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| SPECIES: Scientific [common] | <i>Cryptogramma stelleri</i> [Fragile rock brake] |
| Forest: | Bridger-Teton National Forest |
| Forest Reviewer: | Rose Lehman; Trevor Bloom |
| Date of Review: | 5/6/20; 2/19/21; 4/16/2025 |
| Forest concurrence (or recommendation if new) for inclusion of species on list of potential SCC: (Enter Yes or No) | Yes |

FOREST REVIEW RESULTS:

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

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 |
|----------------------|------------------------------|--|---|---|
| 8/18/1990 | Unknown | U.S.A., Wyoming, Teton County: Wyoming/Salt River Ranges: Wyoming Range: Buck Creek, south of Wyoming Highway 187-189 in Hoback Canyon. 43.285° N, 110.5833° W | Limestone outcrop and streamsid es. Elev. 6100-6700 ft. | Hartman EO #3 and #27720 (WYNDD GIS 2019, Rocky Mountain Herbarium 2020, SEINet 2020) |
| 6/3/2016 | Unknown | Bridger-Teton National Forest: Jackson Hole Mountain Resort: Top of Bridger Gondola. Via Ferrata. 43.6022, -110.8519 | Limestone outcrop, east aspect. | Rocky Mountain Herbarium – Charmaine Delmatier Specimen ID: 905360 |

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?

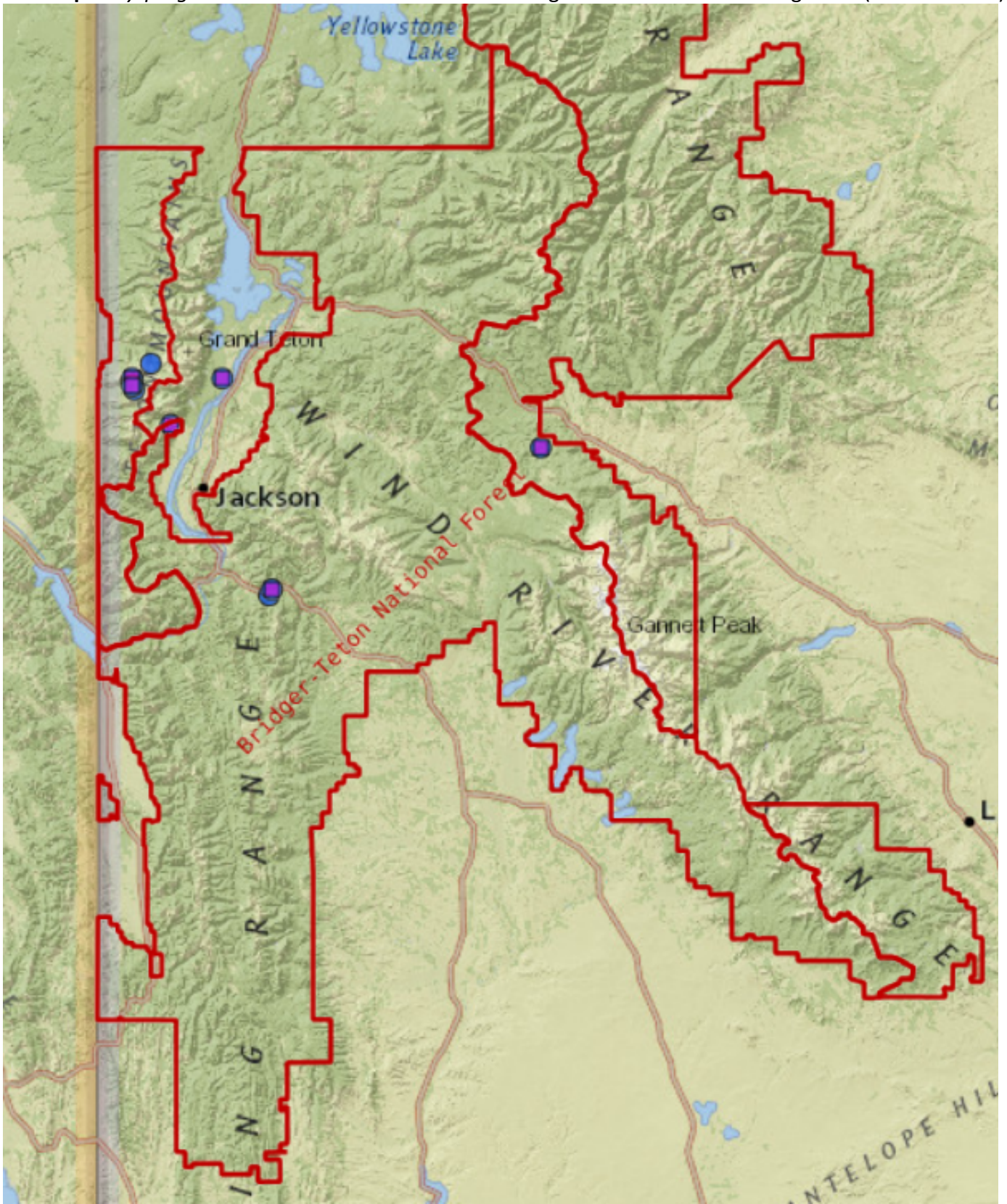
Yes ___ No ___

Provide explanation for determination

N/A—Occurrences have been documented since 1990.

If determination is no, stop assessment

Map 2: *Cryptogramma stelleri* occurrences in the Bridger-Teton and surrounding areas (WYNDD 2025).



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 | G5— Secure <i>Common; widespread and abundant.</i> |
| NatureServe State Status | S1—Critically Imperiled <i>At very high risk of extirpation in the jurisdiction due to very restricted range, very few populations or occurrences, very steep declines, severe threats, or other factors.</i> |
| WYNDD | Plant Species of Concern <i>Species vulnerable to extirpation at the global or state level due to:</i> <ul style="list-style-type: none"> <i>a. their rarity (e.g., restricted distribution, small population size, low population density)</i> <i>b. inherent vulnerability (e.g., specialized habitat requirements, restrictive life history)</i> <i>c. threats (e.g., significant loss of habitat, sensitivity to disturbances)</i> (Wyoming Natural Diversity Database - Species of Concern) |
| USDA Forest Service | Not Region 4 Sensitive |
| USDOJ FWS | Not listed |
| USDOJ BLM | Not listed |
| IUCN | Not listed |

Sources: WYNDD 2025; Heidel 2018; USDA Forest Service Regions 2 and 4 Sensitive Species Lists; NatureServe 2025

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

| Criteria | Rationale |
|---|---|
| Distribution on the Bridger-Teton National Forest | There are two occurrences on BTNF including one at Jackson Hole Mountain Resort and another near Highway 191, both in the Jackson Ranger District (Table 1 and Map 2). The species is likely extremely rare. |
| Distribution outside the Bridger-Teton National Forest | Occurs from Alaska to Northwest Territories, south to Oregon, Nevada and Colorado; and from Ontario to Newfoundland, south to Iowa, Illinois, Michigan, and West Virginia. In Wyoming, known from the Big Horn, Teton and Wyoming Ranges and Yellowstone Plateau (Fremont, Sheridan, Park, and Teton counties). Known from 9 occurrences in Wyoming (WYNDD 2025). |
| Abundance on the Bridger-Teton National Forest | Little census data are available, but this species appears to be extremely uncommon and restricted to small microsites within a specialized habitat (ledges with thin mossy soil in shady limestone cliffs near water) (WYNDD 2020, Fertig 2000). |
| Population Trend on the Bridger-Teton National Forest | Trend data is not available. More study is needed. |
| Habitat Trend on the Bridger-Teton National Forest | Sheltered calcareous cliff crevices and rock ledges, typically in coniferous forest or other boreal habitats at middle and upper altitudes in the mountains (FNA 2020, DNR 2011). |
| Threats to the Species and its Habitat on the Bridger-Teton National Forest | <p>Habitat of calcareous rocks and limestone cliffs could be impacted by recreational climbing, Via Ferrata and limestone mining. Because <i>Cryptogramma stelleri</i> grows in moist areas, specific occurrences could be threatened by any changes in hydrology that would dry out the habitat including climate related effects.</p> <p>According to Intermountain Adaptation Partnership assessments, high elevation 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>High elevation 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</p> |

| Criteria | Rationale |
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| | <p>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 high elevation 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 (Ellstrand and Diane 1993, Halofsky et al. 2018).</p> <p>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 2025).</p> <ul style="list-style-type: none"> • Hartman 1990: Just south of Gros Ventre Wilderness. Along U.S. Highway 191 and may be subject to heavy transit impacts such as dust, barriers to dispersal, and pollution. Numerous invasive species (<i>Cirsium arvense</i>, <i>Centaurea stoebe ssp. micranthos</i>, <i>Cynoglossum officinale</i>) are mapped near the occurrence location. Hoback Campground is within a mile so impacts from recreation may occur. • Delmatier 2016: Bridger-Teton National Forest: Jackson Hole Mountain Resort: Top of Bridger Gondola. Via Ferrata. Could be impacted by further ski area development, especially summer recreation development including increased use of the Via Ferrata. <p>Based on the above analysis there are many potential disturbances that occur nearby that may alter the specific microsite conditions needed by this species.</p> |

| Criteria | Rationale |
|---|---|
| Life history and demographic characteristics of the species | <p><i>Cryptogramma stelleri</i> is a delicate, slender perennial fern with leaves scattered along a creeping, scaly rhizome. Leaves are of 2 types, with separate and morphologically distinct vegetative (sterile) and sporangia-bearing (fertile) forms. Vegetative leaves have long, glabrous, reddish-brown leafstalks and thin, once to twice compound, lance-shaped to elliptic glabrous blades 3.5-9 cm long and 2-5.5 cm wide. Leaflets are broadly ovate with smooth or rounded-toothed margins. Fertile leaves have long stalks equaling to twice as long as the twice pinnate, lance-shaped, 2.5-14 cm long blade. Leaf segments are nearly linear with enrolled margins covering the round sori and have blunt tips (Fertig 2000, WYNDD 2020). New growth produced in spring, dying by late summer (FNA 2020). Life history information on the species, including life history stages, population structure, longevity, mortality, population biology and gamete/spore biology are not available.</p> |
| Date: April 1, 2020 Reviewer: J. Remp | |

Summary and Recommendations

Species (Scientific and Common Name): *Cryptogramma stelleri* [Fragile rock brake]

Cryptogramma stelleri is listed as S1 (critically imperiled) and G5 (secure) globally. Habitat is sheltered calcareous cliff crevices and rock ledges associated with small microsites with mossy soils (moist), typically in coniferous forest or other boreal habitats at middle and upper altitudes in the mountains.

Potential threats to the two known occurrences exist related to proximity to highway, recreation (proximity to campground and ski resort), noxious weed spread as well as changes in microsite conditions specific to the species. Because of the rarity and potential threats, there is a substantial concern for the capability of *C. stelleri* to persist over the long-term on the Bridger-Teton, therefore, it is recommended to be a Species of Conservation Concern.

Evaluator: Rose Lehman Date: 2/19/21

Reviewed: Trevor Bloom Date: 3/25/25

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