

Washington Rare Plant Care and Conservation
Rare Plant Monitoring

To: Russell Holmes
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From: Wendy Gibble
Project Manager
Washington Rare Plant Care and Conservation

Date: December 28, 2009

Re: Final Report
Contract No. AG-046W-P-09-0066

Summary

In 2009, Washington Rare Plant Care and Conservation completed and provided 55 monitoring reports on Region 6 sensitive plant species populations to the Forest Service for the 2009 University of Washington Botanic Garden - Rare Plant Monitoring Project. Monitoring occurred on the Mt. Baker-Snoqualmie, Gifford Pinchot, Okanogan-Wenatchee, and Colville National Forests. In addition to the completed assignments, one other assignment was attempted but the terrain was too difficult for the volunteer to access the site and the volunteer did not provide a report on his attempt. An additional 17 assignments for rare plant occurrences on Forest Service land were made by Rare Care and provided to volunteers, but were not attempted by the volunteers for various reasons. These included difficult access requirements, imprecise mapping information, and not having sufficient time this season to volunteer. All monitoring reports completed for this contract have been provided to lead Forest Botanists.

Introduction

Washington Rare Plant Care and Conservation (Rare Care), a program at the University of Washington Botanic Gardens, conducts a rare plant monitoring project that engages trained volunteers to monitor and report on rare plant populations across Washington State. Using trained volunteers to collect biodiversity and water quality data is widely regarded as a highly effective method for updating resource databases and monitoring environmental health. Over 800 volunteer monitoring programs existed in the United States as of 2008. Rare Care's monitoring program, initiated in 2001, was modeled after the New England Wildflower Society's Rare Plant Monitoring Program (NEWFS 1992) and the Environmental Protection Agency's (EPA) water monitoring quality assurance program (USEPA 1996).

Rare Care conducts the rare plant monitoring project in partnership with the Washington Natural Heritage Program (WNHP) to meet the urgent need of updating population and census data on

Washington's rare plant species. Data collected by monitoring rare plant populations make a vital contribution to the short-term and long-term conservation and management of Washington's native flora: it provides immediately-needed information on the status of the state's rare plant populations that land managers can use to address immediate threats, and it provides population trend data that managers can use to make long-term planning and land use decisions. Between 2001 and 2008, Rare Care trained over 250 volunteers who have monitored over 500 rare plants occurrences.

In 2009, Rare Care contracted with the US Forest Service to conduct rare plant monitoring, utilizing trained volunteers, on Forest Service lands in Washington State. The purpose of this report is to summarize the results of this effort.

Methods

Volunteers participating in this program were carefully screened and trained by Rare Care in accordance with the Rare Care's Quality Assurance Plan for the Rare Plant Monitoring Project (Rare Care 2006). They were required to have at least two years of post-high school coursework in science, a familiarity with native plants and ecosystems, and a commitment to conservation. References for all volunteers were checked prior to accepting them into the program. Before taking an assignment, volunteers were required to attend a one-day training session given by Rare Care staff that covered topics such as how to read and use an element occurrence record, guidelines for selecting an assignment, random plot sampling methodology and practice, and how to complete the field data sheet and accurately map the population. In addition, Rare Care offered volunteers optional trainings on orienteering skills and using GPS units to map populations, as well as plant identification.

Populations of rare plants selected for monitored on Forest Service lands in 2009 were selected by Rare Care based on three criteria, in the order of priority:

1. Requests for specific populations by Forest Service Botanists.
2. Populations of Rare Care's focus species. Focus species were species for which Rare Care is conducting a comprehensive monitoring and review of all known populations on public lands. For 2009, they included nine species that occurred on Forest Service lands: *Anemone patens* var. *multifida*, *Campanula lasiocarpa*, *Carex stylosa*, *Cryptogramma stelleri*, *Fritillaria camschatcensis*, *Microseris borealis*, *Penstemon eriantherus* var. *whitedii*, *Petrophyton cinerascens*, and *Silene seelyi*.
3. Sensitive species populations that had not been monitored in the past 15 or more years based on WNHP records.

Final selection of populations monitored in 2009 were left up to the volunteer monitors, who chose their assigned population based on the time they were available to complete their assignment, the distance they were willing to travel, the difficulty of accessing the population site, and their familiarity with the species. Therefore, not all of the highest priority populations were in fact monitored in 2009.

To coordinate the selection and assignment of rare plant occurrences for volunteers, Rare Care posted the monitoring list to password-protected web pages that volunteers accessed to select their assignments. For each assignment, Rare Care provided volunteers with a copy of the element occurrence record from WNHP's database, a hard copy of the GIS mapping for the occurrence, a USGS 7.5 minute topographic map, and an assignment cover sheet with contact information for the botanist at the appropriate Ranger District.

Volunteer monitors visited sites throughout the growing season when the species was most likely to be identifiable, typically between April and October. Information collected by the volunteers included whether the population is extant, the precise location and area of the population, associated species, phenology data, a description of the habitat and physical environment, and identification of invasive species. Estimates of population size were made either by directly counting the number of individuals or by using random plot sampling in accordance with Elzinga et. al. (1998). However, for some remote sites or sites on difficult terrain, random plot sampling was not possible due to time constraints or safety. For those populations, monitors provided a rough estimate based on observed density of plants and the area covered by the population. Qualitative pollinator data were also collected, including species identity to phylogenetic order.

The data were recorded on a field data sheet developed in collaboration with the Washington Natural Heritage Program. Reports submitted by volunteers were reviewed by Rare Care staff for quality and completeness and, if necessary, Rare Care followed up with volunteers to clarify incomplete or missing information. Completed original field data sheets were provided to lead Forest botanists at the appropriate National Forest where the populations occurred and a copy was provided to WNHP.

Results

Table 1 presents a summary of monitoring reports completed in 2009 for rare plant populations on Forest Service lands. During the 2009 field season, Rare Care volunteers completed reports on 55 surveys representing 36 species. At 64% of the sites, the monitor(s) found and documented the rare plant occurrence. Twelve of the 34 rare plant populations found consisted of fewer than 50 individuals. It is unknown whether these populations are stable or in decline. Surveyors reported invasive species at 20% of the sites and reported potential land use and management concerns at 22% of the sites (Table 2). All reports have been provided to Forest botanists at the appropriate Forest and copies have been provided to WNHP.

In addition, one rare plant occurrence was visited by a Rare Care volunteer; however, he did not provide a report on his visit. Volunteer Rod Gilbert attempted a visit to *Githopsis specularioides* in the Cowlitz Ranger District on the Gifford Pinchot National Forest (element occurrence 16), but turned back because the terrain was too steep and exposed.

Seventeen populations were assigned and materials provided to volunteers for monitoring; however, the assignments were not attempted this season due to a variety of reasons. In most cases, the volunteer simply did not have time to complete the survey. In other cases, imprecise mapping information or inadequate level of expertise kept volunteers from completing their assignments.

Completed rare plant monitoring assignments by volunteers was lower than the target of 60 assignments by approximately 8%. The target was set based in part on what Rare Care completed in 2008, and we attribute the slightly lower than expected number of reports to three factors:

- Rare Care's rare plant monitoring weekend produced seven fewer reports on rare plants on Forest Service lands than in 2008 because the focus of the weekend was to survey new areas for sensitive plant species as well as other species endemic to the Wenatchee Mountains. In fact, the surveys identified four new, previously undocumented sites for sensitive plant species on the Okanogan-Wenatchee National Forest.
- Rare Care did not offer a training session for new volunteers in 2009 in central Washington due to a lack of funding to support that training session. Therefore, we did not have a new cohort of volunteers in that region of the state to offset the inevitable attrition of returning volunteers. This is the region of the state where more of our priority sites were located on Forest Service lands.
- Olympic National Forest did not participate in the rare plant monitoring project in 2009. In the previous three years, Rare Care's volunteers typically monitored 2 to 6 occurrences on the Olympic National Forest annually. Volunteers with a particular interest in the Olympic Peninsula tended to either accept assignments on other lands on the Peninsula, such as WA Department of Natural Resources lands, or did not participate in 2009.

Volunteer Recruitment and Management

Overall, 46 volunteers devoted 1,150 hours to rare plant monitoring during the 2009 field season and contributed 11,791 miles in their personal vehicles. This included hours dedicated to assignment selection and planning, field work, travel, and report writing. The estimated value of volunteer contributions to this project, based on a rate of \$19.51/hour of volunteer time and \$0.55/mile of vehicle travel, is \$28,922.

References

Elzinga, C.L., D.W. Salzer, and J.W. Willoughby. 1998. Measuring and Monitoring Plant Populations BLM Technical Reference 1730-1. Bureau of Land Management. 492 p.

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Rare Care. 2006. Rare Plant Monitoring A Quality Assurance Plan. Unpublished Report. Washington Rare Plant Care and Conservation, University of Washington Botanic Gardens, Seattle, WA.

United States Environmental Protection Agency. 1996. The Volunteer Monitor's Guide to Quality Assurance Project Plans. EPA 841-B-96-003. Washington, D.C. Office of Wetlands, Oceans, and Watersheds.

Table 1. 2009 Rare Plant Monitoring on Region 6 National Forests.

Taxon Name	EO #	Species Found? ¹	Date(s) of Visit	Survey Site Name	Volunteers	Managed Area	Population Size	Site Area (ac)
<i>Agoseris elata</i>	16	Y	7/10/2009 7/24/2009	Upper Naneum Meadow	Julia Bent, Don Knoke, Paul Slichter	Wenatchee River RD, Okanogan-Wenatchee NF	299	
<i>Agoseris elata</i>	New	Y	7/25/2009		Paul Slichter, Susan Wheatley	Cle Elum RD, Okanogan-Wenatchee NF	65	5
<i>Agoseris elata</i>	New	Y	7/25/2009	Lower Naneum Meadow	Ellen Kuhlmann, Kelli Van Norman, Ted Thomas, Barry Wendling	Cle Elum RD, Okanogan-Wenatchee NF	2	3.4
<i>Anemone patens</i> var. <i>multifida</i>	7	N	8/1/2009 8/2/2009	Crater Mt.	Susan O'Neil	Methow RD, Okanogan-Wenatchee NF		
<i>Campanula lasiocarpa</i>	5	Y	8/7/2009	Mount Index	Thomas Eler, Niall Dunne	Skykomish RD, Mt Baker-Snoqualmie NF	>51	10 sf
<i>Carex saxatilis</i> var. <i>major</i>	11	Y	8/13/2009	Boardman Lake	Holly Zox	Darrington RD, Mt Baker-Snoqualmie NF	13 fruiting stems	150 sf
<i>Carex scirpoidea</i> ssp. <i>scirpoidea</i>	N/A	N	9/12/2009	Swamp Creek	Ron Toonen	Mt Baker RD, Mt Baker-Snoqualmie NF		
<i>Carex stylosa</i>	5	Y	8/8/2009	Rocky Creek	Holly Zox	Mt Baker RD, Mt Baker-Snoqualmie NF	1000s of stems	1.5
<i>Chrysolepis chrysophylla</i>	4	N	2/7/2009	S fork Berry Creek	Matt Schroeder, Jeanette Burkhardt	Mt Adams RD, Gifford Pinchot NF		
<i>Chrysolepis chrysophylla</i>	4	N	8/27/2009	Little White Salmon River Drainage Near "Wasp" unit 9	David Selk	Mt Adams RD, Gifford Pinchot NF		
<i>Cryptogramma stelleri</i>	2	N	9/12/2009	Upper Tenmile Creek	Brooke Sullivan, Steve Krueger	Glacier Peak WA, Chelan RD, Okanogan-Wenatchee NF		
<i>Cypripedium fasciculatum</i>	6	Y	5/31/2009	Wenatchee River Mile 45/Vicinity of Plain	Julia Bent, Don Knoke	Wenatchee River RD, Okanogan-Wenatchee NF	11	3.5
<i>Cypripedium fasciculatum</i>	6	Y	5/17/2009	Wenatchee River Mile 45/Plain	Betty Swift, Hally Swift	Wenatchee River RD, Okanogan-Wenatchee NF	194	0.06
<i>Cypripedium fasciculatum</i>	6	Y	5/17/2009	Wenatchee River Mile 45/Plain	Betty Swift, Hally Swift	Wenatchee River RD, Okanogan-Wenatchee NF	13	
<i>Cypripedium fasciculatum</i>	11	Y	7/9/2009	Mount Stuart	Melissa Rathbun, Tina Taylor	Cle Elum RD, Okanogan-Wenatchee NF	12	9 sf
<i>Dryopteris cristata</i>	7	Y	8/8/2009	Woodward Meadows	Lorna Emerich	Three Rivers RD, Colville NF	12 clumps	
<i>Erigeron howellii</i>	New	Y	6/1/2009	Archer Mountain (east of Columbia Falls NAP)	Steven Clark	Mt Adams RD, Gifford Pinchot NF	400-600	5.7
<i>Erigeron salishii</i>	6	Y	8/27/2009	Enchantment Peaks	Brenda Cunningham	Alpine Lakes WA, Wenatchee River RD, Okanogan-Wenatchee NF	500	0.005
<i>Erigeron salishii</i>	9	Y	7/17/2009	Ice Creek	Richard Ramsden	Glacier Peak WA, Entiat RD, Okanogan-Wenatchee NF	500 to 1000	5
<i>Eurybia merita</i>	5	Y	7/31/2009	Chowder Ridge	Richard Ramsden	Mt Baker RD, Mt Baker-Snoqualmie NF	1000	0.2
<i>Fritillaria camschatcensis</i>	12	N	7/1/2009 7/29/2009	South Fork Nooksack	Holly Zox	Mt Baker RD, Mt Baker-Snoqualmie NF		
<i>Fritillaria camschatcensis</i>	15	X	6/21/2009	Sunday Lake	Annee Pusateri	Alpine Lakes WA, Snoqualmie RD, Mt Baker-Snoqualmie NF		
<i>Gaultheria hispidula</i>	9	N	10/16/2009	Black Creek	Raymond Larson	Darrington RD, Mt Baker-Snoqualmie NF		
<i>Iliamna longisepala</i>	101	N	6/15/2009	Big Meadow Creek	Julia Bent, Don Knoke	Wenatchee River RD, Okanogan-Wenatchee NF		
<i>Lomatium sandbergii</i>	1	N	7/16/2009 7/17/2009 8/7/2009	Round Top Mtn. RNA	Lawton Fox	Sullivan Lk RD, Colville NF		
<i>Lycopodium dendroideum</i>	3	Y	11/3/2009	Sulphur Creek Lava Flow	Shannon Schelinder, Sarah Baker	Mt Baker RD, Mt Baker-Snoqualmie NF	670 stems	2

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Taxon Name	EO #	Species Found? ¹	Date(s) of Visit	Survey Site Name	Volunteers	Managed Area	Population Size	Site Area (ac)
<i>Lycopodium dendroideum</i>	10	N	11/3/2009	Sulphur Creek	Shannon Schelinder, Sarah Baker	Mt Baker RD, Mt Baker-Snoqualmie NF		
<i>Lycopodium dendroideum</i>	12	Y	7/28/2009	West Fork of Miller River	Niall Dunne, Thomas Erler	Skykomish RD, Mt Baker-Snoqualmie NF	90	31 sf
<i>Lycopodium dendroideum</i>	New	Y	8/7/2009		Thomas Erler, Niall Dunne	Skykomish RD, Mt Baker-Snoqualmie NF	~30	24 sf
<i>Microseris borealis</i>	9	Y	8/8/2009	Olallie Lake	Kelli Van Norman	Cowlitz Valley RD, Gifford Pinchot NF	>114	0.02
<i>Microseris borealis</i>	11	Y	8/8/2009	Takhlakh Lake South	Kelli Van Norman	Cowlitz Valley RD, Gifford Pinchot NF	127	0.01
<i>Parnassia kotzebuei</i>	2	N	6/21/2009 9/3/2009	Tiffany Lake	Kathleen Learned	Tonasket RD, Okanogan-Wenatchee NF		
<i>Pedicularis rainierensis</i>	49	Y	7/25/2009 8/6/2009	Crystal Mountain Ski Area	Rob Thoms, Dorothy Gist	Snoqualmie RD, Mt Baker-Snoqualmie NF	7150	2.1
<i>Pedicularis rainierensis</i>	49	Y	8/5/2009	Crystal Mountain Ski Area	Rob Thoms	Snoqualmie RD, Mt Baker-Snoqualmie NF	2600	0.7
<i>Pellaea breweri</i>	5	N	9/12/2009	Upper Tenmile Creek Basin	Brooke Sullivan, Steven Krueger	Glacier Peak WA, Chelan RD, Okanogan-Wenatchee NF		
<i>Pellaea breweri</i>	6	N	7/8/2009 7/9/2009	Beverly Creek	Cynthia Smith-Kuebel	Cle Elum RD, Okanogan-Wenatchee NF		
<i>Pellaea breweri</i>	7	Y	7/26/2009	Wenatchee Mountains	Richard Fleenor	Wenatchee River RD, Okanogan-Wenatchee NF	3	0.01
<i>Penstemon eriantherus</i> var. <i>whitedii</i>	5	N	6/13/2009	Blewett Pass	Betty Swift, Hally Swift	Cle Elum RD, Okanogan-Wenatchee NF		
<i>Petrophyton cinerascens</i>	4	Y	8/28/2009	Earthquake Point (Ribbon Cliff)	Julianna Bresnan	Entiat RD, Okanogan-Wenatchee NF	1390	120
<i>Phacelia minutissima</i>	1	N	7/10/2009 7/25/2009	Naneum Creek	Julia Bent, Don Knoke	Cle Elum RD, Okanogan-Wenatchee NF		
<i>Platanthera chorisiana</i>	3	Y	8/5/2009	Lake Serene	Andrew Rapin	Skykomish RD, Mt Baker-Snoqualmie NF	42	100 sf
<i>Platanthera chorisiana</i>	4	N	7/18/2009 8/1/2009	Poodle Dog Pass	Emily-Robin Pierce, Jennifer Rotermund	Henry M Jackson WA, Darrington RD, Mt Baker-Snoqualmie NF		
<i>Platanthera sparsiflora</i>	4	N	8/7/2009 8/9/2009	Sand Creek South	Cleveland Hall	Naches RD, okanogan-Wenatchee NF		
<i>Polemonium viscosum</i>	5	Y	7/19/2009	Pasayten Peak	Hally Swift	Methow Valley RD, Okanogan-Wenatchee NF	9 stems	
<i>Potentilla drummondii</i> ssp. <i>breweri</i>	New	Y	7/26/2009		Ellen Kuhlmann, Paul Slichter, Barry Wendling	Cle Elum RD, Okanogan-Wenatchee NF	29	
<i>Pyrrocoma hirta</i> var. <i>sonchifolia</i>	2	Y	7/12/2009	Howard Creek Trail	Julia Bent, Don Knoke	Cle Elum RD, Okanogan-Wenatchee NF	5,000	
<i>Pyrrocoma hirta</i> var. <i>sonchifolia</i>	New	Y	7/26/2009		Paul Slichter, Ellen Kuhlmann, Barry Wendling	Cle Elum RD, Okanogan-Wenatchee NF	1600+	4.6
<i>Pyrrocoma hirta</i> var. <i>sonchifolia</i>	New	Y	7/23/2009		Julia Bent, Don Knoke	Cle Elum RD, Okanogan-Wenatchee NF	3000	
<i>Saxifraga cernua</i>	3	N	6/21/2009 9/3/2009	Tiffany Lake	Kathleen Learned	Tonasket RD, Okanogan-Wenatchee NF		
<i>Saxifraga rivularis</i>	13	Y	8/6/2009	Chelan-Snohomish County Border	Brenda Cunningham, Tim Manns	Wenatchee River RD, Okanogan-Wenatchee NF	245	0.59
<i>Silene seelyi</i>	3	Y	7/19/2009	Snow Lakes Trail	Gail Roberts	Wenatchee River RD, Okanogan-Wenatchee NF	163 (5 clumps)	0.03
<i>Silene seelyi</i>	22	Y	5/31/2009	Dirtyface Mountain	Michael Muscari	Wenatchee River RD, Okanogan-Wenatchee NF	~10 clumps	14.9
<i>Sisyrinchium sarmentosum</i>	18	N	6/12/2009	Little White Salmon River	Margaret Miller	Mt Adams RD, Gifford Pinchot NF		
<i>Spiranthes porrifolia</i>	1	Y	6/26/2009	Catherine Creek	Paul Slichter, Cathy Flick	Mt Adams RD, Gifford Pinchot NF	1500	100
<i>Sullivantia oregana</i>	New	Y	6/1/2009	Archer Mountain (east of Columbia Falls NAP)	Steven Clark	Mt Adams RD, Gifford Pinchot NF	140	6.0

Notes:

1. Y = yes, N = no, U = identity uncertain, X = site not reached

Table 2. Summary of Invasive Species Threats and Management Comments for 2009 Rare Plant Monitoring Sites on US Forest Service Land.

Taxon Name	EO #	Species found? Y=yes, N=no	Habitat Alteration or Disturbance?	Invasive Species	Management Comments and Threats
<i>Agoseris elata</i>	New	Y		Yes, introduced grasses	Heavy use by elk - migration, some bedding areas. Trail for hikers, horses & motor bikes crosses stream at upper end of meadow.
<i>Agoseris elata</i>	16	Y		Yes, <i>Taraxacum officinale</i>	Trampling by elk. Motorbike usage in the area is heavy - a few crossed the meadow.
<i>Anemone patens</i> var. <i>multifida</i>	7	N	No. Heather is abundant and seems to be expanding in the uplands with <i>A. occidentalis</i> still present w/in patches of heather. Not as much <i>Spirea</i> or <i>Aquilegia</i> as anticipated based on the previous reports.	No	Better management of campers is needed to prevent degradation of meadow areas. There are rocky, flat camping areas above the lake but we saw a group of three camped directly next to the lake on <i>A. occidentalis</i> . There had been significant rock & landslides (and avalanches) in and around basin.
<i>Carex saxatilis</i> var. <i>major</i>	11	Y	Hydrology impacts: heavy flow in seep or high lake level during snowmelt & high runoff. Adjacent land use threats: trampling from the occasional fisherman.	No. (Some are elsewhere on the lakeshore where the trail enters lake.)	I only found a few plants, but they are at a seldom-visited part of this heavily used lake. Only a few fishermen ever use the unmaintained trail or fish this opening. There is a lovely and unofficial campsite in the forest near the CASAM opening that does get some use (recently used fire ring and garbage found).
<i>Carex stylosa</i>	5	Y	Hydrology: standing water in some depressions. Disturbance: some elk trampling & herbivore grazing. Land use threats: digging up pipeline, road repairs.	No	
<i>Cypripedium fasciculatum</i>	11	Y	Yes, dead fir trees throughout the area up to the old location! Pine beetles? Spruce bud worms?	No	Fir tree management needed for diseased trees. The old population may be lost due to mycorrhizal disruption. The new population has two plants right on the edge of trail. Maybe advise no trail widening in that area.
<i>Cypripedium fasciculatum</i>	6	Y	Yes. There has been disturbance in the past, garbage dumping which is now covered, and road use. Neither activity seems to be current. Also, young Douglas firs are growing among the Ponderosa.	No	Some logging is to be done on land adjoining the west boundary of the Forest Service land. This should not be a problem. As long as fir trees do not encroach on the open Ponderosa stand, this site should remain stable. Some of the populations are in areas bordered on two sides by a subdivision of vacation homes with an abundance of small vehicles. A number of old roads run through the area and garbage has been dumped in piles, then partially buried, in the past.
<i>Dryopteris cristata</i>	7	Y		There is lots of <i>Hypericum perforiatum</i> on the open mound to the north, but I don't think it will move into the damp, shady woods.	
<i>Erigeron howellii</i>	New	Y		No	Adjacent land use threats: This area is increasingly being explored and hiked by local people.
<i>Lycopodium dendroideum</i>	10	N	Survey area was a working quarry which may have expanded or changed since previous survey in 1992.		
<i>Lycopodium dendroideum</i>	New	Y		No	Site 1 is vulnerable to foot traffic, be it human or otherwise.
<i>Parnassia kotzebuei</i>	2	N	2006 fire - don't know if it post-dated last observation	No	
<i>Pedicularis rainierensis</i>	49	Y	Disturbance immediately adjacent (20' upslope) of population: disturbance from removal of ridgetop to construct new lift landing. Ridge was cut vertical on southern side and is likely unstable. Possible disturbance from ridge-top road erosion of talus/scree and sand.	No	The vertically-cut slope (for installation of new lift landing) may require stabilization. Any further activity in the area, including erosion prevention and ridge stabilization, should be done cautiously with this population so close immediately downslope of ridge. Also, some construction debris remains as well as installation of plastic poles to mark ski hazards or ski boundaries. Impacts to population are unknown.
<i>Penstemon eriantherus</i> var. <i>whitedii</i>	5	N	No. None that affects open soils, although logging is being done and burns planned.	Yes. Cheat grass sparsely present.	
<i>Petrophyton cinerascens</i>	4	Y		Yes, <i>Linaria dalmatica</i> , <i>Bromus tectorum</i> , <i>Centaurea diffusa</i>	
<i>Phacelia minutissima</i>	1	N	Yes. Elk grazing in the vicinity.	No	

Table 2. Summary of Invasive Species Threats and Management Comments for 2009 Rare Plant Monitoring Sites on US Forest Service Land.

Taxon Name	EO #	Species found? Y=yes, N=no	Habitat Alteration or Disturbance?	Invasive Species	Management Comments and Threats
<i>Platanthera chorisiana</i>	4	N	Yes. Hydrology change? 8/10/83 soil description for shape ID 6614 (subpop #1) is saturated year round. While I was searching for the <i>Platanthera chorisiana</i> in the seep, I checked the sphagnum for saturation. When I pressed on the moss no water was expressed. But frogs were present. For Shape ID 6615 (subpop #2) I found no seep or seep plants ie. <i>Blechnum Dodecatheon</i> , etc.	No	
<i>Platanthera sparsiflora</i>	4	N	No	Yes, <i>Ranunculus repens</i>	
<i>Potentilla drummondii</i> var. <i>breweri</i>	New	Y	Site #2 showed signs of numerous elk tracks disturbing site.	No	Site #1 is on s. side of road where vehicals may impact plants.
<i>Pyrrocoma hirta</i> var. <i>sonchifolia</i>	2	Y		No	Population appears very healthy - some elk impact. Found in vernal wet areas.
<i>Pyrrocoma hirta</i> var. <i>sonchifolia</i>	New	Y		Yes. Possible weedy grasses at all, <i>Cirsium arvense</i> at site #1	Possibility of ORV damage - none seen. Some elk trampling in moist areas.
<i>Pyrrocoma hirta</i> var. <i>sonchifolia</i>	New	Y		Yes, <i>Cirsium arvense</i>	
<i>Saxifraga rivularis</i>	13	Y		No	The trail to High Pass used to run right through this population. It looks like the trail has been rerouted to a point lower than the plants, but the higher route may still be used early in the season when snow is covering the trail. The plants are well tucked under the rocky ledges and in areas where few people will trample them, particularly when late snow covers the ledges.
<i>Silene seelyi</i>	22	Y	No	Yes, cheatgrass	Evidence of 2007 fire nearby but not on rock outcrops
<i>Silene seelyi</i>	3	Y		No	Hydrology of snow melt streams and resultant trail rehab may have affected sites nearer to the creek. This slope, which is a lower slope of wedge Mt. does not appear to be very inviting for hikers or climbers.
<i>Sisyrinchium sarmatosum</i>	18	N	Yes, trampling and grazing of elk.	Yes, <i>Elymus glaucus</i> , <i>Leucanthemum vulgare</i>	
<i>Spiranthes porrifolia</i>	1	Y	Mountain bikers are increasingly using the open slopes here as a slalom course.	<i>Bromus tectorum</i> , <i>Hypericum perforatum</i> , medusa head, Crested Dogtail, other weedy grasses.	Recreation management plan will soon be revised. The previously proposed plan added hiking and horse trails to the area. A state rock pit is immediately south of one subpopulation near SR 14.
<i>Sullivantia oregana</i>	New	Y		No	Adjacent land use threats: This area is increasingly being explored and hiked by local people.