SPECIES: Scientific [common]	*Carex infirminervia* [Weakly-nerved sedge]
Forest:	Bridger-Teton National Forest
Forest Reviewer:	**Daniel Lay; K. Clause**
Date of Review:	**1/29/2020; 3/25/25**
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 Information[1]
1980	Unknown	Lincoln Co., WY. Bridger-Teton National Forest. Skull Creek at Jct. of Little Greys River. 43.1475 -110.8638 +-969m.	Elevation 6070 ft.	J. S. Tuhy #66 (SEINet 2019)
1987	Unknown	Lincoln County, WY. Bridger-Teton National Forest: Greys River Ranger District. Salix River Range, Swift Creek Canyon, 5 miles east-northeast of Afton.	Riparian community on floodplain in *Salix boothii*/*Maianthemum stellatum* community type. Associated with *Salix boothii, Salix drummondiana, Maianthemum stellatum,*	Collector: J. S. Tuhy #3316 (Rocky Mountain Herbarium 2019; WYNDD 2019)

			Ribes lacustre, Heracleum sphondylium. Elevation 7150 ft.	
2001	Unknown	Outside Bridger-Teton National Forest. Teton County, WY, Targhee National Forest: west slope of Teton Range, north side of Trail Creek, 100 yds. E of confluence with Coal Creek, 10.5 air miles NW of Jackson and 9 air miles SE of Victor, ID.	Riparian under *Picea engelmannii* with *Thalictrum occidentale*, *Ribes lacustre*, *Lonicera utahensis, Urtica dioica, Aconitum columbianum.* Elevation 7200 ft.	Collector: Stuart Markow (Rocky Mountain Herbarium 2019)
2007	Unknown (Uncommon)	Outside Bridger-Teton National Forest. Park County, WY. Beartooth Mountains: Clarks Fork of the Yellowstone River Valley, on unnamed drainage N of U.S. Hwy 212, 9.5 air mi SE of Cooke City.	Above mossy, spring-fed streamside in full shade. *Associated with Populus tremuloides, Carex aurea, Fragaria vesca, Astragalus eucosumus, Potentilla fruticosa,* and *Picea engelmannii*. Elevation 7060 ft.	Collector: Bonnie Heidel (Rocky Mountain Herbarium 2019)

[1]The Consortium of Pacific Northwest Herbaria (Consortium of Pacific Northwest Herbaria 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___ No__

If no, provide explanation and stop assessment

N/A–No known occurrences on the Forest since 1990.

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__X_ No___

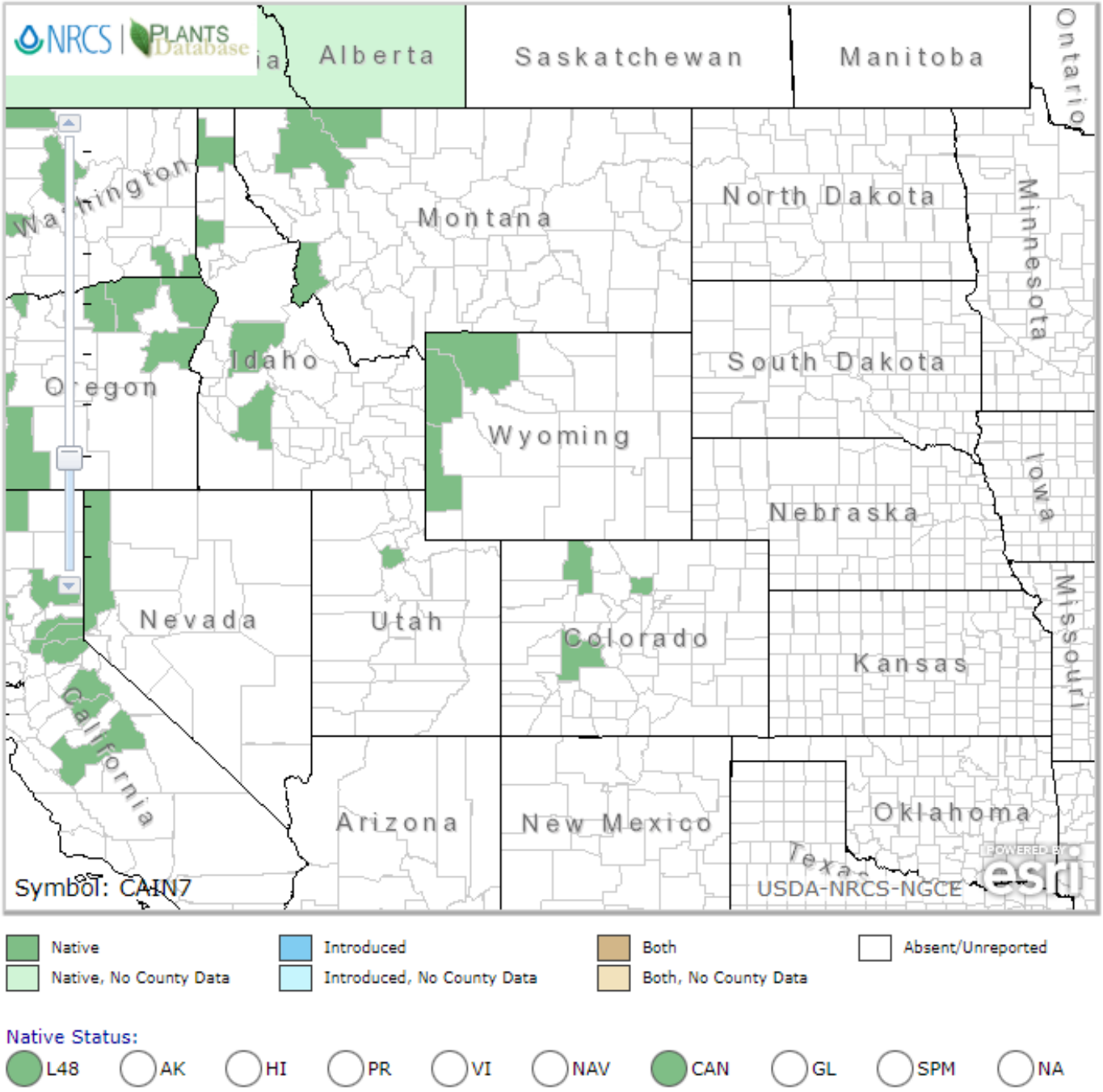
Provide explanation for determination

A recent (2001) occurrence was documented just outside the western boarder on Targhee National Forest. Suitable habitat for this species is available on the Bridger-Teton National Forest, and riparian and wetland areas are generally protected on National Forests. The

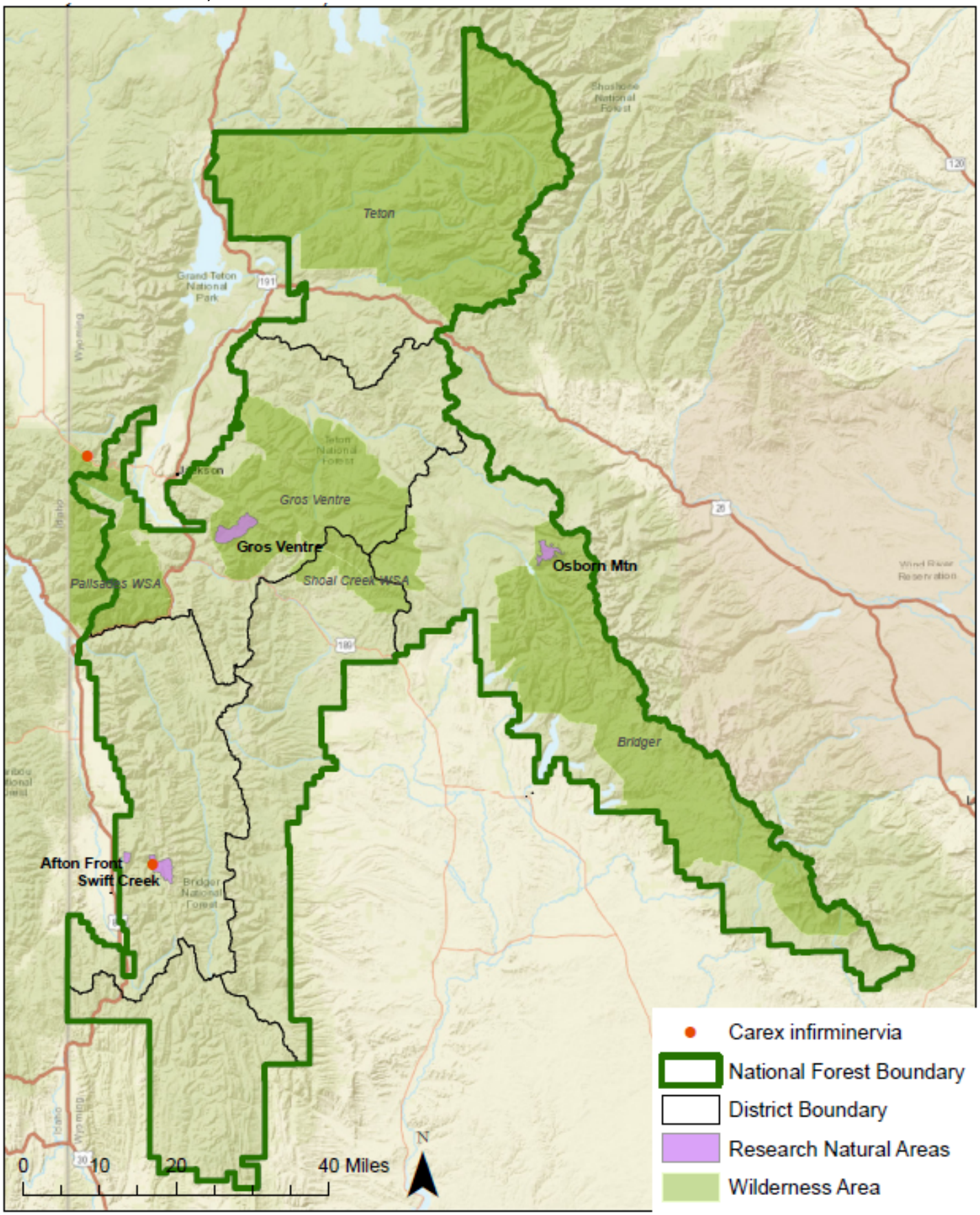
ecological conditions required by this species at occupied habitat (Native Riparian Plant Community of Willows and Forbs) have likely not significantly changed due to anthropogenic disturbance such that the species would have been unable to persist or recolonize since the 1987 collection was made.

If determination is no, stop assessment

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



Map 2, *Carex infirminervia* occurrences in and near Bridger-Teton National Forest (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** *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.*
NatureServe State Status	**S2—Imperiled** *At high risk of extirpation in the jurisdiction due to restricted range, few populations or occurrences, steep declines, severe threats, or other factors*.
WYNDD	**Plant Species of Concern** **G5/S2** *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
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	There is one occurrence of *Carex infirminervia* from 1987 in the Salt River Range in the southwest portion of the Bridger-Teton National Forest and one from 1980 at Skull Creek (Table 1). This suggests populations are sparse and isolated, but further surveying is necessary to better assess the distribution.
Distribution outside the Bridger-Teton National Forest	*Carex infirminervia* ranges from southwestern Alberta and central British Columbia south to northern Colorado and west to central California. Though widespread, populations are infrequent and scattered (Naczi et al. 2002).
Abundance on the Bridger-Teton National Forest	The abundance of C. infirminervia in Wyoming, including on the Bridger-Teton National Forest, is unknown (Heidel 2018). It is considered uncommon throughout its range (Flora of North America 2019), and may also be uncommon on the Bridger-Teton National Forest, but further surveying is necessary to ascertain abundance. Surveys and habitat assessments have not identified this species on Bridger-Teton National Forest, including: • Afton Front Research Natural Area Bridger-Teton National Forest (Fertig and Jones 1994a) • Horse Creek Research Natural Area Bridger-Teton National Forest (Fertig and Jones 1994b) • Swift Creek Research Natural Area Bridger-Teton National Forest (Fertig and Jones 1994c) • 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) • 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) • A Floristic Inventory of Grand Teton National Park, Pinyon Peak Highlands, and Vicinity, Wyoming U.S.A (Kesonie and Hartman 2011) • 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)

Criteria	Rationale
Population Trend on the Bridger-Teton National Forest	*Carex infirminervia* population trends in Wyoming are unknown (Heidel 2018). Only one occurrence has been documented on the Bridger-Teton National Forest in 1987 (Table 1), and further surveying is necessary to ascertain trends on the Forest.
Habitat Trend on the Bridger-Teton National Forest	*Carex infirminervia* inhabits mesic to dry-mesic woodlands and their edges at mid-elevations (600 to 2500 m) (Flora of North America 2019; Naczi et al. 2002). It often grows on slopes above streams and occasionally in open habitats such as grassy slopes. It has been observed growing in association with *C. deweyana*, and *C. leptopoda* (Flora of North America 2019). The condition of riparian and wetland habitats in high elevation forests is generally excellent to good (Lemly and Smith 2018), although some riparian and wetland systems in the Intermountain Region have been affected by intensive use by domestic livestock and native herbivores, beaver removal, nonnative species, modified hydrology from irrigation infrastructure, off-roading vehicle trails, foot trails, or fences (Sada 2008 in Halofsky et al. 2018, Washkoviak et al. 2018, Smith and Lemly 2018). Effects from these activities include changes in stream morphology, discharge, and water availability to riparian ecosystems. 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 2019). The 1987 occurrence of *C. infirminervia* on the Forest is on or near (polygons overlapping) the Swift Creek RNA. RNA's "are managed in conditions minimally disturbed by human activities for nonmanipulative research, monitoring, education and to maintain natural diversity and ecological processes" (USFS 1993), indicating that effects from anthropogenic activities area likely minimal. The 1987 occurrence is approximately 0.5 mile away from a small (<1 acre) invasion of the nonnative plant *Isatis tinctorial* and approximately 2 miles away from a large (483 acres) invasion of the nonnative *Euphorbia esula*. Both these invasive species are capable of rapidly spreading and of forming dense stands. However, *E. esula*, which inhabits riparian areas in addition to grasslands and shrublands (Zouhar 2009), is more likely to compete for habitat with *C. infirminerviai,* and the large invasion could potentially spread into occupied or potential habitat. Several small fires have occurred in the vicinity of the 1987 *C. infirminervia* occurrence since the occurrence was made. The closest, from 1990, overlaps the occurrence polygon and was approximately 0.1 acres in size. Two other small fires (approximately 0.1 and 0.2 acres) occurred within 0.5 mile from the boundary of the occurrence polygon. These data, particularly the 1990 fire indicates potential for fire to have impacted the *C. infirminervia* population and habitat. A "moderately developed" forest system motorized trail overlaps the 1987 occurrence, and it is possible that

Criteria	Rationale
	trail use has increased human presence into the species' habitat, which could cause habitat degradation and damage to individuals (e.g., through trampling). However, if the population is within the Swift Creek RNA, human presence and associated disturbance should be minimal. No active grazing allotments overlap the 1987 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. Given this information, it is likely these populations have experienced low to moderate impacts from natural disturbances (non-native plants and wildfire) and low anthropogenic disturbance.
Threats to the Species and its Habitat on the Bridger-Teton National Forest	Riparian and wetland 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 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 (USFS 2017). No active grazing allotments overlap the 1987 occurrence, and adherence to rangeland management plans will limit the chance of overgrazing. In general, riparian habitat and wetlands on National Forests receive considerations and protections from anthropogenic 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 *C. infirminervia*, where they occur.

Criteria	Rationale
Life history and demographic characteristics of the species	*Carex infirminervia*, a monocot, is a perennial grasslike herb (Calflora 2019). The maximum shoot life span for temperate *Carex* species is approximately 24 months, but mortality is very high; sometimes 90% of shoots do not live for the whole 2-year life span. Snoots in arctic-alpine regions live longer, perhaps as long as 5–7 years, with lower mortality. Causes of mortality of *Carex* species include differences in time of emergence, flowering, animal grazing, the age of the genet, and internal competition through the rhizome system (Bernard 2011).
Date: 9/25/19 Reviewer: L. Chipman Updated: K.Clause 3/25/25	

Summary and Recommendations
Species (Scientific and Common Name): *Carex infirminervia* (Weakly-nerved sedge)
C. infirminervia is listed as S2 (imperiled) and G5 (secure) globally. On the BTNF, this species occurs in mesic to dry-mesic woodlands and their edges at mid-elevations (6,000 to 7,200 ft). The majority of the distribution appears to be in the mountainous terrain of the western United States. There have been 2 documented occurrences on the BTNF, in which one occurs within the protections of Swift Creek RNA. None of the documented occurrences have had baseline abundance or population trend assessments conducted. Additional surveys and long-term trend monitoring need to be conducted on these occurrences to assess the trend of the populations on the BTNF. Based on insufficient trend data and low potential for impacts from identified threats, *C. infirminerva* is not recommended for listing as SCC unless additional data is provided to warrant listing in the future.
Evaluator: Daniel Lay Date: 1/29/2020 Updated: K. Clause 3/25/25

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