SPECIES: Scientific [common]	*Gentianopsis simplex* [Hiker's gentian]
Forest:	Bridger-Teton National Forest
Forest Reviewer:	**J.Irwin 9/30/2020; R.Lehman 10/05/2020**
Date of Review:	**10/05/2020**
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 _____

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]
1976	Unknown	Outside Bridger-Teton National Forest: Sublette County, Wind River Mts. Elkhart Road. T35N R108W S20. 42.9893°, -109.7726°. Datum: NAD 27. Coordinate uncertainty: 800 meters. Coordinate Source: TRS2LL.	*Abies lasiocarpa*/*Carex rostrate*. Slope 8. Exposure 230 Elevation 8860 ft.	Collector: R. Steele, 1134 (Consortium of Pacific Northwest Herbarium 2019)

2006	1 Collection	Bridger-Teton National Forest: Teton Wilderness. Along shore of pond at head of tributary of Coulter Creek, just west of headwaters of East Whetstone Creek.	Elevation 8360 ft. Pond shore surrounded by scattered *Picea engelmannii*	Collector: David Scott (WYNDD 2019, Rocky Mountain Herbarium 2019)
2006	1 Collection	Outside Bridger-Teton National Forest: Grand Teton National Park and Vicinity: John D. Rockefeller Jr. Memorial Parkway: near Polecat Creek, approximately 32.5 air miles N of Moose and 22.3 air miles NNW of Moran.	Elevation 6905 ft; Cold springs and thermal springs with adjacent wetlands	Collector: David Scott (Rocky Mountain Herbarium 2019)

[1] The SEINet data portal (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?

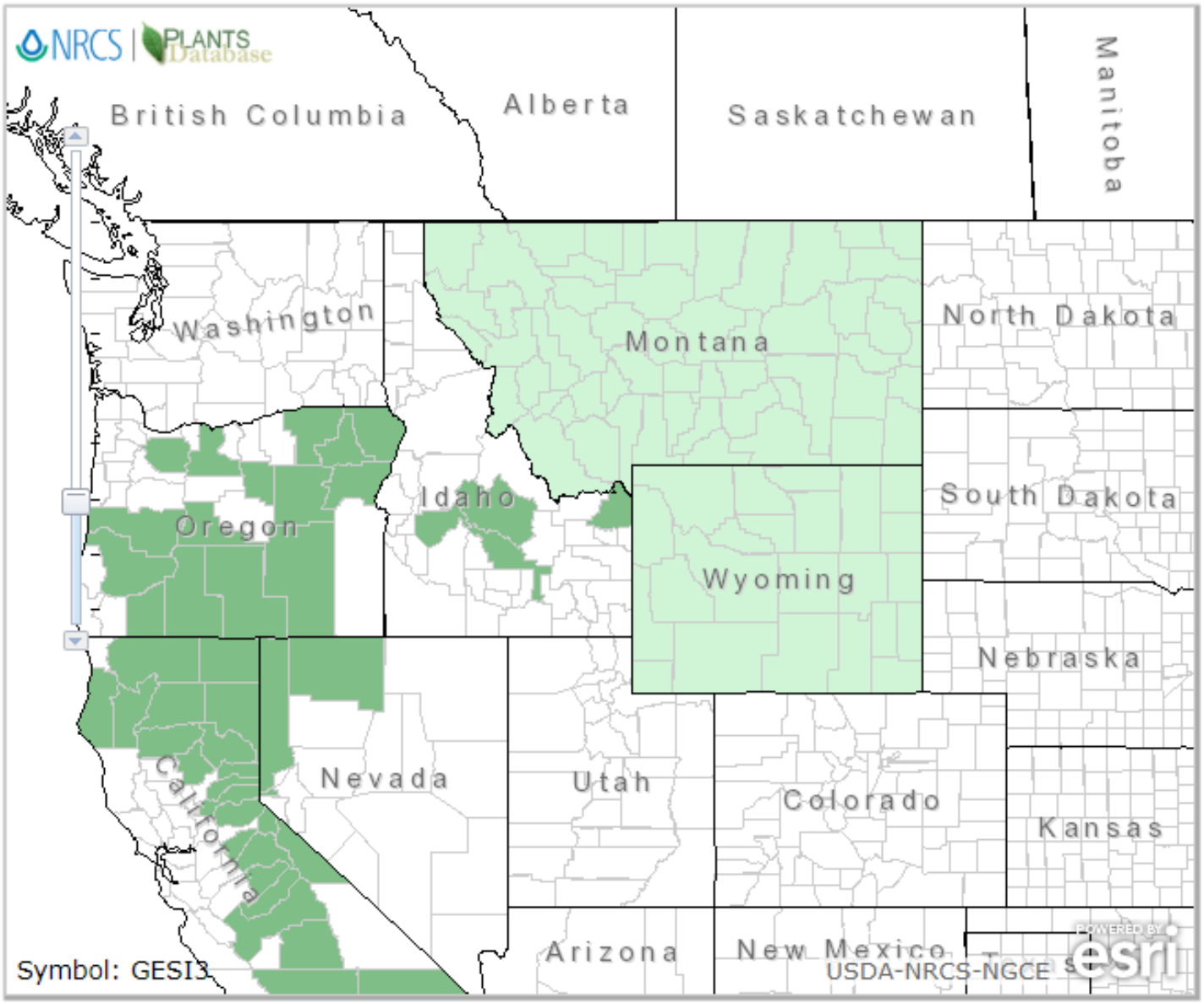
Yes___ No___

Provide explanation for determination

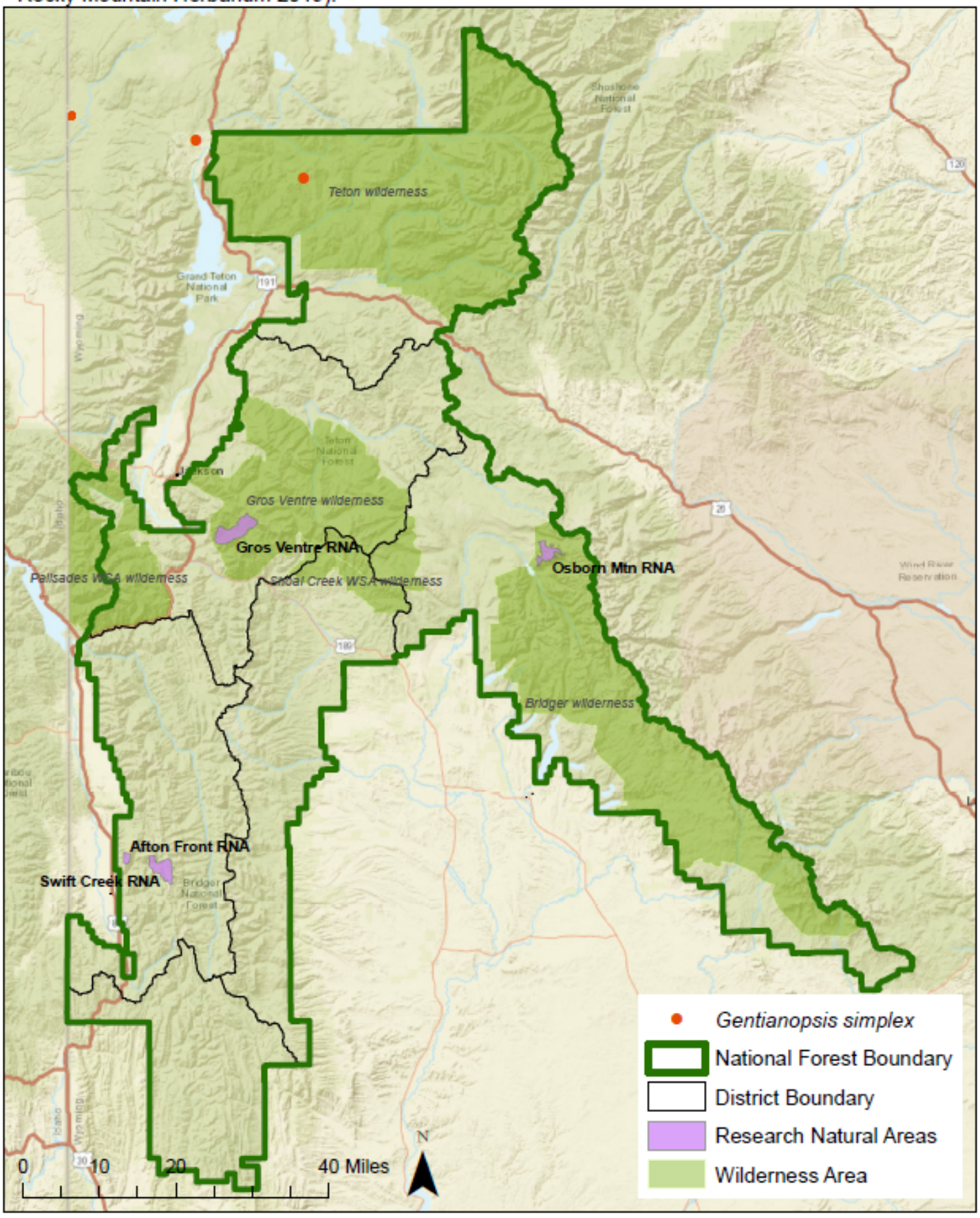
N/A–Occurrences have been made since 1990.

If determination is no, stop assessment

d. **Map 1**, *Gentianopsis simplex* range in Wyoming and surrounding states (NRCS 2019).



Map 2, *G. simplex* occurrences in Bridger-Teton National Forest vicinity (WYNDD 2019; Rocky Mountain Herbarium 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.*
State of Wyoming	Not listed
WYNDD	**Plant Species of Concern** **G5/S1** *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	Not listed

Sources: WYNDD 2019; 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	This species is known from one occurrence on the Bridger-Teton National Forest collected in 2006 (WYNDD 2019; Rocky Mountain Herbarium 2019). Another occurrence was collected approximately 2 miles outside the Forest (**Table 1**), suggesting that more populations may exist on the Forest, but are unknown at this time. The two occurrences listed in Table 1 were discovered during an inventory of federal lands totaling 766 mi^2, including Grand Teton National Park, the John D. Rockefeller Jr. Memorial Parkway, Bridger-Teton National Forest (Pinyon Peak Highlands), and Targhee National Forest (Wyoming's northern portion) (Kesonie and Hartman 2011).
Distribution outside the Bridger-Teton National Forest	The distribution of *g. simplex* extends from the Cascades of Oregon south to the Sierra Nevadas of central California, and east through Oregon to south-central and western Montana, Idaho, and Nevada (NatureServe 2019). In Wyoming, the species was previously known from the Yellowstone area. New collections have expanded its range southward into the Parkway and the Highlands (Kesonie and Hartman 2011). This species was found in wetlands at the margins of both a thermal and cold springs and a pond with scattered individuals of Engelmann spruce (**Table 1**; Kesonie and Hartman 2011, Rocky Mountain Herbarium 2019). The species has a large range, encompassing several states, however, populations appear to be sparse and isolated within the range in Wyoming.
Abundance on the Bridger-Teton National Forest	Only one occurrence of *Gentianopsis simplex* has been documented on the Bridger-Teton National Forest and close to the Forest boundary (**Table 1**; Kesonie and Hartman 2011, Rocky Mountain Herbarium 2019). WYNDD indicates this species is rare in Wyoming with a very low number of populations (Heidel 2018). This information suggests it is also likely rare on the Bridger-Teton National Forest. Although the entirety of Bridger-Teton National Forest has not been floristically inventoried, some areas within and adjacent to Bridger-Teton National Forest have been surveyed over the years. This species was not documented during these survey efforts: • Afton Front Research Natural Area Bridger-Teton National Forest (Fertig and Jones 1994) • Horse Creek Research Natural Area Bridger-Teton National Forest (Fertig and Jones 1994) • Swift Creek Research Natural Area Bridger-Teton National Forest (Fertig and Jones 1994) • Sensitive plant surveys and status of rare plant species on Bridger-Teton National Forest, 1997-1998 (Fertig 1999) • Rare Species and Riparian Vegetation of the Snake River Basin in Wyoming (Jones et al. 2001)

Criteria	Rationale
	• Survey for *Stephanomeria fluminea* on the Bridger-Teton National Forest (Markow 2004) • Wyoming Plant Species of Concern on Caribou-Targhee National Forest: 2007 Survey Results Teton and Lincoln counties, Wyoming (Mancuso and Heidel 2008) • Blackrock Creek Wild and Scenic River Botany Survey (Johnson 2011) • Sensitive and rare plant species inventory in the Salt River and Wyoming Ranges, Bridger-Teton National Forest (Heidel 2012) • Teton to Snake Fuels Management Project Botany Report and Biological Evaluation (Englebert 2013) • Botany inventories in select fens of the Caribou-Targhee and Bridger-Teton National Forests (Heidel 2019).
Population Trend on the Bridger-Teton National Forest	Recent trends for this species are unknown (Heidel 2018); there is insufficient information to assess this criterion.
Habitat Trend on the Bridger-Teton National Forest	*Gentianopsis simplex* inhabits mid-elevation, moist mountain habitats, such as bogs, fens, marshes, meadows, seeps, springs, and along the margins of ponds and streams. The occurrence on Bridger-Teton National Forest was located on a pond shore surrounded by scattered *Picea engelmannii* (WYNDD 2019; Rocky Mountain Herbarium 2019). Other reported associates include various species of *Carex*, *Pinus*, *Salix,* and others (Les 2017). Plants grow on both coarse and sandy substrates. This species is regarded as an indicator of the *Pinus contorta* forest zone (Les 2017). The condition of wetlands in high elevation forests is generally excellent to good (Smith and Lemly 2018), although some riparian and wetland systems in the Intermountain Region have been altered from historical conditions domestic livestock grazing, road construction, and nonnative species (Halofsky et al. 2018). Effects from these activities include changes in stream morphology, discharge, and water availability to riparian ecosystems.
Threats to the Species and its Habitat on the Bridger-Teton National Forest	Wetland and spring habitat may be threatened by climate change effects and disturbance or loss of wetland habitat. Changes in flow regimes, such as those from water diversions and dams, impact the amount, season, and timing of flows. This can substantially alter associated riparian and wetland species because of their dependence on fluvial geomorphic process, surface water, and groundwater. Floods are responsible for erosion, transport, and deposition of sediments, as well as the amounts and location of vegetation and debris. Many dominant riparian species, such as cottonwoods and willows, are pioneer species that depend on these events to provide bare, moist substrates necessary for seed germination and plant establishment (Halofsky et

Criteria	Rationale
	al. 2018). Mid-elevation riparian and wetland communities are rated as having a moderate to high sensitivity to climate change, moderate adaptive capacity, and moderate to high vulnerability (Halofsky et al. 2018). Mid-elevation riparian plant species may have the ability to move upward in elevation, but where resilience has been compromised by human uses, these systems may not be able to easily adjust to changes in their environment. Invasive species that already dominate many mid-elevation sites are likely to expand their dominance. As riparian areas become drier, upland species will continue to expand into these sites (Halofsky et al. 2018). Grazing can impact wetlands by altering water quality, trampling herbaceous vegetation, increasing bare ground, and facilitating noxious weed expansion in riparian areas. Rangelands form a major component of ecosystems in the Bridger-Teton National Forest, and there are open rangelands throughout the Forest, which likely overlap habitat for the species (USFS 2017). While adherence to rangeland management plans will limit the chance of overgrazing, there is potential for impacts to *G. simplex* and its habitat to occur. In general, riparian habitat and wetlands on National Forests receive 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 *G. simplex*, where they occur. To analyze trends in occupied 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 was assessed at each occurrence on the Forest (USFS GIS 2019, Google Earth Pro 2019). The 2006 occurrence of *G. simplex* is on or near the Teton Wilderness Area. A Wilderness Area is “an area of undeveloped Federal land retaining its primeval character and influence, without permanent improvements or human habitation, which is protected and managed so as to preserve its natural conditions" (Wilderness Act of 1964), indicating that effects from anthropogenic activities area likely minimal. There are no mapped nonnative plant invasions within the vicinity (1 mile) of the 2006 occurrence; it is, therefore, unlikely that invasive plants have impacted this population or surrounding habitat. The 2006 occurrence lies along the Colter Creek trail. It is possible that trail use has increased human presence into the species’ habitat, which could cause habitat degradation and damage to individuals (e.g., through trampling). However, since the population is within the Teton Wilderness Area, human presence and associated disturbance should be minimal.

Criteria	Rationale
	The 2006 population lies within a large (approximately 119,439 acres) wildfire that occurred in 1988, before the occurrence was documented. The fire likely altered habitat through changes in the physical and chemical properties of soils, and plant productivity, which may persist years after the fire (Sulwiński et al. 2017). However, since the occurrence was observed 18 years after the fire, the *G. simplex* population was likely not impacted or has recovered. No active grazing allotments overlap the 2006 occurrence. However, as active grazing allotments cover a large portion of the Forest area, it is possibly that impacts from grazing could occur in potential habitat where occurrences have not been documented. The above analysis suggests that habitat for *G. simplex* has likely experienced low effects from natural and anthropogenic disturbances.
Life history and demographic characteristics of the species	Hiker's Gentian has erect, usually simple stems that are 10 to 20 cm tall. The 2 to 5 pairs of opposite leaves are broadly lance-shaped to oval and are 1 to 6 cm long. The flowers are solitary at the ends of the stems. The sepals of the flower are 15 to 20 mm long with four deep lobes at its top. The deep blue, funnel-shaped flower head is 20-40 mm long, four-parted, and lobed over nearly half its length. The lobes have small teeth along the sides but are rounded and margined at the tips. The notches between the lobes are not plaited or fringed. Habitat for this species includes cold springs and thermal springs with adjacent wetlands, mountain bogs, and wet meadows at mid-elevations. *Gentianopsis simplex* is an annual, indicating it completes its life cycle, from germination to the production of seeds, within one growing season. Field observations have shown that typical pollinating insects such as bumblebees did not visit the flowers, but the flowers did contain thrips (Insecta: Thysanoptera), which may serve as pollinators. Additionally ecological information for this species is unavailable, but the possibility of self-pollination should be investigated (Les 2017).
Date: September 8, 2019 Reviewer: Julie Remp	

Summary and Recommendations

Species (Scientific and Common Name): *Gentianopsis simplex* (Hiker's gentian)

Gentianopsis simplex is listed as S1 (critically imperiled) and G5 (secure) globally. General habitat has been described as mid-elevation, moist mountain areas, such as bogs, fens, marshes, meadows, seeps, springs, and along the margins of ponds and streams. The species has a large range, encompassing mountainous areas of several western states. Populations in Wyoming appear to be sparse and isolated.

G. simplex is known from one occurrence on the Bridger-Teton National Forest, within the Teton Wilderness. This and another occurrence found 2 miles outside the Forest were documented in 2006 (WYNDD 2019; Rocky Mountain Herbarium 2019). Population size and trend is not available, but un-surveyed suitable mid-elevation wetland habitats occur elsewhere on the BT. Mid-montane wetland habitats have a moderate to high vulnerability to the effects of climate change by encroachment of upland habitat (Halofsky et al. 2018). Habitats may also be altered through water management, such as by diversion or damming. Although the Teton wilderness population is not in a grazing management area, habitats elsewhere may be affected by livestock grazing and trampling of soil.

Wyoming represents the fringe of species distribution where it is increasingly found to the west, across central Idaho, Oregon and into the southern Cascade Mountains. The one occurrence in the Teton Wilderness is essentially removed from management impacts. Thus, it is recommended that *Gentianopsis simplex* not be recommended as a SCC.

Evaluator: Jessica Irwin Date: 9/30/2020

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