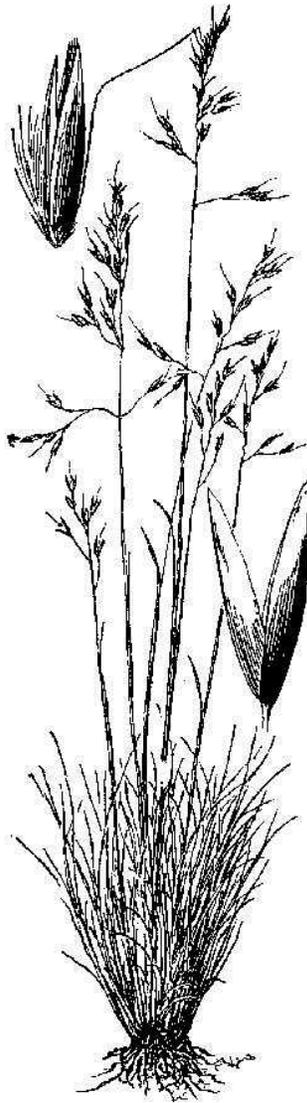


ISSSSP Final Report

***Calamagrostis breweri* Thurb. inventory, 2013**

**Deschutes, Fremont-Winema, and Willamette National
Forests**

April 2014



Introduction



Calamagrostis breweri at Jefferson Park, Willamette National Forest

At the time of the writing of the Conservation Strategy (Lippert et al, 2011), no sites of *Calamagrostis breweri* (CABR) were known from the area between Mt. Jefferson and Mt. Shasta; but in 2011, a site, found later to be misidentified, was reported in the southern portion of the Deschutes National Forest. Although ultimately not CABR (a survey in 2013 showed that it was *Deschampsia cespitosa*), that site report sparked interest in further targeted inventory for this species, which has not occurred on the Deschutes NF, Fremont-Winema NF, nor at Crater Lake National Park. It was hoped that further targeted inventory, coupled with a planned inventory in 2012 in the Mt. Thielsen Wilderness on the Umpqua NF, would reveal new sites of this rare species, giving managers the information needed to allow for more informed management of this species.

The distribution of the species occurs in two disjunct areas: in Oregon, it is found on the north side of Mt. Jefferson, and on the north and south sides of Mt. Hood; in California, it is known from the northern Sierra Nevada mountains. Other than on the Rogue-Siskiyou and

Umpqua National Forests, no inventories for this species have been conducted between Mt. Jefferson and the northern California populations.

Background

There are 55 known sites of CABR on the Mt. Hood NF, and one site on the Willamette NF. Threats, as identified in the CABR Conservation Strategy, are both from natural and human-related sources: natural threats include herbivory and seed predation by insects, rodents, and/or ungulates; human-related threats include high levels of recreational activity in and adjacent to CABR populations, which produce trampling, compaction, and erosion. This includes the maintenance of infrastructure at Mt. Hood Meadows Ski Area, where CABR populations occur. The greatest threat of all may be global climate change, with the main concern being the low genetic diversity found in CABR populations that may not be robust enough to allow for adaptation to rapidly changing habitat conditions. Finding additional populations of CABR may boost the genetic diversity of the species and allow for stochastic events to occur without making the eradication of known populations as serious as it could be currently.



This proposal was meant to address one of the data gaps listed in the CABR Conservation Strategy, which is the analysis and inventory of the 200+ mile gap between populations in northern Oregon and northern California. (Other data gaps include: the role that soil disturbance plays in the ecology of the species; the role that snow management plays in the survivorship of the species; the role that soil type plays in the distribution of the species; and genetic investigations into the differences between the northern Oregon populations).

The intent of the proposal was to gather more information which would give land managers across the breadth of the range of CABR an opportunity to put current knowledge into a broader context in which to pursue questions listed in the preceding paragraph. Thus questions about the species' genetic makeup, its habitat preferences, its response to human disturbance, and its other threats could be pursued with a potentially much more robust data set than was currently available.

Methods

Calamagrostis breweri is described as a delicate, caespitose (tufted or bunchgrass) perennial, found on stream banks, lake margins and moist alpine or subalpine meadows and tree islands (Lippert et al, 2011).

Suitable habitat in Oregon, as described in the Conservation Strategy, is restricted to subalpine habitats in a narrow elevation range, with most populations in Oregon occurring between 5000-6000'. *C. breweri* is usually found in moist meadows with limited vegetative competition from species such as *Phyllodoce* and *Cassiope*. All of the sites are seasonally moist, but specific habitats vary. Site reports indicate that *C. breweri* is usually found in microsites with limited vegetative competition. Almost all populations are reported from open meadows, but some sites contain tree species, most frequently *Tsuga mertensiana* (Lippert et al 2011).

Inventories were conducted in suitable habitat on all three districts of the Deschutes NF, within the Mt. Jefferson Wilderness and Three Sisters Wilderness on the Willamette NF, and on the Klamath and Chemult districts of the Fremont-Winema NF.

Although there are other species CABR could be confused with, such as high elevation *Agrostis* (Jenny Lippert, pers. comm. 2/13/14), Chris Wagner, Detroit Ranger District botanist, indicates the species is readily seen if surveyed for at the right time (September for the Willamette NF sites); additionally, it is of sufficient height (approximately 12") to detect (Wagner, pers. comm. 3/11/14). It also has a reddish tint which is helpful.

While most units did not provide information on their methodologies, it is presumed, as Burt Thomas from the Willamette NF put it, that "...the CABR surveys used visual and botanical information from print reference (Hitchcock, Jepson, etc.) and what was available from various internet sources (USDA PLANTS, CalFlora, Flickr, etc.) to help establish a search image and gauge suitable habitat."

Results

No CABR was located in any of the units inventoried.

Surveys will be entered into the NRM database, as well as any incidental finds of other species of interest.

Sites of other sensitive species were located on the Sisters, Klamath, and Chemult Ranger Districts (see pertinent sections for further information).

See Appendix A for an overview map displaying surveyed areas and known sites.

Deschutes NF

Bend/Ft. Rock Ranger District

As provided by Charmane Powers, Bend/Ft. Rock RD botanist:

Inventories were conducted by Marlo Fisher, Charmane Powers, and Kathleen Cooper (contract botanist). Areas between Cultus Lake and the south base of South Sister at Moraine Lake were investigated, encompassing about 100 acres total. We initially looked at areas that were too wet for this species, but refined our habitat search image to the drier lake and meadow margins. We felt some of the best habitat was that found at the margin of Moraine Lake and in the area where its outlet creek (Goose Creek) emerges from the lake. However, we found *Deschampsia cespitosa* there instead.



At Moraine Lake outlet, base of South Sister, Bend/Ft. Rock Ranger District



Northeast of Cultus Lake, Bend/Ft. Rock Ranger District

Sisters Ranger District

As provided by Rick Dewey, Deschutes National Forest Assistant Botanist:

Rick Dewey spent several days in the vicinity of Trapper Meadow, Three Creeks Lake, Little Three Creeks Lake and visiting small wet meadows in the woods between these three sites. Also did a day hike up to the upper Canyon Creek Meadow, so pretty much visited the Sisters sites listed in the proposal. Most promising habitat, i.e., treeline elevations with both *Carex nigricans* and *Phyllodoce* present was found at the northern edge of the Little Three Creek Lake and at the upper Canyon Creek basin. Incidentally, while in the Three Creeks Lake area, he found three new *Tomentypnum nitens* populations (Trapper Meadow, Little Three Creek Lake and a good-sized fen in the PICO-PIEN-ABIES-TSME-PIAL woods in between. He also found two new *Carex capitata* sites (Little Three Creek Lake and a southern lobe of Trapper Meadow system – although we might choose to call this latter site a subpop, as there is a documented site of CACA13 in the northern corner of the main Trapper Meadow). He also detected a new site of the sensitive liverwort *Harpanthus flotovianus* in a wooded seepage area south (upslope) of the Three Creek Meadow Campground.



Upper Canyon Creek basin, Sisters Ranger District



Little Three Creeks Lake, Sisters Ranger District

Crescent Ranger District

As provided by Christina Veverka, District Botanist (abridged):

Potential survey areas for were selected by comparing Google Earth aerial images of the known sites of *Calamagrostis breweri* (Brewer's sedge) on Mt. Hood and Mt. Jefferson (Lippert et. al 2011) with aerial imagery of subalpine areas within the Crescent Ranger District. From this comparison of aerial imagery, only one area was determined to have similar habitat features (subalpine meadows and draws with low to moderate vegetation cover) as those of the known sites on Mt. Hood and Mt. Jefferson. This area, a collection of small, subalpine lakes and meadows below Diamond Peak, was then targeted for surveys to locate new occurrences of *Calamagrostis breweri*.

A backcountry survey was conducted on September 9-11, 2013. The timing of field work for late summer was scheduled to coincide with the timing of flowering of *Calamagrostis breweri* plants, so that potential specimens could be taxonomically identified. The survey area was located within the Diamond Peak Wilderness, which lies within the southern region of the Deschutes National Forest. The potential survey areas were located along a section of the Pacific Crest Trail that traverses below Diamond Peak. Access to these areas was made cross-country from Yoran Lake, with access to the lake from the Yoran Lake Trail which lies south of Odell Lake.

Using the controlled intuitive method, areas were surveyed by Christina Veverka, Crescent District Botanist, and Liz Ballenger, seasonal botanist. These survey areas consisted of grass and sedge-dominated meadows adjacent to small lakes and between narrow, rocky ridges. Dominant vascular species were documented during the survey, and any unknown species were collected for identification (no Threatened, Endangered, Sensitive, or Survey and Manage species were found). Within Oregon, site reports have indicated that CABR plants have been found within microsites that had limited vegetation competition (Lippert et. al 2011). This is in contrast to the Diamond Peak meadows that were surveyed, which were heavily sedge or grasses dominated, and uniformly covered with vegetation. The exception to this were the drier meadows found just below the rock scree slopes. These sites tended to have a greater forb component and an overall sparser cover of vegetation. It may be that the meadow habitats below Diamond Peak are too vegetated and therefore do not provide any available microsites for Brewer's sedge. Although the Diamond Peak meadows surveyed do retain moisture into late summer, these sites were dry by September. It may be that these areas tend to have more droughty soils that do not retain sufficient moisture for Brewer's sedge.

Although potential subalpine meadows were thoroughly surveyed, no occurrences of Brewer's sedge were found. However, these sites had many similar habitat features as has been documented with the known Brewer's sedge sites on the Mt. Hood and Jefferson sites, most notably similar associated species.

The dominant plant species observed during the surveys included *Phyllodoce*, *Luetkea*, *Deschampsia atropurpurea*, and *Carex nigricans*. All of these species have also been identified as associated species at the documented Brewer's sedge sites in Oregon, with *Carex nigrans* and *Luetkea pectinata* the most common of these associates (Lippert et. al 2011). Within the survey areas, it was observed that *Carex nigricans* was often the dominant species within sedge meadows that were adjacent the small, cairn lakes that dot this region of the Diamond Peak Wilderness. Within drier meadows that lie between rocky ridges, the dominant species tended to be stands of *Deschampsia atropurpurea*.



Diamond Peak Wilderness, Crescent Ranger District



Subalpine meadow below Diamond Peak, Crescent Ranger District

Fremont-Winema NF

Klamath and Chemult Ranger Districts

As provided by Missy Anderson, west zone botanist:

102 acres were surveyed for the *Calamagrostis breweri* Multi-Unit Inventory, using NFIM dollars from the funded ISSSSP proposal. An additional 54 acres were surveyed by FS botany crew and volunteers. 13 sites of 4 different special status botany species were located and mapped. One noxious weed site was located and mapped.

ID	location	acres	date surveyed	target found	other special status species found
1	miller lake	1.5	9/5/2013	no	Gastroboletus subalpinus - 1 site
2	7 mile marsh	18.8	8/29/2013	no	Gastroboletus subalpinus - 5 sites
3	big meadows	54.5	8/21/2013	no	Tomenthypnum nitens - 1 site
4	4 mile lake	3.4	8/21/2013	no	none
5	365 quarry	1.3	8/21/2013	no	none
6	wolf lake	10.1	8/21/2013	no	Schoenoplectus subterminalis - 1 site
7	bull north	6.5	9/18/2013	no	Schoenoplectus subterminalis - 1 site with 3 subpopulations
8	bull south	4.5	9/18/2013	no	Scheuchzeria palustris ssp. americana - 1 subpopulation
9	3449 rd	1	9/18/2013	no	Gastroboletus subalpinus - 1 site



7 Mile Marsh, Chiloquin Ranger District, Fremont-Winema NF

Willamette National Forest

McKenzie River Ranger District

As provided by Burt Thomas, District Botanist:

Survey occurred September 12-16 in the western Cascades, Three Sisters Wilderness. Areas surveyed include: Lane Plateau (1-2 acres), Linton meadow (2 acres), Colechuck/Separation meadow (1.5 acre), Buck meadow (4 acres), and Racetrack meadow (0.5-1 acre). I took time to look at Lane Plateau en route to Linton meadow. Lane Plateau's most conspicuous vegetation consists of Subalpine daisy, fleecflower, and tufted hairgrass. I spent two nights at Linton meadow. Linton's dominant vegetation is similar to Lane Plateau. I hiked through Racetrack meadow and did not spend a great deal of time surveying the area because it did not appear suitable habitat. Colechuck meadow was wetter, greener, and dominated by more flowering forbs (golden rod, Monk's hood, and delphinium) than grasses. Separation was dryer than Colechuck, but it has areas where various sedges and other vegetation adapted to wet areas is prevalent because Separation Creek runs through the meadow. Buck meadow may be the most suitable habitat surveyed because it is dominated by grasses. In visiting Buck meadow, it was observed to be mainly dominated by tufted hairgrass and a few other grass species. Based on a conversation with another Forest botanist, the McKenzie River Ranger District sites visited may be at the very fringe of suitable habitat; compared to CABR sites to the north in Jefferson Park (+6,000 ft.), westside meadows in the Three Sisters Wilderness may not be of sufficient elevation to support CABR populations.



Buck Meadow, McKenzie Ranger District



Racetrack Meadow, McKenzie Ranger District

Detroit Ranger District

As provided by Molly Juillerat, Botanist:

Surveys were conducted over about 100 acres in the Mt. Jefferson Wilderness from north to south. No new populations were found. Four transects were installed within previously-known populations at Jefferson Park, where CABR was in abundance: two near designated camping areas and two near Russell Lake.

Habitat for CABR seems to be very specific. We looked in other meadows at similar elevations but they were very different in overall species composition and also different hydrologic regimes. The surveys in Mt. Jefferson were not part of the original ISSSSP proposal. We had the opportunity to monitor the known site at Jefferson Park in the Mt. Jefferson wilderness.



New transect established at Jefferson Park

Discussion

To the best of our current knowledge, there still remains a large area between the northern California and northern Oregon populations where *Calamagrostis breweri* is absent. We can say that, after this effort, there appears to be more support for the idea that CABR occupies a narrow habitat niche in Oregon, one which does not appear to be well represented.

Coupled with the Umpqua NF's 2012 inventory of the Mt. Thielsen Wilderness, where no CABR was located, this summer's inventory begs the question: why does this species skip so much territory?

Further investigations could focus on the physical characteristics at known sites; in particular, the soil types at known populations, and hydrologic regimes. Elevation was also mentioned as a possible factor. This may help refine future inventories.

Tufted hairgrass (*Deschampsia cespitosa*) was noted on the Deschutes and Willamette to occupy the niche where CABR might have been expected, in the drier meadows. *Deschampsia atropurpurea* was noted on the southern portion of the Deschutes NF, as well.

The results of the 2013 broad inventory would appear to affirm its heritage ranking in Oregon (G3, S2).

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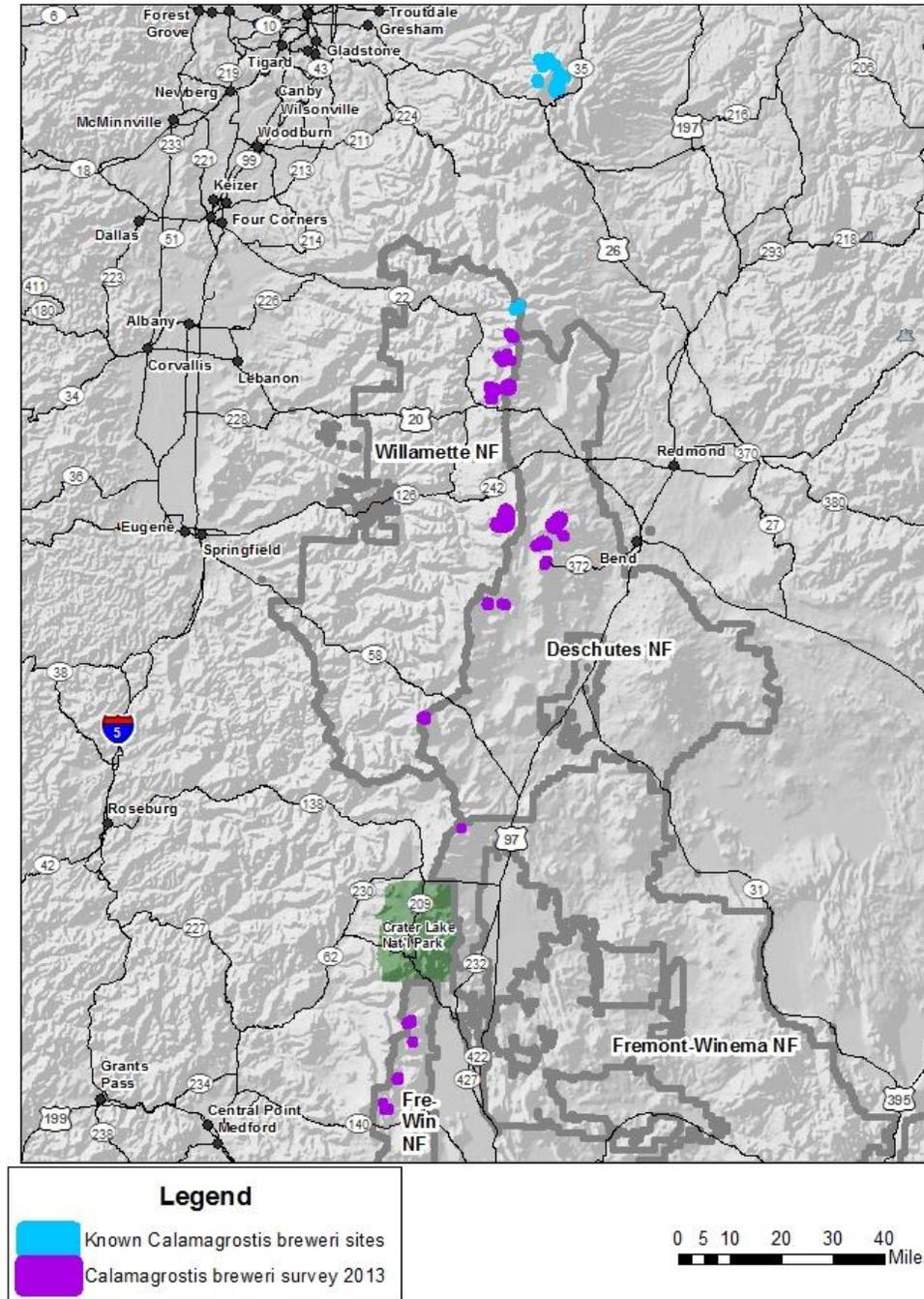
Jefferson Park, Willamette National Forest

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District Botanist, Bend/Ft. Rock Ranger District

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updated 18 April 2014

APPENDIX A

Calamagrostis breweri surveys: Deschutes, Fremont-Winema, and Willamette NF's 2013



Note: All site polygons have been enlarged here so they may be readily seen at this broad scale.