University of Washington
BOTANIC GARDENS

School of Environmental and Forest Sciences
College of the Environment

RARE PLANT CARE & CONSERVATION

Rare Plant Monitoring
2015 Annual Report

SUMMARY

Washington Rare Plant Care and Conservation's rare plant monitoring project provides critically-needed information on the status of Washington State's rare plant species. Volunteers monitor known occurrences of rare plants and report on their status and the habitat where they occur. Monitoring data collected under this project are provided to the Washington Natural Heritage Program and to federal, state, and local land managers to inform short-term and long-term conservation practices. In 2015, 125 rare plant surveys were completed at sites throughout the state. Volunteers found the rare plant species at 57% of the sites monitored. Eight of the sites could not reached by volunteers due to access constraints, and five sites represented potentially new occurrences for the Washington Natural Heritage Program. A total of 101 volunteers participated in the project statewide and 21 new volunteers were trained in 2015.

INTRODUCTION

Washington Rare Plant Care and Conservation (Rare Care) monitors rare plant populations in Washington State to update inventory data for conservation and management efforts. The project started in 2001 as a collaboration between Rare Care and the Washington Natural Heritage Program (WNHP), a program within the Department of Natural Resources that is responsible for tracking native plant diversity in the state. WNHP lists 321 plant species as endangered, threatened, or sensitive to decline in Washington State, and an additional 148 species as review species. Many of the 4,500 occurrences of rare plants across the state are visited very infrequently, or in some cases never; therefore, the status of these occurrences is unknown. The rare plant monitoring addresses this need by engaging volunteers to visit and report on the status and condition of rare plant occurrences and the habitats they reside in.

This report summarizes the results of the 2015 field season. Each season, volunteers visit occurrences of rare plants located primarily on public lands to collect information on the population size and characteristics of its habitat. Their field reports are provided to WNHP and to public agencies responsible for conserving these populations. Through WNHP, these data are available to scientists and land managers working on conservation issues and making land use decisions across the state and the nation. Volunteers participating in the program are required to have previous experience identifying

native plants in the field, have a strong interest in native plant conservation and attend a 1-day training session to learn the monitoring protocols.

2015 MONITORING PRIORITIES

Species and sites selected for monitoring in 2015 were based on a set of priorities developed in conjunction with WNHP and managers at partnering agencies. The highest priority was given to 1) monitoring occurrences specifically requested by land managers of public agencies where rare plant populations occur and 2) Rare Care's focus species. Focus species were those that Rare Care selected for comprehensive monitoring so that all of their occurrences on public lands were monitored in a five-year time frame.

High priority was also given to monitoring occurrences whose records in the WNHP database had not recently been updated. Within this group, higher emphasis was placed on species considered to be threatened or endangered under the WNHP ranking system; therefore, these sites were selected if they had not been monitored in the past five years. For other species, sites were selected if they had not been monitored within the past 10 years in western Washington and the past 20 years in central and eastern Washington. Priority was also placed on monitoring occurrences that were not located by Rare Care volunteers in previous years. After three unsuccessful attempts have been made to locate an occurrence, Rare Care considers the occurrence to be extirpated and will no longer include it on the list of monitoring priorities in future years.

Clackamas corydalis (*Corydalis aquae-gelidae*) was a land manager's priority request for 2015. It occurs along cold, flowing streams in western Washington coniferous forests. Photo by Earl Doan.

MONITORING RESULTS

Rare Care volunteers completed 118 rare plant surveys in 2015, and 7 additional sites were monitored by Rare Care staff. These included 120 occurrences tracked by WNHP, and five of potentially new occurrences (See Table 1). The rare plant species was successfully relocated at 71 of the known and historic occurrences. Volunteers were uncertain of the ID of the species they found at four occurrences and these will need to be revisited. Eight volunteers were unable to reach their site because of challenging terrain or access constraints. For these sites, volunteers provided reports that include valuable access information for future surveyors. Surveyors reported invasive species at 47% of the sites (Table 2) and reported potential land use and management concerns at 42% of the sites (Table 3). 2015 was an unusually warm and dry spring

and summer throughout the state, and late season wildfires impacted volunteers' ability to complete their assignments.

Rare Care's annual monitoring weekend occurred July 10-12, 2015 in the Okanogan Highlands near Tonasket. Thirteen Rare Care volunteers, staff from the US Forest Service and WNHP, and representatives of the Okanogan Highlands Alliance (OHA) participated in the three-day effort to revisit known populations of rare plants and conduct botanical surveys of a calcareous fen on property owned by OHA. Eleven occurrences of rare plants were revisited during the weekend, and ten of those were successfully relocated. They included three populations of *Platanthera obtusata* ssp. *obtusata*, two populations of *Coeloglossum viride*, and one population each of *Vaccinium myrtilloides, Chrysosplenium tetrandrum, Carex magellanica* ssp. *irrigua, Carex gynocrates,* and *Carex capillaris.* We also attempted to monitor a population of *Carex tenuiflora;* however, the population was not reached because it was inaccurately mapped. Rare Care will attempt to visit this site in 2016. The botanical survey of OSA's property yielded a previously unknown population of *Carex tenuiflora*.

A population of boreal bog sedge (*Carex magellanica* ssp. *irrigua*) was monitored in the Okanogan Highlands. Photo by Brenda Cunningham.

New populations of rare plants were also documented at four other locations in the state in 2015. From the Columbia River Gorge area, volunteers reported new populations of green-keeled cotton-grass (*Eriophorum viridicarinatum*), and common bluecup (*Githopsis specularioides*). Also in southwestern Washington, new Clackamas corydalis (*Corydalis aquae-gelidae*) population was reported from Skamania County. Finally, a new occurrence of Alaska harebell (*Campanula lasiocarpa*) was found in the Mt. Baker-Snoqualmie National Forest in King County.

Finally, Rare Care partnered with the Bureau of Land Management to monitor the remaining occurrences of gray cryptantha (*Cryptantha leucophaea*) that had not been visited in the past five years. The objective of this task was to complete an assessment of this sensitive plant's status statewide. Twelve gray cryptantha occurrences were visited in 2015 and several surveys of potential habitat were visited to search for new populations. Since 2009, Rare Care has revisited 33 of the 46 occurrences of this species. Nine occurrences are on private land and were not visited, several were visited by other parties, and two remain to be visited. Of the 46 total occurrences, 26%

Common bluecup (*Githopsis specularioides*) is a diminutive annual that is locally abundant in Klickitat County. One new population was found in 2015. Photo by Wendy Gibble.

could not be relocated and may be extirpated, and 26% have fewer than 50 individuals. It appears that populations have declined by 75% or more at 30% of the occurrences. Three populations consist of 1,000 or more individuals, two of which are on public lands. Preserving these populations is vital for the long-term conservation of this species.

ADDENDUM TO THE 2014 MONITORING RESULTS

Rare Care received four additional monitoring reports from volunteers after the 2014 Annual Report was finalized (Table 4). With these reports, the total number of occurrences reported on by volunteers in 2014 was 129. Invasive species and land management comments on these sites are provided in Table 5.

VOLUNTEER PARTICIPATION

In 2015, 101 volunteers devoted 2,904 hours to rare plant monitoring statewide. This includes hours dedicated to training, preparation and planning, field work and report writing. Rare Care offered a volunteer training in Seattle in 2015 and 24 volunteers participated.

Twenty-four volunteers attended the Seattle training in 2015, including new as well as returning volunteers desiring a refresher on the monitoring protocols. Joe Arnett, WNHP botanist, assisted with the training (pictured second to the right end of the bottom row). Photo by Jennifer Youngman.

Table 1. Rare plant monitoring results for 2015.

Species Name	EO Num[1]	Federal Status[2]	State Status[3]	Visit Date	Species Found	Pop. Size[4]	Managed Area	Owner
Arabis olympica	2		R1	7/20/2015	No		Hood Canal RD, Olympic NF	USAFS
Astragalus columbianus	26	SC	S	5/1/2015	Yes	28,000	Bureau of Land Management, Spokane District	USABLM
Astragalus misellus var. *pauper*	3		S	5/19/2015	Yes	122	Bureau of Land Management, Spokane District	USABLM
Boschniakia hookeri	2		R1	5/21/2015	No		Kitsap Forest NAP	ST DNR
Botrychium hesperium	17		T	8/8/2015	No		Darrington RD, Mt Baker-Snoqualmie NF	USAFS
Calochortus longebarbatus var. *longebarbatus*	36	SC	S	6/20/2015	Yes	1	Klickitat Wildlife Area	ST DFW
Calochortus macrocarpus var. *maculosus*	6	SC	E	7/11/2015	No		Pomeroy RD, Umatilla NF	USAFS
Calochortus macrocarpus var. *maculosus*	10	SC	E	5/11/2015	No		Bureau of Land Management, Vale District	USABLM
Calochortus macrocarpus var. *maculosus*	11	SC	E	7/17/2015	No		Pomeroy RD, Umatilla NF	USAFS
Campanula lasiocarpa	7		S	7/18/2015	Yes	118 stems	Snoqualmie RD, Mt Baker-Snoqualmie NF	USAFS
Campanula lasiocarpa	New[5]		S	7/18/2015	Yes	350 stems	Snoqualmie RD, Mt Baker-Snoqualmie NF	USAFS
Carex capillaris	2		T	7/12/2015	Yes	>1000	Tonasket RD, Okanogan-Wenatchee NF	USAFS
Carex gynocrates	4		S	7/10/2015	Yes	225 stems	Okanogan Highlands Alliance Preserve; Tonasket RD, Okanogan-Wenatchee NF	PVTUUU, USAFS
Carex magellanica ssp. *irrigua*	15		S	7/10/2015	Yes	4500 stems	Three Rivers RD, Colville NF	USAFS
Carex magellanica ssp. *irrigua*	42		S	7/10/2015	Yes	100	Okanogan Highlands Alliance Preserve; Tonasket RD, Okanogan-Wenatchee NF	PVTUUU, USAFS
Carex pluriflora	7		S	7/18/2015	No		Morning Star NRCA; Darrington RD, Mt Baker-Snoqualmie NF	ST DNR, USAFS
Carex sychnocephala	13		S	7/30/2015	Yes	~370	Sinlahekin Wildlife Area	ST DFW
Carex sychnocephala	None[6]		S	8/5/2015	No		Sinlahekin Wildlife Area	ST DFW
Carex tenuiflora	2		T	7/11/2015	No		Tonasket RD, Okanogan-Wenatchee NF	USAFS

Table 1. Rare plant monitoring results for 2015 (continued).

Species Name	EO Num[1]	Federal Status[2]	State Status[3]	Visit Date	Species Found	Pop. Size[4]	Managed Area	Owner
Carex tenuiflora	New[5]		T	7/10/2015	Yes	50	Okanogan Highlands Alliance Preserve; Tonasket RD, Okanogan-Wenatchee NF	PVTUUU, USAFS
Castilleja cryptantha	34	SC	S	7/21/2015	Yes	~ 700	Naches RD, Okanogan-Wenatchee NF	USAFS
Chrysosplenium tetrandrum	3		S	7/11/2015	Yes	500-1,000 stems	Tonasket RD, Okanogan-Wenatchee NF	USAFS
Cicuta bulbifera	3		S	8/8/2015	Yes	26	Lake Terrell Wildlife Area	ST DFW
Cimicifuga elata	7	SC	S	4/18/2015	No		Flaming Geyser State Park	ST SPR
Cimicifuga elata	11	SC	S	6/24/2015	No		Beacon Rock State Park	ST SPR
Cimicifuga elata	12	SC	S	6/22/2015	Yes	2	Columbia River Gorge National Scenic Area	USAFS
Cimicifuga elata	14	SC	S	6/12/2015	Site not reached		Columbia River Gorge National Scenic Area	USAFS
Cimicifuga elata	22	SC	S	7/1/2015	No		South Puget Sound Region	ST DNR
Cimicifuga elata	34	SC	S	7/26/2015	Yes	7	NW Region Baker District	ST DNR
Cimicifuga elata	36	SC	S	7/16/2015	Yes	33	Pacific Cascade Region	ST DNR
Cimicifuga elata	44	SC	S	6/13/2015	No		NW Region Baker District	ST DNR
Cimicifuga elata	48	SC	S	8/20/2015	No		Mt Adams RD, Gifford Pinchot NF	USAFS
Cimicifuga elata	None[6]	SC		6/26/2015	Yes	126	Washougal Oaks NAP & NRCA, Columbia River Gorge National Scenic Area	ST DNR, USAFS
Cimicifuga elata	None[6]	SC	S	6/26/2015	Yes	113	Washougal Oaks NAP & NRCA, Columbia River Gorge National Scenic Area	ST DNR, USAFS
Coeloglossum viride	2		T	7/10/2015	Yes	8	Tonasket RD, Okanogan-Wenatchee NF	USAFS
Coeloglossum viride	4		T	7/11/2015	Yes	4	Tonasket RD, Okanogan-Wenatchee NF	USAFS
Comastoma tenellum	1		S	7/4/2015	No		Chopaka Mountain NAP	ST DNR
Corydalis aquae-gelidae	3	SC	S	6/22/2015	Yes	78	Mt St Helens NVM, Gifford Pinchot NF	USAFS
Corydalis aquae-gelidae	4	SC	S	6/28/2015	Site not reached		Mt St Helens NVM, Gifford Pinchot NF	USAFS
Corydalis aquae-gelidae	18	SC	S	7/10/2015	Yes	142	Mt St Helens NVM, Gifford Pinchot NF	USAFS
Corydalis aquae-gelidae	20	SC	S	7/8/2015	Yes	200	Mt St Helens NVM, Gifford Pinchot NF	USAFS
Corydalis aquae-gelidae	37	SC	S	6/28/2015	No		Mt St Helens NVM, Gifford Pinchot NF	USAFS
Corydalis aquae-gelidae	41	SC	S	7/31/2015	Site not reached		Mt St Helens NVM, Gifford Pinchot NF	USAFS
Corydalis aquae-gelidae	New[5]	SC		6/22/2015	Yes	13	Mt St Helens NVM, Gifford Pinchot NF	USAFS

Table 1. Rare plant monitoring results for 2015 (continued).

Species Name	EO Num[1]	Federal Status[2]	State Status[3]	Visit Date	Species Found	Pop. Size[4]	Managed Area	Owner
Cryptantha leucophaea	2	SC	S	4/12/2015	No		Chelan County Public Works	LOCCTY
Cryptantha leucophaea	17	SC	S	5/19/2015	No		Juniper Forest ACEC, Juniper Dunes EWA	USABLM
Cryptantha leucophaea	19	SC	S	5/28/2015	Yes	91	Bureau of Reclamation	USABOR
Cryptantha leucophaea	23	SC	S	5/27/2015	Yes	76	Hanford National Monument	USFWS
Cryptantha leucophaea	29	SC	S	5/28/2015	Yes	262	Grant County PUD	LOCCTY
Cryptantha leucophaea	32	SC	S	5/26/2015	Yes	2429	Columbia Basin Wildlife Area	ST DFW
Cryptantha leucophaea	33	SC	S	5/7/2015	Yes	713	Bureau of Reclamation	USABOR
Cryptantha leucophaea	34	SC	S	5/23/2015	Yes	27	Columbia Basin Wildlife Area	ST DFW
Cryptantha leucophaea	46	SC	S	5/11/2015	Yes	6,200	Hanford ERP	USAERD
Cryptantha leucophaea	47	SC	S	5/15/2015	No		South Columbia Basin Wildlife Area - Wahluke Slope Unit, Hanford ERP	USAFWS
Cryptantha leucophaea	53	SC	S	5/15/2015	No		Saddle Mountain NWR, Hanford ERP	USAFWS
Cryptantha leucophaea	53	SC	S	5/9/2015	No		Saddle Mountain NWR, Hanford ERP	USAFWS
Cryptantha leucophaea	60	SC	S	5/13/2015	Yes	13	Bureau of Land Management, Spokane District, Columbia NWR	USABLM, USAFWS
Cryptantha spiculifera	4		S	5/16/2015	No		Ringold Fish Hatchery, South Columbia Basin Wildlife Area - Wahluke Slope Unit, Hanford ERP	ST DFW, USAFWS
Cusickiella douglasii	2		T	3/13/2015	Yes	53,060	Columbia Hills NAP	ST DNR
Delphinium viridescens	38	SC	T	6/23/2015	Yes	379	Wenatchee River RD, Okanogan-Wenatchee NF	USAFS
Delphinium viridescens	39	SC	T	6/13/2015	No		Wenatchee River RD, Okanogan-Wenatchee NF	USAFS
Draba aurea	10		S	6/25/2015	Yes	232	Methow Valley RD, Okanogan-Wenatchee NF	USAFS
Draba juvenilis	1		T	6/12/2015	No		Hood Canal RD, Olympic NF	USAFS
Dryas drummondii var. *drummondii*	7		S	7/19/2015	Yes	>1000 stems	Hood Canal RD, Olympic NF	USAFS
Eleocharis rostellata	14		S	8/6/2015	Uncertain		Sinlahekin Wildlife Area	ST DFW
Eremothera pygmaea	14		S	5/17/2015	No		Yakima Training Center	USADOD
Eremothera pygmaea	24		S	6/6/2015	No		South Columbia Basin Wildlife Area - Wahluke Slope Unit, Hanford ERP	USAFWS
Eriophorum viridicarinatum	New[5]			5/1/2015	Yes	100	Conboy Lake NWR	USAFWS

Table 1. Rare plant monitoring results for 2015 (continued).

Species Name	EO Num[1]	Federal Status[2]	State Status[3]	Visit Date	Species Found	Pop. Size[4]	Managed Area	Owner
Eurybia merita	6		S	7/25/2015	Yes	51	Moran State Park	ST SPR
Fritillaria camschatcensis	5		S	5/24/2015	Yes	625	Darrington RD, Mt Baker-Snoqualmie NF	USAFS
Fritillaria camschatcensis	18		S	5/24/2015	No		Snoqualmie RD, Mt Baker-Snoqualmie NF	USAFS
Gentiana glauca	2		S	7/27/2015	Yes	30	Mt Baker RD, Mt Baker-Snoqualmie NF	USAFS
Gentiana glauca	7		S	7/28/2015	Yes	867	Methow Valley RD, Okanogan-Wenatchee NF	USAFS
Geum rivale	7		S	6/24/2015	Yes	381	Three Rivers RD, Colville NF	USAFS
Githopsis specularioides	19		S	5/25/2015	No		Southeast Region	ST DNR
Githopsis specularioides	New[5]			5/4/2015	Yes	50	Klickitat Wildlife Area	ST DFW
Heuchera grossulariifolia var. *tenuifolia*	4		S	5/20/2015	Yes	>250	Columbia River Gorge National Scenic Area	USAFS
Heuchera grossulariifolia var. *tenuifolia*	22		S	5/4/2015	Yes	50	Klickitat Wildlife Area	ST DFW
Hypericum majus	12		S	8/6/2015	Yes	1,895	Little Pend Oreille NWR, Pend Oreille County PUD	USAFWS, LOCCTY
Iliamna longisepala	9		S	5/27/2015	Yes	14 stems	Bureau of Land Management, Spokane District	USABLM
Iliamna longisepala	14		S	8/1/2015	Site not reached		Bureau of Land Management, Spokane District, Leavenworth RD, Okanogan-Wenatchee NF	USABLM, USAFS
Iliamna longisepala	28		S	6/7/2015	Yes	116	Entiat RD, Okanogan-Wenatchee NF	USAFS
Isoetes nuttallii	None[6]		S	4/22/2015	Yes	~ 25	Klickitat Wildlife Area	ST DFW
Leptosiphon bolanderi	10		S	5/4/2015	Yes	100,000s to millions	Klickitat Wildlife Area	ST DFW
Lomatium suksdorfii	38	SC	S	5/4/2015	Yes	250	Klickitat Wildlife Area	ST DFW
Lycopodium dendroideum	7		S	7/17/2015	No		Skykomish RD, Mt Baker-Snoqualmie NF	USAFS
Lycopodium dendroideum	17		S	8/12/2015	Yes	21	Mt Baker RD, Mt Baker-Snoqualmie NF	USAFS
Lycopodium dendroideum	18		S	7/18/2015	Site not reached		Snoqualmie RD, Mt Baker-Snoqualmie NF	USAFS
Nicotiana attenuata	29		S	7/28/2015	Yes	140	Yakima Training Center	USADOD
Orobanche californica spp. grayana	1		E	7/24/2015	No		Conboy Lake NWR	USAFWS
Parnassia fimbriata var. *hoodiana*	2		T	6/21/2015	Uncertain		Pacific Cascade Region	ST DNR

Table 1. Rare plant monitoring results for 2015 (continued).

Species Name	EO Num[1]	Federal Status[2]	State Status[3]	Visit Date	Species Found	Pop. Size[4]	Managed Area	Owner
Parnassia palustris var. *neogaea*	11		S	8/10/2015	Yes	24	Hood Canal RD, Olympic NF	USAFS
Parnassia palustris var. *neogaea*	14		S	8/10/2015	Yes	1	Hood Canal RD, Olympic NF	USAFS
Pediocactus nigrispinus	23		S	3/14/2015	Site not reached		Bureau of Land Management, Spokane District	USABLM
Pediocactus nigrispinus	31		S	5/30/2015	Yes	1,449	Bureau of Land Management, Spokane District	USABLM
Pellaea brachyptera	5		S	5/15/2015	Yes	~500 clumps	Chelan RD, Okanogan-Wenatchee NF	USAFS
Pellaea breweri	8		S	6/15/2015	No		Cle Elum RD, Okanogan-Wenatchee NF	USAFS
Pellaea breweri	9		S	6/13/2015	No		Hood Canal RD, Olympic NF	USAFS
Penstemon eriantherus var. *whitedii*	3		S	5/16/2015	Yes	1	South Columbia Basin Wildlife Area - Wahluke Slope Unit, Hanford ERP	USAFWS
Phacelia lenta	6	SC	T	5/3/2015	Yes	172 clumps	Bureau of Land Management, Spokane District	USABLM
Plantago macrocarpa	8		S	7/26/2015	No		Clearwater Bogs NAP	ST DNR
Platanthera obtusata ssp. *obtusata*	21		S	7/12/2015	Yes	109	Tonasket RD, Okanogan-Wenatchee NF	USAFS
Platanthera obtusata ssp. *obtusata*	26		S	7/10/2015	Yes	20	Okanogan Highlands Alliance Preserve; Tonasket RD, Okanogan-Wenatchee NF	PVTUUU, USAFS
Platanthera obtusata ssp. *obtusata*	38		S	7/11/2015	Yes	>47 reproductive stems	Tonasket RD, Okanogan-Wenatchee NF	USAFS
Platanthera obtusata ssp. *obtusata*	68		S	6/9/2015	Uncertain		Darrington RD, Mt Baker-Snoqualmie NF	USAFS
Polemonium pectinatum	31	SC	T	5/29/2015	No		Bureau of Land Management, Spokane District	USABLM
Polemonium pectinatum	47	SC	T	5/2/2015	Yes	225	Bureau of Land Management, Spokane District	USABLM
Polemonium pectinatum	52	SC	T	5/5/2015	Yes	>500	Bureau of Land Management, Spokane District	USABLM
Ranunculus cooleyae	5		S	5/29/2015	No		Skykomish RD, Mt Baker-Snoqualmie NF	USAFS
Ribes cereum var. *colubrinum*	6		E	4/7/2015	Site not reached		Bureau of Land Management, Spokane District	USABLM

Table 1. Rare plant monitoring results for 2015 (continued).

Species Name	EO Num[1]	Federal Status[2]	State Status[3]	Visit Date	Species Found	Pop. Size[4]	Managed Area	Owner
Ribes oxyacanthoides ssp. *irriguum*	5		T	5/8/2015	No		Indian Canyon Park	LOCCTY
Ribes oxyacanthoides ssp. *irriguum*	23		T	5/29/2015	Uncertain	4	Republic RD, Colville NF	USAFS
Rotala ramosior	None[6]		T	7/21/2015	No		Conboy Lake NWR	USAFWS
Saxifraga hyperborea	1		S	6/14/2015	Yes	1	Hood Canal RD, Olympic NF	USAFS
Saxifraga tischii	5		R1	6/12/2015	No		Hood Canal RD, Olympic NF	USAFS
Saxifraga tischii	8		R1	6/14/2015	Yes	5	Hood Canal RD, Olympic NF	USAFS
Sidalcea hirtipes	10		T	7/29/2015	Yes	not counted	Camp Bonneville	LOCCTY
Silene seelyi	6	SC	S	7/18/2015	No		Wenatchee River RD, Okanogan-Wenatchee NF	USAFS
Silene spaldingii	62	LT	T	7/16/2015	No		Turnbull NWR	USAFWS
Trifolium thompsonii	9	SC	T	6/7/2015	Site not reached		Entiat Slopes NAP	ST DNR
Trifolium thompsonii	17	SC	T	6/7/2015	No		Entiat RD, Okanogan-Wenatchee NF	USAFS
Trillium parviflorum	49		S	3/24/2015	Yes	7,826 stems	WSDOT Southwest Region	ST WDT
Vaccinium myrtilloides	1		S	7/10/2015	Yes	10,000s stems	Tonasket RD, Okanogan-Wenatchee NF	USAFS
Viola renifolia	9		S	5/13/2015	Yes	179	Republic RD, Colville NF	USAFS
Woodwardia fimbriata	20		S	10/24/2015	No		South Puget Sound Region	ST DNR

Number of occurrences monitored: **125**
Number found: **71**
Number not found: **42**
Number of uncertain: **4**
Number of occurrences not reached: **8**

Notes:

1. EO num is the element occurrence number assigned to the site by the Washington Natural Heritage Program.
2. Federal Status: LE = listed endangered, LT = listed threatened, SC = species of concern
3. State Status: E = endangered, R1 = review species (group 1), R2 = reivew species (group 2), S = sensitive, T = threatened, X = possibly extinct or extirpated from Washington.

Table 1. Rare plant monitoring results for 2015 (continued).

Species Name	EO Num[1]	Federal Status[2]	State Status[3]	Visit Date	Species Found	Pop. Size[4]	Managed Area	Owner

4. Population size estimate represents individuals unless otherwise noted.
5. Potentially new site that may not be in WNHP database.
6. Site identified by land owner or other party and may not be in WNHP database.

Abbreviations:

ACEC - Area of Critical Environmental Concern
BSA - State University Natural Area
EWA - Established Wilderness Area
ERD - Energy Research and Development
IND - Indian Reservation
LOCCTY - City Municipality or County
NAP - Natural Area Preserve
NF - National Forest
NRCA - Natural Resources Conservation Area
NSA - National Scenic Area
NVM - National Volcanic Monument
NWR - National Wildlife Refuge
PUD - Public Utility District
PVT - Privately owned
RD - Ranger District
SI - Special Interest
ST DNR - Washington State Department of Natural Resources
ST DFW - Washington State Department of Fish and Wildlife
ST SPR - Washington State Parks and Recreation
ST UAA - State University Property
ST WDT - Washington State Department of Transportation
USABLM - Bureau of Land Management
USADOD - United States Department of Defense
USAFS - United States Forest Service
USAFWS - United States Fish and Wildlife Service
WA -Wildlife Area

Table 2. Invasive species documented at rare plant occurrences monitored and reported on by Rare Care volunteers.

Species Name	EO Num	Species Found	Invasive Species Observed	Comments
Astragalus columbianus	26	Yes	*Salsola tragus*	Large collections of prickly Russian thistle skeletons in valley
Astragalus misellus var. *pauper*	3	Yes	*Bromus tectorum*	
Boschniakia hookeri	2	No	*Cytisus scoparius*	
Calochortus longebarbatus var. *longebarbatus*	36	Yes	Nonnative grasses	
Calochortus macrocarpus var. *maculosus*	10	No	*Bromus tectorum*	
Calochortus macrocarpus var. *maculosus*	11	No	*Bromus tectorum*	Minimal
Carex sychnocephala	13	Yes	*Agrostis gigantea, Bromus commutatus, Phalaris arundinacea, Phleum pratense, Poa palustris, Poa pratensis, Cirsium arvense*	*Agrostis gigantea* common in wetland. *Bromus commutatus* common on upland side; some in wetland. *Phalaris arundinacea* - several large patches; not dominant but a serious threat. *Phleum pratense* common on upland side; some in wetland. *Poa palustris* fairly common in wetland (may or may not be native). *Poa pratensis* common on upland side; some in wetland. *Cirsium arvense* - several patches; not common but may be spreading.
Cicuta bulbifera	3	Yes	*Phalaris arundinacea, Myriophyllum spicatum*	Reed canary grass was intermixed with the cattail. Was already rather heavy. Invasive milfoil was in the shallow waters a few feet from CIBU habitat.
Cimicifuga elata	7	No	*Rubus bifrons, Helix hedera, Ilex aquifolium, Geranium robertianum, Cytisus scoparius, Senecio jacobaea*	The worst invasives are Rubus sp. Including Himalayan blackberry (*Rubus bifrons*). The park has become a refuge for many species of invasive plants, some of which are among the worst: English ivy / holly / daisy, Geranium robertianum, Scotch broom, tansy ragwort and so on.
Cimicifuga elata	11	No	*Rubus bifrons, Taraxacum officinale, Ranunculus repens*	
Cimicifuga elata	12	Yes	Ilex aquifolium	English holly trees (small & shrubby at this time) are in several locations within the forested area near the plants.
Cimicifuga elata	22	No	*Digitalis purpurea*	Area around the communications towers is very weedy with the usual suspects including *Digitalis*.

Table 2. Invasive species documented at rare plant occurrences monitored and reported on by Rare Care volunteers (continued).

Species Name	EO Num	Species Found	Invasive Species Observed	Comments
Cimicifuga elata	36	Yes	*Hedera helix, Geranium robertianum, Rubus bifrons*	
Cimicifuga elata	None	Yes	*Geranium lucidum, Rubus bifrons*	
Coeloglossum viride	4	Yes	*Trifolium repens, Phleum pratense, Cirsium vulgare, Hieracium* sp.	
Comastoma tenellum	1	No	*Taraxacum officinale*	
Cryptantha leucophaea	2	No	*Bromus tectorum, Sisymbrium altissimum, Linaria vulgaris, Centaurea stoebe, Verbascum blattaria*	Invasive species present over the entire island.
Cryptantha leucophaea	17	No	*Bromus tectorum*	Areas of high cheatgrass cover, and stable areas with moderate cheat had sporadic plants.
Cryptantha leucophaea	19	Yes	*Bromus tectorum, Sisymbrium altissimum*	*Bromus tectorum* common both on the bench and on the slopes of the ravine. *Sisymbrium altissimum* more common on the bench than at the ravine.
Cryptantha leucophaea	23	Yes	*Bromus tectorum*	Areas of high cheatgrass had no plants and large shrubs
Cryptantha leucophaea	29	Yes	*Bromus tectorum*	Areas of high cheat grass had no plants, and stable areas with moderate cheat had sporadic plants.
Cryptantha leucophaea	32	Yes	*Bromus tectorum*	Areas of dense cheatgrass had no plants, and stable areas with moderate cheatgrass had sporadic plants.
Cryptantha leucophaea	33	Yes	*Bromus tectorum*	
Cryptantha leucophaea	34	Yes	*Bromus tectorum*	
Cryptantha leucophaea	46	Yes	*Bromus tectorum, Linaria dalmatica*	Areas of high cheat grass had no CRLE6 plants, and stable areas with moderate cheat had sporadic plants.
Cryptantha leucophaea	47	No	*Bromus tectorum, Sisymbrium altissimum, Salsola tragus*	
Cryptantha leucophaea	53	No	*Bromus tectorum*	Cheatgrass abundant and vigorous
Cryptantha leucophaea	53	No	*Bromus tectorum*	Dense cheatgrass

Table 2. Invasive species documented at rare plant occurrences monitored and reported on by Rare Care volunteers (continued).

Species Name	EO Num	Species Found	Invasive Species Observed	Comments
Cryptantha leucophaea	60	Yes	*Bromus tectorum*	Four of the five sites heavily infested by cheatgrass
Cryptantha spiculifera	4	No	*Bromus tectorum, Salsola tragus, Sisymbrium altissimum, Elaeagnus angustifolia*	There was a serious wildfire on the bluff within the last few years which burned sagebrush; the slopes are fairly carpeted with Bromus tectorum, though it is only a few inches tall. 99% of vegetation on dry slopes is invasive.
Eleocharis rostellata	14	Uncertain	*Phalaris arundinacea*	Covers approximately 60% of population area.
Eremothera pygmaea	24	No	*Bromus tectorum, Sisymbrium altissimum, Salsola tragus*	
Eurybia merita	6	Yes	*Cirsium arvense, Cirsium vulgare*	
Geum rivale	7	Yes	*Hieracium caespitosum, Cirsium arvense*	
Githopsis specularioides	New	Yes	*Tragopogon dubius, Poa bulbosa, other nonnative grasses*	
Hypericum majus	12	Yes	*Hieracium caespitosum, Phalaris arundinacea, Centaurea stoebe*	
Iliamna longisepala	9	Yes	*Bromus tectorum, Centaurea* sp., *Sisymbrium altissimum, Poa bulbosa*	
Iliamna longisepala	28	Yes	*Bromus tectorum*	Cheatgrass was predominant with scattered knapweed also.
Isoetes nuttallii	None	Yes	*Bromus tectorum, Poa bulbosa*	These were more around the periphery of vernal pools than in them.
Leptosiphon bolanderi	10	Yes	*Bromus tectorum, Poa bulbosa*	The balds have fewer invasive species, although the two grasses could invade.
Lomatium suksdorfii	38	Yes	*Bromus tectorum, Poa bulbosa*	A few *Bromus tectorum* and *Poa bulbosa* present.
Nicotiana attenuata	29	Yes	*Bromus tectorum*	*Bromus tectorum* taking over open ground
Orobanche californica spp. grayana	1	No	*Phalaris arundinacea*	

Table 2. Invasive species documented at rare plant occurrences monitored and reported on by Rare Care volunteers (continued).

Species Name	EO Num	Species Found	Invasive Species Observed	Comments
Parnassia fimbriata var. *hoodiana*	2	Uncertain	*Hieracium* sp.	*Hieracium* grows abundantly in the drier areas around the PAFIH site, especially along the road and jeep track.
Pediocactus nigrispinus	31	Yes	*Bromus tectorum, Agropyron cristatum*	
Penstemon eriantherus var. *whitedii*	3	Yes	*Bromus tectorum, Salsola tragus*	Small amount of both
Platanthera obtusata ssp. *obtusata*	68	Uncertain	*Lactuca muralis*	Present but not abundant
Polemonium pectinatum	31	No	*Lepidium draba, Bromus tectorum, Artemisia absinthium*	
Polemonium pectinatum	47	Yes	*Taraxacum officinale*	
Polemonium pectinatum	52	Yes	*Bromus tectorum*	Cheatgrass is in most areas that have some topsoil.
Rotala ramosior	None	No	*Phalaris arundinacea*	
Silene spaldingii	62	No	Linaria dalmatica	
Trifolium thompsonii	17	No	*Bromus tectorum*	Especially on the SW border of the searched area below a large rock outcrop and the NW border where there is a dense monoculture of *Bromus tectorum* .
Trillium parviflorum	49	Yes	*Hedera helix, Arisaema* sp.*, Rubus bifrons*	Need for English ivy control/removal. As well as spreading over the ground, ivy also is climbing *Quercus garryana* and will eventually kill the overstory trees. Need for *Arisaema* sp. control/removal where it has invaded from adjacent landscaped areas. It is widespread in Unit 1 and invading the east end of Unit 2. Mowing should continue in order to keep *Rubus bifrons* under control.
Vaccinium myrtilloides	1	Yes	*Trifolium repens*	

Table 3. Land use and management concerns documented for occurrences monitored by Rare Care volunteers.

Species Name	EO Num	Species Found	Adjacent Land Use and Management Comments
Astragalus columbianus	26	Yes	Disturbance to plants on roadways (where population most prevalent)
Astragalus misellus var. *pauper*	3	Yes	Based on what we found, the population may be diminishing.
Carex capillaris	2	Yes	Grazing in the area
Carex pluriflora	7	No	Evidence of past flooding (dead trees). Disturbance from hiking trail/camping areas is possible, but doesn't appear substantial at this time.
Carex sychnocephala	13	Yes	There are signs of some recreational use, but it seems to be light; no trampling of the wetland was observed.
Carex tenuiflora	New	Yes	Beaver dams are raising the water level, but flat topography prevents extreme change.
Castilleja cryptantha	34	Yes	Informal trails cross the meadow, but they may be revegetating now that the lakeside campsites are closed.
Cicuta bulbifera	3	Yes	When the lake rises at the end of this year, it may be too much for the young first-year CIBU. There will likely be some trampling from cattle and activity at other studies - there is a current ornithology study cage at the edge of the site.
Cimicifuga elata	7	No	The park is aggressive in maintaining open spaces and roadsides. By brushing along all forest edges it looks like they have destroyed all suitable habitat for this species. Most suitable habitat is now covered by a very dense growth of Himalayan blackberry (*Rubus bifrons*) that grows thicker each year. Many other invasives also contribute to habitat destruction.
Cimicifuga elata	11	No	A wide area around the camping and road areas is damaged with invasive species taking over. Himalayan blackberries and other common invasives have overgrown the park. Many trails throughout the park have have caused native populations to be lost due to people and dogs.
Cimicifuga elata	34	Yes	Trail present and a geochacing container was found about 1/4 mile NE of original plant location along trail.
Cimicifuga elata	36	Yes	One site has been completely logged, and the CIEL in direct sunlight were stunted and shrivelled. Understory forest plants at other sites appear to be stressed and stunted likely from this year's drought.
Coeloglossum viride	2	Yes	Evidence of disturbance: Burns, logging, grazing.
Coeloglossum viride	4	Yes	Disturbance & threats: logging, livestock grazing, spread of weeds, partiuclarly thistle and hawkweed
Comastoma tenellum	1	No	The entrance to natural area is gated, but there are abundant motorized vehicle tracks going around the gate and on up the trail/road including past the gate in the fence where the trail/road splits and leads up to the peak. The slope on the north side of the mountain is gentle enough that, given the capability of off-road vehicles today, it would present little obstacle to reaching the summit.

Table 3. Land use and management concerns documented for occurrences monitored by Rare Care volunteers (continued).

Species Name	EO Num	Species Found	Adjacent Land Use and Management Comments
Corydalis aquae-gelidae	3	Yes	Trail, logging are possible land use threats.
Corydalis aquae-gelidae	New	Yes	Trail and access to stream may cause foot traffic through some of the habitat.
Cryptantha leucophaea	17	No	Some foot trails through area.
Cryptantha leucophaea	23	Yes	Nearer the highway, trash is prevalent.
Cryptantha leucophaea	29	Yes	Large gravel piles in NW section may be placed on plants.
Cryptantha leucophaea	32	Yes	Many paths through area from people, and trash occasionally seen, but no ATV use seen and less use further from wateway. Some plant clusters do occur directly off paths.
Cryptantha leucophaea	33	Yes	Many ATV trails through area showing regular use, and trash occasionally seen. But ATV use is likely restricted to the many tracks, leaving areas of optimal habitat undisturbed, though without CRLE6.
Cryptantha leucophaea	34	Yes	Area had a high amount of trash, including skeet shooting.
Cryptantha leucophaea	46	Yes	A patch of Dalmation todflax was observed and should be removed.
Cryptantha leucophaea	53	No	Previous grazing. Invasive species.
Cryptantha leucophaea	60	Yes	Off road vehicle tracks observed
Draba aurea	10	Yes	In both sites the plants are right alongside trails or high impact areas like the summit.
Eleocharis rostellata	14	Uncertain	Competition from aggressive grasses including *Phalaris arundinacea* and from encroaching *Betula* sp. and *Crataegus douglasii* shrubs.
Eriophorum viridicarinatum	New	Yes	The Cold Springs Ditch is currently being filled in to restore the natural shoreline. The area cottongrass was found in is several hundred meters downstream of where they stopped filling in the ditch.
Fritillaria camschatcensis	5	Yes	Disturbances and hydrology impacts: Campers and hikers. Trail building.
Fritillaria camschatcensis	18	No	The EO record states that the plant was found on the roadside by a drainage dtich. It would be subject to damage due to erosion and regraveling.
Gentiana glauca	2	Yes	Trail is nearby, but most day hikers do not make it this far.
Geum rivale	7	Yes	There is a conflict with heavy cattle grazing and protection of native and rare plants.
Hypericum majus	12	Yes	Water level changes due to dams and river and grazing by cattle may impact the population.
Lycopodium dendroideum	7	No	Site is right at the edge of the trail. It is heavily used by hikers. Improvements have been made, the log bench and gravel paths.
Parnassia fimbriata var. *hoodiana*	2	Uncertain	The area seems to be increasingly overgrown by brush, as indicated by comparing the various reports over the past years.

Table 3. Land use and management concerns documented for occurrences monitored by Rare Care volunteers (continued).

Species Name	EO Num	Species Found	Adjacent Land Use and Management Comments
Parnassia palustris var. *neogaea*	11	Yes	Disturbance: Debris in creek from landslide of some sort.
Parnassia palustris var. *neogaea*	14	Yes	The road decommissioning was devastating for this population.
Pediocactus nigrispinus	31	Yes	Stress evident from recent fires - cheatgrass and crested wheatgrass encroachment has altered lithosol environment and respective hydrology, showing evidence of inundation and causing rot in some individuals. Jeep trails, fence installations, bullet casings, trampled cacti, and horse/cattle sign indicate heavy usage.
Penstemon eriantherus var. *whitedii*	3	Yes	Evidence of fire. Dirt bike trail along adjacent ridge and beer cans.
Platanthera obtusata ssp. *obtusata*	21	Yes	Disturbance: grazing
Platanthera obtusata ssp. *obtusata*	26	Yes	Beavers are active in the area building dams.The site is protected by barb wire fences, which will need yearly inspection to ensure cattle can't get into the wetlands.
Platanthera obtusata ssp. *obtusata*	38	Yes	Disturbance closer to road by cows or moose - muddy and compacted.
Polemonium pectinatum	52	Yes	Recent soil disturbance from nearby heavy motorcycle-motorcross racing.
Sidalcea hirtipes	10	Yes	Munitions exercises, regrading, mowing , heavy equipment. Soils completely altered, large areas of soil removal. Area recently highly regraded & mowed. Other 1-2 year perennials observed, so some grow back has occurred. Disturbance ongoing at time of visit.
Trillium parviflorum	49	Yes	Trash such as paper and plastics has blown in/been tossed in from adjacent street and parking lot. Other observed disturbance includes landscape debris such as piles of tree limbs, possible runoff from adjacent parking lot, and compaction from mowing equipment or vehicles being driven over the site. Threat of gas/oil/propane spills from adjacent fuel station. Construction of the business park and channelizing of Burnt Bridge Creek altered the historic hydrology.
Vaccinium myrtilloides	1	Yes	Lots of dead logs & woody debris that will increase fire severity.
Viola renifolia	9	Yes	Sites are very heavily trampled by animals; lots of moose scat but also some cattle (may be old).
Woodwardia fimbriata	20	No	Overstory encroachment/fire suppression. There seems to be a good amount of hunting taking place in the fall - destructive markers and trash left behind.

Table 4. Addendum to 2014 rare plant monitoring results.

Species Name[1]	EO Num[2]	Federal Status[3]	State Status[4]	Visit Date	Species Found	Pop. Size[5]	Managed Area	Owner
Carex sychnocephala	9		S	8/9/2014	N		Bureau of Land Management, Spokane District	USABLM
Chrysolepis chrysophylla var. *chrysophylla*	37		S	9/28/2014	Y	12	South Puget Sound Region	ST DNR
Collomia macrocalyx	4		S	4/26/2014	N		Yakima Training Center	USADOD
Cryptantha rostellata	8		T	4/26/2014	N		Yakima Training Center	USADOD
Gentiana glauca	1		S	8/11/2014	Y	134	Mt Baker RD, Mt Baker-Snoqualmie NF	USAFS
Gentiana glauca	None[6]		S	8/17/2014	N		Mt Baker RD, Mt Baker-Snoqualmie NF	USAFS
Lycopodium dendroideum	10		S	6/28/2014	N		Mt Baker RD, Mt Baker-Snoqualmie NF	USAFS
Parnassia palustris var. neogaea	5		S	8/29/2014	N		Pacific RD, Olympic NF	USAFS
Salix sessilifolia	1		S	7/14/2014	U		Edgewater Park	LOCCTY
Silene spaldingii	8	LT	T	10/4/2014	N		Campus Prairie BSA	ST UAA
Silene spaldingii	18	LT	T	10/5/2014	N		Smoot Hill BSA	ST UAA

Notes:
See Table 1 for notes and abbreviations.

Table 5. Invasive species and land management comments for the addendum to 2014 rare plant monitoring results.

Species Name[1]	EO Num[2]	Invasive Species Observed	Invasive Species Comments	Adjacent Land Use and Management Comments
Carex sychnocephala	9	*Phalaris arundinacea*	Almost the entire circumference of the lake was overgrown with *Phalaris arundinacea.*	Signs of cattle (not fresh) were only observed at the south edge of the lake where they can access water.
Chrysolepis chrysophylla var. *chrysophylla*	37			Nearby logging. Trees had some large, dead suckers in four of the eight locations - three in closed canopy, the other in open canopy. One tree showed evidence of insect damage. The outlier tree was partly submerged in construction gravel; it showed evidence of disease in leaves.
Collomia macrocalyx	4	*Bromus tectorum*	*Bromus tectorum* was less common within the search area, but nearby along roads.	
Cryptantha rostellata	8	*Bromus tectorum*		Yes, road construction within the past few years passes through one of the sites.
Gentiana glauca	1			The most likely threat to this population is climate change. The aerial extent of the population is very limited, just 2 square meters. If the habitat were to become drier, it might eliminate this population. Climatic change may also effect plant-pollinator interactions.
Gentiana glauca	None[6]			
Lycopodium dendroideum	10			
Parnassia palustris var. neogaea	5			
Salix sessilifolia	1		Many invasive species taking over the riparian areas.	
Silene spaldingii	8			Much of the site is inhabited by woody brush and trees as well as some thick herb monocultures which may be facilitated by reduction in herbivory and fire in preserve - not "natural state"? Some herbivory though.
Silene spaldingii	18			Manager indicates that pine trees have grown in this area altering it from what was once more open and experienced more human disturbance.