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|---|--|
| <b>SPECIES: Scientific [common]</b>   | <i>Salix candida</i> [Hoary willow]                    |
| <b>Forest:</b>  | Bridger-Teton National Forest                          |
| <b>Forest Reviewer:</b>   | <b>Daniel Lay/Rose Lehman, K. Clause, Trevor Bloom</b> |
| <b>Date of Review:</b>  | <b>1/23/2020; 3/27/2021; 3/27/25</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

| Year Observed                                   | Number of Individuals | Location of Observations (USFS District, Town, River, Road Intersection, HUC etc.)   | Habitat Description   | Source of Information <sup>1</sup>   |
|---|-----------------------|--|---|--|
| 7/12/1994<br>8/1/1998<br>7/16/2006<br>7/24/2018 | <20                   | Cold water fen wetland N of Kendall Warm Springs on E side of the Green River and 31 air miles NNW of Pinedale. East side of forest road 160. One subpopulation 500 feet SW of the above location. | Floating mats, bogs, fens, and willow thickets around ponds on wet to saturated, histic soils, sometimes influenced by limestone. Elevation 6600-9200 feet. | Collector: Walter Fertig, Collection #22815 (New York Botanical Garden Steere Herbarium, accessed 2020). SEINet, 2020 & WYNDD, 2025. |
| 7/24/2018                                       | 20                    | Same EO, different subpopulation 500 feet SW.  | Graminoid fen besides marl pools; 7800 feet.  | WYNDD, 2025.   |

<sup>1</sup>The Consortium of Pacific Northwest Herbaria (Consortium of Pacific Northwest Herbaria 2019) and the Rocky Mountain Herbarium (RMH, 2020) were 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?

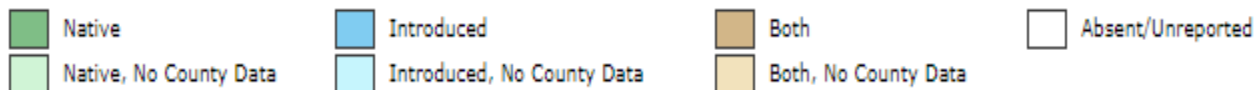
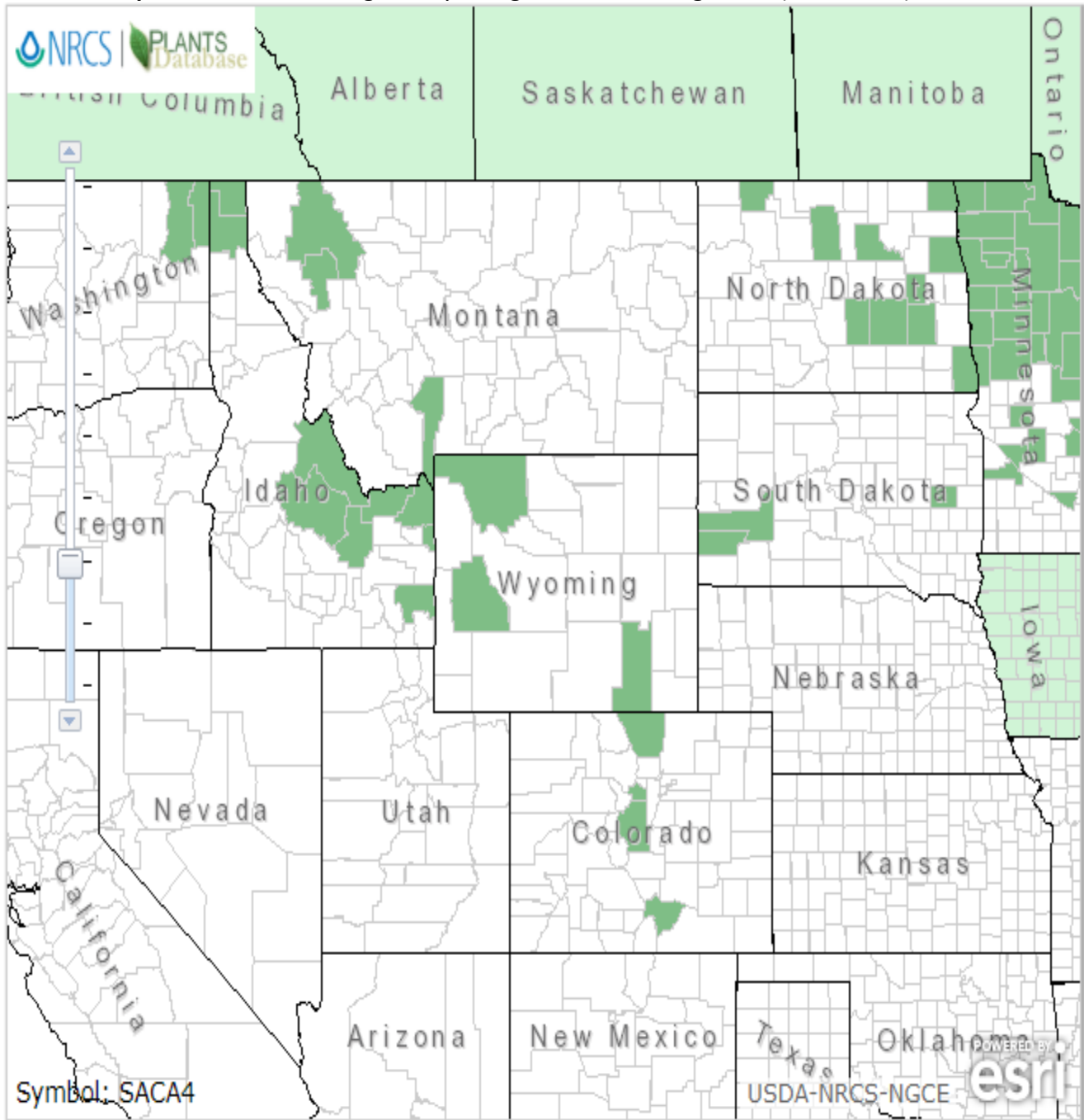
Yes \_\_\_ No \_\_\_

Provide explanation for determination

No known occurrences pre-dating 1990.

If determination is no, stop assessment

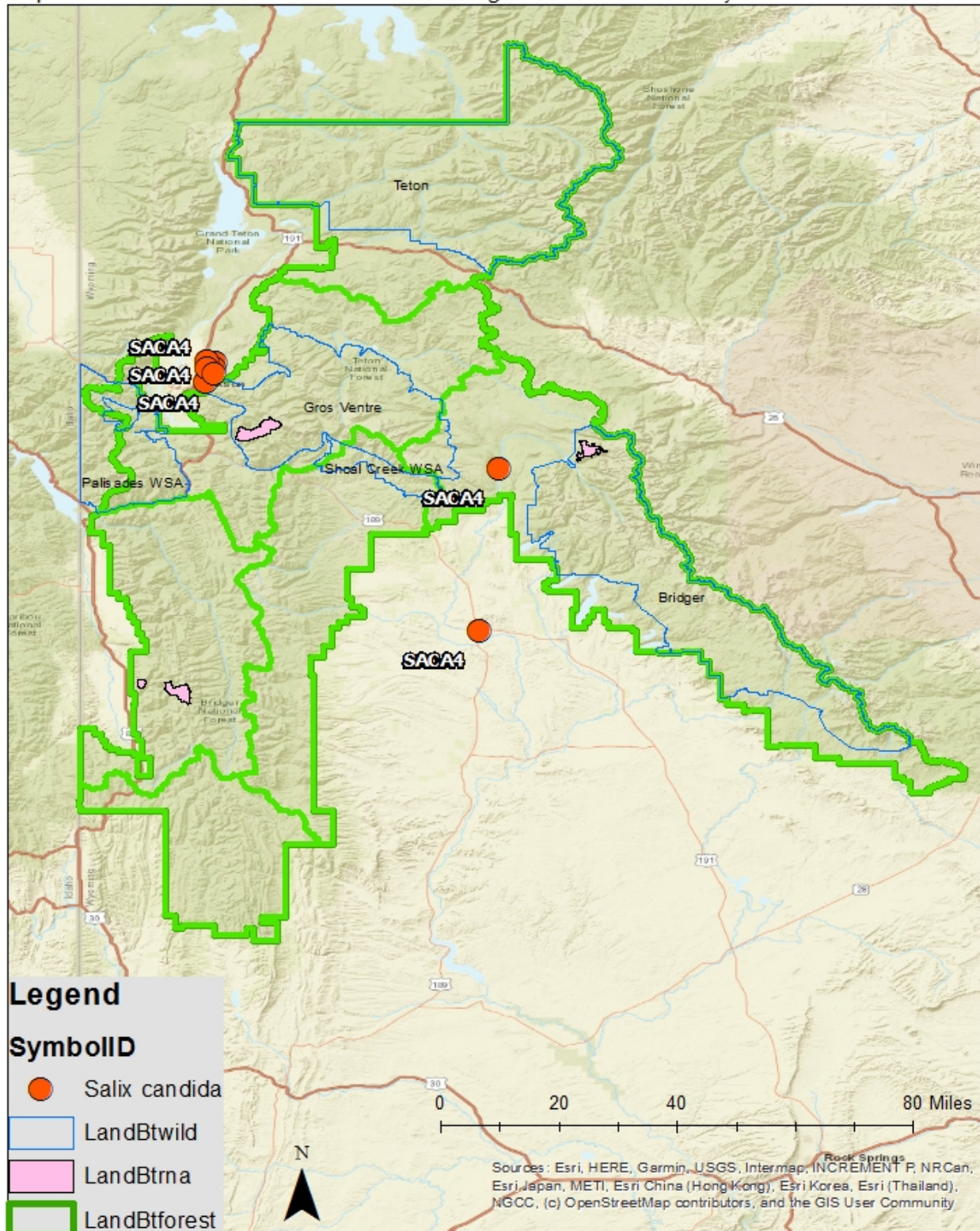
d. **Map 1, *Salix candida* range in Wyoming and surrounding states (NRCS 2020).**



Native Status:



Map 2: Salix candida occurrences within the Bridger-Teton NF and vicinity.



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

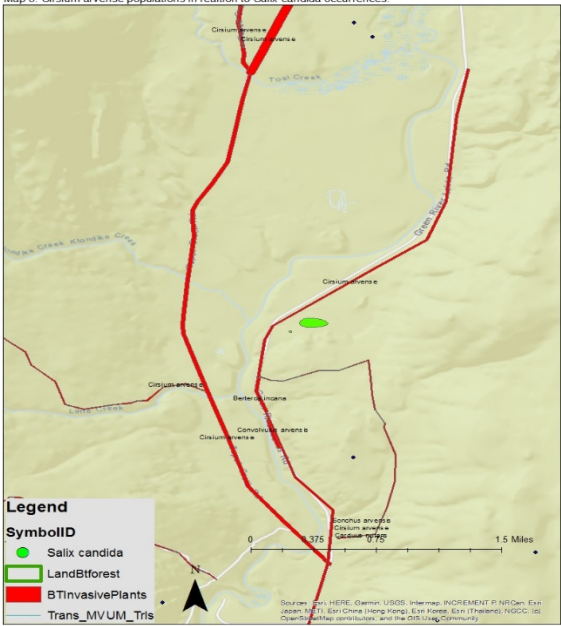
| Entity                     | Status/Rank (include definition)  |
|----------------------------|---|
| Nature Serve Global Status | <p><b>G5—Secure</b></p> <p><i>At very low risk of extinction or elimination due to a very extensive range, abundant populations or occurrences, and little to no concern from declines or threats.</i></p>  |
| Nature Serve State Status  | <p><b>S2S3—Imperiled to vulnerable</b></p> <p><i>At high risk of extirpation in the jurisdiction due to restricted range, few populations or occurrences, steep declines, severe threats, or other factors; At moderate risk of extirpation in the jurisdiction due to a fairly restricted range, relatively few populations or occurrences, recent and widespread declines, threats, or other factors.</i></p>   |
| WYND D                     | <p><b>Plant Species of Concern</b></p> <p><b>G5/S2S3</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> |
| USDA Forest Service        | R2 Sensitive  |
| USDOI FWS                  | Not listed  |
| USDOI BLM                  | Not listed  |

Sources: WYNDD 2025; 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      | Table 1 and Map 2 detail <i>Salix candida</i> occurrences in the Bridger-Teton National Forest. The only EO that occurs on the Bridger-Teton NF is located near Kendall Warm Spring Special Interest Area at an elevation of 7,800 feet. The original occurrence that was found contains less than 20 specimens; while the subpopulation located 500 feet away contains approximately 20 specimens.  |
| Distribution outside the Bridger-Teton National Forest | Distribution ranges from Labrador to Alaska and south to the Great Lakes states, South Dakota, Colorado, and Idaho (Hitchcock and Cronquist 1964). In Wyoming, known from the Absaroka, Beartooth, Laramie, Medicine Bow and Wind River ranges, Yellowstone Plateau, and upper Green River Basin. (Heidel, 2019)   |
| Abundance on the Bridger-Teton National Forest         | <p>Abundance information is minimal for occurrences on the Bridger-Teton National Forest. As mentioned in the described occurrences, <i>S. candida</i> only occurs in one location within the Bridger-Teton NF. Abundance measurements from the main population and subpopulation summed to be around 40 specimens.</p> <p>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:</p> <ul style="list-style-type: none"> <li>• Sensitive plant surveys and status of rare plant species on Bridger-Teton National Forest, 1997-1998 (Fertig 1999)</li> <li>• A Floristic Inventory of Grand Teton National Park, Pinyon Peak Highlands, and Vicinity, Wyoming U.S.A (Kesonie and Hartman 2011)</li> <li>• Sensitive and rare plant species inventory in the Salt River and Wyoming Ranges, Bridger-Teton National Forest (Heidel 2012).</li> <li>• Rare Species and Riparian Vegetation of the Snake River Basin in Wyoming (Jones et al. 2002)</li> </ul> |
| Population Trend on the Bridger-Teton National Forest  | Data on population trends for this species is very minimal. Population sizes were estimated only recently estimated in 2018. The original occurrence site had less than 20 specimens, while the subpopulation was estimated to have around 20 specimens. No multi-year population monitoring has been conducted.   |
| Habitat Trend on the Bridger-Teton National Forest     | <p><i>S. candida</i> habitat consists of floating mats, bogs, fens, and willow thickets around ponds on wet to saturated, histic soils, sometimes influenced by limestone.</p> <p>In (Heidel, 2019), a level 1 inventory of fens on the forest was conducted to determine the status and species diversity of fens on the Bridger-Teton NF. Most of the fens on the forest have had little to no natural or anthropological impacts. In areas along the Green River with easy access and seemingly high-visitation, the fens showed surprisingly few hydrological disturbances. With the data provided within (Heidel, 2019), it can be assumed that habitat for <i>S. candida</i> is stable, but further studies need to be conducted to determine the long-term trend of the habitat.</p>  |

| Criteria   | Rationale  |
|--|--|
| <p>Threats to the Species and its Habitat on the Bridger-Teton National Forest</p> | <p>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. 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). However, no active grazing allotments overlap the two occurrences. Adherence to rangeland management plans will limit the chance of overgrazing in other suitable habitats, which are tied to calcareous wetlands and very limited on the BTNF.</p> <p>The <i>S. candida</i> occurrence is within close proximity to nonnative invasive plant, <i>Cirsium arvense</i>, which occurs along the Green River Road (see map 3). The likelihood of <i>C. arvense</i> impacting the fen/riparian area is quite low, as <i>C. arvense</i> is limited to more xeric/mesic environments where there is not waterlogged soils (NRCS, 2020).</p> |

| Criteria  | Rationale  |
|---|--|
|   | <p data-bbox="706 212 1089 226">Map 3: <i>Cirsium arvense</i> populations in relation to <i>Salix candida</i> occurrences</p>  <p data-bbox="448 873 1503 947">A forest system road does come within 300 feet of the <i>S. candida</i> occurrence, but due to site protection does not seem to have any direct impacts (see map 3).</p> <p data-bbox="448 968 1471 1077">The area in which <i>S. candida</i> occurs overlaps an active grazing allotment, but is currently fenced and protected from grazing to protect the endangered Kendall Warm Springs Dace.</p> <p data-bbox="448 1098 1511 1171">The above analysis suggests that habitat for <i>S. candida</i> may have experienced low impacts from natural and anthropogenic disturbances.</p> |
| <p data-bbox="131 1199 402 1346">Life history and demographic characteristics of the species</p>  | <p data-bbox="448 1199 1495 1346"><i>Salix candida</i> is a low shrub that flowers June through July. Life history and dispersal capacity knowledge is generally limited. Habitat is described as occurring in fens, bogs, and willow thickets on wet saturated histic soils (WWND, 2019).</p>   |
| <p data-bbox="110 1373 423 1404">Date: January 23, 2020</p> <p data-bbox="110 1430 326 1461">Reviewer: D. Lay</p> <p data-bbox="110 1482 358 1551">Updated: K. Clause<br/>3/27/25</p> |  |

## Summary and Recommendations

Species (Scientific and Common Name): *Salix candida* (Hoary willow)

*Salix candida* is listed as S2S3 (imperiled or vulnerable) and G5 (secure) globally. Although it is widely distributed throughout its range and more common at lower elevations, it is considered sparse. Only one occurrence with 2 subpopulations has been documented on the BTNF, both subpopulation contain approximately 20 specimens. General habitat has been described as Fens, bogs, and other areas with saturated histic soils, more often associated with calcareous wetland soil chemistry which is not as common on the landscape at mid- to high-elevations.

Overall, the habitat at Kendall Springs is thought to be stable. *S. candida* population trends have not been monitored on the forest, as the only abundance data are from 2018. Threats to suitable habitat include hydrologic alteration via climate change. Invasive plant species do not pose much of a threat to *S. candida* as the habitat is not preferred by the nearest invasive plants. Climate change is projected to be a long-term threat to both populations and habitat for this species. With the aforementioned data, but lacking sufficient trend, and protections by the Kendall Springs Special Interest area, there currently exist protections, therefore, it is not recommended to be a SCC at this time.

Evaluator: Daniel Lay; Rose Lehman Date: 1/23/2020; 3/27/2021 Updated: K. Clause 3/27/25

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