

<b>SPECIES: Scientific [common]</b>	<i>Astragalus shultziorum</i> [Shultz's milkvetch] (sym: <i>A.molybdenus</i> var. <i>shultziorum</i> )
<b>Forest:</b>	Bridger-Teton National Forest
<b>Forest Reviewer:</b>	R.Lehman
<b>Date of Review:</b>	04/09/2020; 02/19/21
<b>Forest concurrence (or recommendation if new) for inclusion of species on list of potential SCC: (Enter Yes or No)</b>	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

<b>Year Observed</b>	<b>Number of Individuals</b>	<b>Location of Observations (USFS District, Town, River, Road Intersection, HUC etc.)</b>	<b>Habitat Description</b>	<b>Source of Information</b>
8/31/1983	Unknown	Eastern slopes of ridge between Corral Creek and Trail Fork, ca 2 air miles south-southeast of Corral Creek Lake.	Rocky calcareous soil below talus slopes. In flower.	Payson and Armstrong 3671. (WYNDD GIS 2020)
8/5/1979	Unknown	U.S.A., Wyoming, Lincoln County: Wyoming Range: ridge S of Deadman Peak. 42.9984° N, 110.6691° W; NAD 83, uncertainty 0.25 mi., Nat. Geog. TOPO!	Near upper limit of Engelmann spruce and subalpine fir, east-facing slope of clay and limestone, area recently bared of snow,	Leila M. Shultz, 3706. with John S. Shultz. (Rocky Mountain Herbarium)

			<i>Ranunculus eschscholtzii</i> in full bloom. Elev. 9700 ft. Phenology: vegetative only.	2020; SEINet 2020; WYNDD GIS 2020)
8/22/1980	Unknown	United States of America, Wyoming, Lincoln Co., Corral Creek 42.67, -110.77	At base of limestone talus. Elevation: 9400 ft.	Lichvar 3600. (SEINet 2020)
9/17/1980	Unknown	United States of America, Wyoming, Lincoln Co., Ciques at the head of Corral Creek 42.67, -110.77	On rocky knoll of limestone. Elevation: 9400 ft	Lichvar 3926. (SEINet 2020)
9/17/1980	Unknown	United States of America, Wyoming, Lincoln Co., Head of Corral Creek 42.67, -110.77 meters Verbatim	Among boulders on slope of subalpine cirque. Elevation: 9400 ft	Dorn 3682. (SEINet 2020)
8/28/1980	Unknown	United States of America, Wyoming, Lincoln Co., Head of Corral Creek 42.67 -110.77	Rocky subalpine slope. Elevation: 9400 ft	Dorn 3661. (SEINet 2020)
8/21/1980	Unknown	United States of America, Wyoming, Lincoln Co. East slopes of ridge between Corral Creek and Trail Fork, ca 1.2 miles south of Corral Creek Lake.	Rocky calcareous soil below talus slopes. In flower. Common. Occurs with <i>Carex, Erigeron, Potentilla,</i> <i>Sibbaldia.</i>	Lichvar 3600, Dorn 3661. (WYNDD GIS 2020)
8/28/1987	Unknown	U.S.A., Wyoming, Lincoln County: Salt River Range: headwaters of Corral Creek; ca 2 air mi SSE of Corral Creek Lake; ca 9.5 air mi ESE of Afton. 42.6583° N, 110.7701° W; uncertainty 0.5 mi.	Rocky Calcareous soil below talus slopes. Elev. 9700 ft. Phenology: flowering & fruiting.	Hollis Marriott, 10738. (Rocky Mountain Herbarium 2020; SEINet 2020)
8/28/1987	Ca 5000- 10,000 plants in 2 subpopulati ons	U.S.A., Wyoming, Lincoln County: Salt River Range: headwaters of Dick Creek near saddle going into Spring Creek drainage; ca 3 air mi SSE of Corral Creek Lake; ca 10.5 air mi ESE of Afton. 42.6583° N, 110.7509° W; uncertainty 0.5 mi.	Rocky calcareous soil. A few in flower and fruit. (# 10739). Ca 5000-10,000 plants in 2 subpopulations, although genets difficult to distinguish due to vegetative growth. A co- dominant in places. Occurs with <i>Lupinus, Potentilla</i> <i>gracilis, Valeriana,</i>	Hollis Marriott, 10739. (Rocky Mountain Herbarium 2020; SEINet 2020; WYNDD GIS 2020)

			<i>Astragalus kentrophyta</i> . Elev. 10000 ft. Phenology: flowering.	
7/16/1988	Unknown	U.S.A., Wyoming, Lincoln County: Salt River Range: Greys River Drainage: Greysalt Peak W of Sheep Pass in Spring Creek drainage, ca 8 air mi E of Smoot; ca 12 air mi SE of Afton. 42.5995° N, 110.753° W	Tundra area between ledges on east-northeasterly facing slope. Elev. 10450 ft. Phenology: flowering & fruiting.	Orval C. Harrison, 514 . (Rocky Mountain Herbarium 2020; SEINet 2020; WYNDD GIS 2020)
8/30/1989	Unknown	South side of saddle along pack trail just north of ponds between Spring Creek and headwaters of Timber Creek.	In fruit, mostly vegetative.	Marriot observation_id : 303078 (WYNDD GIS 2020)
9/7/1989	Abundant (ca 10,000s of plants)	U.S.A., Wyoming, Teton County: Bridger-Teton National Forest: east side of Rendezvous Mountain, N of Rendezvous Peak, SW of tram; ca 3 air mi W of Teton Village. 43.5906° N, 110.8945° W; uncertainty 0.5 mi.	Rocky calcareous soils in bottoms of cirques and adjacent slopes. Often on sandy soil with calcareous cobbles. Both in open areas and partial shade (subalpine). Abundant (ca 10,000s of plants, although genets are difficult to distinguish due to vegetative reproduction), at times a co-dominant. Elev. 9700 ft. Phenology: Few flowers, no fruit.	Hollis Marriott, 11130. (Rocky Mountain Herbarium 2020; SEINet 2020; WYNDD GIS 2020)
9/5/1989	Unknown	U.S.A., Wyoming, Lincoln County: Salt River Range: Bridger-Teton National Forest: upper Swift Creek; ca 3/4 mi N of pass to Corral Creek, west side of drainage at base of talus slopes; ca 7.5 air mi ESE of Afton.	Vegetated calcareous talus/scree. Elev. 9400 ft. Phenology: flowering & fruiting.	Hollis Marriott, 11129. (Rocky Mountain Herbarium 2020; SEINet 2020; WYNDD GIS 2020)

		42.70056° N, 110.78806° W; uncertainty 0.25 mi.		
7/30/1989	Relatively plentiful	U.S.A., Wyoming, Lincoln County: Salt River Range: Greys River Drainage: Greysalt Peak W of Sheep Pass in Spring Creek drainage, ca 8 air mi E of Smoot; ca 12.5 air mi SE of Afton. Elev. 10425 ft. 42.5995° N, 110.753° W	Plants relatively plentiful among rocks and ledges on grassy tundra area on open east northeasterly facing slope with <i>Castilleja miniata</i> , <i>Antennaria umbrinella</i> , <i>Arnica latifolia</i> , <i>Cerastium arvense</i> , and <i>Silene acaulis</i> . Phenology: flowering.	Orval C. Harrison, 530 (Rocky Mountain Herbarium 2020; SEINet 2020; WYNDD GIS 2020)
7/30/1989	Unknown	U.S.A., Wyoming, Lincoln County: Salt River Range: Smiths Fork Drainage: SW of Sheep Pass near the head of Smiths Fork, ca 8 air mi E of Smoot; ca 12.5 air mi SE of Afton. 42.5995° N, 110.753° W	Open westerly facing slope in reddish exposed soil down to a moist draw, with <i>Arnica mollis</i> , <i>A. longifolia</i> , <i>Artemisia ludoviciana</i> , <i>Senecio crassulus</i> , <i>Ligusticum filicinum</i> , <i>Erigeron ursinus</i> , <i>Sibbaldia procumbens</i> , and <i>Lewisia pygmaea</i> . Elev. 10000 ft. Phenology: flowering & fruiting.	Orval C. Harrison, 531 (Rocky Mountain Herbarium 2020; SEINet 2020)
8/13/1989	Abundant	U.S.A., Wyoming, Lincoln County: Salt River Range: Sheep Pass. 42.6° N, 110.75° W; uncertainty 0.5 mi.	Barren red rocky slope with <i>Arabis</i> and <i>Arnica</i> . Elev. 10000 ft. Phenology: flowering & fruiting.	Robert D. Dorn, 5041 (Rocky Mountain Herbarium 2020; SEINet 2020)
8/30/1989	Abundant	U.S.A., Wyoming, Lincoln County: Salt River Range: Bridger-Teton National Forest: just N of Sheep Pass, near north end of Commissary Ridge, on west side of Spring Creek drainage, ca 12 air mi SE of Afton. 42.6° N, 110.75° W; uncertainty 0.5 mi.	Abundant on rocky soil and vegetated calcareous talus/scree. Elev. 9900 ft. Phenology: fruiting.	Hollis Marriott, 11127 (Rocky Mountain Herbarium 2020; SEINet 2020)
8/13/1991	Unknown	U.S.A., Wyoming, Sublette County: Wind River	Gentle alpine slope, on silty soil with limestone	Hollis Marriott, 11399.

		Mountains: ESE of upper Green River Lake, divide S of Slide Lake at SE end of White Rock ridge. 43.2629° N, 109.7823° W	fragments, with <i>Silene acaulis</i> , <i>Antennaria</i> sp. and <i>Poa</i> sp. Elev. 11150 ft. Phenology: flowering.	with Dennis Horning. (Rocky Mountain Herbarium 2020; SEINet 2020)
7/23/1992	Unknown	U.S.A., Wyoming, Lincoln County: Salt River Range: ridge on north side of Mount Wagner, ca 1 mi N of summit, ca 2 air mi S of Cottonwood Lake, ca 11 air mi SE of Afton. 42.6002° N, 110.8087° W; uncertainty 1 mi.	Grassy slope with boulders at foot of limestone outcrop. Elev. 9200 ft. Phenology: flowering.	Walter Fertig, 13147. (Rocky Mountain Herbarium 2020; SEINet 2020; WYNDD GIS 2020)
8/19/1992	Unknown	U.S.A., Wyoming, Lincoln County: Wyoming/Salt River Ranges: Wyoming Range: just NE of Gunsight Pass; ca 4 air mi NNW of McDougal Gap. 42.9103° N, 110.5942° W; uncertainty 0.5 mi.	Open slopes, meadows, and wet areas. Elev. 9600-10000 ft. Phenology: fruiting.	Ronald L. Hartman, 36345. (Rocky Mountain Herbarium 2020; SEINet 2020; WYNDD GIS 2020)
8/19/1992	Unknown	U.S.A., Wyoming, Lincoln County: Wyoming/Salt River Ranges: Wyoming Range: south end of Mount McDougal on peak 10780 (feet). 42.8669° N, 110.594° W; uncertainty 0.5 mi..	Rocky (limestone) slopes and summit with patches of whitebark pine, subalpine fir, and Engelmann spruce. Elev. 10600-10780 ft. Phenology: flowering & fruiting.	Ronald L. Hartman, 36246. (Rocky Mountain Herbarium 2020; SEINet 2020; WYNDD GIS 2020)
8/14/1992	Unknown	U.S.A., Wyoming, Sublette County: Wyoming/Salt River Ranges: Wyoming Range: middle and northern peaks of Triple Peak; ca 26 air mi SW of Daniel Junction. 42.7925° N, 110.5753° W	Grassy slopes and calcareous outcrops. Elev. 10800-11127 ft. Phenology: fruiting.	Ronald L. Hartman, 35672. (Rocky Mountain Herbarium 2020; SEINet 2020; WYNDD GIS 2020)
7/10/1992	Forming thick mats	Just southwest of Sheep Pass.	Reddish clay soil with sparse vegetation, cracks in limestone ledges and outcrops, steep rocky slopes, growing through mats of <i>Antennaria</i> , etc.,	Nelson and Harrison 22919, 22932 (WYNDD GIS 2020)

			limestone ridge crest. In sod and forming thick mats in low moist area at foot of high ridge. Occurs with <i>Polygonum bistortoides</i> , <i>Pedicularis groenlandica</i> , <i>Salix</i> , <i>Antennaria</i> . In flower and fruit. Forming thick mats.	
7/10/1992	Unknown	U.S.A., Wyoming, Lincoln County: Wyoming/Salt River Ranges: Salt River Range: Sheep Pass and vicinity, ca 8 air mi ESE of Smoot, ca 12 air mi SE of Afton. 42.6° N, 110.75° W; uncertainty 1 mi.	Reddish clay soil with sparse vegetation, cracks in limestone ledges and outcrops, steep rocky slopes, growing through mats of <i>Antennaria</i> , etc., limestone ridge crest. Elev. 10100 ft. Phenology: flowering & fruiting.	B. E. Nelson, 22919. with Russ Nelson and Orval C. Harrison (Rocky Mountain Herbarium 2020; SEINet 2020)
7/10/1992	Forming thick mats	U.S.A., Wyoming, Lincoln County: Wyoming/Salt River Ranges: Salt River Range: Sheep Pass and vicinity, ca 8 air mi ESE of Smoot, ca 12 air mi SE of Afton. 42.6° N, 110.75° W; uncertainty 1 mi.	Growing in sod and forming thick mats in low moist area at foot of high ridge, associated with <i>Polygonum bistortoides</i> , <i>Pedicularis groenlandia</i> , and <i>Salix</i> . Elev. 10100 ft. Phenology: flowering & fruiting.	B. E. Nelson, 22932. with Russ Nelson and Orval C. Harrison (Rocky Mountain Herbarium 2020; SEINet 2020)
7/10/1992	Unknown	U.S.A., Wyoming, Lincoln, Wyoming/Salt River Ranges: Salt River Range: Sheep Pass and vicinity, ca 8 air mi ESE of Smoot, ca 12 air mi SE of Afton. 42.6 -110.75 +-1609m. Verbatim Coordinates: 42.6° N, 110.75° W; uncertainty 1 mi.; T30N R117W S10	Reddish clay soil with sparse vegetation, cracks in limestone ledges and outcrops, steep rocky slopes, growing through mats of <i>Antennaria</i> , etc., limestone ridge crest. Elevation: 10100 ft. Flowering and fruiting	B. E. Nelson, Russ Nelson and Orval C. Harrison 22919 (SEINet 2020)
7/25/1992	Well established population	U.S.A., Wyoming, Lincoln County: Salt River Range: Greys River Drainage:	Well established population in limited area. Grassy rock fall area	Harrison 663 (Rocky Mountain

		above Mink Creek 700 ft SE of La Barge Creek divide, ca 10.5 air mi ESE of Smoot; ca 15 air mi SE of Afton. 42.585° N, 110.7337° W	beneath ledges, mostly along edges of small draw where some soil is exposed, on lower easterly facing slope. Occurs with <i>Potentilla diversifolia</i> var. <i>diversifolia</i> , <i>Androsace septentrionalis</i> . Open slope in grassy rock fall area with some exposed soil beneath ledges. Elev. 9480 ft. In flower.	Herbarium 2020; SEINet 2020; WYNDD GIS 2020)
8/17/1993	population several square meters in extent	U.S.A., Wyoming, Lincoln County: Wyoming/Salt River Ranges: Salt River Range: Commissary Ridge: Between Peak 10315 and Graham Peak, at top of cirque, ca 0.2 mi NW of Peak 10210. 42.4556° N, 110.6908° W	Moderately well-developed soil, population several square meters in extent, seen nowhere else on ridge. Elev. 10180 ft. Phenology: flowering.	Ronald L. Hartman, 44366 (Rocky Mountain Herbarium 2020; SEINet 2020; WYNDD GIS 2020)
8/15/1993	Extensive patches	U.S.A., Wyoming, Lincoln County: Wyoming/Salt River Ranges: Wyoming Range: Trail up to Cheese Pass then N to Peak 10848 then SE to base. 42.5431° N, 110.6167° W	Rock slopes and ridge. Extensive patches at base, east side of escarpment at Cheese Pass. Elev. 10000-10848 ft. Phenology: flowering.	Ronald L. Hartman, 44079 (Rocky Mountain Herbarium 2020; SEINet 2020; WYNDD GIS 2020)
8/15/1993	Several patches 1 meter or more	U.S.A., Wyoming, Sublette County: Wyoming/Salt River Ranges: Wyoming Range: Eastern ridge of Peak 10463 NW of Mount Darby. 42.5439° N, 110.5786° W	Gravelly, rocky slopes with grassy areas. Several patches 1 meter or more near summit. Elev. 10000-10400 ft. Phenology: flowering.	Ronald L. Hartman, 43991. (Rocky Mountain Herbarium 2020; SEINet 2020; WYNDD GIS 2020)
8/14/1993	Ca 1/4 acre	U.S.A., Wyoming, Sublette County: Wyoming/Salt River Ranges: Wyoming Range: Northern end of Mount Darby. 42.5436° N, 110.5597° W	Grassy to gravelly slopes. Ca 1/4 acre on upper slopes of ridge. Elev. 9600-10525 ft. Phenology: flowering.	Ronald L. Hartman, 43903. (Rocky Mountain Herbarium 2020; SEINet

				2020; WYNDD GIS 2020)
7/12/1994	Unknown	U.S.A., Wyoming, Teton County: Gros Ventre Area: peak 1 air mi N of Cache Peak. 43.4425° N, 110.6065° W; uncertainty 2 mi.	Rocky upper slopes and summit. Elev. 9600-10258 ft. Phenology: flowering & fruiting.	Ronald L. Hartman, 47934. (Rocky Mountain Herbarium 2020; SEINet 2020)
7/27/1994	Unknown	U.S.A., Wyoming, Teton County: Gros Ventre Area: ridge 1 air mi SE to 2 air mi SSE of Pyramid Peak. 43.4425° N, 110.4498° W; uncertainty 2 mi.	Alpine ridge, dolomite. Elev. 10300-10879 ft. Phenology: flowering.	Ronald L. Hartman, 48412. with Tom Cramer. (Rocky Mountain Herbarium 2020; SEINet 2020)
7/7/1994	Unknown	U.S.A., Wyoming, Teton County: Gros Ventre Area: 1.5 air mi S to 1 air mi SE of Pinnacle Peak. 43.371° N, 110.5085° W; uncertainty 1 mi.	Calcareous and granitic slopes with rock outcrops, scree, and grassy areas. Elev. 9200-10000 ft. Phenology: flowering.	Ronald L. Hartman, 47298. (Rocky Mountain Herbarium 2020; SEINet 2020)
7/7/1994	Unknown	U.S.A., Wyoming, Teton County: Gros Ventre Area: Ridge southeast of Pinnacle Peak, just east of Little Granite Creek, ca 4 miles west of Granite Creek Campground. 43.3853° N, 110.5281° W; uncertainty 1 mi.	Alpine calcareous ridge. Elev. 10200-10600 ft. Phenology: flowering.	Ronald L. Hartman, 47370. (Rocky Mountain Herbarium 2020; SEINet 2020; WYNDD GIS 2020)
6/28/1994	Unknown	U.S.A., Wyoming, Teton County: Gros Ventre Area: head of Swift Creek trail to ca 1/4 air mi NW of top of Corner Mountain. 43.3793° N, 110.3862° W	Calcareous substrates. Elev. 9500-11000 ft.	Ronald L. Hartman, 46931. (Rocky Mountain Herbarium 2020; SEINet 2020)

8/5/1994	Unknown	U.S.A., Wyoming, Sublette County: Gros Ventre Area: just SE of Steamboat Peak to base of Palmer Peak. 43.371° N, 110.3323° W; uncertainty 1 mi.	Alpine slopes and hills, calcareous. Elev. 10400-10600 ft. Phenology: flowering & fruiting.	Ronald L. Hartman, 49343. (Rocky Mountain Herbarium 2020; SEINet 2020)
8/5/1994	Unknown	U.S.A., Wyoming, Teton County: Gros Ventre Area: west flank of Darwin Peak. 43.3853° N, 110.3127° W	Alpine meadows. Elev. 9800-10200 ft. Phenology: fruiting.	Ronald L. Hartman, 49402. (Rocky Mountain Herbarium 2020; SEINet 2020; WYNDD GIS 2020)
8/17/1994	Unknown	U.S.A., Wyoming, Teton County: Gros Ventre Area: ca 1.5 air mi SE of Darwin Peak. 43.3853° N, 110.2931° W	Rocky alpine slope. Elev. 10400-10600 ft. Phenology: fruiting.	Ronald L. Hartman, 49521. with Tom Cramer (Rocky Mountain Herbarium 2020; SEINet 2020; WYNDD GIS 2020)
8/2/1994	Unknown	U.S.A., Wyoming, Sublette County: Gros Ventre Area: 1-1.5 air mi S and SW of Red Hills. 43.3424° N, 110.2343° W; uncertainty 2 mi.	Lakeside and meadows. Elev. 9800-10500 ft. Phenology: fruiting.	Ronald L. Hartman, 49109.. with Tom Cramer
9/1/1995	Unknown	U.S.A., Wyoming, Teton Co., Teton Range, Rendezvous Mountain, Rock Springs drainage, back of the second cirque, 1.2 km (0.75 mi) air distance southwest of the aerial tramway station, 4.4 km (2.75 mi) air distance west of Teton Village. 43.5825 -110.8805556	In crevices of dolomite cliff. Elevation: 2945-2945	Holmgren 12463 (SEINet 2020)
8/7/1997	Unknown	U.S.A., Wyoming, Teton County: Gros Ventre Range: west slope of Corner Mountain, ca 2 air mi E of	Steep slopes of open, subalpine meadow with scattered <i>Picea engelmannii</i> ; ground	Walter Fertig, 17952. (Rocky Mountain Herbarium

		Granite Falls, above tributary wash of Swift Creek; ca 3/4 air mi W of MacLeod Lake. 43.371° N, 110.391° W; uncertainty 0.25 mi.	cover dominated by <i>Haplopappus suffruticosus</i> , <i>Antennaria media</i> , and <i>Phlox pulvinata</i> on duff-rich, limestone-derived, rocky soils. Elev. 10000-10200 ft. Phenology: flowering.	2020; SEINet 202)
8/4/1998	~500 plants	U.S.A., Wyoming, Sublette County: Gros Ventre Range: southeast flank of Darwin Peak, ca 0.3 mi N of Brewster Lake. 43.3763° N, 110.2836° W; NAD 83, uncertainty 0.25 mi.	Gentle, northeast-facing slope of coarse soil with flat limestone rubble in subalpine forb community amid patches of spruce. Population estimated at 500 plants with 30% in flower and 70% vegetative. Elev. 10040 ft. Phenology: flowering.	Laura Welp, 7891. (Rocky Mountain Herbarium 2020; SEINet 2020; WYNDD GIS 2020)
8/4/1998	Unknown	U.S.A., Wyoming, Sublette County: Gros Ventre Range: north side of Triangle Peak, ca 0.4 mi E of Brewster Lake; ca 2 mi SW of Lunch Lake. Elev. 10400-11000 ft. 43.371° N, 110.2735° W; uncertainty 0.25 mi.	Alpine cushion plant community on ridgeline bordering northeast-facing cirque; vegetative cover (including lichen crust) ca 40%, limestone-gravel cover 40%, bare soil 20-30%; dominant species include <i>Silene acaulis</i> , <i>Phlox pulvinata</i> , <i>Selaginella densa</i> . Phenology: flowering & fruiting.	Walter Fertig, 18492. (Rocky Mountain Herbarium 2020; SEINet 2020; WYNDD GIS 2020)
8/3/1999	Unknown	U.S.A., Wyoming, Teton County: Teton Range: Bridger-Teton National Forest: Jackson Hole Mountain Resort at top of tram, just N of ski area boundary, ca 1 air mi W of Teton Village, ca 12.5 air mi NNW of Jackson. Ctr 43.6052° N, 110.8753° W; uncertainty 1 mi.	Rocky, alpine ridgetop with semi-barren cushion plant community with <i>Antennaria umbrinella</i> , <i>Draba oligosperma</i> , <i>Smelowskia calycina</i> var. <i>americana</i> . Elev. 10400 ft. Phenology: flowering.	Charmaine Delmatier, 8109. (Rocky Mountain Herbarium 2020; SEINet 2020)
8/20/2000	Unknown	U.S.A., Wyoming, Teton County: Teton Range: Bridger-Teton National Forest: Jackson Hole	North-facing, semi-barren slope with <i>Oxytropis deflexa</i> var. <i>foliolosa</i> and cushion plants, on bright,	Charmaine Delmatier, 8379. (Rocky Mountain

		Mountain Resort on Rendezvous Mountain, at junction of Rock Springs Bowl Trail and Green River Bowl Trail, ca 1 air mi W of Teton Village, ca 12.5 air mi NNW of Jackson. Ctr 43.5908° N, 110.8753° W	white limestone. Elev. 9400 ft. Phenology: flowering.	Herbarium 2020; SEINet 2020)
7/26/2000	Unknown	U.S.A., Wyoming, Teton County: Teton Range: Bridger-Teton National Forest: Jackson Hole Mountain Resort on Rendezvous Mountain, ca 3/4 air mi W of top of tram along Skyline Foot Trail, in saddle just N of Cody Bowl, ca 11 air mi NNW of Jackson. 43.5908° N, 110.8952° W; uncertainty 1 mi.	Rocky, semi-barren ridgetop with scattered cushion plants. Phenology: flowering. Elev. 10200 ft.	Charmaine Delmatier, 8231. (Rocky Mountain Herbarium 2020; SEINet 2020)
8/5/2010	Abundant in ca 1 acre	U.S.A., Wyoming, Along trail between Wagner and Cottonwood lakes, ca 1 mile north of summit.	Steep open slopes with north to northeast aspects. Rocky slope, including boulders, but with good soil development and vegetative cover. 20% in flower, 80% vegetative. Abundant in ca 1 acre. Occurs with <i>Polygonum</i> , <i>Carex</i> spp., <i>Erigeron</i> spp., <i>Rumex</i> spp., <i>Senecio</i> spp.	Marriot observation_id : 303065 (WYNDD GIS 2020)
8/25/2011	Abundant, with many 1000's of plants in small area	U.S.A., Wyoming, Ca 1.5 miles south of Greysalt Peak.	Small dip in limestone escarpment crest, on moist gravelly loam. With <i>Draba crassifolia</i> , <i>Noccaea montana</i> , <i>Lupinus argenteus</i> , <i>Senecio crassulus</i> , <i>Pedicularis bracteosa</i> . Vegetative, in bud, and very early flower.	Heidel, 3591 (WYNDD GIS 2020)

			Abundant, with many 1000's of plants in small area.	
8/22/2011	Occasional	United States of America, Wyoming, Lincoln Co., Bridger-Teton National Forest: Salt River Range: Greysalt Peak area, directly W of Sheep Pass, ca. 10 air mi E of Smoot. Ridge immediate south of Greysalt Peak. 42.5995 -110.753 +-969 m.	Limestone escarpment ridgecrest, on rocky loam. With <i>Erigeron ursinus</i> , <i>Eremogone congesta</i> , <i>Castilleja sulphurea</i> , <i>Antennaria rosea</i> , <i>Noccaea montana</i> , <i>Poa secunda</i> var. <i>incurva</i> . Occasional along over 0.2 mile of ridge. Elevation: 10080 ft. Vegetative and in bud.	Heidel, 3593 (SEINet 2020, WYNDD GIS 2020)

The Consortium of Pacific Northwest Herbaria was also searched, and no additional occurrences were found (Consortium of Pacific Northwest Herbaria 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 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?

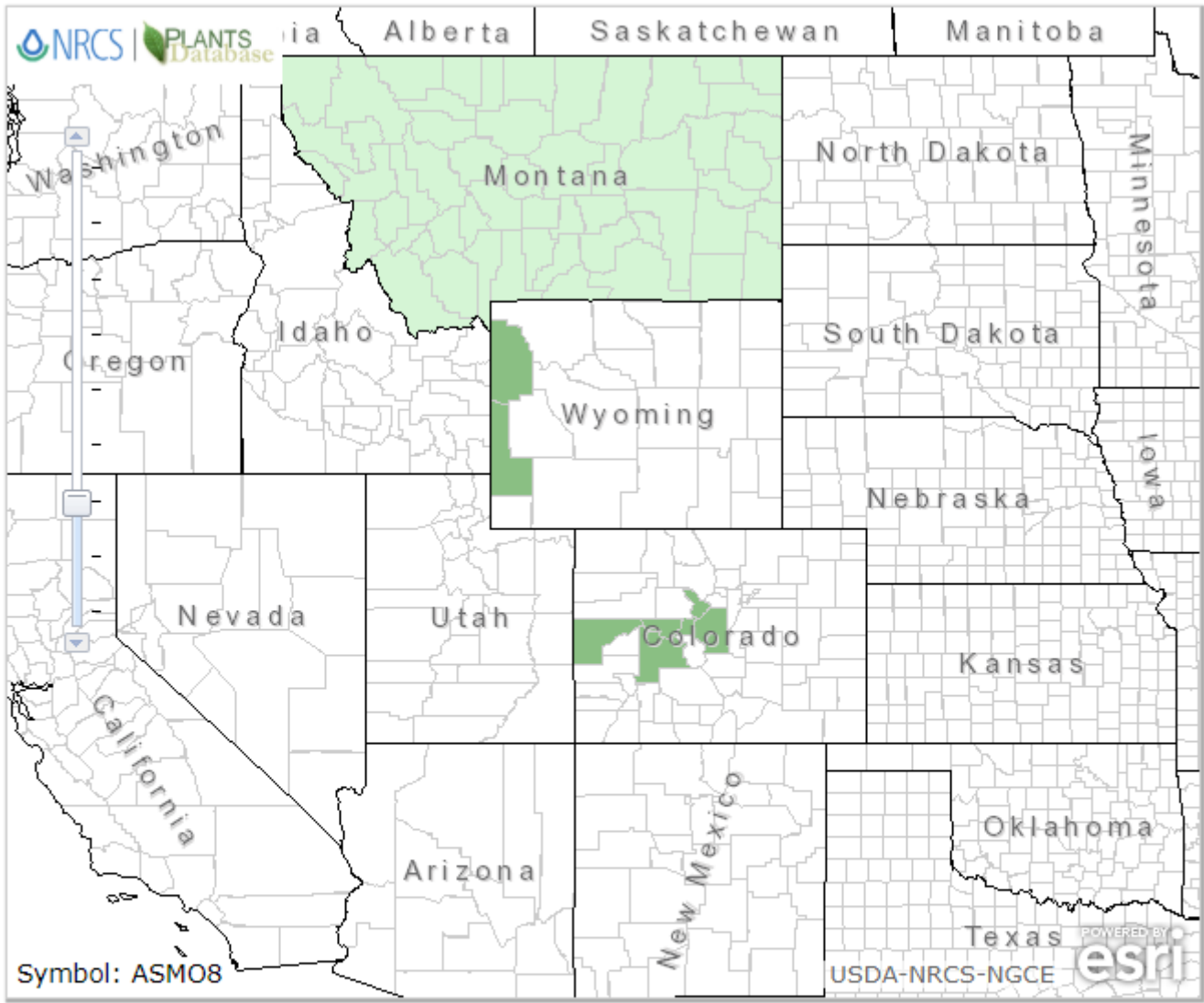
Yes\_\_\_ No\_\_\_

Provide explanation for determination

N/A—Occurrences have been documented since 1990.

If determination is no, stop assessment

Map 1, *Astragalus shultziorum* range in Wyoming and surrounding states (NRCS 2020).

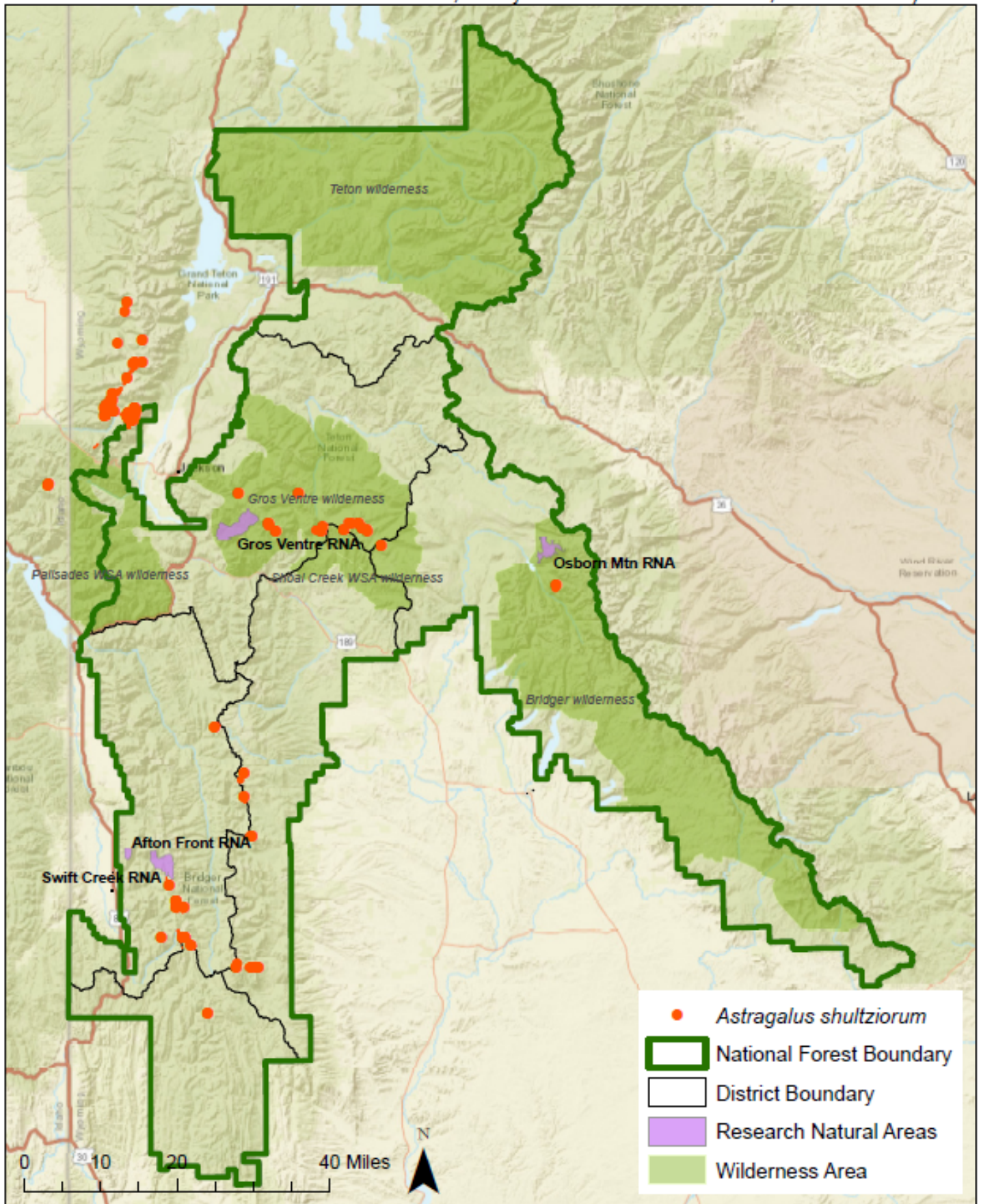


- |  |   |   |  |
|--|---|---|--|
| <input checked="" type="checkbox"/> Native                 | <input type="checkbox"/> Introduced                 | <input type="checkbox"/> Both                 | <input type="checkbox"/> Absent/Unreported |
| <input checked="" type="checkbox"/> Native, No County Data | <input type="checkbox"/> Introduced, No County Data | <input type="checkbox"/> Both, No County Data |  |

Native Status:

- L48 
  AK 
  HI 
  PR 
  VI 
  NAV 
  CAN 
  GL 
  SPM 
  NA

**Map 2.** *A. shultziiorum* 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

<b>Entity</b>	<b>Status/Rank (include definition)</b>
<b>NatureServe Global Status</b>	<p><b>G3Q— Vulnerable</b></p> <p><b>G3</b> – <i>At moderate risk of extinction due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors.</i></p> <p><b>Q</b> – <i>Questionable taxonomy that may reduce conservation priority.</i></p>
<b>NatureServe State Status</b>	<p><b>S3— Vulnerable</b></p> <p><i>At moderate risk of extinction due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors.</i></p>
<b>WYNDD</b>	<p><b>Plant Species of Potential Concern</b></p> <p><i>Species that appear to be secure at present, but because they have limited distribution as regional or state endemics they could become vulnerable under large-scale changes. Species with this status warrant periodic checks.</i></p> <p>(Wyoming Natural Diversity Database - Species of Concern)</p>
<b>USDA Forest Service</b>	Not Region 4 Sensitive
<b>USDOI FWS</b>	Not listed
<b>USDOI BLM</b>	Not listed
<b>IUCN</b>	Not listed

Sources: WYNDD 2020a; Heidel 2018; USDA Forest Service Regions 2 and 4 Sensitive Species Lists; NatureServe 2020

**Table 3.** Status summary based on best available scientific information.

<b>Criteria</b>	<b>Rationale</b>
Distribution on the Bridger-Teton National Forest	This species is known from numerous occurrences throughout the central and western portions of the Bridger-Teton National Forest (Table 1, Map 2), indicating it is broadly distributed within suitable habitat.

Criteria	Rationale
Distribution outside the Bridger-Teton National Forest	<i>Astragalus shultziorum</i> is regional endemic known from the Salt River, Wind River, Wyoming, and Teton Ranges of western Wyoming (Lincoln, Sublette, and Teton counties); it has also been reported from Idaho in the Teton Range (Manusco and Heidel 2008; Heidel 2012; WYNDD 2020b). Most of the known occurrences are on the Bridger-Teton National Forest (Heidel 2012).
Abundance on the Bridger-Teton National Forest	Individual populations may be extremely abundant locally or cover large areas of suitable ridge-top alpine habitat Heidel and Fertig 2008; (WYNDD 2020b). Many occurrences on the Bridger-Teton National Forest are noted to be locally abundant (Table 1; Heidel 2012). The rhizomatous growth form makes it impossible to discern individuals and there are spots where it has higher canopy cover than any other species present (Heidel 2012).
Population Trend on the Bridger-Teton National Forest	Trend data are lacking, but most populations appear to be stable (Heidel and Fertig 2008; Heidel 2012; WYNDD 2020b).
Habitat Trend on the Bridger-Teton National Forest	<p>Habitat is alpine and subalpine forb communities, rocky meadows, ridges, fellfields and scree slopes, primarily on calcareous substrate (Manusco 1990; Heidel 2012; WYNDD 2020b). It is found at elevations ranging from 8,800 to 11,500 ft (Heidel and Fertig 2008), and in a wide range of topographic positions and aspects, depending on setting (Heidel 2012; Manusco 1990).</p> <p>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).</p> <p>The Marriott and Horning #11399 occurrences occurs on the Bridger wilderness area; Hartman #47934, Hartman and Cramer #48412, Hartman #47370, Hartman #47296, Fertig #17942, Hartman and Cramer #49521, Welp #7891, Hartman #49343. Hartman #49402, Fertig #18492, and Hartman and Cramer #49109 occur on the Gros Ventre wilderness area. one is protected in Swift Creek Research Natural Area (Heidel 2012). These occurrences likely experience minimal effects from anthropogenic activities due to protections afforded by these designations. Additionally, occurrences within wilderness areas and RNAs are located outside of RMUs and are far from motorized roads or trails, which further confirms the low potential for human effects. Proximity of some occurrences to non-motorized hiking trails may slightly increase potential for human presence and trampling impacts, but because occurrences are in remote, rugged locations, they likely seldom see human visitors.</p> <p>The remaining occurrences, mainly in the south–western portion of the Forest are not located within</p>

Criteria	Rationale
	<p>wilderness areas or RNAs, and thus do not receive protections afforded by these designations. Many of these occurrences are located within RMUs and are near trails, and thus habitat may experience impacts associated with human presence and livestock. However, due to their remote, rugged locations, most occurrences are generally difficult to access and protected from these impacts.</p> <p>Occurrences are generally far from mapped invasions of non-native plant species. Hartman #43903 and #43991 are within the perimeter of the 2012 Fontenelle Fire; habitat and populations may have been impacted. No other occurrences are located within the perimeter of large fire events.</p> <p>The above analysis indicates habitat has likely experienced low levels of impacts from natural and anthropogenic disturbances. Climate change may lead to future habitat alterations as described below.</p>
<p>Threats to the Species and its Habitat on the Bridger-Teton National Forest</p>	<p>Immediate threats are inferred to be low in the species' alpine, rocky habitat (WYNDD 2020b). Sheep grazing may be a potential threat at some sites, but most occurrences are at sufficiently high elevation and in physically protected sites that receive little use or impacts (Heidel and Fertig 2008; Heidel 2012).</p> <p>Because alpine vegetation and barren rock mainly occur in designated wilderness, roadless, or remote areas where human interference disturbance is minimal, alpine communities are considered to be relatively stable.</p> <p>However, alpine communities are possibly the ecosystems in the region that are most at risk from the effects of climate change because of their shrinking habitat. According to Intermountain Adaptation Partnership assessments, alpine communities have a high sensitivity to climate change, a low adaptive capacity, and very high vulnerability to climate change (Halofsky, et al. 2018). Climate change is expected to cause increasingly warmer and wetter conditions, with worsening summer drought, and alpine areas may transition from snow-dominated to rain-dominated. An extended growing season is projected to occur in the alpine which can result in interspecific competition for resources, changes in plant community composition and displacement of rare plant populations where they currently occupy specific niches (Halofsky et al. 2018).</p> <p>Alpine systems are dependent on snowfields and gradual snowmelt to maintain moisture for vegetation. Warming temperatures, increased drought, and changes in the depth and persistence of snowpack, surface water flow, and timing of peak runoff are projected to greatly affect alpine habitat in the Intermountain Region (Halofsky et al. 2018). The composition and distribution of alpine ecosystems will be affected by decreasing snowpack. For high-elevation vegetation, climate change may affect seed germination and survival by modifying moisture availability and therefore result in reduced plant success. Specific effects will depend on vulnerability thresholds of the characteristic species and the rate and magnitude of changes over time. Reduced snowpack with warming is likely to cause major changes in alpine plant communities (Halofsky, et al.</p>

Criteria	Rationale
	<p>2018).</p> <p>Some loss of alpine vegetation communities, especially mesic meadows, attributed to upslope migration of trees and shrubs may occur (Halofsky et al. 2018). Some, subalpine communities may have potential to migrate higher in elevation as a response to changing conditions, but this may be limited by underdeveloped soils at higher altitudes. Furthermore, the rate of climatic change in alpine communities may outpace the ability of species to shift their distribution (Ash et al. 2016; Dirnbock et al. 2011). Other communities may already exist at the highest elevations in the BTNF and, therefore, may have limited upward migration potential.</p> <p>Rare plant populations that may be small, isolated, tied to snowpack abundance and distribution timing changes of spring thaw and fall frost cycles, and/or have limited dispersal capacity, are highly vulnerable to impacts from environmental change including reductions in pollination (Ellstrand and Diane 1993, Halofsky et al. 2018). Changes in temperature and precipitation may lead to greater variability in forb flowering, which could create an asynchronistic effect with native pollinator emergence (Halofsky et al. 2018; Miller-Struttman et al. 2015), leading to decreased reproduction in native plants. The value of pollinators in natural systems is difficult to quantify, but as pollinators are critical for successful reproduction and seed set for approximately 85% of flowering species globally (Hatfield et al. 2012), this asynchronistic effect may have profound implications.</p>
<p>Life history and demographic characteristics of the species</p>	<p>Schultz's milk-vetch is a low perennial herb with slender, elongate subterranean stems arising from a branched rootcrown. Leaves are 1.5-8 cm long and alternate on the 1-2 cm of exposed stem; the petiole length of leaves is reduced toward the top. Leaves have 11-17 green leaflets that are lanceolate to ovate-elliptic, and pubescent on both surfaces or smooth above. The pale, translucent stipules encircle the stem, have 2 teeth, and cover the leaf bases. The cream-colored, lavender-tinged flowers are typically in pairs (1-4) surmounting a 1-4 cm tall flowering stalk. The banner is 11-12 mm long, longer than the wings and keel, sometimes streaked, and the keel has a purple-tip. The calyx is 5.7-6.7 mm long, with slender teeth and short, black hairs. The pod is lance-ovate, 10-12 mm x 3- 3.5 mm, with a prolonged narrow beak, sessile, keeled on back, 3-sided in cross-section and becomes papery-thin when ripe. Flowering is from Late June-early September (Heidel and Fertig 2008; Heidel 2012; Manusco 1990; WYNDD 2020b).</p>
<p>Date: April 6, 2020 Reviewer: L. Chipman</p>	

## Summary and Recommendations

Species (Scientific and Common Name): *Astragalus shultziorum* (Shultz's milkvetch)

*Astragalus shultziorum* is listed as S3 in for Wyoming and G3Q (apparently secure) globally. It is a species of protentional conservation concern by WYNDD. *Astragalus shultziorum* is regional endemic with most known occurrences on the BTNF. Known occurrence can be abundant and immediate threats are inferred to be low in the species' alpine and subalpine, rocky habitat.

There are taxonomic questions concerning *A. shultziorum* being recognized as a species, it may be a variety of *Astragalus molybdenus* (*A.m. var. shultziorum*) or not a recognized variety but synonyms with *A.molybdenus*. *Flora of North America* treatment once published is the recommended authority for taxonomic reference.

Given the species occurrences on the BTNF are often abundant with few identified threats within its rocky alpine/subalpine habitat and the fact there are questions concerning its taxonomic treatment, it is recommended that *Astragalus shultziorum* not be included as a SCC.

Evaluator: Rose Lehman Date: 02/19/2021

## References

- Ash, J.D., Givnish, T.J., Waller, D.M. 2016. Tracking lags in historical plants species' shifts in relation to regional climate change. *Global Change Biology*, doi: 10.1111/gcb.13429.
- Consortium of Pacific Northwest Herbaria. 2020. Specimen data search. Available at: <http://pnwherbaria.org>.
- Dirnbock, T., F. Essl, and W. Rabitsch. 2011. Disproportional risk for habitat loss of high-altitude endemic species under climate change. *Global Change Biology*, 17:990-996.
- Ellstrand C. E., and Diane R. E. 1993. Population Genetic Consequences of Small Population Size: Implications for Plant Conservation. *Annual Review of Ecology and Systematics*. Vol. 24:217-242. Internet website: <http://web.nateko.lu.se/courses/ngen03/Ellstrand-Elam-1993.pdf>.
- Google Earth Pro, 2020. Aerial photo and mapping analysis. Software version 7.3.2.5776 (64-bit).
- Halofsky, Jessica E.; Peterson, David L.; Ho, Joanne J.; Little, Natalie, J.; Joyce, Linda A., eds. 2018. Climate change vulnerability and adaptation in the Intermountain Region. Gen. Tech. Rep. RMRS-GTR-375. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. Part 1. pp. 1–197.
- Hatfield, R., Jepsen, S., Mader, E., Black, S.H., Shepherd, M. 2012. Conserving bumble bees: guidelines for creating and managing habitat for America's declining pollinators. The Xerces Society for Invertebrate Conservation.
- 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., M. Andersen and J. Handley. 2014. Evaluating potential threats to Wyoming Threatened, Endangered and Sensitive plants. Wyoming Natural Diversity Database, Laramie, WY.

Heidel, B., and W. Fertig. 2008. State Species Abstract— *Astragalus shultziorum*- Shultz's milkvetch. Wyoming Natural Diversity Database. 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.

Miller-Struttman, N.E., Geib, J.C., Franklin, J.D., Kevan, P.G., Holdo, R.M., Ebert-May, D., Lynn, A.M., Kettenbach, J.A., Hedrick, E., Galen, C. 2015. Functional mismatch in a bumble bee pollination mutualism under climate change. *Science*, 349(6255): 1541-1544.

NatureServe. 2020 NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Internet website: <http://explorer.natureserve.org>.

Rocky Mountain Herbarium Specimen Database. 2020. University of Wyoming, Department of Botany. Laramie, WY. Internet website: <http://rmh.uwyo.edu/data/search.php>.

SEINet. 2020. SEINet data portal. Available at: <http://swbiodiversity.org/seinet/collections/index.php>.

USDA, National Resources Conservation Service (NRCS). NRCS. 2020. The PLANTS Database. Available at <http://plants.usda.gov>. National Plant Data Team, Greensboro, NC 27401-4901 USA.

Wyoming Natural Diversity Database (WYNND). 2020a. Wyoming Natural Diversity Database; Data Explorer. Laramie, WY: University of Wyoming.

WYNND. 2020b. *Astragalus shultziorum*- Shultz's milkvetch. Wyoming Field Guide. University of Wyoming. Available at: <http://fieldguide.wyndd.org/>