

SPECIES: Scientific [common]	<i>Draba crassa</i> Rydberg [thick-leaf whitlow-grass]
Forest:	Bridger-Teton National Forest
Forest Reviewer:	Rose Lehman
Date of Review:	1/25/20;3/25/20; 3/31/21
Forest concurrence (or recommendation if new) for inclusion of species on list of potential SCC: (Enter Yes or No)	No

FOREST REVIEW RESULTS:

- The Forest concurs or recommends the species for inclusion on the list of potential SCC:
Yes ___ No X
- 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:

- Is the Species Native to the Plan Area? Yes X No ___

If no, provide explanation and stop assessment.

- 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
7/23/1941	unknown	Bridger-Teton National Forest: Teton County: Wind River Mt. Wyo. Head of Titcomb Valley.	Rocky alpine meadow. 11000 ft.	Collector: Craighead, s.n. MONTU 161517 (CPNWH 2020)
8/11/1983	unknown	Bridger-Teton National Forest: Absaroka Mountains: on Continental Divide ca 1-2 mi N of Bonneville Pass. T44N R109W S8; also, S9. 43.7922 N, 109.9582 W; uncertainty 2 mi.	On tundra. Phenology: flowering & fruiting. Elev. 10000-11000 ft.	Collector: Erwin F. Evert, 5994, RM 532137 (Rocky Mountain Herbarium 2020, SEINet 2020)

7/31/1990	unknown	Bridger-Teton National Forest: Bridger Wilderness: West Slope Wind River Range: summit and west slope of Vista Peak, ca 21 air mi NNE of Pinedale. T37N R107W S20; also, S29. 43.1586 N, 109.7222 W; uncertainty 2 mi.	Granitic alpine summit. Elev. 10800-11800 ft.	Collector: Walter Fertig, 5019, unaccessioned (Rocky Mountain Herbarium 2020, SEINet 2020)
8/6/1990	unknown	Bridger-Teton National Forest: Bridger Wilderness: West Slope Wind River Range: Flat Top Mountain, ca 29 air mi N of Pinedale. T38N R108W S1; also, S2, S11, and S12. 43.29 N, 109.7594 W.	South face talus slope/crumbly shale cliff face. Elev. 10800-11640 ft.	Collector: Walter Fertig, 5458, unaccessioned (Rocky Mountain Herbarium 2020, SEINet 2020)
8/13/1990	unknown	Bridger-Teton National Forest: Bridger Wilderness: West Slope Wind River Range: Fremont Peak, ca 22 air NE of Pinedale. T36N R107W S3. 43.1158 N, 109.6131 W.	Granite cliff faces and talus fields on south face. Elev. 11400-13360 ft.	Collector: Walter Fertig, 6039, unaccessioned (Rocky Mountain Herbarium 2020, SEINet 2020)
8/6/1991	unknown	Bridger-Teton National Forest: Bridger Wilderness: West Slope Wind River Range: west slope and summit of Mount Geikie, ca 28 air mi E of Pinedale. T33N R105W S13. 42.8317 N, 109.3372 W.	Cracks and crevices in granite outcrops in alpine zone. Elev. 11000-12370 ft.	Collector: Walter Fertig, 10910, unaccessioned (Rocky Mountain Herbarium 2020, SEINet 2020)
8/22/1991	unknown	Bridger-Teton National Forest: Bridger Wilderness: West Slope Wind River Range: Dragon Head Peak, ca 25 air mi E of Pinedale. T34N R105W S26; also, S27. 42.8908 N, 109.3781 W; uncertainty 2 mi.	Ledges and crevices in granitic outcrops in alpine zone. Elev. 10600-12200 ft.	Collector: Walter Fertig, 12051, unaccessioned (Rocky Mountain Herbarium 2020, SEINet 2020)
8/7/1997	unknown	Bridger-Teton National Forest: Gros Ventre Wilderness: Gros Ventre Range: west slope of Corner Mountain on west side of ridge 0.5 mi W of MacLeod	Granite talus slope below summit ridge in small soil pockets amid rock; soil clay; rock cover ca 80%.	Collector: Walter Fertig, 17954, RM 633199 (Rocky Mountain Herbarium 2020, SEINet 2020)

		Lake; ca 2.3 mi E of Granite Falls, ca 16 air mi SE of Jackson. T39N R113W S3 SE1/4 of NE1/4. 43.371 N, 110.391 W; uncertainty 0.25 mi.	Phenology: fruiting. Elev. 10850 ft.	
8/4/1998	unknown	Bridger-Teton National Forest: Gros Ventre Wilderness: Gros Ventre Range: southeast flank of Darwin Peak, ca 0.3 mi N of Brewster Lake. T40N R112W S33 SE1/4 of SW1/4. 43.3853 N, 110.2931 W; uncertainty 0.25 mi.	Northeast facing subalpine meadow near stream. Soil moist and clayey with surface of flat limestone rock from adjacent talus slope. Phenology: flowering. Elev. 10400 ft.	Collector: Laura Welp, 7893, RM 703105 (Rocky Mountain Herbarium 2020, SEINet 2020).
8/4/1998	unknown	Bridger-Teton National Forest: Gros Ventre Wilderness: 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. T39N R112W S9 SW1/4 of SE1/4. 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 <i>Phlox pulvinata</i> , <i>Astragalus kentrophyta</i> , <i>Castilleja pulchella</i> , <i>Smelowskia</i> , <i>Carex nardina</i> , and <i>Dryas</i> . Phenology: flowering & fruiting. Elev. 11000-11600 ft.	Collector: Walter Fertig, 18521, RM 645407 (Rocky Mountain Herbarium 2020, SEINet 2020)
7/18/2007	unknown	Bridger-Teton National Forest: Teton Wilderness: near Wildcat Peak, ca 14 air mi N of Moran; ca 28 air mi NNE of Moose. T47N R114W S16 SE1/4. 44.0411 N, 110.5318 W; GPS Reading.	Subalpine forb meadow. Phenology: fruiting. Elev. 8680 ft.	Collector: David Scott, 4910, RM 837605 (Rocky Mountain Herbarium 2020, SEINet 2020)

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?

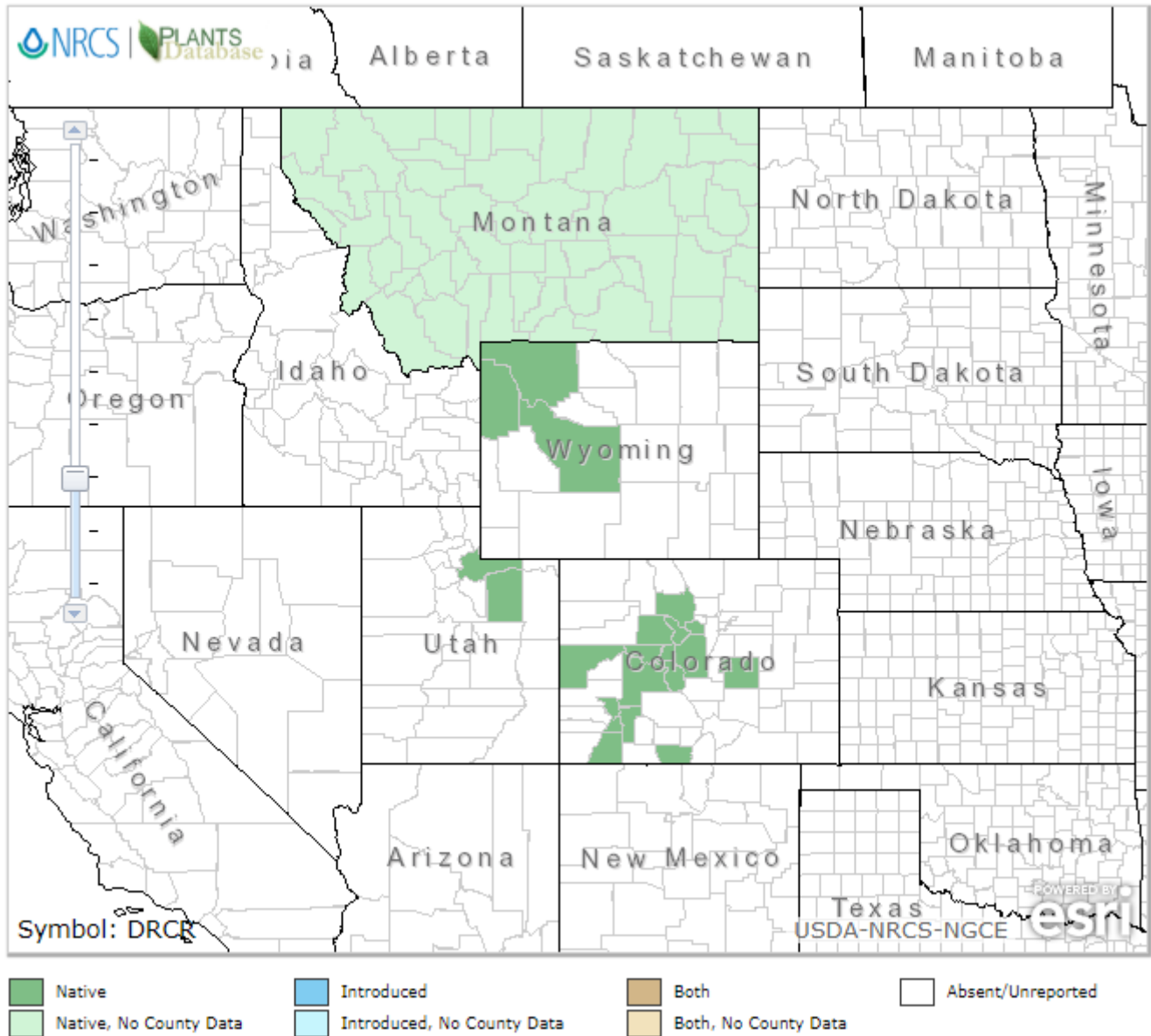
Yes___ No___

Provide explanation for determination

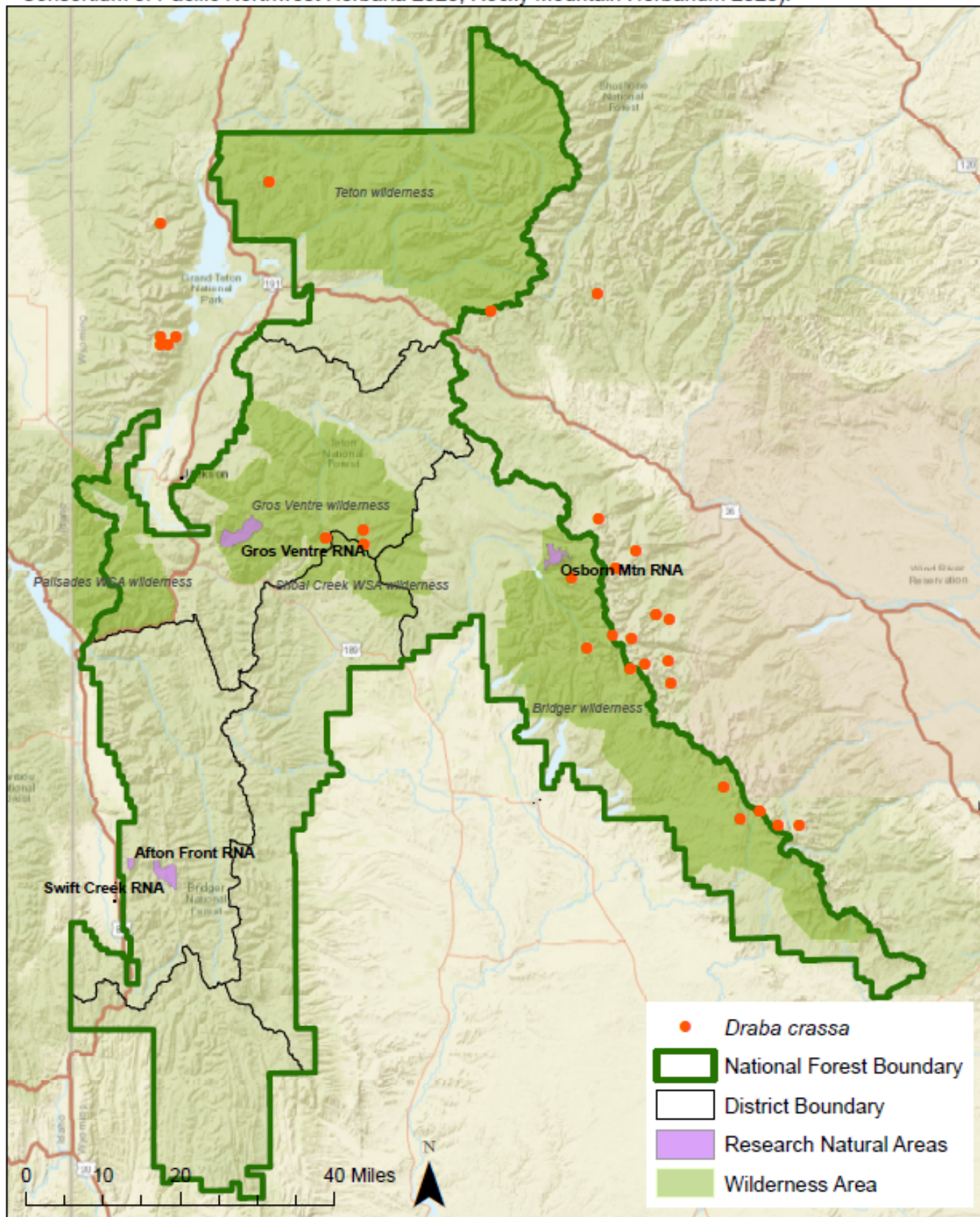
N/A—Occurrences have been made since 1990.

If determination is no, stop assessment

d. **Map 1, *Draba crassa* range in Wyoming and surrounding states (NRCS 2020).**



Map 2. *D. crassa* 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	<p>G3G4—Vulnerable—Apparently Secure</p> <p><i>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.</i></p> <p><i>Apparently Secure – Uncommon but not rare; some cause for long-term concern due to declines or other factors.</i></p> <p><i>A numeric range rank (e.g., G3G4) is used to indicate any range of uncertainty about the status of the species or ecosystem.</i></p>
NatureServe State Status	<p>S3—Vulnerable</p> <p><i>At moderate risk of extinction due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors.</i></p>
State of Wyoming	Not listed
WYNDD	<p>Plant Species of Potential Concern</p> <p><i>Species that appear to be secure at present, but because they have limited distribution as regional or state endemics, they could become vulnerable under large-scale changes. Species with this status warrant periodic checks.</i></p> <p>(Wyoming Natural Diversity Database - Species of Concern)</p>
USDA Forest Service	Not Region 4 Sensitive
USDOI FWS	Not Listed
USDOI BLM	Not Listed
IUCN	Not listed

Sources: Heidel 2018; NatureServe 2020

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

Criteria	Rationale
Distribution on the Bridger-Teton National Forest	<p><i>Draba crassa</i> is known from 9 contemporary (post-1990) collections on the Bridger-Teton National Forest, with the most recent collection made in 2007 (Table 1, Map 2; Rocky Mountain Herbarium 2020, SEINet 2020). Most contemporary collections from the forest are from the Wind River Range (Bridger Wilderness). Collections have also been made from the Gros Ventre Range and Absaroka Range (Fertig 1999, Jones et al. 2001).</p> <p>Prior to 1990, 2 collections were made on the forest, from 1941 and 1983 (Rocky Mountain Herbarium 2020, CPNWH 2020, Table 1). These are located in the Wind River Range and Absaroka Range, respectively.</p>
Distribution outside the Bridger-Teton National Forest	<p><i>Draba crassa</i> is a regional endemic species of south-central Montana, western Wyoming, northeastern Utah, and central Colorado. In Wyoming, outside of the Bridger-Teton National Forest, <i>Draba crassa</i> is known from Grand Teton National Park and the Shoshone National Forest (Fertig 1998), where it occurs in the Absaroka, Wind River, Teton, and Gros Ventre Ranges (Park, Teton, Fremont, and Sublette counties (Heidel 2018; WYNDD 2020)</p>
Abundance on the Bridger-Teton National Forest	<p>Occurrences are based on collections with limited or no abundance or population information, so a precise abundance estimate cannot be made. WYNDD (2020) notes that populations may be locally abundant, although often restricted to suitable microhabitats. Based on the 9 known occurrences documented since 1990 and distributed in alpine habitat in the Absaroka, Gros Ventre, and Wind River Ranges of the Bridger-Teton National Forest, abundance is estimated as moderate. However, without abundance data for occurrences or species-specific surveys, confidence in this criterion is low.</p>
Population Trend on the Bridger-Teton National Forest	<p>Trends for this species are assumed to be stable (WYNDD 2020) with low confidence (Heidel 2018).</p>
Habitat Trend on the Bridger-Teton National Forest	<p>Habitat for <i>Draba crassa</i> is on mountain ridges, talus slopes, alpine fellfields, and scree and cliff (WYNDD 2020). All contemporary occurrences are located within designated Wilderness areas on the forest (Map 2). These high-altitude communities receive minimal disturbance from forest management activities including recreation, motorized vehicle travel, and vegetation treatments. Alpine habitats are likely stable on the forest but may decrease due to climate change effects (see below).</p>

Criteria	Rationale
<p>Threats to the Species and its Habitat on the Bridger-Teton National Forest</p>	<p>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.</p> <p>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).</p> <p>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).</p> <p>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 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.</p> <p>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. Changes in temperature and precipitation may also lead to greater variability in forb flowering, which could create an asynchronistic effect with native pollinator emergence (Halofsky et al. 2018; Miller-Struttman et al. 2015), leading to decreased</p>

Criteria	Rationale
	<p>reproduction in native plants. 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. 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 contemporary occurrence on the Forest (USFS GIS 2019, Google Earth Pro 2020).</p> <p>All 9 contemporary occurrences on the forest are in designated wilderness areas. A Wilderness Area is “an area of undeveloped Federal land retaining its primeval character and influence, without permanent improvements or human habitation, which is protected and managed so as to preserve its natural conditions” (Wilderness Act of 1964), indicating that effects from anthropogenic activities area likely minimal. Additionally, no roads exist near these occurrences, which further confirms the low potential for human effects. Proximity (within approximately 0.5 to 1 mile) of most occurrences to non-motorized hiking trails may slightly increase potential for human presence and trampling impacts, but because the occurrences are in remote, rugged locations, they likely seldom see human visitors.</p> <p>One contemporary occurrence (David Scott 4910) is in subalpine habitat that burned in the 1988 Huck Fire. This occurrence may have been negatively affected by the fire, and associated indirect effects such as soil erosion or invasive plant establishment, that are likely following wildfire. However, given the time since the fire, these threats are likely reduced or no longer present. A small population of <i>Cirsium arvense</i> is located approximately 0.5-mile north of this occurrence, at lower elevation, on East Rodent Creek.</p> <p>One contemporary occurrence (Walter Fertig, 10910) is within the Cross-Lake livestock grazing allotment. However, impacts from livestock are likely minimal to non-existent given the alpine environment which is unsuitable for livestock.</p> <p>The above analysis suggests that habitat for <i>Draba crassa</i> has likely experienced low effects from natural and anthropogenic disturbances.</p>
Life history and demographic characteristics of the species	Thickleaf draba is a perennial forb with weak or recurved flowering stems 5-15 cm tall from a fleshy rootcrown. Basal leaves are long-petioled with oblanceolate, fleshy, entire blades 2-8 cm long and 5-10 mm wide. Leaves are glabrous except for long cilia on the margins. Stem leaves are 1-2 cm long, sessile, ovate, and entire to toothed. The inflorescence is a raceme of 4-25 yellow, 4-petaled flowers. Fruits are elliptic, glabrous siliques 10-16 mm long and 3-5 mm wide with thick styles ca 0.75 mm long. Flowing is from July to August (WYNDD 2020).
Date: January 15, 2020	

Criteria	Rationale
Reviewer: Morgan Trieger	

Summary and Recommendations

Species (Scientific and Common Name): *Draba crassa*

D.crassa is listed as S3 in Wyoming and G3G4 globally. It is a WYNDD Species of Potential Conservation Concern. *Draba crassa* is a regional endemic species of south-central Montana, western Wyoming, northeastern Utah, and central Colorado. On the BTNF there are 9 documented occurrences. Habitat for *D.crassa* is on mountain ridges, talus slopes, alpine fellfields, and scree and cliff (WYNDD 2020). All contemporary occurrences are located within designated Wilderness areas on the forest (Map 2). Alpine habitats are likely stable on the forest but may decrease due to climate change effects.

Because the majority (72 percent) of alpine vegetation in Wyoming is in wilderness areas (WGFD 2017), habitat for *D.crassa* may be considered intact and stable. Long term change in snowpack and temperature is a main threat to these areas and may alter habitat conditions in the future.

Given these considerations, it is recommended that *D.crassa* not be managed as a SCC.

Evaluator: Rose Lehman Date: 03/31/2021

References

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