SPECIES: Scientific [common]	*Ipomopsis aggregata* var. *tenuituba* or ***Ipomopsis tenuituba* ssp. *tenuituba**** [Slender-trumpet ipomopsis]
Forest:	Bridger-Teton National Forest
Forest Reviewer:	**R. Lehman, K. Clause, Trevor Bloom**
Date of Review:	**5/5/20; 6/1/20; 01/12/21; 3/27/25**
Forest concurrence (or recommendation if new) for inclusion of species on list of potential SCC: (Enter Yes or No)	**No**

***Accepted name for this taxon (USDA 2020, Heidel 2018)

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[1]
1929	Unknown	Wyoming, Lincoln County: Red Mountain, northeast of Smoot.	Elev. 8800-10400 ft. Brushy slope.	Edwin B. Payson, George M. Armstrong #3622 (Rocky Mountain Herbarium 2020; SEINet 2020)
1993	Unknown	Wyoming, Lincoln County: Wyoming/Salt River Ranges: Salt River	Elev. 9000-9200 ft. Coniferous forests, grassy slopes and shaley, semi-	Hartman #42580 (Rocky Mountain

		Range: end of Indian Creek Road, ca 21 air mi NE of Cokeville.	barren slopes with stream below.	Herbarium 2020; SEINet 2020)
1993	Unknown	Wyoming, Lincoln County: Wyoming/Salt River Ranges: Salt River Range: Indian Ridge, east flank: Bear Trap Creek, then NW on West Bear Trap Creek, ca 0.2 trail miles either side of their confluence.	Elev. 8100-8250 ft. Stream side and lower slopes.	Hartman #44546; EO #10 (Rocky Mountain Herbarium 2020; SEINet 2020; WYNDD GIS 2019)
1993	Unknown	Wyoming, Lincoln County: Wyoming/Salt River Ranges: Tunp Range: N end of Hams Fork Ridge, ca 15 air mi NE of Cokeville.	Elev. 8900-9000 ft. Lodgepole pine, subalpine fir and aspen covered ridge.	Hartman #42666 (Rocky Mountain Herbarium 2020; SEINet 2020)
1993	Unknown	Wyoming, Lincoln County: Wyoming/Salt River Ranges: Tunp Range: 0.2-1 road mi N of Bridger-Teton National Forest's southern boundary, ca 9 air mi NE of Cokeville.	Elev. 8180-8240 ft. Lodgepole pine and subalpine fir overstory with logged areas.	Hartman #43310 (Rocky Mountain Herbarium 2020; SEINet 2020)

[1]The Consortium of Pacific Northwest Herbaria (Consortium of Pacific Northwest Herbaria 2020) 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?

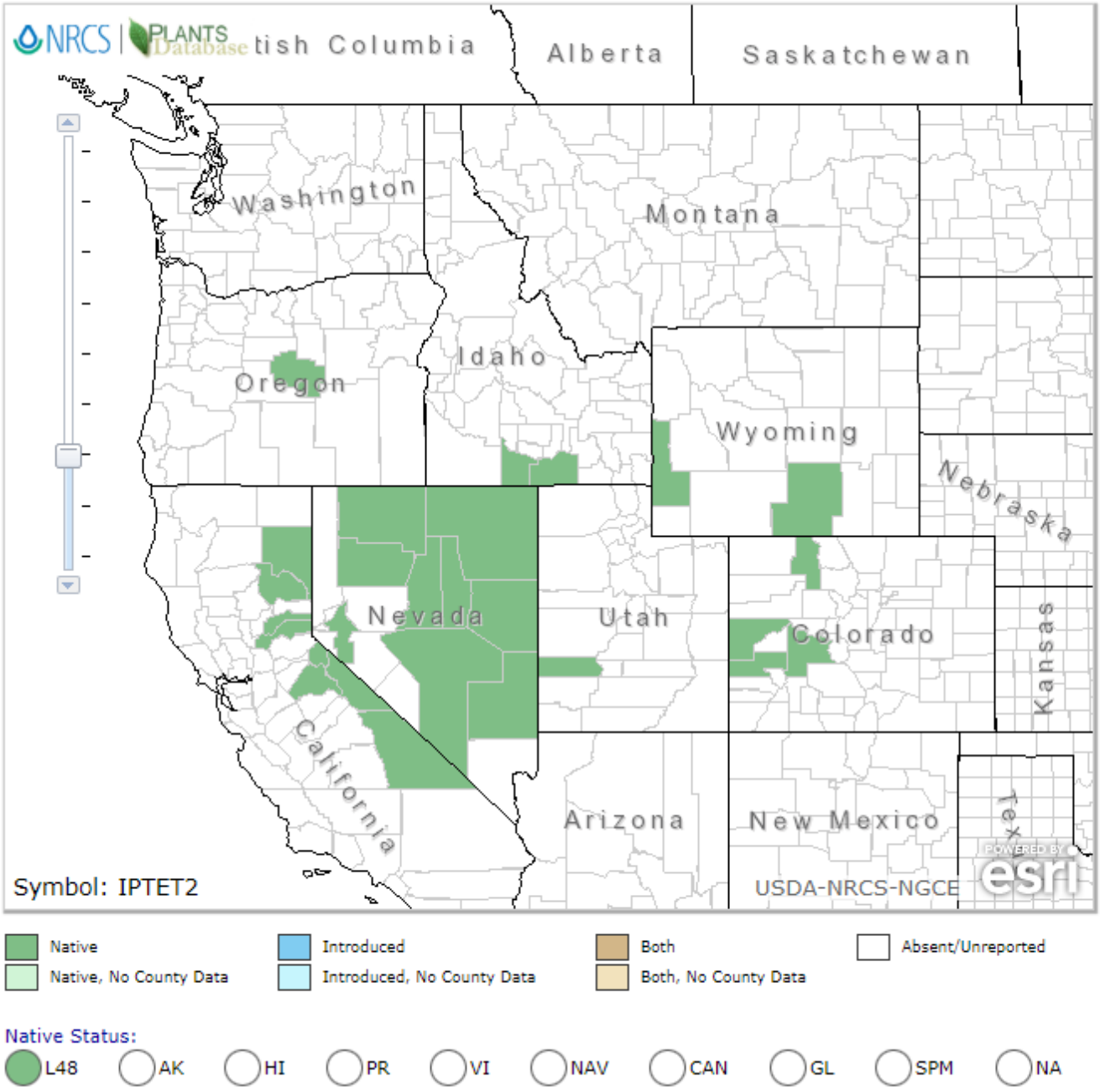
Yes___ No___

Provide explanation for determination

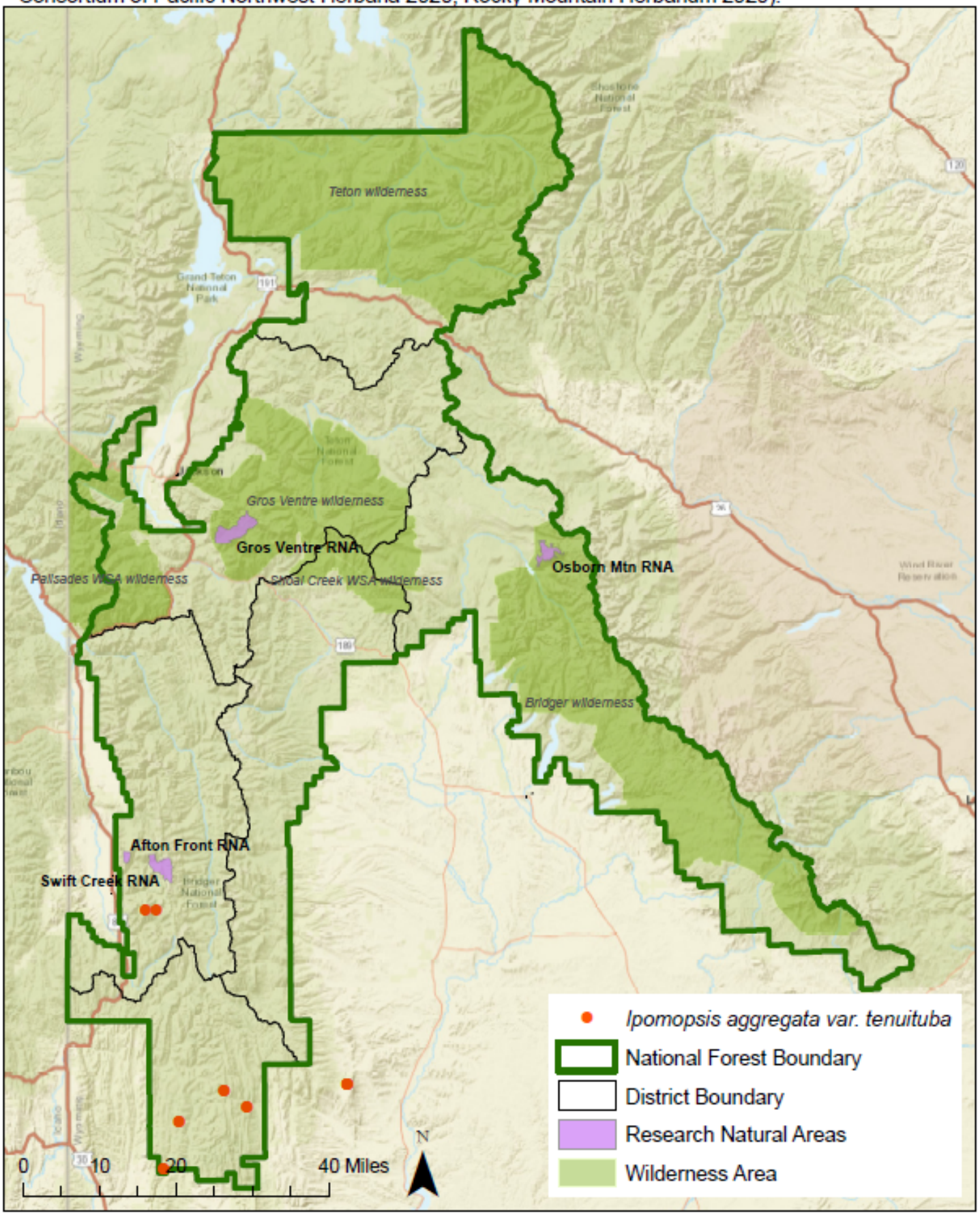
N/A–Occurrences have been documented since 1990.

If determination is no, stop assessment

Map 1, *Ipomopsis aggregata var. tenuituba* range in Wyoming and surrounding states (NRCS 2020).



Map 2, *I. aggregata var. tenuituba* 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

Entity	Status/Rank (include definition)
NatureServe Global Status	**G4G5— Apparently Secure/Secure** *At fairly low risk of extinction or elimination due to an extensive range and/or many populations or occurrences, but with possible cause for some concern as a result of local recent declines, threats, or other factors. — At very low risk or extinction or elimination due to a very extensive range, abundant populations or occurrences, and little to no concern from declines or threats.* **TNR—Taxon Not Ranked**
NatureServe State Status	**S1—Critically Imperiled** At very high risk of extinction or elimination in the jurisdiction due to very restricted range, very few populations or occurrences, very steep declines, very severe threats, or other factors.
WYNDD	**Plant Species of Concern** **G4G5TNR** *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 listed in Region 4
USDOI FWS	Not listed
USDOI BLM	Not listed
IUCN	Not listed

Sources: WYNDD 2020a; 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	There are five known *I. aggregata* var. *tenuituba* occurrences on the Bridger-Teton National Forest, four of which were discovered since 1990 (**Table 1, Map 2**). The 1929 occurrence status is unknown and represents the most northerly record for this species. All are in the lower–western portion of the Forest (Lincoln County).
Distribution outside the Bridger-Teton National Forest	*Ipomopsis aggregata* var. *tenuituba* ranges from eastern Oregon and California, east to southeastern Wyoming, central Colorado, and southern Utah. In Wyoming, it is known from 13 occurrences in the Medicine Bow, Laramie, Salt River, Tunp, and Sierra Madre ranges (Albany, Carbon, Lincoln, and Sublette counties) (WYNDD 2020b).
Abundance on the Bridger-Teton National Forest	Abundance is generally rare (Heidel 2018), but population numbers on the Bridger-Teton National Forest are unknown.
Population Trend on the Bridger-Teton National Forest	Population trends on the Bridger-Teton National Forest are unknown due to lack of data (Heidel 2018).
Habitat Trend on the Bridger-Teton National Forest	Habitat is open grassy meadows or sagebrush flats in the mountains. Wyoming populations occur in *Pinus contorta* forests, granitic rock outcrops, and mountain big sagebrush/snowberry grasslands sometimes with *Pinus flexilis*, on sandy slopes, brushy meadow swales, and roadbanks. 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 (WYNDD GIS 2019, Google Earth Pro 2020). The following summarizes identified disturbances for each occurrence in Bridger-Teton National Forest: None of the mapped occurrences occur within Wilderness Areas or Research Natural Areas, and thus habitat is not receiving protections from anthropogenic activities otherwise afforded by these designations. All occurrences occur within grazing allotments, indicating habitat may be subject to impacts such as sediment compaction, trampling of herbaceous vegetation, increases in bare ground, and noxious weed expansion. Likewise, all occurrences are in close proximity (less than a mile) to motorized roads, which increases the potential for habitat degradation from human presence and vehicle use. One occurrence (Hartman #44546) is within the perimeter of a 14705-acre wildfire (Fontenelle). As the occurrence was documented in 1993, prior to the fire's occurrence in 2000, it is possible that the population and/or habitat was damaged.

Criteria	Rationale
	Several occurrences are within the perimeter of or in close proximity to mapped non-native plant invasions—Hartman #43310 (1993) is within and Hartman #44546 (1993) is 0.15 miles from a mapped *Carduus nutans* invasion; Hartman #42580 (1993) is within and Hartman #42666 (1993) is ~0.14 miles from a mapped *Cirsium arvense* invasion. In addition to habitat degradation from the invasions, these populations may experience increased competition. The above analysis suggests that habitat for *I. aggregata* var. *tenuituba* has likely experienced moderate to high levels of effects from natural and anthropogenic disturbances.
Threats to the Species and its Habitat on the Bridger-Teton National Forest	*Ipomopsis aggregata* var. *tenuituba* is potentially threatened by grazing and water developments (WYNDD 2020b). However, population status and trends do not exist to substantiate these threats. Habitat loss where populations occur, fragmentation, and degradation caused by human recreation, livestock grazing, resource development (timber and mineral), and invasive non-native plant species are potential threats (Ladyman 2007). Invasive plants have been identified as a major threat to the biological diversity and ecological integrity within and outside the Bridger-Teton National Forest. Untreated invasive plant infestations have the potential to expand at an average rate of 1.3 to 25 percent per year (USFS 2017). 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). Reduction of snowpack and advancement of snow melt date may negatively impact long term survival of populations (Campbell 2019). 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.

Criteria	Rationale
Life history and demographic characteristics of the species	*Ipomopsis aggregata* var. *tenuituba* is a short-lived perennial herb with stems 25-60 cm tall. The hairy basal and stem leaves are pinnately divided into linear segments and have a skunk-like odor. The inflorescence is a narrow, terminal panicle with flowers tending to crowd onto one side of the main axis. The trumpet-like flowers have a slender, tubular white or pale violet corolla 25-60 mm long and 2-3.5 mm wide at the mouth. Unlike the more common red flowered Ipomopsis aggregate which are pollinated mostly by hummingbirds, I. aggregata var. tenuituba is mainly moth pollinated. Anthers are shorter than the corolla tube. The calyx is 5-lobed, with the lobes shorter than the fused tubular base. Flowering occurs from July to early August (WYNDD 2020b).
Date: March 6, 2020 Reviewer: L. Chipman Updated: K. Clause 3/27/25	

Summary and Recommendations

Species (Scientific and Common Name): *Ipomopsis aggregata* var. *tenuituba* (slender-trumpet ipomopsis)

Ipomopsis aggregata var. *tenuituba,* maintained as *Ipomopsis tenuituba* var. *tenuituba* (USDA 2020, Heidel 2018) is listed as S1 (critically imperiled) and G4G5 (apparently secure/secure) globally. Populations range from eastern Oregon and California, east to southeastern Wyoming, central Colorado, and southern Utah. On the Bridger-Teton Forest, there are five occurrences, four of which were discovered since 1990 and the fifth dating back to 1923. General habitat has been described as open grassy meadows or sagebrush flats in the mountains. In Wyoming, populations occur in *Pinus contorta* forests, granitic rock outcrops, and mountain big sagebrush/snowberry grasslands sometimes with *Pinus flexilis*, on sandy slopes, brushy meadow swales, and roadbanks.

There are several potential threats to occurrences on the Forest. All occurrences occur within grazing allotments, indicating habitat may be subject to impacts such as trampling of herbaceous vegetation, increases in bare ground, and noxious weed expansion. Likewise, all occurrences are in proximity (less than a mile) to motorized roads. Three (of four) of the contemporary occurrences have invasive species documented in proximity; *Carduus nutans* and *Cirsium arvense*. A long-term reduction of snowpack and advancement of snow melt date may negatively impact long term survival of populations (Campbell 2019). The specific relationship with moths for pollination increases the species sensitivity to change in pollinator populations. Unfortunately, none of the populations have trend data or even estimates of population size.

The presence of disturbances which may negatively impact populations, coupled with the lack of trend or baseline population estimates greatly hinders an understanding of conservation urgency for this species. Of particular interest are any populations occurring in actively disturbed or invaded habitats such as reports of plants occurring on roadsides. If monitoring demonstrates impacts from threats and declining trends, this species may be recommended as an SCC in the future. However, given the lack of population status and trend information and that global populations are apparently secure with Wyoming's contribution to this ranking low, *Ipomopsis tenuituba* var. *tenuituba* is not recommended as an SCC at this time.

Evaluator: Jessica Irwin & Rose Lehman Date: 01/12/2021 Updated: K. Clause 3/27/25

References

Campbell D.R. 2019. Early snowmelt projected to cause population decline in a subalpine plant. Proceedings of the National Academy of Sciences 116 (26) 12901-12906

Consortium of Pacific Northwest Herbaria. 2019. Specimen data search. Available at: http://pnwherbaria.org.

Google Earth Pro, 2020. Aerial photo and mapping analysis. Software version 7.3.2.5776 (64-bit).

Halofsky, J.E., D.L. Peterson, J.J. Ho, N.L. Little, L.A. Joyce, editors. 2018. Climate change vulnerability and adaptation in the Intermountain Region. Gen. Tech. Rep. RMRS-GTR-xxx. Fort Collins, CO: US Department of Agriculture, Forest Service, Rocky Mountain Research Station.

Heidel, B. 2018. Wyoming plant species of concern, March 2018. Wyoming Natural Diversity Database, Laramie, WY. Accompanied by Wyoming plant species of potential concern, with tables of additions and deletions.

Mancuso, M. and B. Heidel. 2008. Wyoming Plant Species of Concern on Caribou-Targhee National Forest: 2007 Survey Results Teton and Lincoln counties, Wyoming. Prepared for Caribou-Targhee National Forest by Wyoming Natural Diversity Database, Laramie, WY.

NatureServe. 2020. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Internet website: http://explorer.natureserve.org.

Rocky Mountain Herbarium Specimen Database. 2020 University of Wyoming, Department of Botany. Laramie, WY. Internet website: http://rmh.uwyo.edu/data/search.php. Accessed on January 21, 2020.

SEINet. 2020. SEINet data portal. Available at: http://swbiodiversity.org/seinet/collections/index.php.

USDA, National Resources Conservation Service (NRCS). NRCS. 2020. The PLANTS Database. Available at http://plants.usda.gov. National Plant Data Team, Greensboro, NC 27401-4901 USA.

Wyoming Natural Diversity Database (WYNDD). 2020a. Wyoming Natural Diversity Database; Data Explorer. Laramie, WY: University of Wyoming.

WYNDD 2020b. *Ipomopsis aggregata* var. *tenuituba* — Slender-trumpet ipomopsis. Wyoming Field Guide. Laramie, WY: University of Wyoming. http://fieldguide.wyndd.org/

WYNDD GIS 2019. GIS data of Wyoming Natural Diversity Database. Bridger Teton National Forest, U.S Forest Service. Department of Agriculture. Data received April 25, 2019.