

SPECIES: Scientific [common]	<i>Kelloggia galioides</i> [Milk kelloggia]
Forest:	Bridger-Teton National Forest
Forest Reviewer:	Randall Griebel
Date of Review:	10/14/2021
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	Source of Information¹
8/9/1899	Unknown	Outside Bridger-Teton National Forest: U.S.A., Wyoming, Teton County: Yellowstone National Park: Lewis River. Elev. 7700 ft. 44.2588° N, 110.631° W; uncertainty 3 mi.	On the cliffs. Phenology: flowering & fruiting.	Aven Nelson 6374 (Rocky Mountain Herbarium 2021; SEINet 2021; WYNDD 2021a)
8/13/1920	Unknown	Outside Bridger-Teton National Forest: U.S.A., Wyoming, Teton County: Teton	Dry slope. Phenology: fruiting.	Edwin B. Payson 2303 (Rocky Mountain Herbarium 2021;

		Mountains: Jackson Hole. Elev. 7500 ft. 43.7908° N, 110.7417° W; NAD 83, uncertainty 1 mi.,		SEINet 2021; WYNDD 2021a)
8/7/1962	Infrequent	Outside Bridger-Teton National Forest: U.S.A., Wyoming, Teton County: Grand Teton National Park: on the east face of Symmetry Spire. Elev. 7600 ft. 43.7778° N, 110.755° W; uncertainty 1 mi.	Infrequent in the main couloir. Phenology: flowering & fruiting.	Richard J. Shaw 964 (Rocky Mountain Herbarium 2021; SEINet 2021; WYNDD 2021a)
8/4/1999	Unknown	U.S.A., Wyoming, Teton County: Teton Range: Bridger-Teton National Forest: Jackson Hole Mountain Resort at upper Craggs and Upper Hoback Ski Runs. Elev. 9900 ft. 43.6052° N, 110.8553° W; uncertainty 1 mi.	Granite outcrops in open areas with sparsely distributed mixed conifers and <i>Antennaria luzuloides</i> , <i>Circaea alpina</i> var. <i>pacifica</i> , and <i>Gnaphalium viscosum</i> . Phenology: flowering & fruiting.	Charmaine Delmatier 8113 (Rocky Mountain Herbarium 2021; SEINet 2021; WYNDD 2021a)
8/4/1999	Unknown	U.S.A., Wyoming, Teton County: Teton Range: Bridger-Teton National Forest: Jackson Hole Mountain Resort at upper Craggs and Upper Hoback Ski Runs Elev. 9900 ft. 43.6052° N, 110.8553° W; uncertainty 1 mi.	Granite outcrops in open areas with sparsely distributed mixed conifers and <i>Antennaria luzuloides</i> , <i>Circaea alpina</i> var. <i>pacifica</i> , and <i>Gnaphalium viscosum</i> . Phenology: flowering & fruiting.	Charmaine Delmatier 8120 (Rocky Mountain Herbarium 2021; SEINet 2021; WYNDD 2021a)
7/28/2000	Unknown	U.S.A., Wyoming, Teton County: Teton Range: Bridger-Teton National Forest: Jackson Hole Mountain Resort on Rendezvous Mountain, ca 11 air mi NNW of Jackson. Ctr Elev. 8400 ft.	Whitebark pine on open, east-facing slope with <i>Stellaria longipes</i> , <i>Silene parryi</i> . Phenology: flowering & fruiting.	Charmaine Delmatier 8276 (Rocky Mountain Herbarium 2021; SEINet 2021; WYNDD 2021a)

		43.5908° N, 110.8553° W; uncertainty 1 mi.		
7/16/2006	Unknown	Outside Bridger-Teton National Forest: U.S.A., Wyoming, Teton County: Grand Teton National Park and Vicinity: Teton Range: near Moran Bay, ca 13 air mi W of Moran; ca 14 air mi NNW of Moose. Elev. 7210 ft. 43.8548° N, 110.7506° W	Talus opening in <i>Picea engelmannii</i> forest. Phenology: flowering & fruiting.	David Scott 1889 (Rocky Mountain Herbarium 2021; SEINet 2021; WYNDD 2021a)

The Consortium of Pacific Northwest Herbaria was also searched, and no additional occurrences were found (Consortium of Pacific Northwest Herbaria 2021).

- 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

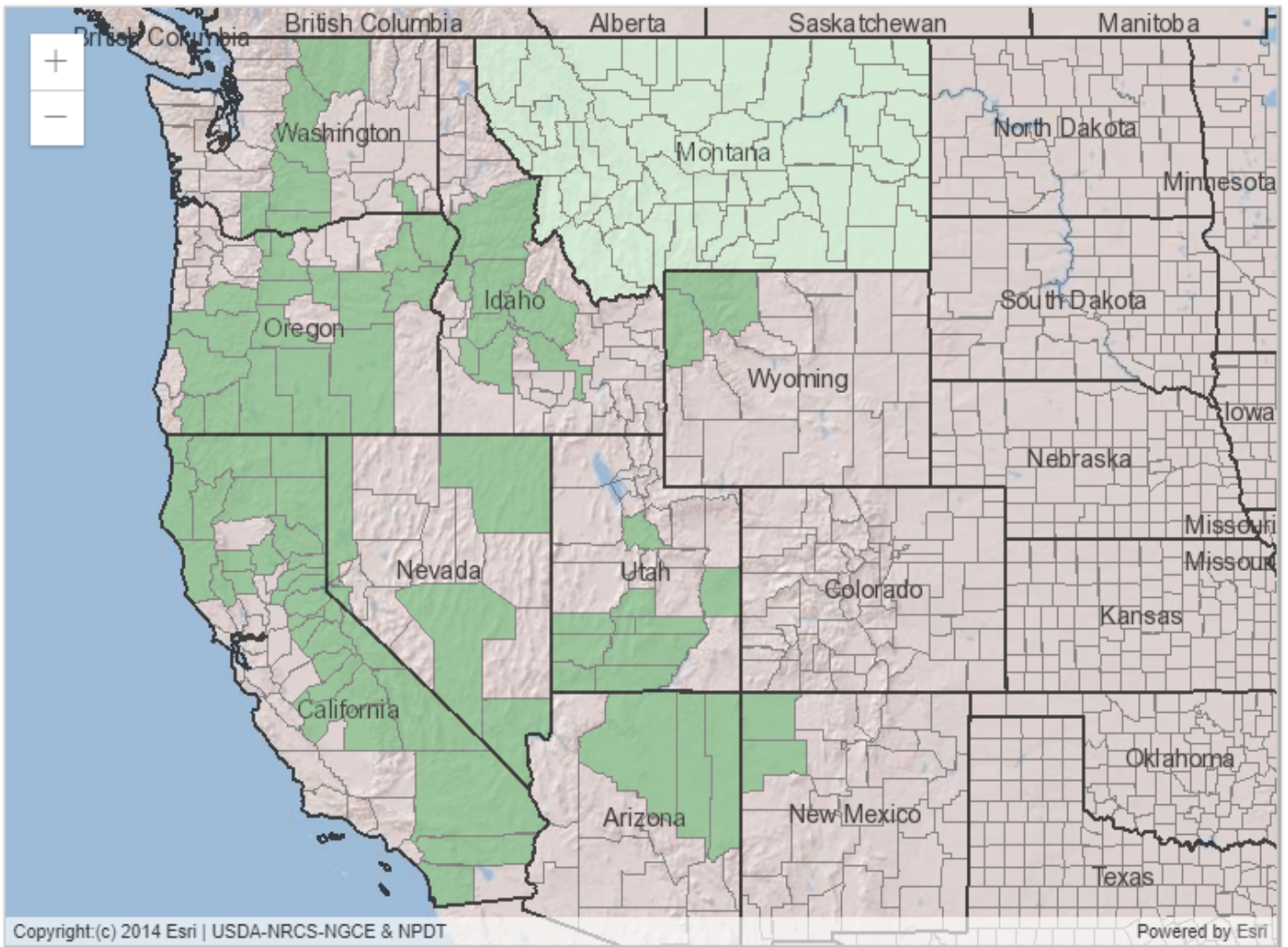
- c. For species with known occurrences on the Forest predating 1990, does the weight of evidence suggest the species still occurs in the plan area?

Yes___ No___

N/A—occurrences have been documented since 1990.

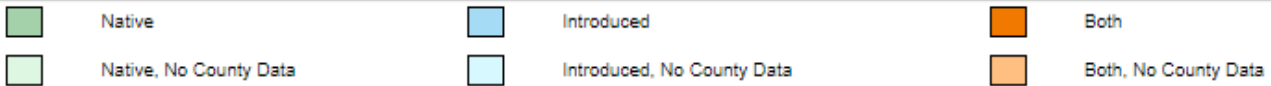
If determination is no, stop assessment

Map 1, *Kelloggia galioides* range in Wyoming and surrounding states (NRCS 2021).



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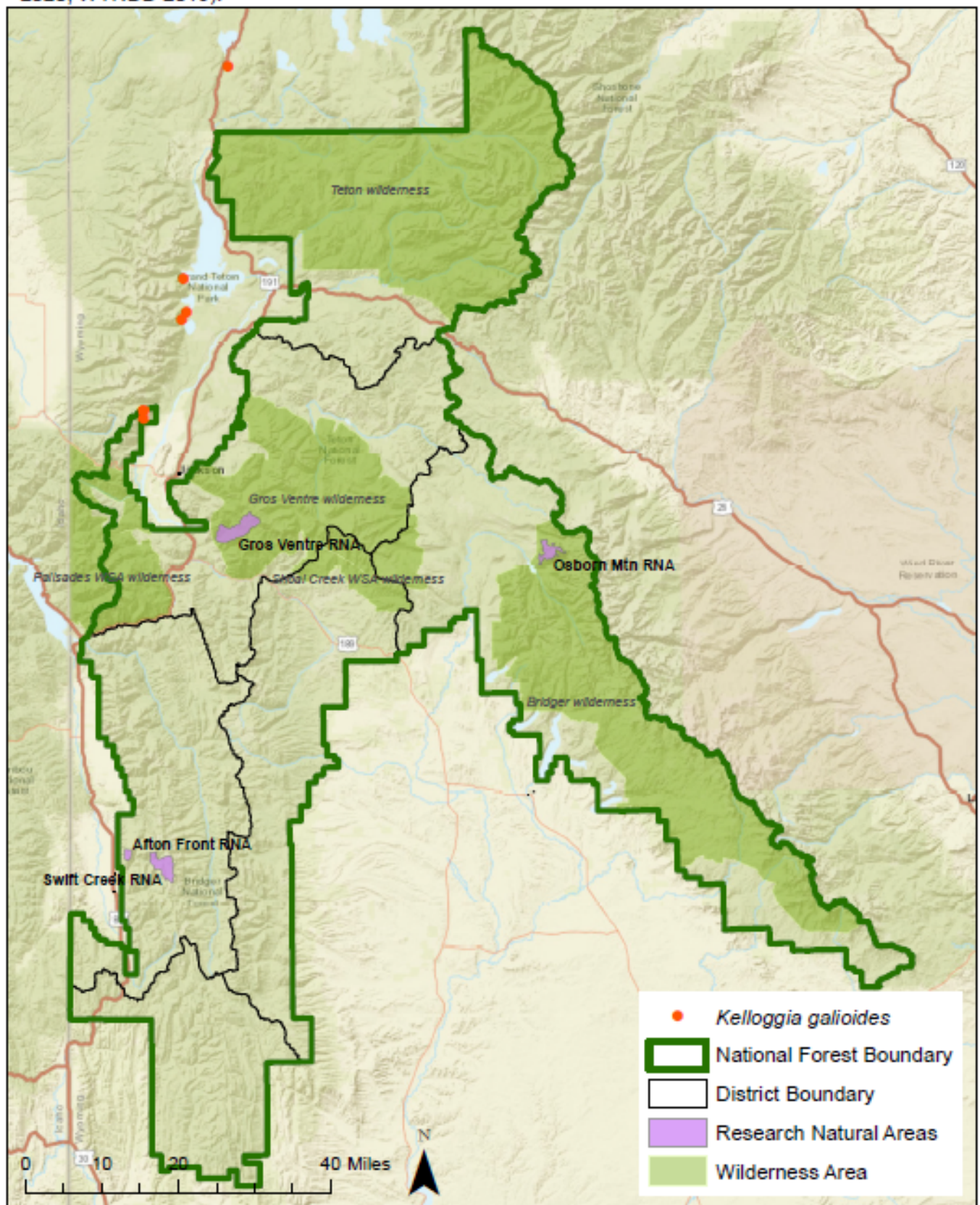
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Native Status:



Map 2. *K. galioides* occurrences in Bridger-Teton National Forest vicinity (Rocky Mountain Herbarium 2020, WYNDD 2019).



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>At very low risk of extinction or elimination due to a very extensive range, abundant populations or occurrences, and little to no concern from declines or threats.</i>
NatureServe State Status	S2—Imperiled <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>
WYNDD	Not listed
USDA Forest Service	Not Region 4 Sensitive
USDOI FWS	Not listed
USDOI BLM	Not listed
IUCN	Not listed

Sources: Heidel 2018; IUCN 2021; NatureServe 2021; USDA Forest Service Regions 2 and 4 Sensitive Species Lists; WYNDD 2020b

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

Criteria	Rationale
Distribution on the Bridger-Teton National Forest	<p><i>Kelloggia galioides</i> is known from three occurrences on the Bridger-Teton National Forest, from 1999–2000. These occurrences were in Jackson Hole Mountain Resort, on granite outcrops or slopes in open areas with whitebark pine or other sparsely distributed mixed conifers (Table 1, Map 2). Several additional occurrences have been documented in proximity to, but outside the border of, the Bridger-Teton National Forest, generally on rocky, open areas or with sparse conifers (Table 1, Map 2). The scarcity of recent occurrences directly on the Bridger-Teton National Forest suggests the species may be sparsely distributed on the Forest, but further surveying effort is needed to better define the distribution.</p>
Distribution outside the Bridger-Teton National Forest	<p><i>Kelloggia galioides</i> occurs from Washington to California, east to Montana, Utah, and New Mexico. In Wyoming, it is known from the Absaroka, Teton, and Wind River Ranges, Jackson Hole, the Overthrust Belt, and Yellowstone Plateau (Fremont, Lincoln, Park and Teton counties) (NatureServe 2021; WYNDD 2021b). It has also been reported for the Salt River Range (WYNDD 2021b).</p>
Abundance on the Bridger-Teton National Forest	<p>One occurrence in Grand Teton National Park was noted as infrequent (Table 1). However, as most records do not report abundance, overall abundance on the Bridger-Teton National Forest cannot be assessed (Fertig 2000; WYNDD 2021b).</p>
Population Trend on the Bridger-Teton National Forest	<p>Population trends in Wyoming, including on the Bridger-Teton National Forest, are unknown (WYNDD 2021b) due to lack of data.</p>
Habitat Trend on the Bridger-Teton National Forest	<p><i>Kelloggia galioides</i> occurs in wooded or open slopes in the mountains, sometimes among rocks or along streams, from moderate to high elevations. Wyoming populations are in rocky places, cliff crevices, and open Douglas-fir forests, with sparse vegetation (WYNDD 2021).</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 2021).</p> <p>The three occurrences on the Bridger-Teton National Forest (Dematier 8120, Dematier 8113, and Dematier 8276) are located within the Jackson Hole Mountain Resort, directly on ski runs and near motorized roads. These populations, therefore, are subject to impacts from recreation, road use, and human presence, all of which could cause habitat degradation and damage to individuals (e.g., through trampling). All three occurrences are also in the vicinity of invasions non-native plants, such as <i>Carduus nutans</i>, <i>Cirsium arvense</i>, and <i>Linaria dalmatica</i>. These invasive species may compete for habitat with <i>K. galioides</i> and have likely compromised habitat conditions.</p>

Criteria	Rationale
	<p>None of the occurrences on the Bridger-Teton National Forest are within wilderness areas, RNAs, active RMUs, or fire perimeters, and thus, they have not been impacted by grazing, burning, or management for wilderness areas or RNAs.</p> <p>Given this information, it is likely these populations have experienced moderate to high impacts from anthropogenic disturbance. Climate change may lead to future habitat alterations as described below.</p>
<p>Threats to the Species and its Habitat on the Bridger-Teton National Forest</p>	<p>Specific threats to <i>K. galioides</i> are unknown (Fertig 2000; WYNDD 2020b). At least four occurrences are protected within the Grand Teton and Yellowstone National Parks and the North Absaroka and Washakie wilderness areas (Fertig 2000; WYNDD 2020b). Recreation is likely a threat to the occurrences on the Bridger-Teton National Forest, which are located within the Jackson Hole Mountain Resort.</p> <p>Climate change is likely a significant threat to forest and nonforest ecosystems of the Intermountain West. Projections for the Intermountain Adaptation Partnership region estimate that average annual minimum and maximum temperatures are likely to increase by 5 to 12 deg F, mean annual precipitation will remain the same or increase slightly, extreme events (e.g., drought and extreme precipitation events) will occur more frequently and be more severe, and greenhouse gas concentrations will continue to increase through the end of the 21st century. Increased minimum daily temperatures have resulted in longer frost-free periods. Projections vary by subregion, but even where precipitation is projected to increase slightly, higher temperatures are likely to increase effective drought and soil water deficit (Halofsky et al. 2018).</p> <p>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-Struttmann et al. 2015), leading to decreased 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.</p>
<p>Life history and demographic characteristics of the species</p>	<p><i>Kelloggia galioides</i> is a glabrous, herbaceous perennial with clustered stems 10-60 cm tall arising from creeping rhizomes. The leaves are opposite, sessile, narrow, and 1.5-5 cm long by 2-15 mm wide. Flowers are 5-8 mm long, with 4 fused sepals and 4 pink or white fused petals arising from the top of the ovary. Fruits are ball-like, covered with hooked bristles, and break into 2 segments at maturity. Flowering occurs from June-August (WYNDD 2020b).</p>
<p>Date: 10/4/21 Reviewer: L. Chipman</p>	

Summary and Recommendations

Kelloggia galioides is ranked as secure throughout its range, but imperiled in Wyoming, where it is known from the Absaroka, Teton, and Wind River Ranges, Jackson Hole, the Overthrust Belt, and Yellowstone Plateau. There are three recent, documented occurrences on the Bridger-Teton National Forest, all of which were on outcrops or slopes with sparsely distributed conifers in the Jackson Hole Mountain Resort (Table 1, Map 2). Population trends and abundance on the Forest are unknown due to lack of data. Recreation is likely the main threat to the occurrences on the Forest, given their location on a popular ski resort, and it is likely these populations have experienced moderate to high impacts from anthropogenic disturbance. Climate change may lead to future habitat alterations. Due to a lack of information on population trends and abundance, *K. galioides* is not recommended as a species of conservation concern at this time; if future surveys indicate concerns based on population trends and abundance, the species should be reassessed.

References

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