

<b>SPECIES: Scientific [common]</b>	<b><i>Potentilla hyparctica</i> var. <i>elatior</i> [arctic cinquefoil]</b> Other scientific names: <b><i>Potentilla hyparctica</i> ssp. <i>elatior</i></b>
<b>Forest:</b>	Bridger-Teton National Forest
<b>Forest Reviewer:</b>	<b>R.Lehman</b>
<b>Date of Review:</b>	<b>5/7/20; 4/8/2021</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 \_\_\_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

<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</b>
8/17/1984	Unknown	U.S.A., Wyoming, Sublette County: West Slope Wind River Range: north side of Osborn Mountain at head of Mill Creek and ca 4 mi NE of Lower Green River Lake. 43.334° N, 109.7849° W	Moist, rocky soil along tundra streamlets. Elev. 11600 ft. Phenology: flowering.	Erwin F. Evert, 7596. (Rocky Mountain Herbarium 2020)
8/17/1991	Unknown	U.S.A., Wyoming, Sublette County: Wind River	Large flat area of sparsely vegetated soils and gneiss	Hollis Marriott, 11406.

		Mountains: Continental Divide NE of Green River Lakes and N of upper Dads Lake drainage, ca 0.15 air mi SSE of Burro Peak. 43.3778° N, 109.8221° W	derived from igneous rocks. Elev. 12300 ft. Phenology: flowering.	(Rocky Mountain Herbarium 2020)
8/16/1994	Unknown	U.S.A., Wyoming. West face of Big Sheep Mountain, ca 2.25 air miles west of Lower Green River Lake. 306277.69727, 455265.789911	Limestone and sandstone talus slopes (west and south facing) from timberline to near crest of slope. Alpine community. Occurs with <i>Parrya nudicaulis</i> , <i>Senecio canus</i> , <i>Trisetum spicatum</i> , <i>Polemonium viscosum</i> , <i>Penstemon montanus</i> . Phenology: Vegetative.	Walter Fertig, 15406. EO #4 (WYNDD 2019)

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

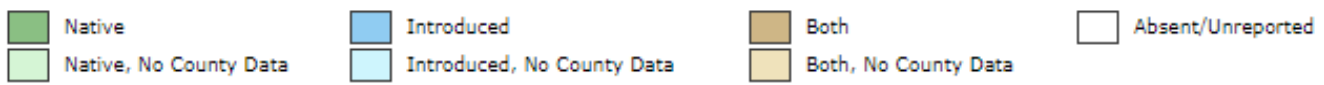
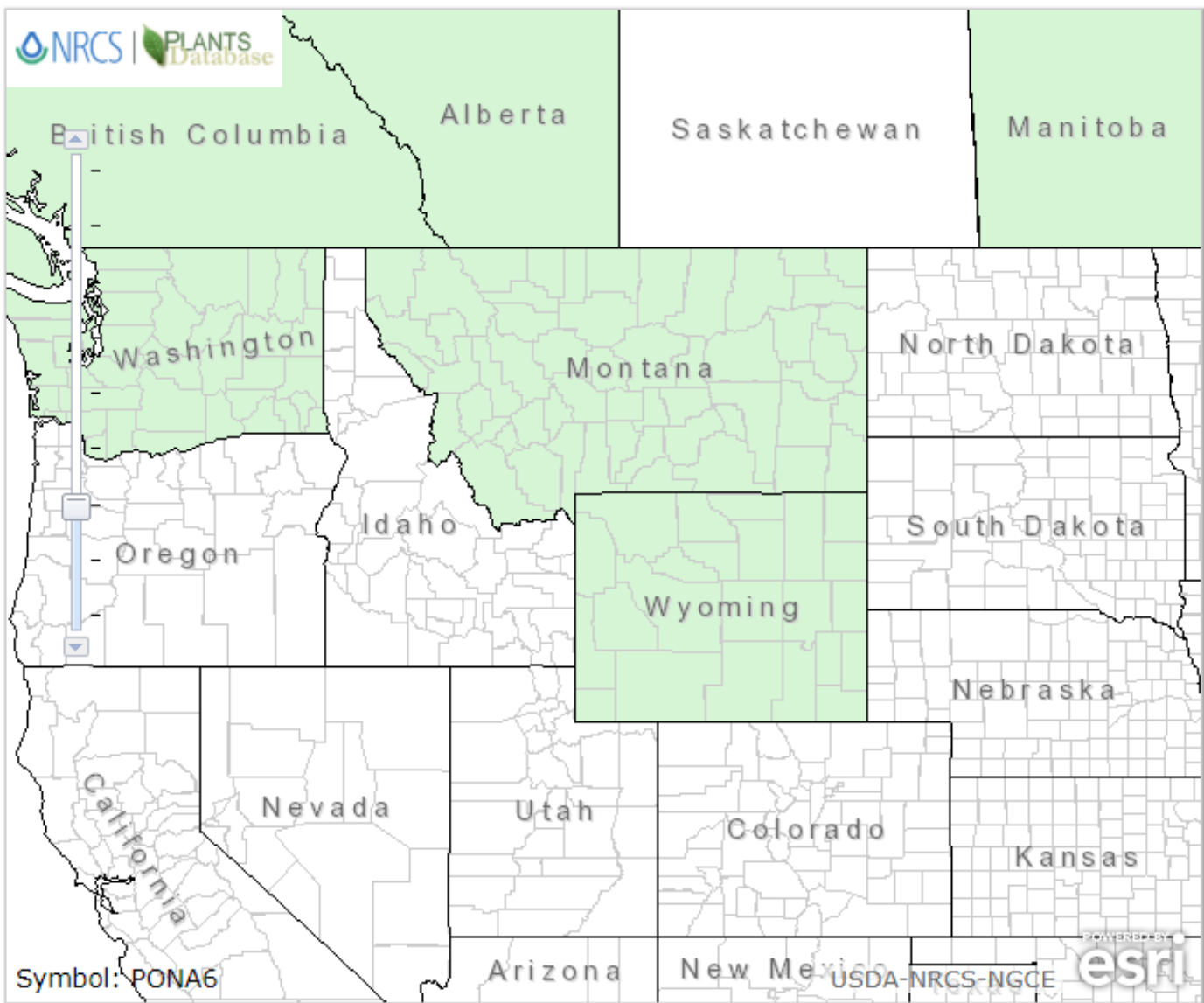
Yes\_\_\_ No\_\_\_

Provide explanation for determination

N/A—Occurrences have been documented since 1990.

If determination is no, stop assessment

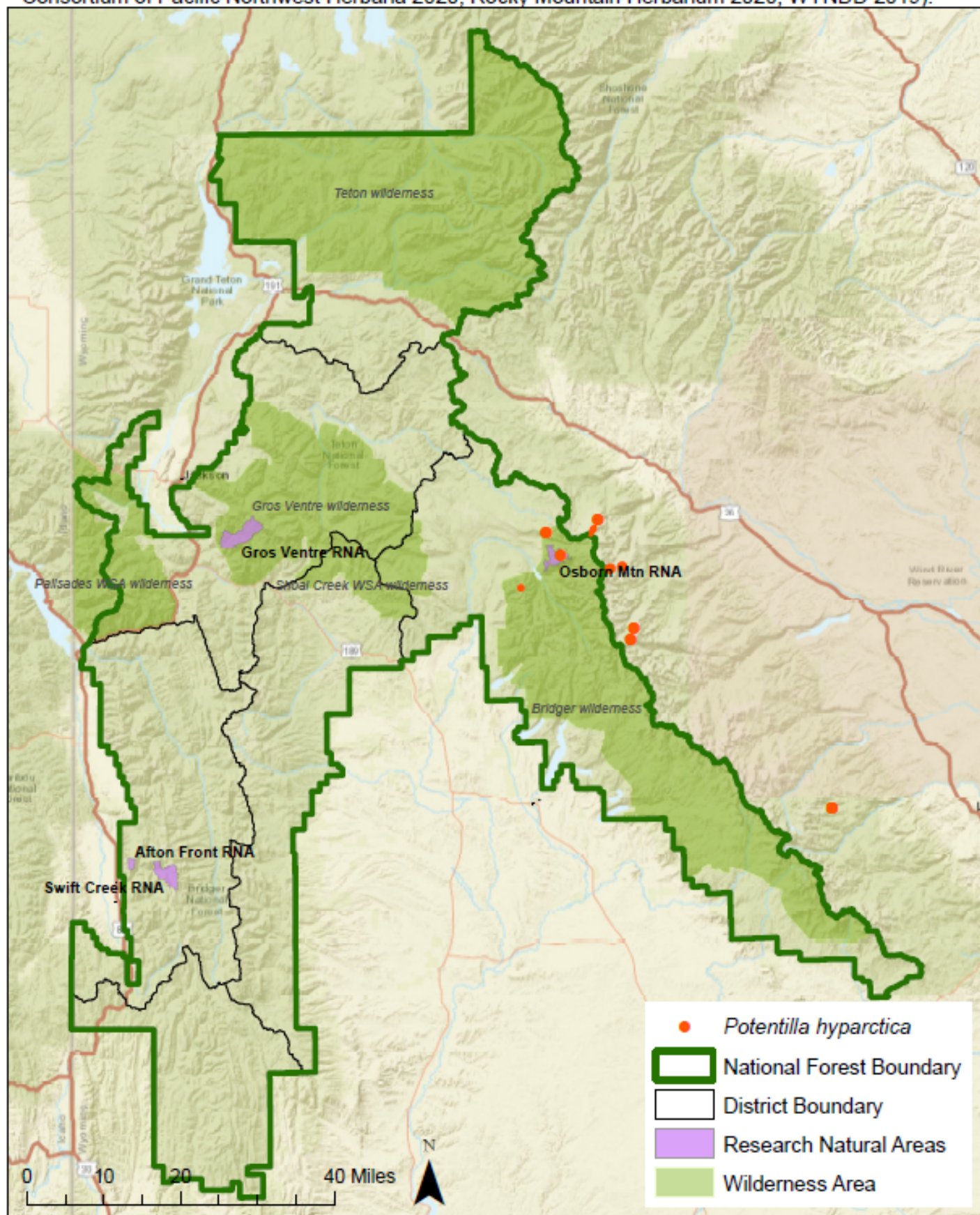
**Map 1, *Potentilla hyparctica* range in Wyoming and surrounding states (NRCS 2020).**



Native Status:



**Map 2, *P. hyparctica* occurrences in Bridger-Teton National Forest vicinity (SEINet 2020; Consortium of Pacific Northwest Herbaria 2020; 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

<b>Entity</b>	<b>Status/Rank (include definition)</b>
<b>NatureServe Global Status</b>	<p><b>G5TNR—Secure/Unranked</b></p> <p><b>G5</b>—<i>Common; widespread and abundant.</i></p> <p><b>TNR</b>—<i>Taxonomic rank not yet assessed.</i></p>
<b>NatureServe State Status</b>	<p><b>S1—Critically Imperiled</b></p> <p><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></p>
<b>WYNDD</b>	<p><b>Plant Species of Concern</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 Region 4 Sensitive
<b>USDOI FWS</b>	Not listed
<b>USDOI BLM</b>	Not listed
<b>IUCN</b>	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	<i>Potentilla hyparctica</i> is known from three records on the Bridger-Teton National Forest. These records are on the central-east portion of the Forest, on alpine tundra habitat within the Bridger wilderness area (Table 1, Map 2). The scarcity of occurrences suggests this species is rare and isolated on the Forest.
Distribution outside the Bridger-Teton National Forest	<i>Potentilla hyparctica</i> occurs from Alaska and the Yukon south to British Columbia and Alberta, east to Labrador. In Wyoming, known only from the north Wind River Range (Fremont and Sublette counties).
Abundance on the Bridger-Teton National Forest	Abundance on the Bridger-Teton National Forest cannot be assessed due to lack of data (Markow and Fertig 2000; WYNDD 2020).
Population Trend on the Bridger-Teton National Forest	Population trends on the Bridger-Teton National Forest cannot be assessed due to lack of data (Markow and Fertig 2000; WYNDD 2020).
Habitat Trend on the Bridger-Teton National Forest	<p><i>Potentilla hyparctica</i> inhabits damp ericaceous heath, snow patch meadows, damp arctic and alpine tundra, rocky outcrops, solifluction slopes, talus, mainly acidic Bedrock. Wyoming populations occur in alpine fellfields, rocky meadows, and late snowbeds at elevations of 11720-12300 feet (Markow and Fertig 2000; WYNDD 2020).</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 2020).</p> <ul style="list-style-type: none"> <li>• Occurrence #4 (15406 – 1994): Occurs within the Bridger wilderness area; not within RMU; not in vicinity (over 1 mi) of any roads or motorized trails; within 1 mi of non- motorized trails; not within perimeter of large fire event; not near any mapped non-native plant invasions</li> <li>• Collection #11406 (1991): Occurs within the Bridger wilderness area; not within RMU; not in vicinity (over 1 mi) of any roads or motorized trails; within 1 mi of non- motorized trails; not within perimeter of large fire event; not near any mapped non-native plant invasions</li> <li>• Collection #7596 (1984): Occurs within the Bridger wilderness area and Osborn Mtn RNA; not within RMU; not in vicinity (over 1 mi) of any roads, motorized trails, or non- motorized trails; not within perimeter of large fire event; not near any mapped non-native plant invasions</li> </ul> <p>The above analysis suggests that habitat for <i>P. hyparctica</i> has experienced low levels of effects from natural and anthropogenic disturbances, and trends may be stable on the forest. However, climate change effects</p>

Criteria	Rationale
	could degrade conditions, as described below.
<p>Threats to the Species and its Habitat on the Bridger-Teton National Forest</p>	<p>Immediate threats are inferred to be low in the species' rocky alpine habitat (Markow and Fertig 2000; 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.</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</p>

Criteria	Rationale
	<p>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-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>
<p>Life history and demographic characteristics of the species</p>	<p>Arctic cinquefoil is a tufted perennial herb with few to several stems from a caudex. Stems are 2-10 cm tall and have a mix of short and long-spreading hairs. Basal leaves are long-petioled and divided into 3 obovate leaflets with sharp to rounded-toothed margins. Leaves are loosely long-hairy and grayish beneath, but not white-woolly. Stem leaves are progressively smaller and sessile. Flowers occur singly or in groups of 2-3 and have a calyx of 5 ovate sepals alternating with 5 leafy bracts, 5 yellow petals (equal or longer than the calyx), 20 or more stamens, and numerous pistils with slender, terminal styles. Fruits are glabrous achenes. The flowering/fruiting period is July-August (WYNDD 2020).</p>
<p>Date: May 1, 2020 Reviewer: L. Chipman</p>	

## Summary and Recommendations

Species (Scientific and Common Name): ***Potentilla hyparctica* var. *elatior*** (arctic cinquefoil)

*Potentilla hyparctica* var. *elatior* has a conservation ranking of G5TNR S1. Formerly known as *Potentilla nana*, that taxon is now relegated to populations having an obligate arctic distribution (FNA). This separation begs the question as to what the G rank for those populations in Wyoming should be and is likely less than G5. It occurs from Alaska and the Yukon south to British Columbia and Alberta, east to Labrador. In Wyoming, there are three occurrences on the Bridger-Teton Forest and another seven on the west slope of the Wind River Range. It inhabits damp ericaceous heath, snow patch meadows, damp arctic and alpine tundra, rocky outcrops, solifluction slopes, talus. Populations in Wyoming occur at elevations of 11720-12300 feet (Markow and Fertig 2000; WYNDD 2020).

All three occurrences fall within designated wilderness areas, and outside of existing RMUs. None of the occurrences are within 1-mile of motorized roads or trails and only one lies within 1-mile of non-motorized trail. Habitat for *P. hyparctica* var. *elatior* has experienced low levels of effects from natural and anthropogenic disturbances, and trends may be stable on the forest.

However, climate change effects could degrade conditions and there is evidence that snowpack dynamics could have a disproportionate effect on species persistence. Climate related effects such as reduced snowpack, increased competition from lower elevation species and drying of wetlands could reduce habitat and viability. The time scale and severity of such climate impacts are not well understood. Given this assessment of threats, it is recommended that *Potentilla hyparctica* var. *elatior* not be included as a species of conservation concern. Should evidence of more immediate climate change impacts on local alpine habitats come to light, then the conservation of this taxon should be re-examined.

Evaluator: Jessica Irwin & Rose Lehman Date: 04/2020; 4/8/2021

## References

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