FIELD VISITS TO UPDATE IDAHO DOUGLASIA (*DOUGLASIA IDAHOENSIS*) OCCURRENCES ON THE BOISE NATIONAL FOREST

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ABSTRACT

Idaho douglasia (*Douglasia idahoensis*) is a low cushion or mat-forming forb having a colorful display of bright pink to magenta flowers that bloom soon after snowmelt. It is endemic to the mountains of central Idaho, with populations on the Boise National Forest (NF) representing the species southern extent. Idaho douglasia occurs on open subalpine summits, ridges, and adjacent slopes, often along the margins or in gaps of nearby conifer woodlands. Approximately two-thirds of the 30 known occurrences are located on land administered by the Boise NF. The remaining one-third occur on the Nez Perce NF. Idaho douglasia is a Sensitive plant species for both Forests. In 2003, the Boise NF contracted the Idaho Conservation Data Center to visit selected Idaho douglasia occurrences to update population, habitat, threat, and other conservation information. This will ensure the Boise National Forest has accurate and current information to assist in their design and writing of a Conservation Strategy for the species. The original Conservation Strategy Agreement between the Boise NF and U.S. Fish and Wildlife Service expired in 1993. We documented nine of the ten occurrences visited in 2003 to be extant, none of them facing high magnitude, imminent threats putting their immediate conservation at risk. We were unable to relocate the occurrence at Little Silver Creek Ridge. Its status is unclear. The number of Idaho douglasia plants tallied at each occurrence ranged from a high of >4,000 at Goat Mountain Ridge Complex, to 25 at Curtis Lake. Occurrences vary in size from approximately 0.2 to >30 acres. Portions of three occurrences have burned within the past decade. Human-related disturbances such as recreation use and sheep grazing are presently minor or absent at the various occurrences we visited. Wildfire is a disturbance that needs to be brought more to the forefront in the context of Idaho douglasia conservation. Off-road motorized use is another threat that may be underestimated at the present time.

ACKNOWLEDGMENTS

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INTRODUCTION

Idaho douglasia (*Douglasia idahoensis*) is a low cushion or mat-forming forb with a colorful display of bright pink to magenta flowers that bloom soon after snowmelt. It occurs on open subalpine summits, ridges, and adjacent slopes; usually on northerly aspects. The well-drained, gravelly soils are derived from decomposing Idaho batholith granite. Idaho douglasia is endemic to the mountains of central Idaho, with populations distributed in a series of isolated, discontinuous, widely separated clusters extending from the upper Selway River drainage in eastern Idaho County, southward to the Trinity Mountains area in northeastern Elmore County. Occurrences are often small in aerial extent and many contain <1000 individuals. Rangewide, Idaho douglasia is known from 30 occurrences, all on U.S. Forest Service land (Idaho Conservation Data Center 2004). Approximately two-thirds (21) of the known occurrences are on land administered by the Boise National Forest (NF), the remaining one-third (9) are on the Nez Perce NF.

Idaho douglasia has a NatureServe global conservation rank of G2 (Idaho Conservation Data Center 2004). This rank is given to taxa imperiled rangewide because of rarity or other factors making them vulnerable to extinction. Idaho douglasia is also a Sensitive Plant species for both Forest Service Regions 1 and 4. Habitat destruction or degradation have been identified as the primary threat to occurrences located on the Boise NF. Disturbances associated with roads and trails, motorized recreational activity, livestock grazing, helicopter landing sites, mining operations, and wildfires have been identified as existing or potential threats at a number of occurrences (Boise National Forest 1993a).

An initial assessment of the rangewide conservation status of Idaho douglasia was made in 1990 (Moseley 1990). In 1993, the Boise NF and U.S. Fish and Wildlife Service signed a Conservation Agreement outlining actions to be taken by both parties to help ensure the long-term persistence of Idaho douglasia (Boise National Forest 1993a). The agreement expired in 2003. At the time the agreement expired, nearly all Idaho douglasia occurrences on the Boise NF had conservation information that was at least five years old, and in nearly one-half of the cases, a decade or more old. The Boise NF recognized more current information was needed before a new, updated Conservation Agreement could be written. The Boise NF also recognized the only way to obtain this information was by field visits to as many occurrences as possible. To help meet this need, the Boise NF contracted the Idaho Conservation Data Center (IDCDC) to visit selected Idaho douglasia occurrences. The main objective of our visits was to update population, habitat, threat, and other conservation information for selected occurrences. Another objective was to obtain GPS coordinates for all of the occurrences we visited and ensure their accurate mapping. This report summarizes the results of our 2003 Idaho douglasia surveys on the Boise NF.

METHODS

An occurrence is a specific geographic location for an element of conservation concern (NatureServe 2003). It is the standard database contrivance used throughout the Natural Heritage/Conservation Data Center network for tracking rare species and plant communities. Delineation and segregation of occurrences are based on biological attributes as much as possible. All Idaho douglasia occurrences in the IDCDC database are identified by a three-digit code (e.g., 001) for data management purposes. Prior to the initiation of field work, the IDCDC database was used to compile location, population size, threat, date of last visit, habitat condition, and other pertinent information for each of the 21 known Idaho douglasia occurrences on the Boise NF. The Boise NF used this information to create a prioritized list of occurrences

needing site revisits and collection of updated conservation information. Updated occurrence information will provide the foundation for the Boise NF to prepare a new and updated Conservation Agreement for Idaho douglasia. Occurrences with the least amount and oldest information, known or suspected vulnerability to threat factors, and other conservation questions or characteristics were assigned the highest priority for site revisits. Ten occurrences were selected for revisits by the IDCDC, five on the Cascade Ranger District west and south of Warm Lake, and five located in the Graham area, on the Idaho City Ranger District (Table 1).

Table 1. Idaho douglasia occurrences visited, 2003.

EO #	**Site name**	**General location**
	Cascade Ranger District	
002	Gold Fork Rock	<0.5 mi W of Gold Fork Rock, ca 7 mi W of Warm Lake
031	Gold Fork Rock N	<0.5 mi N of Gold Fork Rock, ca 7 mi W of Warm Lake
028	Big Creek Summit NW	ca 1 mi NW of Big Cr. Summit, ca 7 mi W of Warm Lake
029	Curtis Lake	ca 4 mi S of Big Cr. Summit, ca 7 mi SW of Warm Lake
006	Rice Peak W	ca 0.5 mi W of Rice Peak, ca 10 mi S of Warm Lake
	Idaho City Ranger District	
015	Goat Mountain Ridge Complex N	ca 1 mi N of Goat Mtn., ca 3 mi NW of Graham G.S.
023	Goat Mountain Ridge Complex S	Goat Mtn. area, ca 4 mi W of Graham Guard Station
016	Wolf Mountain Ridge Complex	East of Wolf Mountain, ca 5 mi NW of Graham G.S.
024	Little Silver Creek Ridge	ca 1 mi N of Shepard Peak, ca 3 mi NW of Graham G.S.
025	Shepard Peak-Silver Mountain	Shepard Peak & Silver Mtn., ca 2 mi NW of Graham G.S.

Idaho douglasia occurrences were relocated in the field using maps, directions, and other location information associated with each element occurrence record in the IDCDC database. We mapped the extent and counted the number of Idaho douglasia plants, recorded habitat and disturbance information, assessed threats and other conservation or management issues by walking through and thoroughly surveying as much of the occurrence area as possible. All of this information was used to complete a specifically designed “Idaho douglasia Element Occurrence Update Form” for each occurrence visited. Most Idaho douglasia occurrences are comprised of two or more subpopulations separated by gaps of unsuitable or unoccupied habitat. We recorded at least one set of location coordinates using a navigation grade GPS unit for most subpopulations comprising an occurrence. In addition, we took photographs to document general site conditions at each occurrence. Information collected in the field was used to update Idaho douglasia records in the IDCDC’s Element Occurrence database (Idaho Conservation Data Center 2004). These records contain a cumulative history of information and form the basis for assessing the conservation status and management needs of each occurrence.

We did not survey for new Idaho douglasia populations as part of this project. However, we did search potentially suitable habitat located between subpopulations. This was done while hiking from one subpopulation to the next in an effort to more fully document the distribution and extent of Idaho douglasia within the general occurrence area.

RESULTS

We visited ten Idaho douglasia occurrences between July 3 and October 7, 2003. We were able to relocate and collect updated information for all occurrences except Little Silver Creek Ridge (024). This occurrence was not relocated despite a thorough search in the area where originally mapped. We were also unable to relocate some previously documented subpopulations at three occurrences. Time limitations prevented revisits to several of the subpopulations comprising the extensive Wolf Mountain Ridge Complex (016) occurrence. New, or extensions of previously known subpopulations were discovered at three occurrences. Idaho douglasia subpopulations in the Gold Fork Rock area were originally mapped as two distinct occurrences. Our survey verified that all subpopulations are located in close proximity (within 0.5 mile) to one another. Based on this finding, the two occurrences have been combined into a single occurrence in the IDCDC database. A similar situation was found at Goat Mountain. Subpopulations of Idaho douglasia in this area were originally considered two separate occurrences: one located north of Goat Mountain and the other south of Goat Mountain. The discovery of an intervening subpopulation in 2003 links the two occurrences. As a result, they too have been combined into one Goat Mountain Ridge Complex occurrence in the IDCDC database. Table 2 summarizes our occurrence revisit success.

Table 2. Results of Idaho douglasia occurrence visits, 2003.

EO #	Site name	Revisit success
002	Gold Fork Rock	three original subpopulations; southern two relocated; unable to relocate the northernmost; three new subpopulations found
031	Gold Fork Rock N	one original subpopulation; relocated and combined with 002 to form a single Gold Fork Rock occurrence
028	Big Creek Summit NW	the original population was relocated
029	Curtis Lake	two original subpopulations; southern one relocated; unable to relocate the northern; extension to southern subpopulation discovered
006	Rice Peak W	two original subpopulations; southern subpopulation relocated; unable to relocate the northern
015	Goat Mountain Ridge Complex N	eight original subpopulations; all relocated; two new ones found; occurrence 023 added to 015 because new subpopulations connect the two previously separate occurrences
023	Goat Mountain Ridge Complex S	seven original subpopulations; all relocated; combined with 015 to form the single Goat Mountain Ridge Complex occurrence
016	Wolf Mountain Ridge Complex	six subpopulations; three easternmost revisited, but only two relocated; the three westernmost subpopulations not revisited
024	Little Silver Creek Ridge	unable to relocate the original population
025	Shepard Peak-Silver Mountain	two subpopulations; both relocated

We tallied a total of approximately 8,000 Idaho douglasia plants at the nine relocated occurrences. The largest number of plants occur at the Goat Mountain Ridge Complex occurrence. Curtis Lake has the fewest plants. Occurrences range in size from approximately 0.2 to 35 acres. All of the occurrences we relocated are comprised of two or more subpopulations separated by varying distances of unsuitable or unoccupied habitat. Table 3 summarizes population information for each occurrence we visited.

Table 3. Abundance and size information for . Idaho douglasia occurrences, 2003.

EO #	Years of prior visits	[1]Ca total # plants		# subpopulations	Ca size (acres)
		Prior visit	2003		
002	1988; 1996	290	400-500	7	3
006	1988; 1997	400-500	400-500	2	2
015	1994	1000-2500	4075	12	10
016	1992; 1993	1000	452	6	35
024	1993	100-200	none found	1	5-10
025	1993	600-1250	2245	2	8
028	1994	100+	200-300	2	1
029	1994	16	25	2	0.2

[1] For 002, prior year combines the counts from former 002 and 031 occurrences. For 015, prior year combines the counts from former 015 and 023 occurrences. Only part of occurrence 016 was visited in 2003.

Habitat characteristics are similar for all the Idaho douglasia occurrences we visited. We found it to be most common along northwest, to more commonly north and northeast-facing, low angle, convex, subalpine ridgecrests. Plants often descend onto adjacent steep, rocky, upper to mid-slope openings, ledges on cliff walls, or scree/talus chutes between rock outcrops. Plants are restricted to well-drained, gravelly, to coarse sandy granitic soil, or occasionally scree and talus. Sites range from open to partially shaded, to occasionally well-shaded. Idaho douglasia sites are usually located along the margins or within gaps of the surrounding subalpine forest, or in areas supporting only a few widely scattered trees. The vegetation is typically characterized by an open conifer canopy, a low, sparse herbaceous layer, and high (often at least 90%) bare ground cover. Commonly associated species include subalpine fir (*Abies lasiocarpa*), whitebark pine (*Pinus albicaulis*), Geyer's sedge (*Carex geyeri*), smooth woodrush (*Luzula hitchcockii*), Drummond's rush (*Juncus drummondii*), needleleaf sandwort (*Arenaria aculeata*), alpine knotweed (*Polygonum phytolaccaefolium*), alpine buckwheat (*Eriogonum pyrolifolium*), mountain penstemon (*Penstemon montanus*), elliptic-leave penstemon (*Penstemon ellipticus*), and chionophila (*Chionophila tweedyi*). The latter two species are common associates at occurrences on the Cascade Ranger District, but apparently not the Idaho City Ranger District.

Idaho douglasia occurrences

Updated Element Occurrence Records for each Idaho douglasia occurrence we visited in 2003 are in Appendix 1. Subpopulation information for each record includes GPS coordinates. Appendix 2 contains updated map locations for each of these occurrences. Copies of our "Idaho douglasia Element Occurrence Update Forms" are in Appendix 3. Photographs for each occurrence are in Appendix 4. A synopsis of population, habitat, landscape, disturbance, threat, management needs, and conservation assessment information for each occurrence is summarized below.

Gold Fork Rock (002)

Total number of plants: ca 400-500

Subpopulation information: Seven subpopulations ranging in size from a few square meters to ca 1.5 acres, each supporting <10 to ca 200 plants.

Size of occurrence: ca 3 acres

Additional potential habitat in the area: Overall, additional potential habitat is limited in the general area. A few small, scattered openings of unsurveyed potential habitat occur along ridges south, north, and west of Gold Fork Rock.

General habitat description and condition: Northeast- or northwest-facing, gentle to steep, upper and very upper subalpine slope positions having high bare ground cover of shallow, loose to stable granitic scree. The associated open subalpine fir (*Abies lasiocarpa*) dominated woodlands contain a relatively sparse and mostly low-growing herbaceous understory. Overall habitat condition is excellent.

Landscape condition: The occurrence is located within a large, contiguous, predominately natural landscape judged to be in excellent overall condition.

Disturbances and threats: The openings of loose granitic scree where Idaho douglasia occurs are naturally prone to chronic erosion. There is no evidence of recent wildfire or other large-scale disturbance events in the occurrence area. There are no signs of timber harvest, livestock grazing, or other land use disturbances in the occurrence area. These activities have, or still do occur approximately two miles away, mainly to the west and south. A trail along the Gold Fork Rock ridgecrest and the remnants of an old lookout at Gold Fork Rock are the only signs of human disturbance in the general area. Recreation use associated with the Gold Fork Rock trail does not appear to be adversely impacting the occurrence at this time. Motorcycle and ATV tracks were observed on lower sections of the trail, but not at the occurrence. However, some level of motorized use in the occurrence area probably does take place. Wildfire has the potential to seriously impact most of the subpopulations due to their proximity to conifer stands. Related fire-fighting activity also poses a potential disturbance threat.

Management needs and recommendations: Accelerated erosion and other direct and indirect impacts could adversely effect Idaho douglasia if ridgecrest and upper slope off-trail motorized travel were to become prevalent in the area. We recommend Forest Travel Plans prohibiting off-road and off-trail motorized travel be maintained for the Gold Fork Rock area.

Monitoring needs: This occurrence is a good candidate for periodic monitoring visits to ensure recreational uses in the area are not adversely affecting Idaho douglasia and its habitat. It is also a good candidate to acquire quantitative baseline population information. This information will be invaluable for any future post-fire monitoring studies.

Research needs: None identified.

Conservation assessment: The likelihood of this occurrence persisting for the next 50 years if conditions do not change is judged to be good. From a management perspective, the occurrence should be highly defensible. There are no extrinsic human factors that might

degrade or destroy the occurrence that are outside the control and management actions of the Boise NF.

Additional comments: This occurrence encompasses and combines what were previously designated as two separate occurrences in the IDCDC database (002 and 031). Element Occurrence 031 no longer applies to Gold Fork Rock. A large population of Kellogg's lewisia (*Lewisia kelloggii*) also occurs in the Gold Fork Rock area.

Rice Peak West (006)

Total number of plants: ca. 400-500

Subpopulation information: The occurrence is comprised of two subpopulations. The larger, eastern subpopulation has approximately 400-500 genets patchily distributed over a 2 acre area. The western subpopulation has <25 genets in two small patches over an <0.2 acre area.

Size of occurrence: ca. 2 acres

Additional potential habitat in the area: Potential habitat is locally common in the vicinity of the eastern subpopulation. Portions of the avalanche chutes and upper slopes in the subpopulation area had snow that may have been covering some additional Idaho douglasia patches. In addition, portions of the rock face were too steep to safely survey and may also contained additional patches. Potential habitat is much less extensive and more spotty in the vicinity of the western subpopulation. Additional, unsurveyed Idaho douglasia habitat may exist southwest of the occurrence in the Rocky Peak area.

General habitat description and condition: Idaho douglasia occurs along gentle ridgecrest, to steep upper and mid-slope positions having either a north or northeast aspect. Plants occupy sparsely vegetated rocky openings of fine- to gravelly-textured decomposed granite. These openings and rock outcrops occur along the margins or within gaps of the surrounding subalpine forest vegetation. Overall habitat condition is excellent.

Landscape condition: The occurrence is located within a large block of unfragmented, minimally disturbed, predominately natural landscape. The surrounding forests are largely unburned.

Disturbances and threats: Snow loading and avalanches are the primary disturbance factors at the eastern subpopulation. There is no evidence of human-caused habitat alteration in the immediate vicinity of either subpopulation site. Motorized recreation use of the Telephone Ridge trail occurs in close proximity to the western subpopulation. However, steep, rocky terrain protects the subpopulation from direct off-road use. A user-created motorcycle trail approaches but does not reach the eastern subpopulation. This illegal track would pose a substantial threat to the subpopulation if it were pioneered to the area supporting Idaho douglasia. The Rice Peak lookout trail is located within 0.5 mile of both subpopulations, but present use patterns are not a threat to either one. There are no signs of timber harvest, livestock grazing, or other land use disturbances in the general occurrence area. Portions of both subpopulations are vulnerable to wildfire due to their proximity to conifer stands or stringers. Related fire fighting activity also poses a potential disturbance threat. A fire lookout is perched atop Rice Peak <1 mile from the occurrence.

Management needs and recommendations: A user-created dirt track approaches the eastern subpopulation from the ridgeline to the north. This illegal motorcycle track leaves the main

Telephone Ridge trail at Point 8006 (see USGS map) and heads uphill along the ascending ridgeline. It peters out before it reaches the top of the ridge, but would pose a substantial threat if it attained the ridgecrest. Management action will likely be required to ensure this does not happen. Another attempt to relocate and obtain GPS coordinates for the western subpopulation should be made in the future.

Monitoring needs: Monitoring motorized recreation use near the subpopulation sites is warranted. The occurrence is also a good candidate to acquire quantitative baseline population information. This information will be invaluable for any future post-fire monitoring studies.

Research needs: None identified.

Conservation assessment: The likelihood of this occurrence persisting for the next 50 years if conditions do not change is judged to be good. From a management perspective, the occurrence should be highly defensible. There are no extrinsic human factors that might degrade or destroy the occurrence that are outside the control and management actions of the Boise NF.

Goat Mountain (015)

Total number of plants: ca. 4,075

Subpopulation information: This extensive occurrence is comprised of 12 subpopulations scattered along approximately four miles of ridgecrest and associated upper slope habitat both north and south of Goat Mountain. Eight of the subpopulations are relatively large and vigorous. Subpopulations are separated from each other by <0.5 mile of unsuitable habitat. Subpopulations range in size from <0.1 to about 1.2 acres supporting approximately 45 to 880 Idaho douglasia plants each.

Size of occurrence: at least 7 to 8 acres

Additional potential habitat in the area: Additional potential habitat likely occurs north of Goat Mountain on point 8870 (see USGS map) and east of Goat Mountain on the ridge of point 8816 (see USGS map). Additional potential habitat occurs on the ridge between South Fork Cub Creek and Cub Creek, as well as toward point 8896 (see USGS map), located on the ridge just west of the Bear River headwaters. Additional Idaho douglasia plants may occur on the lower to mid-slopes of the north face of point 8970 (see USGS map). This area (below subpopulation 5) was not surveyed because of the difficulty and danger of sampling the steep, exposed faces.

General habitat description and condition: Idaho douglasia occurs on north-northwest to north-northeast aspects between 8,300 feet and 8,900 feet elevation. Most plants occur in openings within about 10 m of the ridgecrest, but they extend further downslope within scree/talus chutes in places. Sites vary from low angle, convex ridgecrests, to steep upper slopes and cirque basin walls. The habitat is characterized by scattered subalpine fir and whitebark pine trees, a sparse, forb-dominated herbaceous layer, and high cover of exposed granitic gravelly-sandy soil, or occasionally scree/talus. Overall habitat condition is excellent

Landscape condition: The occurrence area is mostly undisturbed and located in a large, contiguous, predominately natural roadless area. It is located in steep and rugged terrain about 0.75 miles southeast of an occasionally used gravel road. A major wildfire burnt large areas of the watershed to the west, east, and south of this occurrence in 1994. However, the burn

occurred in a mosaic pattern or was insignificant at higher elevations around Goat Mountain. The Cub Creek drainage burned most heavily.

Disturbances and threats: Threat level and immediacy are low at this occurrence. Recreation use is probably limited to a few hikers and hunters per year. There is a summit register atop point 8915 that had only five entries since 1995. One subpopulation has a path through it used mainly by wildlife, but also occasionally by hikers enroute to the Point 8915 summit. There are no established trails in the area and opportunities for motorized off-trail access is limited due to downed trees in burned areas and steep terrain. Motorized access to one subpopulation may be possible from the road to point 8625 (see USGS map). Impacts from sheep grazing and trampling have been reported for this occurrence in the past, but no recent evidence of sheep activity was observed in 2003. The allotment is apparently still open, however. In 1994, a large wildfire burned portions of the surrounding landscape, including the upper Cub Creek area. Nearly all habitat occupied by Idaho douglasia in this area escaped with no or only minimal impacts from the fire. A portion of one subpopulation (subpopulation 7) is an exception. In this area, Idaho douglasia density is lower compared to nearby unburned habitat, and plants were absent from a few places that appeared to be suitable habitat. No firefighting lines with cut trees were observed in the occurrence area. Currently, fire appears to be only a minor threat, as little fuel is available in potential Idaho douglasia habitat. Occupied habitat within the occurrence is also subject to some “natural” rill erosion, mountain goat and elk trailing and bedding, and occasional rodent digging. These disturbances are localized and do not appear to threaten the persistence of Idaho douglasia in the area. A few subalpine fir and whitebark pine seedlings are encroaching on occupied habitat in places, but succession to a closed forest canopy that would preclude Idaho douglasia seems very unlikely due to the harsh environmental conditions of the sites.

Management needs and recommendations: Livestock access is minimal to the majority of areas occupied by Idaho douglasia because of steep, rocky terrain and many downed trees in the burned areas. Nonetheless, impacts from sheep grazing and trampling have been reported in the past for this occurrence. Proactive steps to remove disturbances associated with sheep grazing such as allotment retirement are worth investigating. We recommend that present Forest Travel Plans regulations prohibiting off-trail motorized travel be maintained for the Goat Mountain area. The occurrence is located in a remote area with no road or trail leading directly to it. Current management emphasizing maintenance of the area’s roadless character is compatible with the long-term conservation of Idaho douglasia at Goat Mountain.

Monitoring needs: Visits to this occurrence in the early 1990s noted sheep grazing impacts in places and that monitoring may be warranted. Selected subpopulations (such as subpopulation 8) in this occurrence remain good candidates to monitor sheep grazing and trailing impacts.

Research needs: The subpopulation at the head of Cub Creek presents an opportunity to study the post-fire response of Idaho douglasia and its habitat.

Conservation assessment: The likelihood of this occurrence persisting for the next 50 years if conditions do not change is judged to be excellent. From a management perspective, the occurrence should be highly defensible. There are no extrinsic human factors that might degrade or destroy the occurrence that are outside the control and management actions of the Boise NF.

Additional comments: This occurrence encompasses and combines what were previously designated as two separate occurrences in the IDCDC database (015 and 023). Element

Occurrence 023 no longer applies to Goat Mountain. Kellogg's lewisia co-occurs with Idaho douglasia at four of the subpopulations.

Wolf Mountain Ridge Complex (016)

Total number of plants: ca. 450

Subpopulation information: This occurrence consists of six subpopulations. The three easternmost were visited in 2003, but only two were relocated. One supports approximately 365 plants dispersed over approximately 3 acres. The other has approximately 90 plants over 1.5 acres. The status of the third subpopulation is unclear.

Size of occurrence: The two subpopulation relocated in 2003 cover approximately 4.5 acres. The entire occurrence has been estimated to encompass approximately 35 acres in the past.

Additional potential habitat in the area: Suitable northerly-facing habitat disappears along the ridge complex west and south of Wolf Mountain.

General habitat description and condition: Idaho douglasia occurs within an open pole- and sapling-dominated subalpine fir/Geyer's sedge woodland on steep, north-facing granitic scree slopes. Overall habitat condition is excellent.

Landscape condition: The population occurs within a large, contiguous, predominantly natural landscape. The impacts of past (and current) fire suppression activities and domestic sheep grazing are apparent. A relatively recent wildfire burned in the Bear River drainage, south of the population.

Disturbances and threats: Snow loading, snow creep, and scree sliding are the primary natural disturbance factors within the occurrence. Although there is no evidence of human-caused alteration in occurrence areas visited in 2003, a historic fire line is located on the ridgecrest east of the occurrence. A recently felled whitebark pine tree and associated helicopter landing site was observed above the eastern subpopulations. Ground disturbance and impacts to the vegetation associated with domestic sheep grazing are noticeable, and in places severe, on the ridge east of the population, up to the saddle west of Pt. 8092 (see USGS map). Sign of sheep use in 2003 was not evident within the eastern subpopulations, although they could access the area. Sheep potentially pose a serious threat to Idaho douglasia based on grazing and trampling impacts observed outside, but near the occurrence. Substantial motorized off-road use is occurring along the Wolf Mountain ridge system, although no current use was evident within the subpopulations. The development of motorized off-road trails in the vicinity of the occurrence poses a threat of increasing magnitude and imminence.

Management needs and recommendations: We recommend that allotment management plans be reviewed, and if necessary altered, to assure domestic sheep are routed to avoid Idaho douglasia. We recommend that present Forest Travel Plans regulations prohibiting off-trail motorized travel be maintained for the Wolf Mountain area. Management action is required to stem the user-created motorized off-trail use approaching the eastern end of the occurrence.

Monitoring needs: Allotment and off-road recreational uses of the area should be monitored to assure management is consistent with the long-term maintenance of Idaho douglasia in the area. Monitoring may have to be conducted on an annual basis if disturbances associated with these two uses become more prevalent within the occurrence area.

Research needs: This occurrence offers the possibility to research the relationships between tree establishment and growth, and Idaho douglasia population size and vigor. We recommend another attempt to relocate the easternmost subpopulation in the near future to determine whether we simply missed seeing plants it in 2003, or it has been extirpated, or perhaps originally mapped incorrectly.

Conservation assessment: The two subpopulations we relocated appeared vigorous and with good habitat conditions. We were unable to find a third subpopulation, and no attempt was made to visit the three westernmost subpopulations. If habitat conditions and plant vigor are as good at these other subpopulations, then the likelihood of this occurrence persisting for the next 50 years if conditions do not change is judged to be excellent. From a management perspective, the occurrence should be highly defensible. There are no extrinsic human factors that might degrade or destroy the occurrence that are outside the control and management actions of the Boise NF.

Little Silver Creek Ridge (024)

We were unable to relocate this occurrence in 2003 despite a thorough search of ridge areas originally mapped as occupied habitat.

Total number of plants: 100-200 plants were reported in 1993.

Subpopulation information: A single population.

Size (area) of occurrence: ca. 10 acres

Additional potential habitat in the area: Potential habitat may occur on the ridge immediately north of “Little Silver Creek Lake Basin” and Point 8455 (see USGS map).

General habitat description and condition: Northwest to northeast-facing ridgecrests, upper slopes and chutes. The vegetation is characterized by a burned to partially burned, open stand of whitebark pine and subalpine fir having a sparse forb-dominated herbaceous understory. The occurrence area burned in 1994, but appears to be recovering and in good ecological condition. No signs of excessive erosion were observed. Overall habitat condition is good.

Landscape condition: The occurrence area is mostly undisturbed and located at the edge of a large contiguous, predominately natural roadless area. It is located in steep, rugged terrain roughly 0.5 mile from an occasionally used gravel road. A wildfire burned in a mosaic pattern across large areas of the surrounding watersheds to the north, east, and south.

Disturbances and threats: In 1994, a large wildfire burned nearly all of the “Little Silver Creek Lake Basin”, including 50% to 70% of the northwest to northeast-facing upper slopes, chutes, and ridgecrests likely to support Idaho douglasia. Scattered fire-killed trees have fallen into areas of potential habitat. These areas probably had minimal fuel load at the time of the fire. No tree cutting or other fire line construction activity was observed in the occurrence area. However, firefighting lines with cut trees were seen near the gravel road. Direct recreation use is likely limited to a few hikers and hunter per year. There are no trails leading to the occurrence area. It would take a determined effort through downed wood and thick sagebrush in steep terrain to access the occurrence using an off road vehicle. No evidence of recent sheep grazing was observed, although the allotment is apparently still open.

Management needs and recommendations: We recommend that present Forest Travel Plans regulations prohibiting off-trail motorized travel be maintained for the Little Silver Creek ridge area. Sheep grazing does not appear to be much of a disturbance factor at this time. Nonetheless, proactive steps to remove possible disturbances associated with sheep grazing such as allotment retirement are worth investigating.

Monitoring needs: Post-fire habitat recovery and population monitoring is probably warranted if Idaho douglasia is relocated in the future.

Research needs: We recommend another attempt to relocate Idaho douglasia in the near future to verify whether or not the occurrence has been extirpated, or perhaps originally mapped incorrectly. Additional potential habitat to the north should be searched as well.

Conservation assessment: It is unclear if this occurrence is still extant. It is possible we simply missed seeing plants in 2003, especially if they are widely scattered and few in number. Another possibility is that the occurrence was originally mismapped when discovered in 1993. At least one more visit should be undertaken before considering the occurrence extirpated. From a management perspective, the occurrence should be highly defensible. There are no extrinsic human factors that might degrade or destroy the occurrence that are outside the control and management actions of the Boise NF.

Shephard Peak-Silver Mountain (025)

Total number of plants: ca 2,245

Subpopulation information: The occurrence is comprised of two subpopulations separated by about 0.5 mile of unsuitable habitat. Shepard Peak supports the larger of the two Idaho douglasia subpopulations. It has approximately 2,100 genets scattered over 6 to 10 acres. The smaller subpopulation at Silver Mountain contains about 145 plants scattered over <1 acre.

Size (area) of occurrence: ca. 8 acres

Additional potential habitat in the area: Suitable potential habitat between the two subpopulations appears limited. There may be some additional clusters of plants on the lower to mid-slopes of the north face of Shephard Peak, an area not surveyed because of the difficulty and danger of sampling the steep, exposed face. A few additional plants might also occur on the lower to mid-slopes below the chute on Silver Mountain, but potential habitat is limited in this area due to the large amounts of talus deposition.

General habitat description and condition: Idaho douglasia is restricted to northerly aspects on sites ranging from low-angle convex ridgecrests to steep scree chutes, open slopes, and occasional rock outcrops on cirque basin walls. Scattered subalpine fir, sparse herbaceous vegetation, and high ground cover of gravelly-sandy granitic soil or loose scree/talus. Overall habitat condition is excellent.

Landscape condition: The occurrence area is mostly undisturbed. It is located at the edge of a large, contiguous, predominately natural roadless area in steep and rugged terrain about 0.7 mile from an occasionally used gravel road. Extensive segments of the landscape to the north, east, and south burned in a large wildfire. The burn had a mosaic pattern or was insignificant at higher elevations around both Shephard Peak and Silver Mountain. A significant firefighting line

with cut trees was observed about 0.3 miles north of the northwest portion of the Shephard Peak subpopulation.

Disturbances and threats: In 1994, wildfire burned up to the northwest trending ridgecrest of Shephard Peak, an area that supports Idaho douglasia. Only a few small patches of suitable habitat actually burned, but some Idaho douglasia plants do occur within these areas. A few fire-killed trees fell into occupied habitat, but impacts to Idaho douglasia appear minimal. No residual impacts are apparent from some tree cutting for fire line construction within 10 m of occupied habitat. At Silver Mountain, a small patch burn approached within 20 m of habitat occupied by Idaho douglasia. Recreation use is probably limited to a few hikers and hunters per year. There are no established trails in the area and opportunities for motorized off-trail access is limited due to downed trees in burned areas. No recent sheep grazing has occurred in the occurrence area, although the allotment is apparently still available. Sheep band use was reported in the general area, but not within the occurrence when it was originally discovered in 1993. A minor amount of mountain goat trailing and bedding occurs along the margins of occupied habitat in places.

Management needs and recommendations: Livestock access is minimal in the majority of areas occupied by Idaho douglasia because of steep, rocky terrain and many downed trees in the burned areas. Nonetheless, proactive steps to remove disturbances associated with sheep grazing such as allotment retirement are worth investigating. We recommend that Forest Travel Plans regulations prohibiting off-trail motorized travel be maintained for the Shepard Peak and Silver Mountain areas. The occurrence is located in a remote area with no road or trail leading directly to it. Current management emphasizing maintenance of the area's roadless character is compatible with the long-term conservation of this Idaho douglasia occurrence.

Monitoring needs: None identified.

Research needs: The Shepard Peak subpopulation presents an opportunity to study the post-fire response of Idaho douglasia and its habitat.

Conservation assessment: The likelihood of this occurrence persisting for the next 50 years if conditions do not change is judged to be excellent. From a management perspective, the occurrence should be highly defensible. There are no extrinsic human factors that might degrade or destroy the occurrence that are outside the control and management actions of the Boise NF.

Additional comments: Kellogg's lewisia co-occurs with Idaho douglasia on the ridgecrests.

<u>Big Creek Summit NW (028)</u>

Total number of plants: 200-300

Subpopulation information: Two subpopulations separated by ca. 0.1 mile. The larger subpopulation contains 200-300 genets scattered over ca. 0.7 acre; the smaller has 5 genets and covers a few square meters.

Size (area) of occurrence: ca 1 acre

Additional potential habitat in the area: Portions of the north-facing rock outcrop below the ridgecrest at the larger subpopulation may contain a few additional clusters of plants, but the

face is too steep and rocky to safely search. Potential Idaho douglasia habitat drops out east of the occurrence. Extensive rocky ridge and upper slope areas southwest of the occurrence all face east and southeast. To the northeast, the ridge system looses elevation and is largely forested. Near the occurrence, Idaho douglasia is absent from habitat that looks superficially suitable except for its southerly aspect.

General habitat description and condition: Gentle ridgecrest and associated steep north-facing upper slope and rock outcrop positions. The open conifer overstory has a sparse herbaceous understory. Bare ground cover of gravelly, loose, granitic residuum with bedrock near and protruding the surface exceeds 90% in most places. Overall habitat condition is excellent.

Landscape condition: The occurrence is located within a large, contiguous, predominately natural landscape except for the paved road between Cascade and Warm Lake located roughly one mile south of the occurrence.

Disturbances and threats: The Big Creek Summit trail passes within 100 m of the occurrence and is the only sign of human disturbance in the general area. Recreation use associated with the trail does not appear to be adversely impacting the occurrence at this time. The paved road between Cascade and Warm Lake is located roughly one mile south of the occurrence, but associated disturbances appear to be limited to near the road corridor. There are no signs of timber harvest, livestock grazing, or other land use disturbances in the occurrence area. Scattered evidence of old fires occur in the general area. However, recent, large-scale wildfires have not affected the occurrence area, although they have occurred elsewhere in the general Warm Lake region. Both subpopulations are vulnerable to wildfire due to their proximity to conifer stands. Related fire fighting activity also poses a potential disturbance threat to Idaho douglasia along and near the ridgecrest.

Management needs and recommendations: Present levels of recreation use along the Big Creek Summit trail appear to be compatible with the long-term maintenance of Idaho douglasia in the area. We recommend any future trail improvements or related actions to not encourage increased access and use around the occurrence. We also recommend that present Forest Travel Plans prohibiting off-trail motorized travel be maintained for the Big Creek Summit trail area.

Monitoring needs: The Big Creek Summit trail provides ready access to the occurrence area. The occurrence is a good candidate for periodic monitoring visits to ensure recreational uses in the area are not adversely affecting Idaho douglasia and its habitat. It is also a good candidate to acquire quantitative baseline population information. This information will be invaluable for any future post-fire monitoring studies.

Research needs: None identified.

Conservation assessment: The likelihood of this occurrence persisting for the next 50 years if conditions do not change is judged to be good. From a management perspective, the occurrence should be highly defensible. There are no extrinsic human factors that might degrade or destroy the occurrence that are outside the control and management actions of the Boise NF.

Additional comments: Kellogg’s lewisia may be present in the vicinity of the larger subpopulation, but insufficient above-ground material was available to make a positive identification.

Curtis Lake (029)

Total number of plants: ca 25

Subpopulation information: The occurrence is comprised of two subpopulations. The southern subpopulation above “Frog Ponds” was relocated in 2003, but the northern subpopulation located roughly 1.5 miles further north near Curtis Lake was not. The subpopulation near “Frogs Pond” consists of two and possibly three small discrete patches of plants. One patch contains 10 genets in an area <10x10 m in size and is associated with a rock outcrop area that provides a small (<0.2 acre) opening in the surrounding conifer forest. A second patch contains 8 genets in a 25x25 m swath located just below a ridgecrest. Neither of these patches appears to be the one reported by Greg Lind in 1994, which apparently was not relocated in 2003. It likely occurs just southeast of where Idaho douglasia was found in 2003.

Size of occurrence: ca 0.2 acre

Additional potential habitat in the area: Additional potential Idaho douglasia habitat is rare in the general occurrence area. In the vicinity of the southern subpopulation it is limited to a few small scattered open forest patches along the north- and northeastern-facing slopes south of “Frogs Pond”, and nearby at the very head of Alpine Creek. The forested landscape in the Curtis Lake area precludes all but a few small, scattered microsites as potential habitat in the vicinity of the northern subpopulation.

General habitat description and condition: Idaho douglasia occurs in small openings of decomposing granitic scree on steep northerly-facing slopes and ridgecrests surrounded by subalpine fir-whitebark pine forest. The prevailing forested landscape is in excellent condition.

Landscape condition: The occurrence is located within a large, unfragmented, predominately natural landscape.

Disturbances and threats: A series of minor angler trails providing user-created access to “Frog Ponds” occur a short distance east of the southern subpopulation. There are no signs of timber harvest, livestock grazing, or other land use disturbances in the occurrence area. The nearest timber harvest areas are located about 1.5 miles from the occurrence. Small amounts of burned wood and other evidence of old fire occur in the vicinity of this subpopulation. Wildfire has the potential to strongly alter the small Idaho douglasia sites and perhaps destroy all or part of the small, local patches.

Management needs and recommendations: Idaho douglasia would be at risk if the occurrence area was ever open to timber harvest, including post-fire salvage logging.

Monitoring needs: In the absence if wildfire, periodic visits to ensure habitat conditions remain largely undisturbed are probably all that is needed. If the occurrence area were to burn, a more thoughtful and higher priority monitoring effort to study the response and persistence of the small Idaho douglasia patches would be warranted. For this reason, the occurrence is a good candidate to acquire quantitative baseline population information that will be invaluable for any future post-fire monitoring studies.

Research needs: None identified.

Conservation assessment: The likelihood of this occurrence persisting for the next 50 years if conditions do not change is judged to be fair. The relatively small number of plants and aerial extent at each subpopulation, and the likelihood a large, hot fire could destroy or strongly alter all of the small patches of suitable habitat combine to make the risk of local extirpation higher than at other occurrences we visited in 2003. From a management perspective, the occurrence should be highly defensible. There are no extrinsic human factors that might degrade or destroy the occurrence that are outside the control and management actions of the Boise NF.

DISCUSSION AND RECOMMENDATIONS

Idaho douglasia plants were not found at Little Silver Creek Ridge despite a thorough search in the general occurrence area. Portions of potential Idaho douglasia habitat in the occurrence area burned several years ago during a large wildfire. It is not known what effect, if any, the fire had on Idaho douglasia, and the status of the Little Silver Creek Ridge occurrence remains unclear at this time. Future field surveys will be needed to determine if we simply missed seeing plants in 2003, if the occurrence was originally mismapped, or if has been extirpated. We documented the other nine occurrences visited in 2003 to be extant, and none face high magnitude, imminent threats putting their immediate conservation at risk. However, Idaho douglasia continues to merit conservation concern because of its limited distribution, the small number of plants and aerial extent of many occurrences, sensitivity of its subalpine ridgecrest and upper slope habitat to disturbance, and the existence of one or more ongoing or potential threat factors at most occurrences, rangewide.

The majority of known Idaho douglasia occurrences are located on the Boise NF. The remainder occur on the Nez Perce NF. Conservation efforts on behalf of Idaho douglasia will be best served with the participation and coordination of both Forests. In 1993, an initial Conservation Agreement was signed by the Boise NF and U.S. Fish and Wildlife Service that outlined specific objectives and actions to promote Idaho douglasia conservation on the Boise NF (Boise National Forest 1993a). The Agreement has since expired, and an updated Conservation Agreement presents an opportunity to put in place management direction and priority to improve Idaho douglasia's long-term conservation outlook on the Boise NF.

All of the occurrences we revisited in 2003 are located in relatively remote areas. Mining, logging, road building, intensive recreational use, heavy livestock use, or other human-caused activities that have the potential to destroy or degrade substantial amounts of Idaho douglasia habitat are presently absent from all of the occurrence areas. Evidence of past sheep grazing and recreation use was observed at one or more occurrences, but not at levels having obvious adverse effects on Idaho douglasia or its habitat. The occurrence most at risk due to human-caused disturbances is at Wolf Mountain. Sheep grazing has had obvious negative impacts to the vegetation and soil surface just east of the occurrence. Such intensive use directly within the occurrence would similarly impact Idaho douglasia and its habitat. Increasing off-road motorized use along the Wolf Mountain ridge complex has not yet reached the occurrence area, but has the potential to do so. Motorized traffic within the occurrence area would undoubtedly lead to accelerated erosion and possibly crush/destroy Idaho douglasia plants. A helicopter landing pad near the occurrence suggests other disturbances have or may take place in the future.

Wildfire is a disturbance that needs to be brought more to the forefront in the context of Idaho douglasia conservation. Assessing past or potential impacts of fire is difficult, but at least portions of all the occurrences we visited are vulnerable to the direct and/or indirect effects of wildfire. Direct effects include not only the loss of burned plants, but also habitat modification related to accelerated erosion, canopy loss, and other microhabitat changes. Indirect effects are

related to fire fighting activities that could potentially disturb and degrade Idaho douglasia habitat. Disturbances associated with fire fighting activities probably have at least as much potential to adversley impact Idaho douglasia habitat as a hot fire.

It is possible that wildfire played a role in the apparent decline or possibly even loss of Idaho douglasia at Little Silver Creek Ridge. It is also reasonable to conjecture that wildfire reduced Idaho douglasia density in burned, compared to unburned sections of one of the Goat Mountain subpopulations. In addition, a wildfire within the past decade impacted a small amount of occupied Idaho douglasia habitat at the Shephard Peak-Silver Mountain occurrence. It is just a matter of time before fire affects the other occurrences to one degree or another. One or more subpopulations at Gold Fork Rock, Big Creek Summit NW, and Curtis Lake are vulnerable to substantial wildfire impacts because of their proximity to conifer stands and other fuels. Most occurrences also contain subpopulations or portions of subpopulations that have minimal fuel loads and would likely suffer little if any direct fire impacts. An exception is at Curtis Lake. Both small subpopulations comprising this occurrence are surrounded by forests and vulnerable to the direct effects of stand replacing wildfire.

Off-road motorized use is another threat that may be underestimated at the present time. After all, none of the occurrences we visited had evidence of rampant off-road vehicle disturbance. However, the use of ATVs and motorcycles for recreation is increasing across Idaho, and the Boise NF is no exception. As these machines become more powerful in the future they will be able to access areas currently off limits to most riders. This includes ridgecrest areas presently occupied by Idaho douglasia. In a single visit, one or two off-road machines have the potential to do a tremendous amount of damage to Idaho douglasia and its habitat at nearly all occurrences. Controlling motorized recreation and preventing user-created trails from accessing Idaho douglasia occurrences will likely be a critical management issue in the future.

Occurrence-specific management recommendations are provided in the RESULTS section of this report. A few additional general recommendations we have include:

1. Ideally, a Conservation Agreement for Idaho douglasia would include both the Boise and the Nez Perce national forests. Monitoring, research, and possibly other management actions would benefit if done in a coordinated and comprehensive manner. We recommend a joint Forest approach for the Conservation Agreement if at all possible.

2. In the original Conservation Agreement (Boise National Forest 1993a), the stated emphasis of a proposed monitoring program is to “determine the viability needs” of Idaho douglasia. It is likely this type and level of monitoring research will remain elusive into the foreseeable future. A monitoring emphasis redirected to assess and monitor motorized recreation, livestock grazing, and other anthropogenic disturbances and threats would probably provide information more applicable to what land managers can actually do on the ground to benefit Idaho douglasia and its habitat. In addition, there seems to be clear need to address questions related to the effects of wildfire and the post-fire response and recovery of Idaho douglasia and its habitat. One of Moseley’s (1990) recommendations was to implement quantitative monitoring of small occurrences to determine their long-term population trends. This information is still needed. We recommend development of a revised research and monitoring program that efficiently addresses all of these information needs.

3. Due to research conducted by Sondenaa (2000), much more is now known about the reproductive biology of Idaho douglasia then when the initial Conservation Agreement was written in 1993. However, additional research studies that clarify Idaho douglasia life history

characteristics and ecological relationships would benefit future conservation action decision making. We recommend research projects addressing these questions be pursued in the future.

4. In 1993, the Boise NF produced a scoping paper for the establishment of seven Special Interest Botainical Areas (SIBA) to protect selected Idaho douglasia populations (Boise National Forest 1993b). None of the seven areas were ever designated. Gold Fork Rock, Rice Peak West, Goat Moutain Ridge, and Wolf Mountain Ridge were four of the seven occurrences proposed for SIBA designation and they remain important conservation targets for Idaho douglasia. We recommend the boundaries of the proposed Goat Mountain Ridge SIBA be extended south of Goat Mountain to encompass all twelve subpopulations comprising this large occurrence. We also recommend the Boise NF adopt the SIBA designation for all seven of the occurrences originally under consideration. Designation would highlight the conservation value of the SIBAs and facilitate the control or elimination of activities that may threaten the long-term persistence of Idaho douglasia .

REFERENCES

Boise National Forest. 1993a. Conservation agreement for *Douglasia idahoensis*. Boise National Forest and U.S. Fish and Wildlife Service. 20 p., plus maps.

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Moseley, R.K. 1990. Report on the conservation status of *Douglasia idahoensis*, in Idaho. Idaho Department of Fish and Game, Idaho Conservation Data Center. 34 p., plus appendices.

NatureServe. 2002. EO dataset standards. Draft. NatureServe, Arlington, VA.

Sondenaa, A. 2000. The reproductive biology and allozyme diversity of the rare Idaho mountain primrose, *Douglasia idahoensis* (Primulaceae). PhD dissertation. University of Idaho, Moscow. 108 p.

Appendix 1

Idaho douglasia Element Occurrence Records.

Appendix 2

Maps of Idaho douglasia occurrences.

Appendix 3

Copies of Idaho douglasia Element Occurrence update field forms.

Appendix 4

Photographs of Idaho douglasia occurrences.