SPECIES: Scientific [common]	***Parrya rydbergii* [Rydberg's parrya]** Incorrectly applied name: ***Parrya nudicaulis***
Forest:	Bridger-Teton National Forest
Forest Reviewer:	**R.Lehman; Trevor Bloom**
Date of Review:	**5/7/20; 4/7/2021; 4/7/2025**
Forest concurrence (or recommendation if new) for inclusion of species on list of potential SCC: (Enter Yes or No)	**No**

FOREST REVIEW RESULTS:

1. The Forest concurs or recommends the species for inclusion on the list of potential SCC:
   Yes___ No__X_

2. Rationale for not concurring is based on (check all that apply):
   Species is not native to the plan area _____
   Species is not known to occur in the plan area _____
   Species persistence in the plan area is not of substantial concern ____X___

FOREST REVIEW INFORMATION:

1. Is the Species Native to the Plan Area? Yes_X__ No___

   If no, provide explanation and stop assessment.

2. Is the Species Known to Occur within the Planning Area? Yes_X__ No____

   If no, stop assessment.

Table 1. All Known Occurrences, Years, and Frequency within the Planning Area

Year Observed	Number of Individuals	Location of Observations (USFS District, Town, River, Road Intersection, HUC etc.)	Habitat Description	Source of Information[1]
8/1/1925	Unknown	U.S.A., Wyoming, Sublette County: Sheep Mountain: in the vicinity of Green River Lakes. 43.2754° N, 109.8766° W; NAD 83, uncertainty 2 mi., Digital Map	Limestone slide. Elev. 9000-11600 ft. Phenology: fruiting	Edwin B. Payson, 4504. with Lois B. Payson (Rocky Mountain Herbarium 2020)
8/9/1990	Unknown	U.S.A., Wyoming, Sublette County: West Slope Wind River Range: Gypsum	Alpine broken limestone/shale talus slope on west flank of peak.	Walter Fertig, 5706 (Rocky Mountain

		Mountain; ca 28 air mi N of Pinedale. 43.26917° N, 109.91694° W; uncertainty 2 mi.	Elev. 10600-11515 ft. Phenology: fruiting.	Herbarium 2020)
8/15/1991	Unknown	U.S.A., Wyoming, Sublette County: West Slope Wind River Range: north slope of Gypsum Mountain; ca 29 air mi N of Pinedale. 43.26917° N, 109.91694° W; uncertainty 2 mi.	Open canopy limestone-shale crumbly talus on alpine ridge separating two small cirques. Elev. 10000-11200 ft. Phenology: fruiting.	Walter Fertig, 11498 (Rocky Mountain Herbarium 2020)
8/15/1991	Unknown	U.S.A., Wyoming, Sublette County: Wind River Mountains: E of lower Green River Lake, crest of limestone ridge S of Mill Creek, N of Clear Creek, just S of highest flat area on crest. 43.3203° N, 109.8221° W	On mostly barren limestone scree, with small mats of alpine willow nearby. Elev. 10950 ft. Phenology: fruiting.	Hollis Marriott, 11404. with Dennis Horning (Rocky Mountain Herbarium 2020)
8/17/1991	Unknown	U.S.A., Wyoming, Sublette County: West Slope Wind River Range: between Valaite Lake W to divide then N to slope of Big Sheep Mountain. 43.2558° N, 109.8786° W	Talus and boulder slopes. Elev. 10200-11200 ft.	Ronald L. Hartman, 31107. with Jonathan Hughes (Rocky Mountain Herbarium 2020)
8/10/1993	Unknown	U.S.A., Wyoming, Sublette County: West Slope Wind River Range: ridge on west slope of Osborn Mountain; ca 1 1/4 air mi E of Lower Green River Lake. 43.3196° N, 109.8247° W; uncertainty 1 mi.	West facing barren limestone talus slopes below summit ridge; with *Parrya, Saussurea, Hymenoxys grandiflora,* and *Senecio amplectens*. Elev. 10800 ft. Phenology: flowering & fruiting.	Walter Fertig, 14323. with Charmaine and Larry Refsdal (Rocky Mountain Herbarium 2020)
8/16/1994	Unknown	U.S.A., Wyoming, Teton County: Gros Ventre Area: east slope of Darwin Peak. 43.3853° N, 110.2931° W; uncertainty 1 mi.	Rocky alpine slopes. Elev. 9600-10800 ft. Phenology: fruiting.	Ronald L. Hartman, 49437. with Tom Cramer
8/17/1994	Unknown	U.S.A., Wyoming, Sublette County: Gros Ventre Area:	Rocky alpine ridge and upper slopes. Elev. 10400-11535 ft.	Ronald L. Hartman,

		Triangle Peak NE to low point of ridge. 43.371° N, 110.2539° W; uncertainty 3 mi.	Phenology: fruiting.	49584. with Tom Cramer
8/18/1994	Unknown	U.S.A., Wyoming, Sublette County: West Slope Wind River Range: south slope of Gypsum Mountain; ca 0.5 mi N of South Fork Gypsum Creek; ca 3/4 mi W of Big Sheep Mountain. 43.2622° N, 109.9044° W; uncertainty 0.25 mi.	Alpine talus slope of gray limestone and pinkish-brown sandstone just below summit rim. Elev. 11200 ft. Phenology: fruiting.	Walter Fertig, 15414 (Rocky Mountain Herbarium 2020)
8/20/1994	Unknown	U.S.A., Wyoming, Sublette County: West Slope Wind River Range: ridge on east slope of Big Sheep Mountain, 3/4-1 mi W of Lower Green River Lake, ca 29 air mi N of Pinedale. 43.2825° N, 109.8592° W; uncertainty 1 mi.	West facing limestone-sandstone talus slope from just below timberline upslope to alpine ridge crests; low cover, plants restricted to crevices in bedrock and gravel. Elev. 9600 ft. Phenology: fruiting.	Walter Fertig, 15421 (Rocky Mountain Herbarium 2020)
8/4/1998	Unknown	U.S.A., Wyoming, Sublette County: Gros Ventre Range: north side of Triangle Peak, ca 0.4 mi E of Brewster Lake; ca 2 mi SW of Lunch Lake. 43.371° N, 110.2735° W; uncertainty 0.25 mi.	Calcareous talus slopes on semi-stable ridgeline leading to summit cone; cushion plant community with scattered *Silene acaulis, Dryas,* and *Polemonium*. Elev. 10500-11000 ft. Phenology: flowering & fruiting.	Walter Fertig, 18498 (Rocky Mountain Herbarium 2020)
8/4/1998	Unknown	U.S.A., Wyoming, Sublette County: Gros Ventre Range: saddle at north end of Doubletop Mountain and lower slopes on north side of Doubletop Peak, ca 1.5 mi S of Brewster Lake. 43.3567° N, 110.2931° W; uncertainty 0.25 mi.	Cushion plant community on gravelly dolomite rim of saddle above steep wall of limestone; vegetative cover up to 50%, rock cover ca 40%; dominants include *Phlox pulvinata, Astragalus kentrophyta, Castilleja pulchella, Smelowskia, Carex nardina,* and *Dryas*. Elev. 11000-11600 ft. Phenology: flowering & fruiting.	Walter Fertig, 18518 (Rocky Mountain Herbarium 2020)

[1]The Consortium of Pacific Northwest Herbaria and WYNDD GIS data was also searched, and no additional occurrences were found (Consortium of Pacific Northwest Herbaria 2020; WYNDD 2019).

a. Are all Species Occurrences Only Accidental or Transient?

Yes___ No_X__

If yes, document source for determination and stop assessment.

b. For species with known occurrences on the Forest since 1990, based on the number of observations and/or year of last observation, can the species be presumed to be established or becoming established in the plan area?

Yes_X__ No__

If no, provide explanation and stop assessment

c. For species with known occurrences on the Forest predating 1990, does the weight of evidence suggest the species still occurs in the plan area?

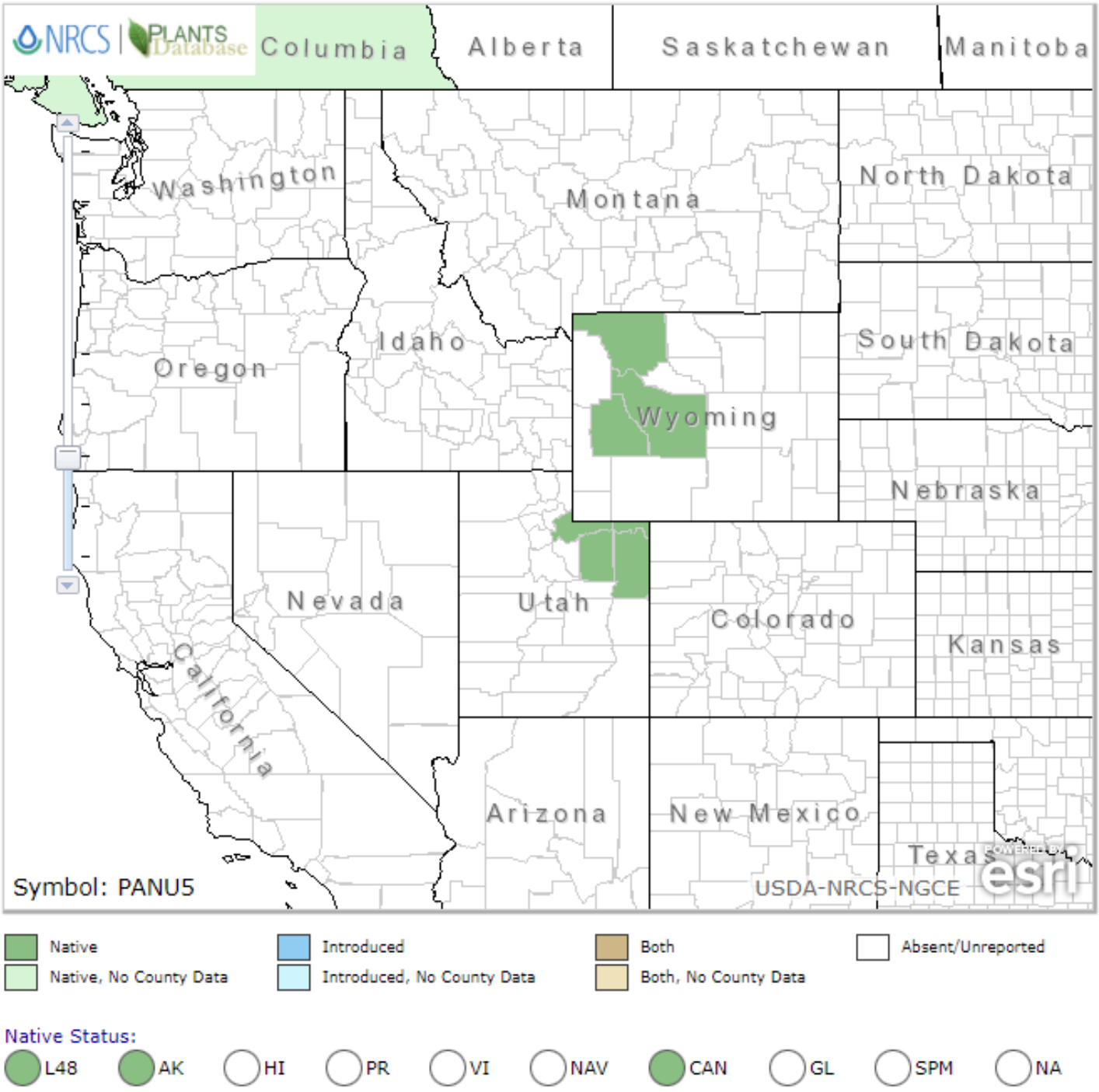
Yes___ No___

Provide explanation for determination

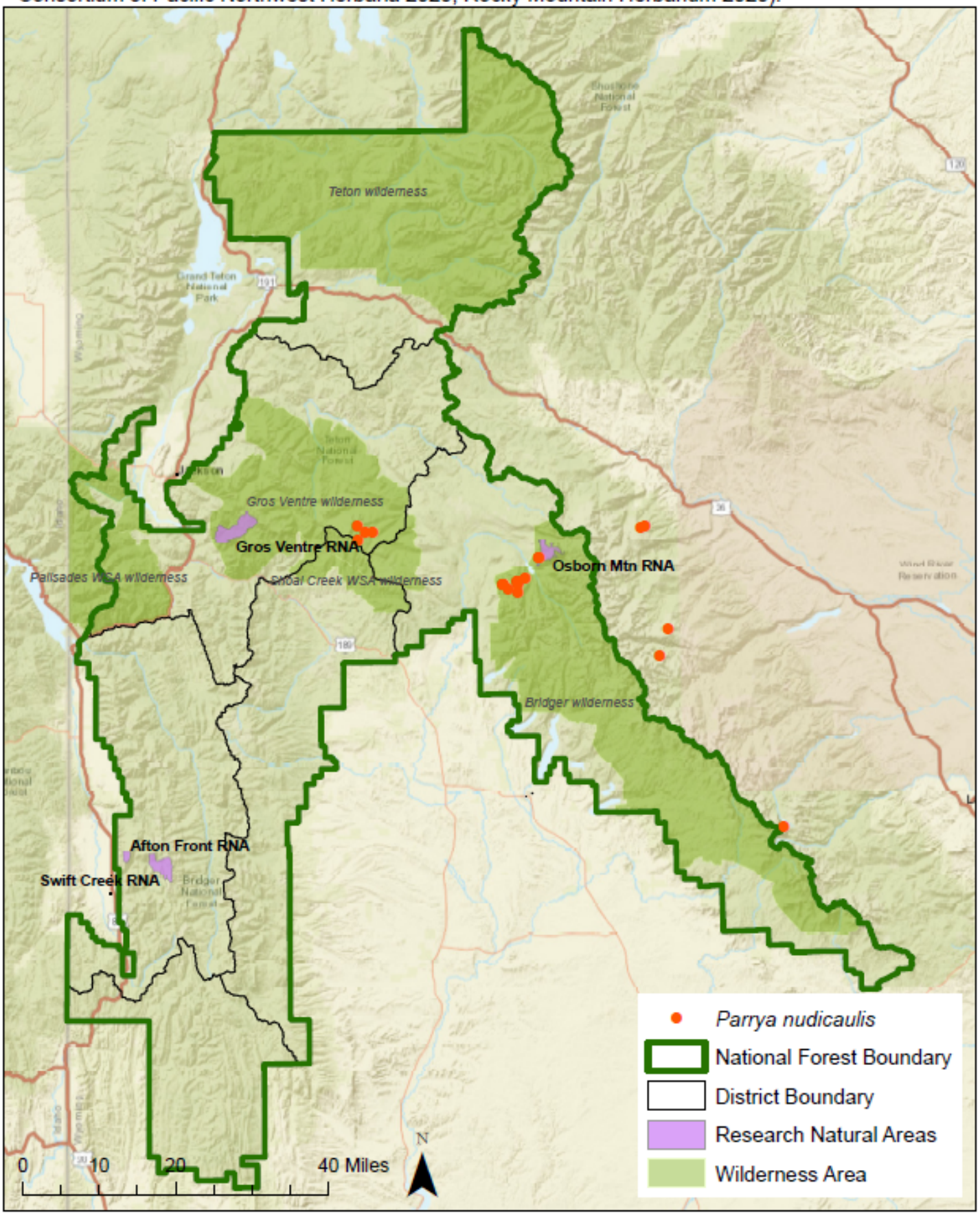
N/A–Occurrences have been documented since 1990.

If determination is no, stop assessment

Map 1, *Parrya nudicaulis* range in Wyoming and surrounding states (NRCS 2020).



Map 2, *P. nudicaulis* occurrences in Bridger-Teton National Forest vicinity (SEINet 2020; Consortium of Pacific Northwest Herbaria 2020; Rocky Mountain Herbarium 2020).



3. Is There Substantial Concern for the Species' Capability to persist Over the Long-term in the Plan Area Based on Best Available Scientific Information?

Table 2. Status summary based on existing conservation assessments

Entity	Status/Rank (include definition)
NatureServe Global Status	**G3—Vulnerable** *At moderate risk of extinction due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors.*
NatureServe State Status	**S2—Imperiled** *At high risk of extirpation in the jurisdiction due to restricted range, few populations or occurrences, steep declines, severe threats, or other factors.*
WYNDD	**Plant Species of Concern** *Species vulnerable to extirpation at the global or state level due to:* *a. their rarity (e.g., restricted distribution, small population size, low population density)* *b. inherent vulnerability (e.g., specialized habitat requirements, restrictive life history)* *c. threats (e.g., significant loss of habitat, sensitivity to disturbances)* (Wyoming Natural Diversity Database - Species of Concern)
USDA Forest Service	**Region 4: Sensitive Species** *Those plant and animal species identified by a Regional Forester for which population viability is a concern, as evidenced by* *a. Significant current or predicted downward trends in population numbers or density.* *b. Significant current or predicted downward trends in habitat capability that would reduce a species' existing distribution.* (FSM 2670.5 – Threatened, Endangered & Sensitive Species)
USDOI FWS	Not listed
USDOI BLM	Not listed
IUCN	Not listed

Sources: WYNDD 2020; Heidel 2018; USDA Forest Service Regions 2 and 4 Sensitive Species Lists; NatureServe 2020

Table 3. Status summary based on best available scientific information.

Criteria	Rationale
Distribution on the Bridger-Teton National Forest	*Parrya rydbergii* (formerly *P. nudicaulis*) is known from 12 records on the Bridger-Teton National Forest, all but one of which is from 1990 or later. These records are on the central to central-east portion of the Forest, on alpine slopes and ridges (Table 1, Map 2). All records are within the Bridger and Gros Ventre wilderness areas. *P. rydbergii* was formerly treated as a subspecies of *P. nudicaulis* and later reduced to synonymy of that species. It is geographically disjunct from *P. nudicaulis* and can be easily distinguished from that nearest relative (Flora of North America 2020). Therefore, occurrences on the Bridger-Teton National Forest, which are recorded as *P. nudicaulis*, are treated as *P. rydbergii* in this assessment.
Distribution outside the Bridger-Teton National Forest	*Parrya rydbergii* is a regional endemic of Utah and Wyoming in treatment by Al-Shehbaz (2010), but it was previously treated as part of widespread circumboreal species (*P. nudicaulis*) that occurs from Alaska to Nunavut, south to British Columbia (WYNDD 2020). In Wyoming, it is known from Beartooth, Gros Ventre, and Wind River Ranges (Fremont, Park, Sublette, and Teton counties) (Flora of North America 2020; WYNDD 2020).
Abundance on the Bridger-Teton National Forest	Population data are available from only 4 occurrences, but these figures suggest that the species numbers at least 100,000 individuals in Wyoming in over 450 acres of habitat (WYNDD 2020). Abundance on the Bridger-Teton National Forest may therefore be common, but more data is needed for verification.
Population Trend on the Bridger-Teton National Forest	This species was thought to be much less common than surveys in 1994 indicated. These higher numbers are probably due to better sampling rather than a recent population increase (Fertig 2000; WYNDD 2020). However, due to lack of population data, population trends on the Bridger-Teton National Forest cannot be assessed.
Habitat Trend on the Bridger-Teton National Forest	This species inhabits alpine tundra, usually in rock stripes, boulder fields and talus in Utah. Wyoming populations are on steep, unconsolidated alpine talus slopes, pavement or cliff crevices of gray limestone or pinkish sandstone in the alpine or upper subalpine zones, with low cushion plants and alpine willow species, and also on moist grassy hummocks on low saddles (WYNDD 2020). To analyze trends in occupied habitat, aerial imagery and a USFS GIS database of invasive plant populations, historical wildfires, trails, roads, Wilderness Areas, and Research Natural Areas was assessed at each

Criteria	Rationale
	contemporary occurrence on the Forest (USFS GIS 2019, Google Earth Pro 2020). • Collections #49437 (1994): within Gros Ventre wilderness area; not within RMU; no open roads or motorized trails; within vicinity of non-motorized trails; not within perimeter of large fire events; not within vicinity of any mapped non-native plant invasions • Collection #49584 (1994): within Gros Ventre wilderness area; within or on border of RMU; no open roads or motorized trails; within vicinity of non-motorized trails; not within perimeter of large fire events; not within vicinity of any mapped non-native plant invasions • Collection #18498 (1998): within Gros Ventre wilderness area; on border of RMU; no open roads or motorized trails; within vicinity of non-motorized trails; not within perimeter of large fire events; not within vicinity of any mapped non-native plant invasions • Collection #18518 (1998): within Gros Ventre wilderness area; not within RMU; no open roads or motorized trails; within vicinity of non-motorized trails; not within perimeter of large fire events; not in vicinity of any mapped non-native plant invasions • Collection #11404 (1991), Collection #14323 (1993): within Bridger wilderness area; not within RMU; not within vicinity of open roads, motorized trails, or non-motorized trails; on the border or within the 1988 Natural Bridge Fire, but population observed after the event; not in vicinity of any mapped non-native plant invasions • Collection #15421 (1994): within Bridger wilderness area; not within RMU; not within vicinity of open roads or motorized trails; within vicinity (1 mi) of non-motorized trails; not within perimeter of large fire events; not in vicinity of any mapped non-native plant invasions • Collection #4504 (1925): within Bridger wilderness area; not within RMU; not within vicinity of open roads or motorized trails; within vicinity (1 mi) of non-motorized trails; not within perimeter of large fire events; not in vicinity of any mapped non-native plant invasions • Collection #15411 (1994): within Bridger wilderness area; not within RMU; not within vicinity of open roads or motorized trails; within vicinity (1 mi) of non-motorized trails; not within perimeter of large fire events; not in vicinity of any mapped non-native plant invasions • Collection #31107 (1991): within Bridger wilderness area; not within RMU; not within vicinity of open roads or motorized trails; within vicinity (1 mi) of non-motorized trails; not within perimeter of large fire events; not in vicinity of any mapped non-native plant invasions • Collection #15414 (1994): within Bridger wilderness area; not within RMU; not within vicinity (1 mi) of open roads, motorized trails, or non-motorized trails; not within perimeter of large fire events; not in vicinity of any mapped non-native plant invasions

Criteria	Rationale
	• Collection #5706 (1990), #11498 (1991): within Bridger wilderness area; not within RMU; not within vicinity of open roads, motorized trails, or non-motorized trails; not within perimeter of large fire events; not in vicinity of any mapped non-native plant invasions The above analysis suggests that habitat for *P. rydbergii* has likely experienced low effects from natural and anthropogenic disturbances, and trends may be stable on the forest. However, climate change effects could degrade conditions, as described below.
Threats to the Species and its Habitat on the Bridger-Teton National Forest	Immediate threats are inferred to be low in the species' rugged alpine habitat, which is adequately protected by management policy and rough terrain (Fertig 2000; WYNDD 2020). This species is dependent on natural disturbances to maintain rockslide habitat (Fertig 1995; WYNDD 2020). Because alpine vegetation and barren rock mainly occur in designated wilderness, roadless, or remote areas where human interference disturbance is minimal, alpine communities are considered to be relatively stable. However, alpine communities are possibly the ecosystems in the region that are most at risk from the effects of climate change because of their shrinking habitat. According to Intermountain Adaptation Partnership assessments, alpine communities have a high sensitivity to climate change, a low adaptive capacity, and very high vulnerability to climate change (Halofsky, et al. 2018). Climate change is expected to cause increasingly warmer and wetter conditions, with worsening summer drought, and alpine areas may transition from snow-dominated to rain-dominated. An extended growing season is projected to occur in the alpine which can result in interspecific competition for resources, changes in plant community composition and displacement of rare plant populations where they currently occupy specific niches (Halofsky et al. 2018). Alpine systems are dependent on snowfields and gradual snowmelt to maintain moisture for vegetation. Warming temperatures, increased drought, and changes in the depth and persistence of snowpack, surface water flow, and timing of peak runoff are projected to greatly affect alpine habitat in the Intermountain Region (Halofsky et al. 2018). The composition and distribution of alpine ecosystems will be affected by decreasing snowpack. For high-elevation vegetation, climate change may affect seed germination and survival by modifying moisture availability and therefore result in reduced plant success. Specific effects will depend on vulnerability thresholds of the characteristic species and the rate and magnitude of changes over time. Reduced snowpack with warming is likely to cause major changes in alpine plant communities (Halofsky, et al. 2018). Some loss of alpine vegetation communities, especially mesic meadows, attributed to upslope migration of trees and shrubs may occur (Halofsky et al. 2018). Some, subalpine communities may have potential to

Criteria	Rationale
	migrate higher in elevation as a response to changing conditions, but this may be limited by underdeveloped soils at higher altitudes. Furthermore, the rate of climatic change in alpine communities may outpace the ability of species to shift their distribution (Ash et al. 2016; Dirnbock et al. 2011). Other communities may already exist at the highest elevations in the BTNF and, therefore, may have limited upward migration potential. Rare plant populations that may be small, isolated, tied to snowpack abundance and distribution timing changes of spring thaw and fall frost cycles, and/or have limited dispersal capacity, are highly vulnerable to impacts from environmental change including reductions in pollination (Ellstrand and Diane 1993, Halofsky et al. 2018). Changes in temperature and precipitation may lead to greater variability in forb flowering, which could create an asynchronistic effect with native pollinator emergence (Halofsky et al. 2018; Miller-Struttmann et al. 2015), leading to decreased reproduction in native plants. The value of pollinators in natural systems is difficult to quantify, but as pollinators are critical for successful reproduction and seed set for approximately 85% of flowering species globally (Hatfield et al. 2012), this asynchronistic effect may have profound implications.
Life history and demographic characteristics of the species	*Parrya rydbergii* is a glandular, perennial herb with stems up to 20 cm high. The stout, woody rootstalk is branched and covered by old leaf bases. Leaves are mostly basal and have oblanceolate, entire to coarsely toothed, stalked blades 5-25 mm wide. The flowers have four pink to lavender (sometimes white) petals and four purple glandular or glabrous sepals and are arranged in a raceme. The oblong, flattened fruits are usually over 2 cm long and constricted between the seeds (torulose). The flowering/fruiting period is from July to early August (Fertig 2000; WYNDD 2020). Studies on *P. nudicaulis* have shown that plants are self-compatible and strongly protandrous, setting almost no seed in the absence of pollinators. In one study, floral visitation rates were low in both years of the study and the most frequent pollinators were syrphid and muscid flies (Fulkerson et al. 2012). Pollen limitation was severe and may be the result of selection favoring an overproduction of ovules as a bet-hedging strategy in the context of highly variable pollen receipt (Fulkerson et al. 2012)
Date: May 1, 2020 Reviewer: L. Chipman	

Summary and Recommendations
Species (Scientific and Common Name): ***Parrya rydbergii*** (Rydberg's parrya)
Parrya rydbergii has a conservation ranking of G3 S2. The formerly recognized name of Parrya nudicaulis has been relegated to those populations endemic to Alaska and Canada. The name Parrya rydbergii is now appropriate for populations in the continental US. It has a disjunct distribution in Utah and Wyoming. In Utah, P. rydbergii is confined to the Uinta Mountains. In Wyoming it is documented in the Absaroka, Gros Ventre and Wind River Ranges. Wyoming represents about 1/2 to 3/5 of the global distribution of this species. On the Bridger-Teton there are 18 plus one historic (1925) occurrences. Populations are on steep, unconsolidated alpine talus slopes, pavement or cliff crevices of gray limestone or pinkish sandstone in the alpine or upper subalpine zones, with low cushion plants and alpine willow species, and also on moist grassy hummocks on low saddles (WYNDD 2020). Such habitat is largely unsuitable for invasion by exotic species, unsuitable for grazing and avoided by recreationists. That said, all of the populations occur within designated wilderness areas and only a few fall on the border of actively grazed RMUs. Population data are available from 4 occurrences, and these figures suggest that the species numbers at least 100,000 individuals in Wyoming in over 450 acres of habitat (WYNDD 2020). Abundance on the Bridger-Teton National Forest may therefore be common, but more data is needed for verification. Given existing wilderness protections, abundance in known populations, and habitat which is resistant to most disturbance, it is recommended that Parrya rydbergii not be included as a species of conservation concern.
Evaluator: Jessica Irwin & Rose Lehman Date: 04/2021;

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