

<b>SPECIES: Scientific [common]</b>	<i>Astragalus terminalis</i> [railhead milkvetch]
<b>Forest:</b>	Bridger-Teton National Forest
<b>Forest Reviewer:</b>	<b>Rose Lehman</b>
<b>Date of Review:</b>	<b>3/25/20; 01/13/21</b>
<b>Forest concurrence (or recommendation if new) for inclusion of species on list of potential SCC: (Enter Yes or No)</b>	<b>No</b>

**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 \_\_\_\_\_

**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

<b>Year Observed</b>	<b>Number of Individuals</b>	<b>Location of Observations (USFS District, Town, River, Road Intersection, HUC etc.)</b>	<b>Habitat Description</b>	<b>Source of Information<sup>1</sup></b>
6/14/1989	Unknown	Teton County: Bridger Teton National Forest: ca 7 air mi NE of Jackson; ca 0.8 mi NE of junction of Sheep Creek and Goodwin Lake Trailhead roads. 43.5332° N, 110.6362° W; uncertainty 0.5 mi.	Sagebrush grassland. Elev. 7800-7900 ft.	Denise Culver, 80 (Rocky Mountain Herbarium 2020)
6/28/1995		Teton County: Bridger Teton National Forest: Mount Leidy Highland	Shales, limestone, and gypsum; open hill on east	Ronald L. Hartman, 51484 (Rocky Mountain

		Area: Dry Cottonwood Creek, 2-3 air mi E of east end Upper Slide Lake. 43.5764° N, 110.2776° W	side of entrance to valley. Elev. 7600 ft.	Herbarium 2020, SEINet 2020)
6/28/1995	Unknown	Teton County: Bridger-Teton National Forest: Gros Ventre Area: ca 7 air mi NE of Jackson. 43.5476° N, 110.6362° W; uncertainty 1 mi.	Fen and surrounding sagebrush plains. Elev. 6800-6900 ft.	Ronald L. Hartman, 51542 (Rocky Mountain Herbarium 2020, SEINet 2020)
6/7/2006	Unknown	Teton County: Bridger-Teton National Forest: Mount Leidy Highlands: Moran; ca 22.5 air mi NE of Jackson. 43.7608° N, 110.5536° W	On Forest Road 30310 above the Triangle X Ranch, ca 6 air mi SW of Steep sagebrush slopes. Elev. 7020-7180 ft.	B. E. Nelson, 68503 (Rocky Mountain Herbarium 2020, SEINet 2020)

<sup>1</sup>The Consortium of Pacific Northwest Herbaria (Consortium of Pacific Northwest Herbaria 2019) was also searched, and no additional occurrences on the Bridger-Teton National Forest were found.

- 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?

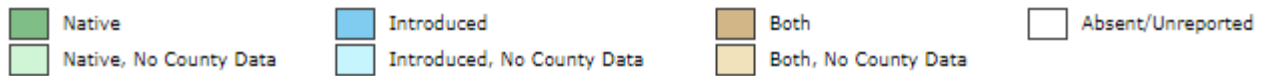
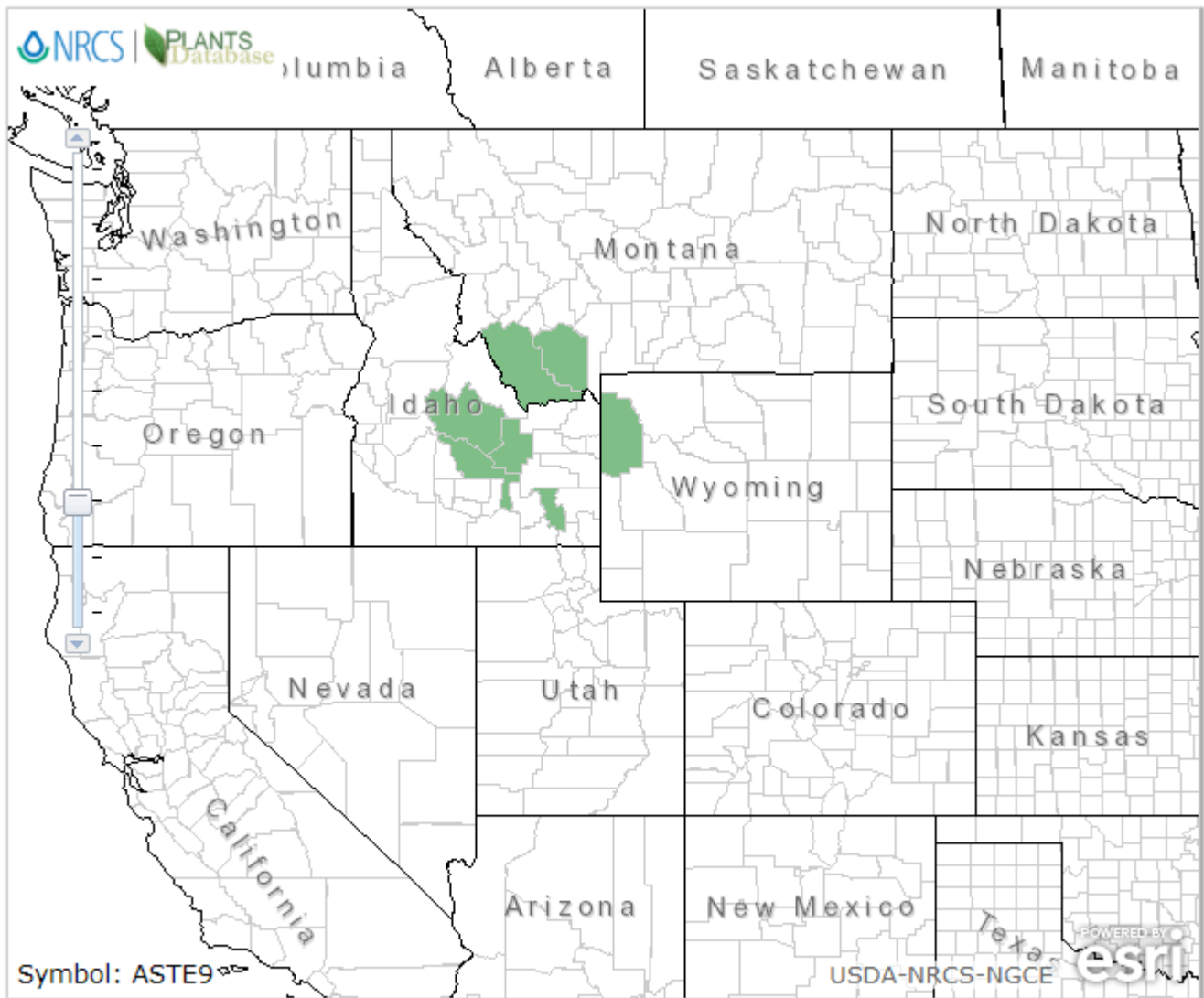
Yes \_\_\_ No \_\_\_

Provide explanation for determination

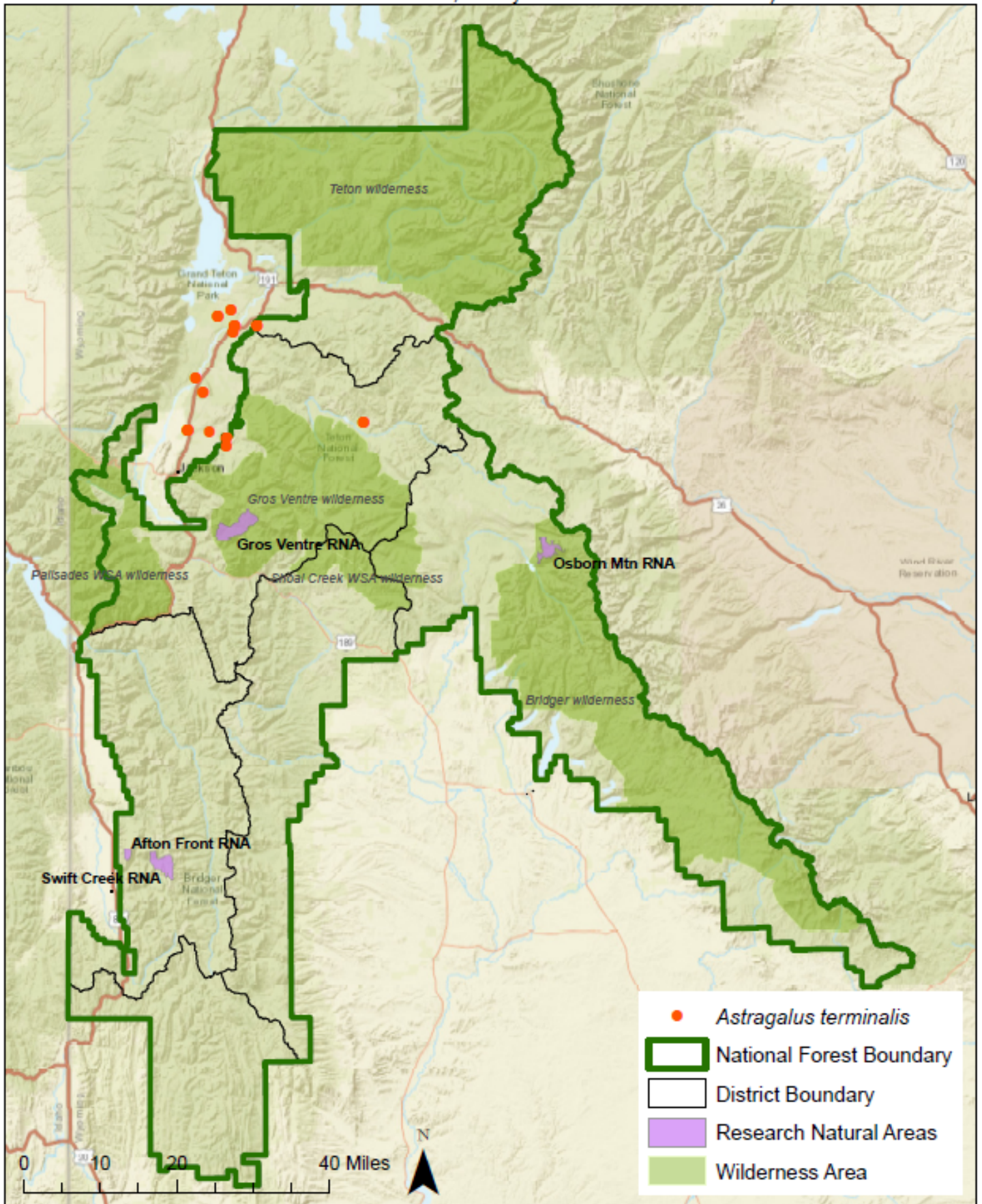
N/A—Occurrences have been documented since 1990.

If determination is no, stop assessment

**Map 1, *Astragalus terminalis* range in Wyoming and surrounding states (NRCS 2019).**



**Map 2.** *A. terminalis* 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

<b>Entity</b>	<b>Status/Rank (include definition)</b>
<b>NatureServe Global Status</b>	<p><b>G3— Vulnerable</b></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>
<b>NatureServe State Status</b>	<p><b>S2—Imperiled</b></p> <p><i>At high risk of extirpation in the jurisdiction due to restricted range, few populations or occurrences, steep declines, severe threats, or other factors.</i></p>
<b>WYNDD</b>	<p><b>Plant Species of Concern</b></p> <p><b>G3/S2</b></p> <p><i>Species vulnerable to extirpation at the global or state level due to:</i></p> <ul style="list-style-type: none"> <li><i>a. their rarity (e.g., restricted distribution, small population size, low population density)</i></li> <li><i>b. inherent vulnerability (e.g., specialized habitat requirements, restrictive life history)</i></li> <li><i>c. threats (e.g., significant loss of habitat, sensitivity to disturbances)</i></li> </ul> <p>(Wyoming Natural Diversity Database - Species of Concern)</p>
<b>USDA Forest Service</b>	Not a Region 4 Sensitive
<b>USDOI FWS</b>	Not listed
<b>USDOI BLM</b>	Not listed
<b>IUCN</b>	<p><b>LC – Least Concern</b></p> <p><i>A taxon is Least Concern when it has been evaluated against the criteria and does not qualify for Critically Endangered, Endangered, Vulnerable or Near Threatened. Widespread and abundant taxa are included in this category.</i></p> <p>(IUCN – Red List Categories and Criteria)</p>

Sources: WYNDD 2020; Heidel 2018; USDA Forest Service Regions 2 and 4 Sensitive Species Lists; NatureServe 2019

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

Criteria	Rationale
Distribution on the Bridger-Teton National Forest	Known from four occurrences on Bridger-Teton National Forest near the Gros Ventre Range ( <b>Map 2 and Table 1</b> ).
Distribution outside the Bridger-Teton National Forest	<i>Astragalus terminalis</i> is geographically restricted; known from east-central Idaho, north to southwestern Montana and south to western Wyoming. In Montana, the plant is known from more than a dozen sites in Beaverhead and Madison Counties. In Wyoming the plant is known from only ten occurrences with seven found in Grand Teton National Park or the National Elk Refuge. Other records are from public lands managed for multiple use. (WYNND 2020).
Abundance on the Bridger-Teton National Forest	<p><i>Astragalus terminalis</i> abundance is uncommon. Population size is not known, although the species appears to be restricted to narrow corridors of river cobblestone habitat (WYNND 2020).</p> <p>Other surveys and habitat assessments have not identified this species on Bridger-Teton National Forest, including:</p> <ul style="list-style-type: none"> <li>• Afton Front Research Natural Area Bridger-Teton National Forest (Fertig and Jones 1994a)</li> <li>• Horse Creek Research Natural Area Bridger-Teton National Forest (Fertig and Jones 1994b)</li> <li>• Swift Creek Research Natural Area Bridger-Teton National Forest (Fertig and Jones 1994c)</li> <li>• Sensitive plant surveys and status of rare plant species on Bridger-Teton National Forest, 1997-1998 (Fertig 1999)</li> <li>• Rare Species and Riparian Vegetation of the Snake River Basin in Wyoming (Jones et al. 2001)</li> <li>• Survey for <i>Stephanomeria fluminea</i> on the Bridger-Teton National Forest (Markow 2004)</li> <li>• Wyoming Plant Species of Concern on Caribou-Targhee National Forest: 2007 Survey Results Teton and Lincoln counties, Wyoming (Mancuso and Heidel 2008)</li> <li>• A Floristic Inventory of Grand Teton National Park, Pinyon Peak Highlands, and Vicinity, Wyoming U.S.A (Kesonie and Hartman 2011)</li> <li>• Blackrock Creek Wild and Scenic River Botany Survey (Johnson 2011)</li> <li>• Sensitive and rare plant species inventory in the Salt River and Wyoming Ranges, Bridger-Teton National Forest (Heidel 2012)</li> <li>• Teton to Snake Fuels Management Project Botany Report and Biological Evaluation (Englebert 2013)</li> <li>• Botany inventories in select fens of the Caribou-Targhee and Bridger-Teton National Forests (Heidel 2019)</li> </ul>

Criteria	Rationale
Population Trend on the Bridger-Teton National Forest	Trend data are lacking, but populations appear to be stable.
Habitat Trend on the Bridger-Teton National Forest	<p>Gravelly alluvial terraces, stony hillsides and summit flats along rivers, commonly associated with low sagebrush and calcareous bedrock. Wyoming populations are on gravelly outwash terraces, stony or grassy hillsides, and cushion plant-bunchgrass communities on summit flats of brownish-sandy clay soil with abundant surface gravel (WYNND 2020). <i>Astragalus terminalis</i> is known to co-occur with <i>L. carinata</i> on the summit of Blacktail Butte in Grand Teton National Park, but was not found during surveys on the elk refuge in 1996-97 (Fertig 1998). Potential habitat exists along the gravel terraces of upper Flat Creek and on the foothills of the Gros Ventre Range on whitish clay soils with abundant surface gravels. Potential habitat may also exist along the crest of Refuge Peak Ridge.</p>
Threats to the Species and its Habitat on the Bridger-Teton National Forest	<p>Prescribed burning has been identified as a potential threat to this species on adjacent Bridger-Teton National Forest lands. Competition from exotics may also be a threat. This species does not appear to be readily grazed, probably due to the presence of anti-herbivory compounds in its foliage (Fertig 1998). Populations outside of the federal managed lands may be potentially threatened by gravel quarrying.</p> <p>To analyze trends in habitat, aerial imagery and a USFS GIS database of existing grazing allotments, invasive plant populations, historical wildfires, trails, roads, Wilderness Areas, and Research Natural Areas (RNAs) was assessed at each occurrence (USFS GIS 2019, Google Earth Pro 2019). The following summarizes identified disturbances for each occurrence in Bridger-Teton National Forest:</p> <ul style="list-style-type: none"> <li>• 6/14/1989 Denise Culver, 80: Outside designated wilderness. There are no known fire, trail, road, or other nearby disturbances.</li> <li>• 6/28/1995 Ronald L. Hartman, 51484: Outside designated wilderness. There are no known fire, trail, road, or other nearby disturbances. This occurrence is within the vacant Winter Range FR C&amp;H allotment.</li> <li>• 6/28/1995 Ronald L. Hartman, 51542: Outside designated wilderness. There are several nearby invasive species polygons (<i>Hyoscyamus niger</i>, <i>Centaurea stoebe</i> ssp. <i>micranthos</i>, and <i>Carduus nutans</i>) within 0.25 mile of this mapped occurrence. No livestock allotment or other disturbances nearby.</li> <li>• 6/7/2006 B. E. Nelson, 68503: Outside designated wilderness. Along Forest Road 30310. <i>Carduus nutans</i> invasive 2006 polygon mapped over occurrence location. This occurrence is within the Lower Spread Creek C&amp;H allotment.</li> </ul> <p>Sagebrush steppe habitats are projected to experience an increased risk of wildfires and greater risk of invasive by exotic species (which tend to become more frequent with wildfires outside of natural fire regimes</p>

Criteria	Rationale
	<p>in this habitat type), such as cheatgrass, halogeton, and Russian thistle (Halofsky et al. 2018). Areas with dense cheatgrass can increase the fire-return intervals, further exasperating threats.</p> <p>Invasive plants have been identified as a major threat to the biological diversity and ecological integrity within and outside the BTNF. Invasive plants create many adverse environmental effects, including, but not limited to: displacement of native plants; reduction in functionality of habitat and forage for wildlife and livestock; threats to populations of threatened, endangered and sensitive species; alteration of physical and biological properties of soil, including productivity; changes to the intensity and frequency of fires; facilitation of further invasive species invasions; and loss of recreational opportunities (Halofsky et al. 2018). The presence of invasive plant species may be compounded by the presence of cattle which may create an environment more conducive to the establishment of invasive plant species (Halofsky et al. 2018).</p> <p>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-Struttman 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.</p>
Life history and demographic characteristics of the species	<p><i>Astragalus terminalis</i> is a perennial herb from a woody, forked caudex with several erect, leafy stems 5-30 cm high. Occurs in gravelly outwash terraces, stony or grassy hillsides, and cushion plant-bunchgrass communities on summit flats of brownish-sandy clay soil with abundant surface gravel.</p>
Date: January 23, 2020 Reviewer: J. Remp	

## Summary and Recommendations

Species (Scientific and Common Name): *Astragalus terminalis* [railhead milkvetch]

*Astragalus terminalis* is listed as S2 (imperiled) and G3 (vulnerable) globally. It is a regional endemic known from at least 50 occurrences across east-central Idaho, southwestern Montana and western Wyoming. In Wyoming the plant is known from 12 occurrences with four of these on the Bridger-Teton Forest. Plants grow on gravelly outwash terraces, stony or grassy hillsides, and cushion plant-bunchgrass communities on summit flats of brownish-sandy clay soil with abundant surface gravel (WYNND 2020). Further potential habitat exists in narrow corridors with possibility for new occurrences should new surveys take place.

The four occurrences on the forest lack trend data and follow-up visitation has not taken place since their initial observation. Thus, an assessment of long-term survival must account for the existing and potential threats to habitat.

Sagebrush-grassland habitats are projected to experience an increased risk of wildfires and greater risk of competition by invasive species, particularly cheatgrass, spotted knapweed, and Russian thistle. Two occurrences have documented populations of invasive species within ¼ mile. No wildfire has occurred near the four populations. Active grazing may affect two of the populations, but plants are probably not palatable and may even present a toxicity hazard to livestock. Two populations are also near or adjacent roads and may experience increased disturbance as a result.

Despite significant uncertainty and potential threats, little is known about population demographics and species response to disturbance. Nevertheless, abundant occurrence records in Idaho and Montana derived from general floristic surveys suggest the species may be abundant within its range. Indeed, habitat for the species is widespread in other jurisdictions, but very specific and limited on the Bridger-Teton. Populations on the Forest represent the geographic and ecologic edge of the species. Given these considerations, *Astragalus terminalis* is not recommended as SCC.

Evaluator: Jessica Irwin & Rose Lehman Date: 01/13/2021

## References

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