SPECIES: Scientific [common]	***Arceuthobium douglasii* [Douglas fir dwarf-mistletoe]**
Forest:	Bridger-Teton National Forest
Forest Reviewer:	**R.Lehman**
Date of Review:	**5/20/20; 10/14/20**
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]
6/6/1962		U.S.A., Wyoming, Lincoln County: Bridger National Forest: bank of Snake River at Wolf Creek Campground. 43.1914° N, 110.8799° W; uncertainty 9+ mi.	Forested campground. Elev. 6100 ft. Abundant. Phenology: buds.	Roger Peterson 62-64; EO #1 (WYNDD 2019, SEINet 2020, Rocky Mountain Herbarium 2020)

[1]The Consortium of Pacific Northwest Herbaria, WYNDD GIS data, and SEINet were also searched, and no additional occurrences were found (Consortium of Pacific Northwest Herbaria 2020; WYNDD 2019; SEINet 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___ No__ Unknown _X_

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?

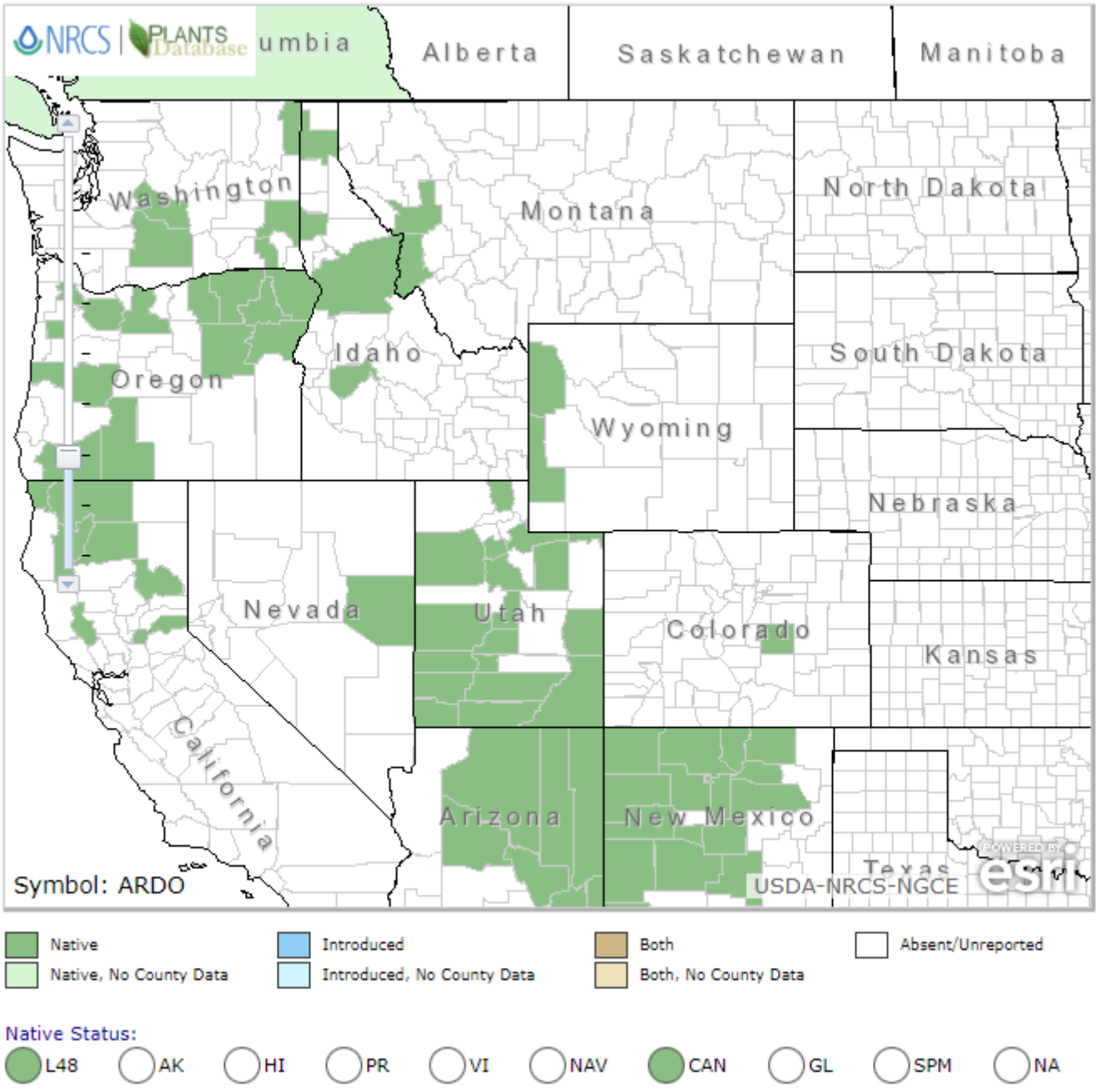
Yes___ No___ Unknown _X_

Provide explanation for determination

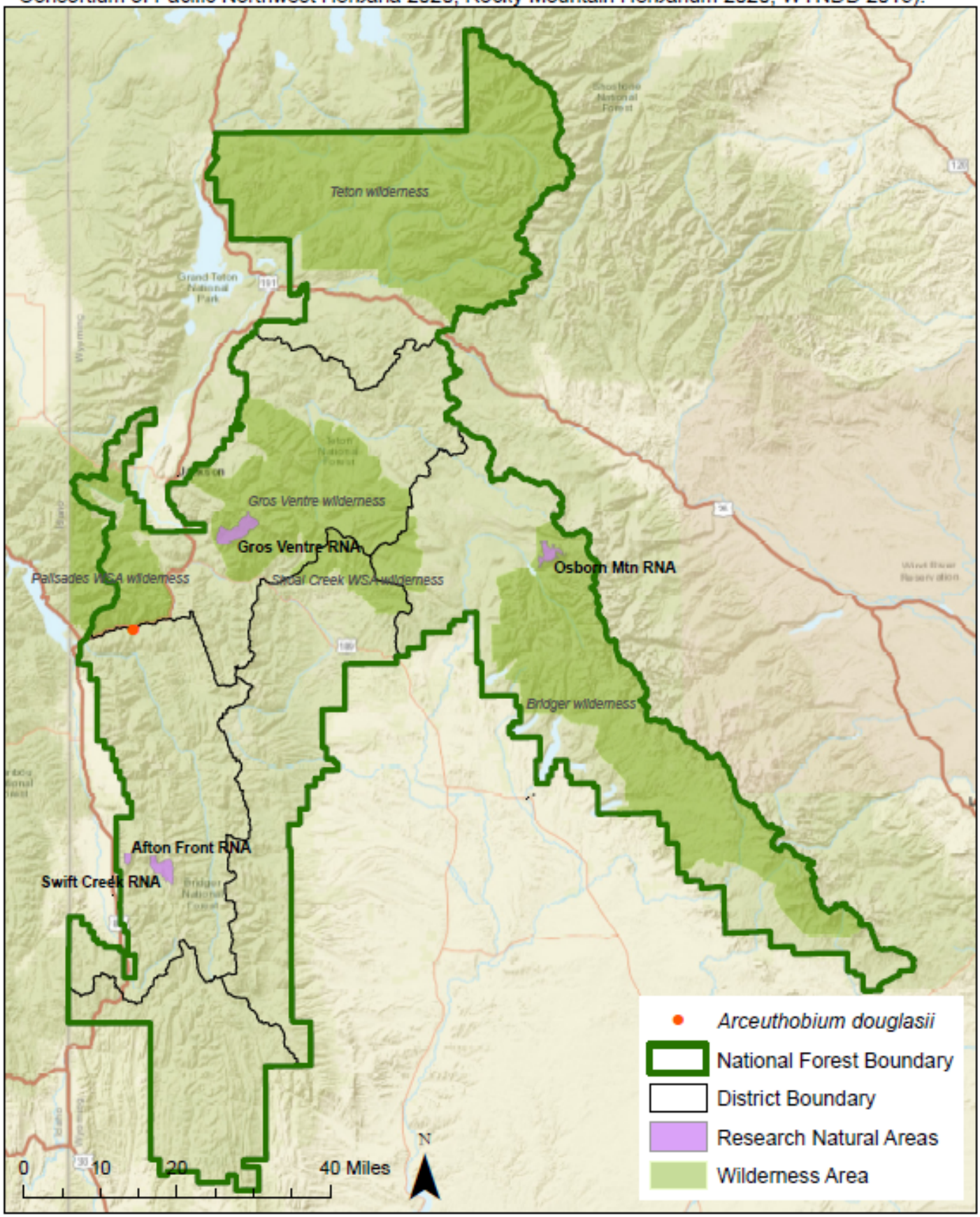
Known from one historic 1963 occurrence in a forested campground. Status is unknown for this species. More study is needed.

If determination is no, stop assessment

Map 1, *Arceuthobium douglasii* range in Wyoming and surrounding states (NRCS 2020).



Map 2, *A. douglasii* 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** *Secure — 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.*
NatureServe State Status	**SH— Possibly Extirpated** *Known from only historical records but still some hope of rediscovery. There is evidence that the species or ecosystem may no longer be present in the jurisdiction, but not enough to state this with certainty. Examples of such evidence include (1) that a species has not been documented in approximately 20-40 years despite some searching and/or some evidence of significant habitat loss or degradation; (2) that a species or ecosystem has been searched for unsuccessfully, but not thoroughly enough to presume that it is no longer present in the jurisdiction.*
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	Not listed

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	Known from one historic (1962) at Wolf Creek Campground (Table 1, Map 2). Possibly extirpated from Wyoming. More study is needed.
Distribution outside the Bridger-Teton National Forest	Occurs from southern British Columbia and western Montana to California and Texas. In Wyoming, known from the Snake River Canyon and west slope of Teton Range (Lincoln and Teton counties).
Abundance on the Bridger-Teton National Forest	The species was reported as common and abundant on the two 1962 specimen labels.
Population Trend on the Bridger-Teton National Forest	Not known. It is a parasite that damages its host. Population numbers may fluctuate.
Habitat Trend on the Bridger-Teton National Forest	Parasitic on Douglas-fir. Wyoming historic collections do not have habitat information but were from canyon and valley settings near Snake River (WYNDD 2020). 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). • Element Occurrence #1: Status is unknown. This historic occurrence was located in a forested campground and may be extirpated. Threats are not known for this parasitic species but would likely be affected by changes in Douglas fir host trees.
Threats to the Species and its Habitat on the Bridger-Teton National Forest	Not known. However, climate change is likely a significant threat to forest ecosystems of the Intermountain West. Projections for the Intermountain Adaptation Partnership region estimate that average annual minimum and maximum temperatures are likely to increase by 5 to 12 deg F, mean annual precipitation will remain the same or increase slightly, extreme events (e.g., drought and extreme precipitation events) will occur more frequently and be more severe, and greenhouse gas concentrations will continue to increase through the end of the 21st century. Increased minimum daily temperatures have resulted in longer frost-free periods. Projections vary by subregion, but even where precipitation is projected to increase slightly, higher temperatures are likely to increase effective drought and soil water deficit (Halofsky et al. 2018).

Criteria	Rationale
Life history and demographic characteristics of the species	Douglas-fir dwarf mistletoe is an obligate parasite with stems mostly 0.5-3 cm long and less than 2 mm thick. It is characteristically found on Douglas-fir, producing witches' brooms. Its flattened, olive-green stems are concentrated near the tip of the host-stem branch and are arranged in 1 plane to produce a fan-like appearance. Flowers are terminal on short lateral branches; the branches bearing staminate flowers are often more than 2 per node but branches bearing pistillate flowers are in pairs. Staminate flowers are subglobose in bud, have tepals that are reddish-purple within, and the tepals are not keeled except for the two upper lateral ones. Fruits are olive-green, 3.5-4.5 mm long x 1.5-2.5 mm wide (WYNDD 2020). Dwarf mistletoes have separate male and female plants. Seeds are produced annually on female plants. These are explosively released (typically 1 to 12 meters), and stick to host material. Upon germination, dwarf mistletoes produce an endophytic system, a specialized rootlike structure that is in contact with the phloem and xylem of host trees, from which the parasite obtains nutrients and water. Aerial shoots appear 3 to 5 or more years after infection; the period before shoots are visible is known as the latent period. Spread of dwarf mistletoe occurs both from tree to tree and within the crowns of individual trees. Infections tend to build up initially in the lower half of a crown and gradually spread upward. Lateral spread of dwarf mistletoe through single-storied stands averages about 0.5 meter per year. Spread is relatively rapid from infected overstory trees to nearby regeneration (USFS 2013).
Date: May 8, 2020 Reviewer: J. Remp	

Summary and Recommendations
Species (Scientific and Common Name): *Arceuthobium douglasii*
Arceuthobium douglasii (Douglas fir dwarf-mistletoe) is listed as SH (Possibly Exterpated) and G5 (Secure) globally. Wyoming Natural Diversity Database lists the species as a Plant Species of Concern. Parasitic on Douglas-fir. Wyoming historic collections (1962) represent one documented site at from a forested campground. Status and occurrence is unknown for this species. Threats are not known for this species but would likely be affected by changes in Douglas-fir host trees. Douglas-fir is very common on the BTNF. Based on this analysis it is recommended that *Arceuthobium douglasii* not be included as a SCC. The one known occurrence is historic and the potential habitat is very common on the forest. More study is needed.
Evaluator: Rose Lehman Date: 10/14/2020

References

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