SPECIES: Scientific [common]	***Phippsia algida* [ice grass]**
Forest:	Bridger-Teton National Forest
Forest Reviewer:	**R.Lehman**
Date of Review:	**5/7/20; 4/8/2021**
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 Description	Source of Information
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	Occurs with *Carex bipartita, Carex incurviformis,* and *Juncus biglumis* on tundra in small bog. Elev. 11600 ft. Phenology: flowering & fruiting.	Erwin F. Evert, 7591, EO #3 (Rocky Mountain Herbarium 2020; WYNDD GIS 2019)
8/18/1988	Unknown	U.S.A., Wyoming, Sublette County: Downs Mountain. 43.2191° N, 109.6853° W; uncertainty 1 mi.	Mixed talus below southwest facing snowbeds. Elev. 13000 ft.	Robin Jones, 679. EO #5 (Rocky Mountain

			Phenology: flowering & fruiting.	Herbarium 2020; WYNDD GIS 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?

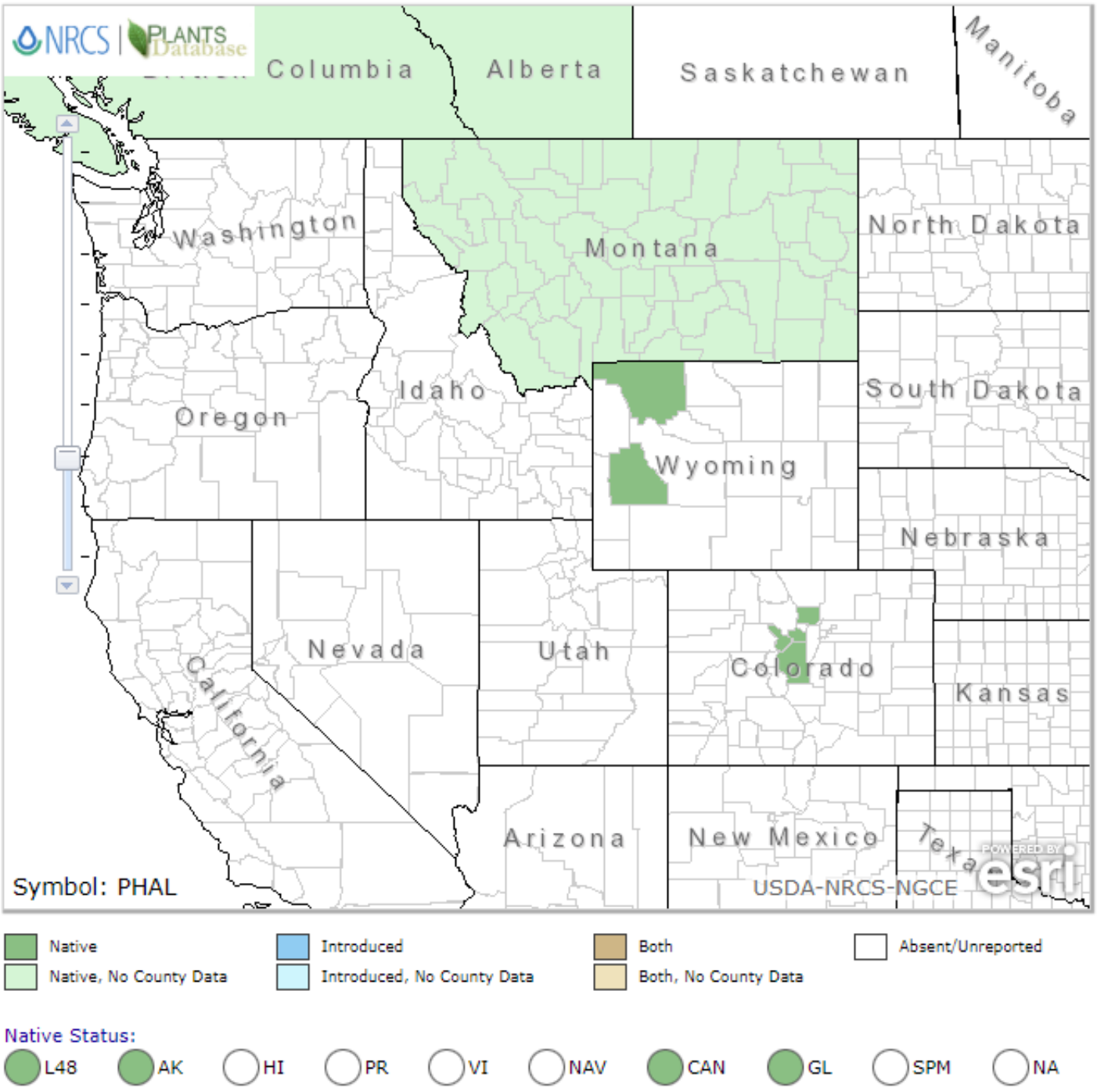
Yes___ No___

Provide explanation for determination

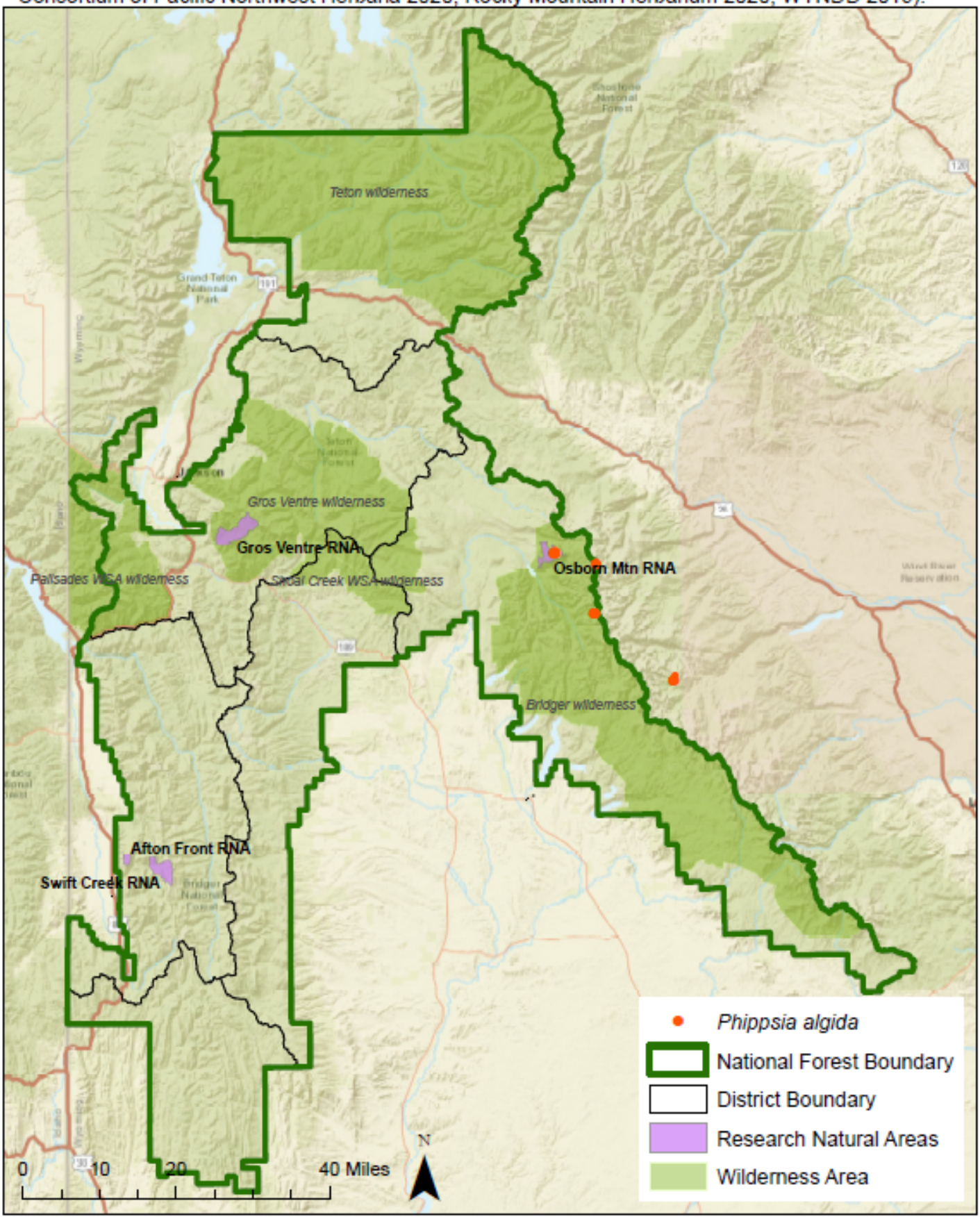
N/A–Occurrences have been documented since 1990.

If determination is no, stop assessment

Map 1, *Phippsia algida* range in Wyoming and surrounding states (NRCS 2020).



Map 2, *P. algida* 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

Entity	Status/Rank (include definition)
NatureServe Global Status	**G5—Secure** *Common; widespread and abundant.*
NatureServe State Status	**S1—Critically Imperiled** *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.*
WYNDD	**Plant Species of Concern** *Species vulnerable to extirpation at the global or state level due to:* *a. their rarity (e.g., restricted distribution, small population size, low population density)* *b. inherent vulnerability (e.g., specialized habitat requirements, restrictive life history)* *c. threats (e.g., significant loss of habitat, sensitivity to disturbances)* (Wyoming Natural Diversity Database - Species of Concern)
USDA Forest Service	Not Region 4 Sensitive
USDOI FWS	Not listed
USDOI BLM	Not listed
IUCN	**Least Concern**

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	*Phippsia algida* is known from two records on the Bridger-Teton National Forest. These records are on the central-east portion of the Forest, on alpine tundra habitat (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	*Phippsia algida* is a circumpolar species that occurs from Alaska to Greenland, south across much of northern Canada, and widely disjunct in the Rocky Mountains throughout Montana, Wyoming, and Colorado. In Wyoming, it is known only from the Beartooth and Wind River Range (Park and Sublette counties); it has also reported in Fremont County (Markow and Fertig 2000; MTNHP 2020; WYNDD 2020).
Abundance on the Bridger-Teton National Forest	Populations are typically small and restricted to specialized microhabitats. Several populations surveyed on the Beartooth Plateau in 1996 consisted of colonies of ca 30 plants in areas of less than 0.1 acre (WYNDD 2020).
Population Trend on the Bridger-Teton National Forest	No trend data are available. This species may benefit from moderate grazing activity (particularly from the increase in nitrogen from animal wastes), but it is not known what impacts long-term sheep grazing has had in the Beartooth Range (Markow and Fertig 2000; WYNDD 2020).
Habitat Trend on the Bridger-Teton National Forest	*Phippsia algida* inhabits as wide variety of moist, arctic and alpine habitats often in meltwater of receding snowbanks at 10100-13000 feet (Markow and Fertig 2000). Wyoming populations are on wet gravel along alpine rivulets issuing from persisting snow banks and in gravelly places bordering alpine fens (WYNDD 2020). *Phippsia algida* is highly nitrophilous, can tolerate highly alkaline soils, peat, imperfectly drained silts, and clays, such as mudflats in ephemeral river channels, as well as disturbed soil (Aiken et al. 2007). 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). • Occurrence #3 (7591 - 1984): Within Osborn Mtn RNA and Bridger wilderness area; 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 • Occurrence #5 (679 - 1988): Within Bridger wilderness area; ; 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

Criteria	Rationale
	The above analysis suggests that habitat for *P. algida* 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, as described below.
Threats to the Species and its Habitat on the Bridger-Teton National Forest	Immediate threats are inferred to be low in the species' alpine habitat. Plants may possibly sensitive to snowmelt conditions (WYNDD 2020) as well as grazing, trampling, and habitat loss (Markow and Fertig 2000). Riparian habitat and wetlands receive additional considerations and protections from disturbances through forest management direction and water regulations. These considerations and protections would avoid or minimize adverse effects to special status riparian and wetland plants, such as *Eriophorum scheuchzeri*, where they occur. Climate related effects and drying of wetlands could reduce habitat and viability for rare species. Warming temperatures and reduced snowpack may result in the loss of high-elevation riparian and wetland habitats, resulting in drier, less productive systems. With rising temperatures, frigid snow- and water-dependent ecosystems in the upper portions of watersheds will have very little room to move upslope. Elevating temperatures will increase competition from riparian species now occurring at lower elevations, and smaller snowpacks will increase competition from upland species that occupy drier sites. According to the Intermountain Adaption Partnership assessments, high-elevation riparian and wetland communities have a moderate to high sensitivity to climate change, a low to moderate adaptive capacity, and high vulnerability to climate change (Halofsky et al. 2018) 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 (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-Struttmann 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.
Life history and demographic characteristics of the species	*Phippsia algida* is a low-growing, densely tufted perennial graminoid with stems 2-10 cm tall. Leaf blades are flat, up to 25 mm long, and with tips that resemble the prow of a boat. Panicles are 5-35 mm long with short branches. Spikelets are 1-3 mm long, one-flowered, and have unequal, short glumes (the first sometimes absent). The flowering/fruiting period is from August to September (WYNDD 2020). Although this species is

Criteria	Rationale
	usually perennial, it may be annual in some extreme environments having sufficient growing season for seed production in a single year (Aiken et al. 2007).
Date: May 1, 2020 Reviewer: L. Chipman	

Summary and Recommendations
Species (Scientific and Common Name): ***Phippsia algida*** (ice grass)
Phippsia algida has a conservation ranking of G5 S1. It is a circumpolar species that occurs from Alaska to Greenland, south across much of northern Canada, and widely disjunct in the Rocky Mountains throughout Montana, Wyoming, and Colorado. In Wyoming, it is known only from the Beartooth and Wind River Range (Park and Sublette counties); it has also reported in Fremont County (Markow and Fertig 2000; MTNHP 2020; WYNDD 2020). It is known from two records on the Bridger-Teton Forest. *Phippsia algida* inhabits as wide variety of moist, arctic and alpine habitats often in rivulets issuing from persisting snow banks and in gravelly places bordering alpine fens. It is highly nitrophilous, can tolerate highly alkaline soils, peat, imperfectly drained silts, and clays, such as mudflats in ephemeral river channels, as well as disturbed soil (Aiken et al. 2007). Both occurrences fall within designated wilderness areas, and outside of existing RMUs. None of the occurrences are within 1-mile of any roads or trails. 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 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 Phippsia algida 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

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