SPECIES: Scientific [common]	***Physaria integrifolia**** or *Physaria integrifolia* var. *monticola* [creeping Bladderpod]
Forest:	Bridger-Teton National Forest
Forest Reviewer:	R.Lehman
Date of Review:	11/11/20; 01/13/20
Forest concurrence (or recommendation if new) for inclusion of species on list of potential SCC: (Enter Yes or No)	No

***Variety no longer supported (FNA 2019)**

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]
1923	1 Collection	Hills E of Afton.	Elevation 6500 ft. Dry clay slope.	Collector Edwin B. Payson #3825 (Rocky Mountain Herbarium 2019)
1950	1 Collection	1 mi W of Gros Ventre Slide. Infrequent on dry hill side.	Infrequent on dry hill side.	Collector Richard J. Shaw #528 (Rocky Mountain Herbarium 2019)
1974	1 Collection	North of Middle Piney Lake in floodplain; 30 mi	Elevation 10000 ft. Loose gravel.	Collector Jack Landon #229

		W of Big Piney, ridge E of Wyoming Peak.		(Rocky Mountain Herbarium 2019)
1978	1 Collection	Wyoming Range: 3 mi E of Soda Lake, S Cottonwood Creek crossing of Bridger Forest Road 050.	Elevation 8100 ft. Rocky outcrop.	Collector Leila M. Schultz #2653 (Rocky Mountain Herbarium 2019)
1978	1 Collection	Wyoming Range: mountain to the southwest of Triple Peaks.	Elevation 9800-9900 ft. Rocky outcrop above Doug. Fir and Abies.	Collector John S. Schultz #347 (Rocky Mountain Herbarium 2019)
1979	1 Collection	Shale Creek drainage, W slope of the Wyoming Range, 14 air mi E of Smoot.	Steep, open W facing slopes.	Collector Leila M. Schultz #3443 (Rocky Mountain Herbarium 2019)
1981	1 Collection	Wyoming Range E of Soda Lake.	Rocky calcareous slope associated with *Artemisia tridentata*, *Penstemon humilus*.	Collector Robert W. Lichvar #4586 (Rocky Mountain Herbarium 2019)
1982	1 Collection	Wyoming Range; Middle Piney Lake.	Elevation 8500 ft. Calcarious clay slope associated with *Artemisia, Phacelia*.	Collector Robert W. Lichvar #5222 (Rocky Mountain Herbarium 2019)
1982	1 Collection	McDougal Gap.	Elevation 8600 ft. Barren bank (roadcut); associated with *Phacelia, Astragalus*.	Collector Robert D. Dorn #3822 (Rocky Mountain Herbarium 2019)
1990	1 Collection	Gros Ventre: 1.8 air mi E of Hoback Junction. Approximately 0.55 mile north of U.S. Highway 191.	Elevation 6000-7200 ft. Sagebrush slopes and ridge top with patches of douglas-fir and aspen.	Collector Ronald L. Hartman #25564a (Rocky Mountain Herbarium 2019)
1990	1 Collection	Wyoming Range: Willow Creek Drainage: ridge at pass for trail from Adams Creek N 0.5 mi towards Ramshorn Peak (to within 1 mi); 11 air mi SE of Hoback Junction.	Elevation 9800-10200 ft. Subalpine/alpine meadow with limestone and some shale and red beds.	Collector Ronald L. Hartman #26934 (Rocky Mountain Herbarium 2019)
1992	1 Collection	Salt River Range: slopes on west side of Swift Creek; 2.5 air mi NE of Afton.	Open canopy, crumbly sandy-shale talus at edge of roadcut and on slopes above road.	Collector Walter Fertig #13075 (Rocky Mountain Herbarium 2019)
1992	1 Collection	Salt River Range: North Fork Swift Creek on east side of canyon; 4 air mi NE of Afton.	At edge of trail on sandy shale-lime substrate on west facing slope.	Collector Walter Fertig #13086 (Rocky Mountain Herbarium 2019)

1992	1 Collection	Western Slope Wyoming Range: Shale Creek; 1.5 mi SW of summit of Wyoming Peak; 16.5 air mi SE of Afton.	Elevation 8600-8800 ft. West facing steep sandy-shale slopes above creek; sandy openings interspersed with dense patches of sagebrush and snowberry.	Collector Walter Fertig #13172 (Rocky Mountain Herbarium 2019)
1992	1 Collection	Salt River Range: Phillips Creek, 5 air mi N of Afton.	Lodgepole pine and Douglas fir on north exposures, grass and herb communities and sagebrush on south exposures with Rocky Mountain juniper and some maple on ridges and slopes, also streamside; south exposure and ridge.	Collector Ronald L. Hartman #32454 (Rocky Mountain Herbarium 2019)
1992	1 Collection	Wyoming Range: Jamb Creek and lower slopes of ridge to N, 2.5 air mi SE of Hoback Peak.	Elevation 9200-9600 ft. Sandstone and sand on open semi-barren slope and limestone outcrops above with whitebark pine and Douglas fir.	Collector Ronald L. Hartman #34241 (Rocky Mountain Herbarium 2019)
1992	1 Collection	Wyoming Range: Lookout Mountain at west end of Beaver Ridge on North Fork Dry Beaver Creek; 25 air mi WNW of Daniel Junction.	Grassy areas and ridge.	Collector Ronald L. Hartman #35242 (Rocky Mountain Herbarium 2019)
1992	1 Collection	Salt River Range: Man Peak, S of summit to 0.5 mi; 9 air mi E of Thayne.	Limestone ridge and outcrops.	Collector Ronald L. Hartman #35954 (Rocky Mountain Herbarium 2019)
1992	1 Collection	Wyoming Range: southeast end of Mount McDougal from Kleinstick Mine NW to county line; 0.3 air mi SE of peak 10780 (feet); 1-1.3 air mi N to NW of McDougal Gap.	Talus slope, often stabilized, and limestone outcrops.	Collector Ronald L. Hartman #36208 (Rocky Mountain Herbarium 2019)
1992	1 Collection	Wyoming Range: Mount McDougal between peaks 10682 and 10742 (feet) and N to top of ridge	Rocky (limestone) slopes and summit with patches of whitebark pine,	Collector Ronald L. Hartman #36317 (Rocky Mountain Herbarium 2019)

		overlooking Gunsight Pass; 2-3 air mi NNW of McDougal Gap.	subalpine fir, and Engelmann spruce.	
1992	1 Collection	Salt River Range: Star Peaks: peak 9988 ft. and slope immediately to W.	Rocky slopes and summit with islands of conifers.	Collector Ronald L. Hartman #36317 (Rocky Mountain Herbarium 2019)
1993	1 Collection	Salt River Range: end of Indian Creek Road, 21 air mi NE of Cokeville.	Coniferous forests, grassy slopes and shaley, semi-barren slopes with stream below.	Collector Ronald L. Hartman #42657 (Rocky Mountain Herbarium 2019)
1993	1 Collection	Salt River Range: E of Afton; 0.9 mi E of Swift Creek Campground.	Eastern aspect.	Collector C. H. Refsdal #109 (Rocky Mountain Herbarium 2019)
1994	1 Collection	Gros Ventre Area: Gros Ventre Wilderness Area: ridge E of Crystal Creek; 14 air mi SE of Kelly.	Elevation 8600-9450 ft. Open ridges, rocky slopes, and meadows.	Collector Ronald L. Hartman #46566 (Rocky Mountain Herbarium 2019)
1994	1 Collection	Gros Ventre Area: upper Gros Ventre River Road, 1.5 air mi SE of Goosewing Guard Station.	Sagebrush slopes and area along river.	Collector Ronald L. Hartman #46738 (Rocky Mountain Herbarium 2019)
1994	1 Collection	Gros Ventre Area: 1.5 air mi S to 1 air mi SE of Pinnacle Peak.	Elevation 9200-10000 ft. Calcareous and granitic slopes with rock outcrops, scree, and grassy areas.	Collector Ronald L. Hartman #47330 (Rocky Mountain Herbarium 2019)
1994	1 Collection	Gros Ventre Area: Tepee Creek Ridge W to Red Hills; 6-9 air mi SW of Mosquito Lake.	Elevation 9600-10400 ft. Grassy ridge with patches of Engelmann spruce and whitebark pine.	Collector Ronald L. Hartman #47530 (Rocky Mountain Herbarium 2019)
1996	1 Collection	Outside Bridger-Teton National Forest: Teton Range East Slope: Rendezvous Mountain, just below ridge between Granite Canyon and Jackson Hole, 3/4 mi W of Apres Vous Peak, 1.5 air mi NW of Teton Village; 8 air mi NW of Jackson.	Elevation 9200-9500 ft. Rocky slopes and ledges dominated by forbs and graminoids.	Collector Stuart Markow #11323 (Rocky Mountain Herbarium 2019)

[1]The Consortium of Pacific Northwest Herbaria (Consortium of Pacific Northwest Herbaria 2019) and the SEINet data portal (SEINet 2019) 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

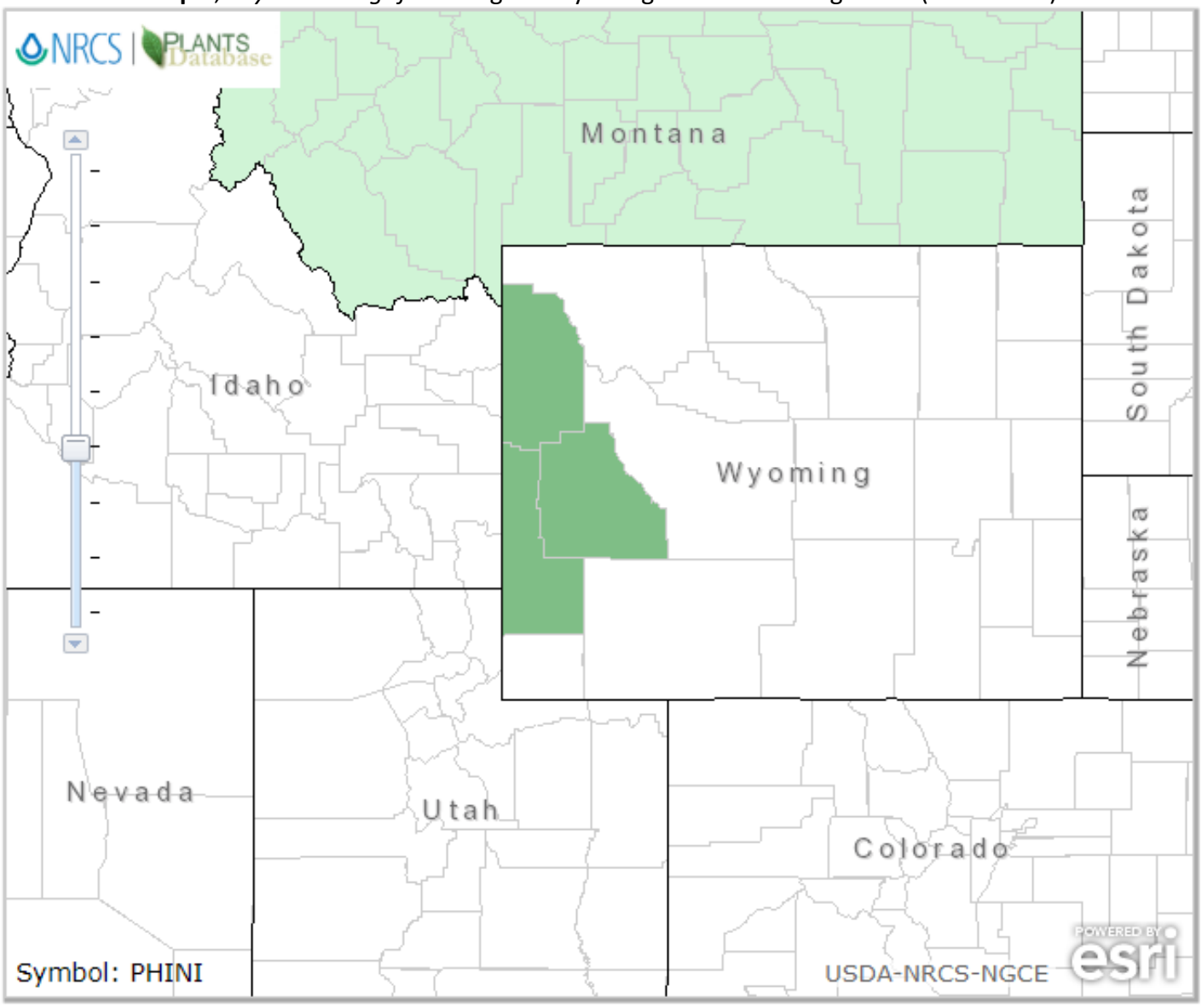
c. For species with known occurrences on the Forest predating 1990, does the weight of evidence suggest the species still occurs in the plan area?

Yes___ No___

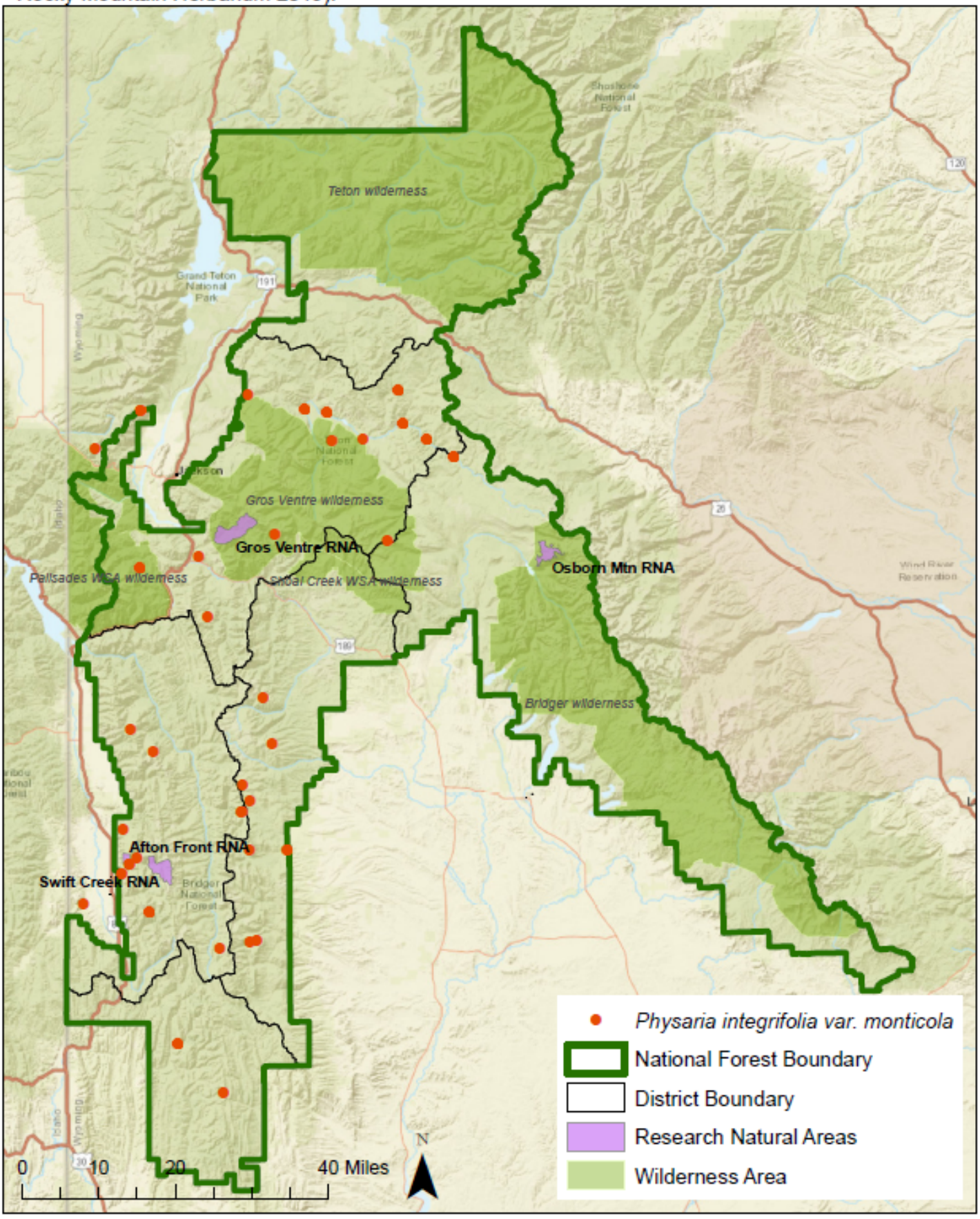
Provide explanation for determination

If determination is no, stop assessment

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



Map 2, *P. integrifolia var. monticola* 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	**G3G4T2T3Q—Imperiled/Vulnerable** *Imperiled: At high risk of extinction due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors. Vulnerable: At moderate risk of extinction or elimination due to a fairly restricted range, relatively few populations or occurrences, recent and widespread declines, threats, or other factors.* ***Q in the rank indicates questionable taxonomy that may reduce conservation priority.***
NatureServe State Status	**SNR—Unranked** *National or subnational conservation status not yet assessed.*
WYNDD	Not listed
USDA Forest Service	**R4 Sensitive Species (variety currently not recognized)** *Those plant and animal species identified by a Regional Forester for which population viability is a concern, as evidenced by* *a. Significant current or predicted downward trends in population numbers or density.* *b. Significant current or predicted downward trends in habitat capability that would reduce a species' existing distribution.*
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	*Physaria integrifolia* is known from the Big Piney and Greys River Districts of the Bridger-Teton National Forest (Fertig et al. 1994), where 19 occurrences have been observed since 1990 (Table 1, Map 2).
Distribution outside the Bridger-Teton National Forest	Very little documentation is available on *Physaria integrifolia* (NatureServe 2019). It is a regional endemic to the mountains of west-central Wyoming (Lincoln and Sublette Counties), eastern Idaho (Fertig et al. 1994), and Wyoming (Rethwisch 2014)..
Abundance on the Bridger-Teton National Forest	Occurrences are based on collection with limited or no abundance or population information. Based on at least over 19 known occurrences documented since 1990 and distributed through the central–lower portion of the Bridger-Teton National Forest, abundance is estimated as low to moderate. However, without abundance data for occurrences or species-specific surveys, confidence in this criterion is low. 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 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) • 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	Comprehensive surveys have not been conducted for this species. Most occurrences are from incidental observations or collections that lack population information. Population determinations are not possible without more inventory information.
Habitat Trend on the Bridger-Teton National Forest	*Physaria integrifolia* inhabits in calcareous hills and slopes, shale-limestone cliffs, bare steep slopes, red clay banks, and shale at 6,500 to 8,600 feet elevation (Fertig et al. 1994; Rethwisch 2014). Associated species include *Artemisia tridentata* and *Penstemon humilis* (Midwestherbaria.org 2019). Occurrences on the Bridger-Teton National Forest were mainly within grasslands, herbaceous, and sagebrush communities, sometimes with patches of conifers (Table 1). In general, nonforest ecosystems of the Intermountain West have been affected by agriculture, livestock grazing, and invasive species (Halofsky et al. 2018). 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). Grazing may have impacted habitat to some extent by compacting sediment, trampling herbaceous vegetation, increasing bare ground, and facilitating noxious weed expansion, but adherence to rangeland management plans has likely limited impacts. In general, the barren, rocky areas where *Physaria integrifolia* occurs are likely stable with low potential to change from forest management activities.
Threats to the Species and its Habitat on the Bridger-Teton National Forest	Remote aerial imagery of known location for this species indicate that most known locations occur next to dirt roads and as such there is a potential for impacts to individuals from motorized vehicles and populations may be impacted by road construction (Rocky Mountain Herbarium 2019). As a perennial, this species may be more resistant to environmental conditions that would adversely impact populations. The remote and rocky areas inhabited by this species would further insulate it from environmental disturbance events such as fire and plant invasions (Midwestherbaria.org 2019). The *Physaria* genus in general has a combination of sulfur-containing compounds and leaf hairs that deter herbivory (Heidel 2014). To analyze trends in habitat and potential disturbances 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) were assessed at each occurrence (USFS GIS 2019, Google Earth Pro 2019). The following summarizes identified disturbances for each occurrence in Bridger-Teton National Forest: • 1923 Collection #3825: Unknown is this occurrence still persists. No allotment identified. Swift Creek motorized road within 0.3 mile; forest service road open yearlong and suitable for passenger cars. Approximately 0.75 mile from Afton development.

Criteria	Rationale
	• 1950 Collection #528: Unknown is this occurrence still persists. In the Gros Ventre Wilderness. No allotments identified. As mapped this occurrence is separated from paved Gros Ventre Road and mapped invasive plants by Gros Ventre River. • 1974 Collection #229: Outside wilderness. In Twin Peaks Bighorn Sheep allotment. Invasive Canada thistle documented approximately 0.6 mile to northeast along Middle Piney Rd. • 1978 Collection 2653: Outside wilderness. In South Cottonwood allotment. Near Wyoming Range Road; forest service road open yearlong and suitable for passenger cars. Canada thistle infestation along Wyoming Range Road approximately 1 mile to southwest. No other disturbances nearby. • 1978 Collection #347: Outside wilderness, approximately 0.9 mile outside 1956 Cottonwood Fire burn area. Within the Triple Peak vacant allotment; no livestock impacts. No other disturbance nearby. • 1982 Collection #5222: Occurrence is outside wilderness near Middle Piney Lake and may be subject to recreation impacts. It is in the Twin Peaks Bighorn Sheep allotment and approximately 0.32 mile from Middle Piney Road, Middle Piney trail, and Canada thistle infestation to the northwest. • 1982 Collection #3822: Outside wilderness. Approximately 0.3 mile from McDougal Gap Road with invasive butter and eggs (*Linaria vulgaris)* infestation (mapped 2016) along this gravel road. No other disturbance nearby. • 1990 Collection #25564a: Outside wilderness. No disturbances documented within 0.55 mile. • 1990 Collection #26934: Outside wilderness. Approximately 0.15 mile from Lick Creek trail. No other disturbances nearby. • 1992 Collection #13075 and 1993 Collection #109: Outside wilderness. Approximately 0.25 mile from Swift Creek Road; forest service road open yearlong and suitable for passenger cars. Not within identified allotment. No other disturbances documented nearby. • 1992 Collection #13086: Outside wilderness. Approximately 0.4 mile from North Fork Swift Creek trail and 0.5 mile from Swift Creek Road. Invasive plants (Dyer's woad (*Isatis tinctorial*) and nodding plumeless thistle (*Carduus nutans*)) along Swift Creek Road approximately 0.6 miles to the south. • 1992 Collection #13172: This occurrence is in the Mink Creek allotment. Adjacent to off highway vehicle Shale Creek/Kinney Creek Loop; forest service road open yearlong and not maintained for passenger cars. No other disturbances within a mile. • 1992 Collection #32454: Outside wilderness. Approximately 0.07 mile from invasive leafy spurge (*Euphorbia esula*) along off highway vehicle Bradshaw Spur and Bradshaw Canyon forest service roads (mapped in 2016). These roads open yearlong and not maintained for passenger cars.

Criteria	Rationale
	• 1992 Collection #34241: Outside wilderness. Within 2018 Roosevelt Fire burn area. Approximately 0.5 mile from Highline trail. No other disturbances documented nearby. • 1992 Collection #35242: Outside wilderness. Approximately 0.06 mile from Dry Beaver Creek, 0.54 mile from North Fork Dry Beaver Creek Road (dirt road open yearlong and suitable for passenger cars), and 0.9 mile from nodding plumeless thistle infestation along road (mapped 2016). Outside 2018 Roosevelt Fire burn area. • 1992 Collection #35954: Outside wilderness. In the White Creek -Man Peak forage reserve allotment. No disturbances document within 0.5 mile. • 1992 Collection #36208: Outside wilderness. Approximately 0.11 mile from Wyoming Range trail (forest service trail # 048). No other disturbances documented nearby. • 1992 Collection #36317: Outside wilderness. Approximately 0.12 mile from Wyoming Range trail (forest service trail # 048). No other disturbances documented nearby. • 1993 Collection #42657: Canada thistle infestation (mapped in 2011) is adjacent to this occurrence. Within Indian Creek allotment. Approximately 0.5 mile west of Commissary ridge trail. No other disturbance documented nearby. • 1994 Collection #46566: In Gros Ventre Wilderness. In Upper Gros Ventre forage reserve allotment. Occurrence is in the 2011 Red Rock Fire burn area. Trails are over 0.75 miles away and no roads or invasive species are documented nearby. • 1994 Collection #46738: Outside Gros Ventre Wilderness (0.15 mile to NE). Approximately 0.71 mile from Breakneckflat Cottonwood Creek Road; native material forest service road. Approximately 0.71 mile from small Canada thistle infestation 2018. • 1994 Collection $47330: In Gros Ventre Wilderness. No livestock allotment. One mile away from 2001 Highland Wildland Fire for Resource Benefit area. No documented roads, trails, invasive species nearby. • 1994 Collection #47530: In Gros Ventre Wilderness. In Kinky Creek allotment (status?). No documented disturbances within 3 miles. Climate change is likely a significant threat to nonforest 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

Criteria	Rationale
	increase effective drought and soil water deficit (Halofsky et al. 2018).
Life history and demographic characteristics of the species	The caudex of this perennial species is usually branched, and basal leaves form a strong rosette. Racemes are congested. Fruiting pedicels are spreading, straight or slightly curved, 0.27 to 0.43 inches. Fruits are didymous and highly inflated. Trichomes are appressed in the fruit. There are 8 ovules per ovary (Rethwisch 2014). Flowering occurs June to July. Species in the *Physaria* genus reproduce strictly by sexual reproduction and are generally pollinated by bees (Heidel 2014). Restriction to sparsely vegetated areas may indicate it is a poor competitor (Heidel 2014), but this has not been confirmed by species-specific research. In general, population growth or establishment could be limited by competition with other species (e.g., invasive species), inadequate genetic variability for long-term persistence, ineffective pollination, or reduced habitat availability, as a result of human-related changes or environmental fluctuations, but there is insufficient knowledge about *Physaria integrifolia* to determine what specific factors limit population growth for this species.
Date: September 16, 2019 Reviewer: Julie Remp	

Summary and Recommendations

Species (Scientific and Common Name): ***Physaria integrifolia*** or *Physaria integrifolia* var. *monticola* (Creeping Bladderpod)

Recent revision has determined that morphology formerly distinguishing *Physaria integrifolia* var. *monticola* is the result of environmental (not genetic) variation. Therefore, it is now referred to as *Physaria integrifolia. P. integrifolia* has not been ranked in Wyoming, but NatureServe has listed it as G3G4 (Imperiled/Vulnerable) globally. With a distribution limited to western Wyoming and eastern Idaho, this species has nearly half of all known occurrences on the Bridger-Teton Forest. Considering historical uncertainty and the combination of two former varieties, there are at minimum thirty-five occurrences on the forest. Targeted surveys have not taken place and would probably reveal many more. Populations occur on slopes, cliffs and banks variously composed of shale, limestone or red clay at 6,500 to 10,000 feet elevation.

Given the large number of occurrences and the wide range of elevations in which they are found, associated disturbances are numerous and varied. Less than one third of occurrences fall within active grazing allotments. A few populations lie within burn perimeters. Most populations occur near dirt roads that may or may not be open year-round, but which provide a vector for invasive species. Invasive species reported near several populations include Dyer's woad, butter & eggs, plumeless thistle, Canada thistle and leafy spurge. Assessment of trends are not possible owing to a lack of baseline census and lack of return visits.

Members of the genus, *Physaria,* have a combination of sulfur-containing compounds and leaf hairs that deter herbivory (Heidel 2014). However, restriction of populations to sparsely vegetated areas may indicate it is a poor competitor (Heidel 2014). That said, the continuance of such barren habitats may prove critical to the species persistence. Colonization of habitat by nonnative species or increase in vegetative cover by other natives at one population would demonstrate susceptibility in many populations. Those habitats on cliff-sides, scree and rock are probably more resistant to competitive encroachment. Given the species abundance, as well as its resistance to grazing and presence in impervious habitats, it is recommended that *Physaria integrifolia* not be added as a SCC. That said, should any trend monitoring take place, certain populations may serve as invaluable indicators of resilience on the forest. Such populations need to have exposure to one or more severe disturbances, particularly from fire, grazing and invasive plants.

Evaluator: Jessica Irwin & Rose Lehman Date: 11/11/20; 01/13/21

References

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

Englebert, Cynthia 2013. Teton to Snake Fuels Management Project: Botany Report and Biological Evaluation. Prepared for Jackson Ranger District, Bridger-Teton National Forest, by TEAMS Planning Enterprise Unit. April 2012. Updated May 2013.

Fertig, W. and Jones, G.P. 1994a. Establishment Record for Afton Front Research Natural Area within Bridger-Teton National Forest, Teton County, Wyoming. Prepared for the U.S. Forest Service.

Fertig, W. and Jones, G.P. 1994b. Establishment Record for Horse Creek Research Natural Area within Bridger-Teton National Forest, Teton County, Wyoming. Prepared for the U.S. Forest Service.

Fertig, W. and Jones, G.P. 1994c. Establishment Record for Swift Creek Research Natural Area within Bridger-Teton National Forest, Teton County, Wyoming. Prepared for the U.S. Forest Service.

Fertig, W. 1999. Sensitive plant surveys and status of rare plant species on Bridger-Teton National Forest, 1997-1998. Report prepared by the Wyoming Natural Diversity Database, Laramie, Wyoming.

Heidel, B. 2012. Sensitive and rare plant species inventory in the Salt River and Wyoming Ranges, Bridger-Teton National Forest. Wyoming Natural Diversity Database. Laramie, WY.

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.

Heidel, B. 2019. Botany inventories in select fens of the Caribou-Targhee and Bridger-Teton National Forests. Report prepared for the USDA Forest Service – Region 4 by the Wyoming Natural Diversity Database - University of Wyoming, Laramie, Wyoming.

Johnson, Tyler 2011. Blackrock Creek Wild and Scenic River Botany Survey. Unpublished report.

Jones, G.P., R.S. Smith, W.F. Fertig, D.A. Keinath, M.L. Neighbours, L.A. Welp and G.P. Beauvais. 2001. Rare Species and Riparian Vegetation of the Snake River Basin in Wyoming. Prepared for the U.S. Bureau of Reclamation, by the Wyoming Natural Diversity Database, University of Wyoming. Laramie, WY.

Kesonie, D. and Hartman, R. 2011. A Floristic Inventory of Grand Teton National Park, Pinyon Peak Highlands, and Vicinity, Wyoming U.S.A. Journal of the Botanical Research Institute of Texas 5(1) pages 357 – 388.

Markow, S. 2004. Survey for *Stephanomeria fluminea* on the Bridger-Teton National Forest Prepared for the Bridger-Teton National Forest and the Region 4 Forest Service Office, by the Wyoming Natural Diversity Database, University of Wyoming. Laramie, WY.

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.

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. 2014. Status of Physaria saximontana var. saximontana (Rocky Mountain Twinpod) in Central Wyoming, Fremont, Hot Springs, and Park counties. Laramie, WY.

Midwestherbaria.org. 2019. Physaria integrifolia var. monticola. Available online at: http://midwestherbaria.org/imglib/midwest/misc/201504/webmedia_1430046265_web.jpg.

National Resources Conservation Service (NRCS). 2019. Internet website: https://plants.usda.gov/core/profile?symbol=BOSI. Accessed on August 03, 2019.

NatureServe. 2019. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Internet website: http://explorer.natureserve.org.

Rethwisch, Kayla. 2014. A preliminary systematic analysis of the species of genus Physaria (Brassicaceae) of Wyoming" (2014). Honors Program Theses. Available online at: https://scholarworks.uni.edu/cgi/viewcontent.cgi?article=1141&context=hpt.

Rocky Mountain Herbarium Specimen Database. 2019 University of Wyoming, Department of Botany. Laramie, WY. Internet website: http://rmh.uwyo.edu/data/search.php. Accessed July 2019.

Rocky Mountain Herbarium. 2019. Physaria integrifolia var. monticola. Available online at: http://rmh.uwyo.edu/data/results.php?Polygon=&Zoom=&Herbarium=&Project=&Accession=&Barcode=&Family=&Genus=physaria&Species=integrifolia&Subtaxon=monticola&Collector=&CollNum=&Day=&Month=&Year=&Country=&State=&County=&Locality=&MinElev=&MaxElev=&Sort1=SASName1&Limit=100&Submit=Search+Specimens.

SEINet. 2019. SEINet data portal. Available at: http://swbiodiversity.org/seinet/collections/index.php.

USFS (United States Forest Service). 2017. Intermountain Region Bridger-Teton National Forest Grazing Allotment Disposition Management Map. Available at: https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd532173.pdf. Accessed on August 26, 2019 .

Wyoming Natural Diversity Database. 2019. Wyoming Natural Diversity Database; Data Explorer. Laramie, WY: University of Wyoming