cited in report: See Appendix 1.

2. Other pertinent publications.

- a. Technical: Atwood, D., and N. Charlesworth. 1987.  
Status report - Douglasia idahoensis. Unpublished  
report on file at the Idaho Natural Heritage Program,  
Idaho Department of Fish and Game, Boise.
- b. Popular: None.

B. Herbaria consulted: Specimens of Idaho douglasia are known to be deposited in the New York Botanical Garden Herbarium (NY), University of California Herbarium, Berkeley (UC), University of Idaho Herbarium, Moscow (ID), Forest Sciences Laboratory Herbarium, Intermountain Research Station, Boise (BOIS), University of Washington Herbarium, Seattle (WTU), Marion Ownbey Herbarium, Washington State University, Pullman (WS), and the Boise National Forest Herbarium, Boise (Boise SO). Following is a list of known herbarium specimens, indexed by site:

001 - A. Steele 1350 (BOIS); Caicco s.n. (ID)  
002 - J.W. Thompson 13766 (NY, UC, WTU)  
003 - Henderson, Bingham, and Wellner 3403 (ID, NY, UC, WS,



WTU); Henderson and Cholewa 3846 (ID)  
004 - Henderson, Helmers, Wellner, and Bingham 3473 (ID, NY);  
Henderson, Bingham, Reese, and S. and P. Brunsfeld 4577  
(ID); Christ 51-593 (ID); 51-594 (ID); 13992 (NY);  
Baker 12597 (ID).  
005 - Ulmschneider s.n. (ID)  
006 - Moseley 1331 (ID)

Unknown location - L.O.M. s.n. (Boise SO); W.N. Sparhawk s.n.  
(Boise SO)

C. Fieldwork: After scientists from the University of Idaho Herbarium and the Idaho Natural Areas Coordinating Committee discovered Idaho douglasia on Square Mountain in 1976, they conducted extensive surveys for it in the Gospel Peak and Buffalo Hump areas of the Gospel-Hump Wilderness and in the Elk Mountain and Red River areas. Members of the Idaho Natural Areas Coordinating Committee also tried to relocate the Gold Fork Lookout population in the late 1970's. Steve Caicco, then botanist with the Idaho Natural Heritage Program did some limited surveys for Idaho douglasia in the Scott Mountain area of the Boise National Forest in 1984. I did extensive field surveys on the Payette and Boise National Forests in 1988, as part of a Challenge Cost-share project. In 1989, I conducted surveys of potential habitat of Idaho douglasia on the Nez Perce National Forest, as part of a Challenge Cost-share project. Additional field surveys of potential habitats on the Boise National Forest that I was unable to inventory in 1988, were conducted in 1989 as part of this Section 6 Status Survey.

D. Knowledgeable individuals:

Bob Moseley  
Idaho Natural Heritage Program  
Idaho Fish and Game  
600 S. Walnut St.  
P.O. Box 25  
Boise, ID83707

Doug Henderson  
University of Idaho Herbarium  
Department of Biological Sciences  
University of Idaho  
Moscow, ID 83843

Steve Caicco  
P.O. Box 3823  
Lacey, WA 98503

Helen Ulmschneider  
Raptor Research Center  
Boise State University  
Boise, ID 83706

E. Other information sources: None known.

18. Summary of material on file: Color slides, field forms, computer records, maps and all published and unpublished references pertaining to Idaho douglasia are on file at the Idaho Natural Heritage Program office.

IV. Authorship.

19. Initial authorship:

Bob Moseley  
Idaho Natural Heritage Program  
Idaho Fish and Game  
600 S. Walnut St.  
P.O. Box 25  
Boise, ID83707

20. Maintenance of status report: The Idaho Natural Heritage Program will maintain current information and update the status report as needed. Should Idaho douglasia be listed as an endangered or threatened species by the U.S. Fish and Wildlife Service, the Service, through its Boise Field Office, should maintain the primary file on information, encourage others to provide new information, and distribute new findings, as received, to the interested parties (Section II.16).

V. New information.

21. Record of revisions: Not applicable.

## Appendix 1

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## Appendix 2

Line drawings of Douglasia idahoensis.  
(from Henderson 1981a)

## Appendix 3

Slides of Douglasia idahoensis and its habitat.

- Slide 1. Douglasia idahoensis close-up of flowers and leaves. Note large pink flowers and relatively succulent leaves.
- Slide 2. Douglasia idahoensis close-up of whole plant. Note cushion habit and mass of pink flowers.
- Slide 3. Douglasia idahoensis habitat on Square Mountain (003); highest density of population occurs in Juncus drummondii-dominated area from ridgecrest on left, downslope to where Xerophyllum tenax increases in cover.
- Slide 4. Douglasia idahoensis habitat on Elk Mountain (004); relatively gentle ridgeline in area of wind erosion. Note large douglasia clumps in foreground.
- Slide 5. Rice Peak (006) overview - Douglasia idahoensis occurs in several of the open scree areas on the ridgeline and in the chutes in the center of the photograph.
- Slide 6. Gold Fork (002) site - Douglasia idahoensis is scattered locally in this opening within Abies lasiocarpa/Carex geyeri habitat type.
- Slide 7. Douglasia idahoensis plants on edge of Bilk Mountain Trail near Elk Mountain (004). Note beer can for scale.

## Appendix 4

Distribution maps for Douglasia idahoensis .

- Map 1. Overview of the distribution of Douglasia idahoensis.
- Map 2. Location of Scott Mountain 1 (001) and Scott Mountain 2 (005) populations. Portion of 1959 Garden Valley 15' quadrangle.
- Map 3. Location of Peace Rock 1 (007) and Peace Rock 2 (008) populations. Portion of 1953 Deadwood Reservoir 15' quadrangle.
- Map 4. Location of Rice Peak (006) population. Portion of 1954 Warm

Lake 15' quadrangle.

- Map 5. Location of Gold Fork Rock (002) populations. Portion of 1954 Gold Fork 15' quadrangle.
- Map 6. Location of the Douglasia idahoensis population on Square Mountain (003).Portion of 1963 Marble Butte 7.5' quadrangle.
- Map 7. Portion of 1981 Nez Perce National Forest map showing the distribution of Douglasia idahoensis in the Elk Mountain - Wylies Peak area.
- Map 8. Location of the Douglasia idahoensis populations on Elk Mountain (004) and Bilk Mountain (011).Portion of 1966 Running Lake 7.5' quadrangle.
- Map 9. Location of the Douglasia idahoensis population above Goat Lake (010).Portion of 1966 Running Lake 7.5' quadrangle.
- Map 10. Location of the Douglasia idahoensis population on Wylies Peak (009).Portion of 1966 Wylies Peak 7.5' quadrangle.

#### Appendix 5

##### Occurrence records for Douglasia idahoensis.

- Page 1.Record for Scott Mountain 1 (001)
- Page 2.Record for Gold Fork Rock (002)
- Page 3.Record for Square Mountain (003)
- Page 4.Record for Elk Mountain (004)
- Page 5.Record for Scott Mountain 2 (005)
- Page 6.Record for Rice Peak (006)
- Page 7.Record for Peace Rock 1 (007)
- Page 8.Record for Peace Rock 2 (008)
- Page 9.Record for Wylies Peak (009)
- Page 10.Record for Bilk Mountain (010)
- Page 11.Record for Goat Lake (011)