Prairie Bush-Clover
(Lespedeza leptostachya)

5-Year Review:
Summary and Evaluation

Photo: Dawn Marsh

U.S. Fish and Wildlife Service, Midwest Region
Minnesota-Wisconsin Ecological Services Field Office
Bloomington, Minnesota

5-YEAR REVIEW
Prairie bush-clover
(*Lespedeza leptostachya*)

1.0 GENERAL INFORMATION

Species: Prairie bush-clover (*Lespedeza leptostachya*)
Date listed: January 9, 1987
FR citation(s): 52 FR 781-784
Classification: Threatened

Lead Field Office: Minnesota-Wisconsin Ecological Services (ES) Field Office, Bloomington, Minnesota, Dawn Marsh, 952-252-0092 ext. 202, dawn_marsh@fws.gov

Lead Region: Midwest Region 3, Bloomington, Minnesota, Laura Ragan, 612-713-5292, laura_ragan@fws.gov; Alisa Shull, 612-713-5334, alisa_shull@fws.gov

Cooperating Field Offices: Illinois/Iowa ES Field Office, Moline, Illinois, Kristen Lundh 309-757-5800, kristen_lundh@fws.gov; Chicago ES Field Office, Chicago, Illinois, Cathy Pollack, 847-608-3101, cathy_pollack@fws.gov.

BACKGROUND:

The prairie bush-clover is a member of the pea family that occurs in Illinois, Iowa, Minnesota, and Wisconsin (Fig. 1). Main threats to the species include the conversion of remnant prairie to cropland or developed sites, spread of non-native invasive plant species, the encroachment of dominant vegetation, prolonged drought, and hybridization. Please see the prairie bush-clover species status assessment report for additional information on current threats to the species (U.S. Fish and Wildlife Service [USFWS] 2021).

Methodology used to complete the review:

In accordance with section 4(c)(2) of the Endangered Species Act of 1973, as amended (Act), the purpose of a 5-year review is to assess each threatened species and endangered species to determine whether its status has changed and if it should be classified differently or removed from the List of Threatened and Endangered Wildlife and Plants. The U.S. Fish and Wildlife Service (Service) evaluated the biology and status of the prairie bush-clover (*Lespedeza leptostachya*) as part of a Species Status Assessment (SSA) to inform this 5-year review.

The lead species biologist and regional recovery coordinator worked closely with species experts from the Minnesota Department of Natural Resources and the Wisconsin Department of Natural Resources to develop the SSA report (USFWS 2021). The SSA report represents our evaluation of the best available scientific information, including the resource needs and the current and future condition of the species. We developed a tool to standardize and assess the current

condition of known prairie bush-clover populations and two future scenarios to discuss the viability (ability of a species to maintain populations in the wild over time) of the species in the future. Independent peer reviewers and partner representatives reviewed the SSA report before we used it as the scientific basis to support our 5-year review decision-making process.

FR Notice citation announcing this status review: 85 FR 53842. Endangered and Threatened Wildlife and Plants; Initiation of 5-Year Status Reviews of 14 Listed Animal and Plant Species. August 31, 2020.

1.0 REVIEW ANALYSIS

1.1 Recovery Criteria:

According to recovery criteria outlined in the recovery plan (USFWS 1988), prairie bush-clover may be considered for delisting when 1) a minimum of 20 viable, naturally occurring prairie bush-clover populations within the core habitat area have been protected and are managed, and 2) a minimum of 15 viable, naturally occurring prairie bush-clover populations, representing the full range of habitat types, outside the core area have been protected and are managed. Habitat types in the recovery plan are not specified, but soil characteristics, moisture regimes, slope, aspect, and the geological and glacial history of the site should be taken into consideration to protect a range of genotypic diversity within the species (USFWS 1988, p. 25).

Populations are no longer characterized as core or peripheral because additional widely distributed and diverse populations were found across all four states. In the SSA report, four prairie habitat types are used to characterize prairie bush-clover populations: bedrock prairie, dry prairie, dry-mesic prairie, and mesic prairie. Each of these prairie types have different soil characteristics and moisture regimes. Prairie bush-clover populations known at the time of listing were regularly found on north-facing slopes in the previous “core area”. Additional surveys have found that the species can also occur on west- and east-facing slopes (Nancy Sather, Minnesota Department of Natural Resources (MNDNR), retired, pers. comm, June 30, 2021).

Based on the analysis conducted for this 5-year review, the above delisting criteria have nearly been met. While populations are no longer categorized as core or peripheral and were assessed by prairie type, 44 populations in the previous “core area” currently have excellent, good, or fair resiliency and 18 are permanently protected and consist of high-quality prairie habitat and/or are managed to replicate natural disturbance processes and to prevent dominant vegetation encroachment (Table 1). Thirty-four populations in the former “peripheral area” currently have excellent, good, or fair resiliency and thirteen are permanently protected and consist of high-quality prairie habitat and/or are managed.

Table 1. Number of prairie bush-clover (*Lespedeza leptostachya*) populations in the core and peripheral areas and the number of populations in each resiliency category. The number in parentheses is the number of populations permanently protected with high quality habitat and/or management.

Area	Excellent	Good	Fair	Poor	Total
Core	11 (8)	13 (8)	20 (2)	18 (0)	62 (18)
Peripheral	1 (1)	12 (5)	21 (6)	17 (1)	51 (13)
Combined	12 (9)	25 (13)	41 (8)	35 (1)	113 (31)

Many sites with known prairie bush-clover populations have not been surveyed in over 10 years. As a result, there is uncertainty about their current presence and whether the habitats will be managed into the future. It is unlikely that sites with excellent or good resiliency have become extirpated because the majority of these populations are protected and threats are managed.

1.2 Updated Information and Current Species Status

1.2.1 Biology and Habitat:

Prairie bush-clover is a long-lived, dry-prairie plant species that both historically and currently occurs in Illinois, Iowa, Minnesota, and Wisconsin (Fig. 1). The species occurs on remnant prairie sites and disturbed sites, or prairie habitats that have been previously mowed, burned, cultivated, or grazed (USFWS 1988, p. 7; Nancy Sather, MNDNR, retired, pers. comm., June 30, 2021). The number of known populations of prairie bush-clover has increased from 36 populations at the time of listing in 1987 (52 FR 783) to 113 populations today. The number of known extant populations has increased in Iowa, Minnesota, and Wisconsin. Additional populations were found in all four states as a result of increased survey effort post-listing. For instance, seven new prairie bush-clover populations were discovered in Minnesota in 1990 (Sather 1991, p. 1).

Prairie bush-clover plants may take five or more years to reach maturity. Once mature, adult plants may flower annually, and a single plant may persist on the landscape for thirty years (Derek Anderson, MNDNR, pers. comm. 2020). For example, 15% of individual prairie bush-clover plants observed at a site in Minnesota in 2010 were first observed in 1983, when monitoring at the site started (Nancy Sather, MNDNR, retired, pers. comm., June 30, 2021). The species has a relatively short-lived seed bank, and conditions for germination and seedling establishment must occur at least every few years to maintain healthy prairie bush-clover populations (Vitt *et al.* 2017, p. 167).

For additional information regarding prairie bush-clover biology and habitat, see the SSA report (USFWS 2021, pp. 10-26).

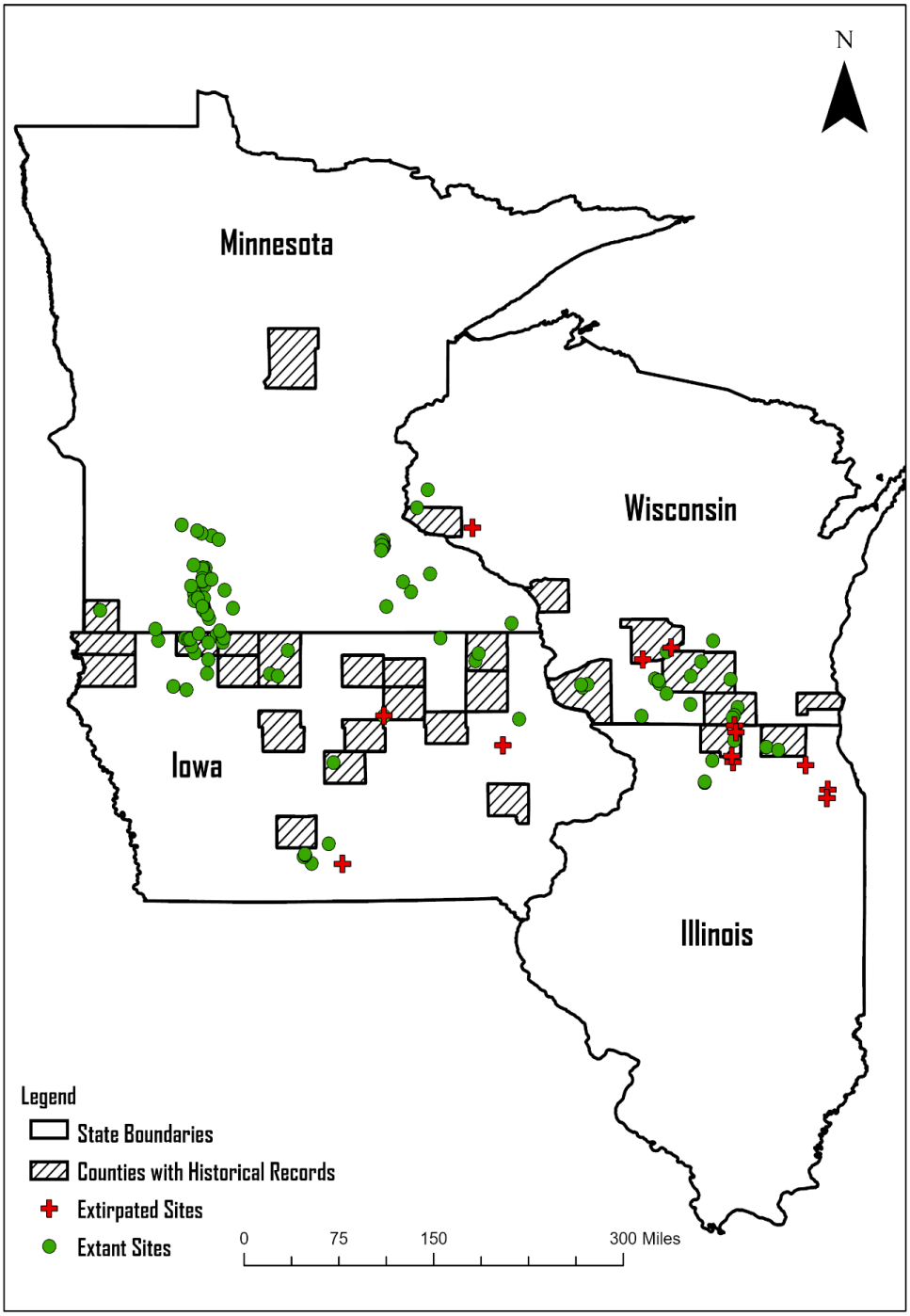

Figure 1. Current and historical distribution by county of prairie bush-clover (*Lespedeza leptostachya*). Extant sites have had at least one prairie bush-clover plant observation since 1970 and are not otherwise known to be extirpated or historical.

1.2.2 Threats Analysis (threats, conservation measures, and regulatory mechanisms):

Current or potential future threats to prairie bush-clover include the incompatible use of herbicides at or near known population sites (Factor E), habitat conversion (Factor A), dominant vegetation encroachment (Factor E), prolonged drought (Factor E), climate change (Factor E), and hybridization (Factor E) with round-headed bush-clover (*Lespedeza capitata*) (Fig. 2). The assessment of the current condition of extant prairie bush-clover populations is based on population size, habitat quality and management (dominant vegetation encroachment), amount of contiguous suitable habitat, and whether the site is protected from habitat conversion (protection status).

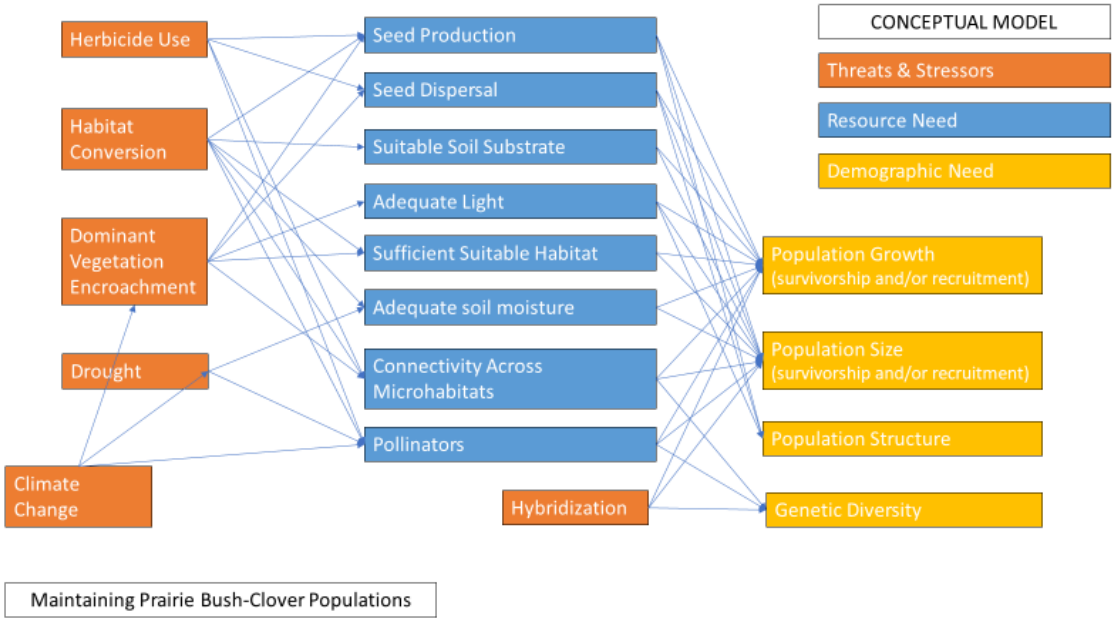

Figure 2. Conceptual model of prairie bush-clover (*Lespedeza leptostachya*) threats and stressors and how they influence resource and demographic needs of the species.

Our current condition assessment considers the two primary threats to prairie bush-clover, habitat conversion and encroaching dominant vegetation. The conversion of remnant prairie to row crops, gravel quarries, and commercial development destroyed at least three known prairie bush-clover populations in Illinois and Wisconsin. Currently the 44 populations with no protection status are at greatest risk of conversion to row crop or residential development. An additional 4 populations currently have an informal agreement, and 11 populations are owned privately or by an organization that is currently interested in conservation, but no permanent protection is in place. Fifty-four populations are permanently protected from habitat conversion (Table 2).

Prairie systems are reliant on natural disturbance regimes to maintain the structure of the prairie. Without fire, grazing, or other natural disturbances, prairie communities may transition to scrub-shrub or early successional habitat types. Mature prairie bush-

clover plants can succumb to prolonged competition with dominant vegetation encroachment. Management actions that replicate natural disturbances minimize the threat of encroaching dominant vegetation. Thirty-one populations are currently permanently protected with high quality prairie habitat and/or are managed to minimize threats to the species. Populations permanently protected and managed are likely to persist into the foreseeable future.

Table 2. Number of permanently protected prairie bush-clover (*Lespedeza leptostachya*) populations by state and prairie type.

Prairie Type	Illinois	Iowa	Minnesota	Wisconsin
Dry	3	0	12	2
Dry-Mesic	1	14	0	11
Mesic	1	4	3	0
Bedrock	1	1	1	0

For additional information regarding prairie bush-clover threats and how threats were considered in assessing the current and projected future condition of populations, see the SSA report (USFWS 2021, pp. 27-29). We considered the potential impacts from herbicide use, climate change, drought, and hybridization in the SSA report; however, we did not include these in our assessment of population condition because we lacked sufficient information at an appropriate scale to do so. Currently, there is no threat acting across the species' range that is causing the species to be in danger of extinction.

1.2.3 Current and Projected Future Condition

Of the 113 extant prairie bush-clover populations, 12 currently exhibit excellent resiliency and 25 exhibit good resiliency (Table 3). Populations with excellent or good resiliency occur in three of the four prairie habitat types used to characterize prairie bush-clover populations. Forty-one populations across all four habitat types currently have fair resiliency. Populations are widely distributed across the four states and prairie types which enhances the ability of prairie bush-clover to adapt to novel changes in its environment and makes a catastrophic event that negatively impacts all populations highly unlikely (Fig. 3). While the number of prairie bush-clover populations in bedrock prairie is low, the number of populations in this prairie type has likely always been low (Table 3). Across all four states, 54 prairie bush-clover populations (48% of extant populations) are owned by a conservation organization (federal, state, or non-profit) or are permanently protected for the purpose of conservation. Twenty-eight protected populations are in excellent or good condition and twenty-six are in fair or poor condition.

Table 3. Prairie bush-clover (*Lespedeza leptostachya*) resiliency by representative category (bedrock prairie, dry prairie, dry-mesic prairie, mesic prairie). Resiliency is characterized by calculated element occurrence (EO) rank (see USFWS 2021, p. 31).

Resiliency	Bedrock Prairie (% of Extant)	Dry Prairie (% of Extant)	Dry-Mesic Prairie (% of Extant)	Mesic Prairie (% of Extant)	Total (% of Extant)
Excellent (A)	0 (0%)	7 (13%)	3 (7%)	2 (14%)	12 (11%)
Good (B)	1 (17%)	10 (19%)	14 (34%)	0 (0%)	25 (22%)
Fair (C)	2 (33%)	19 (37%)	13 (32%)	7 (50%)	41 (36%)
Poor (D)	3 (50%)	16 (31%)	11 (27%)	5 (36%)	35 (31%)
Extirpated	0	7	5	0	12
Total Extant	**6**	**52**	**41**	**14**	**113**

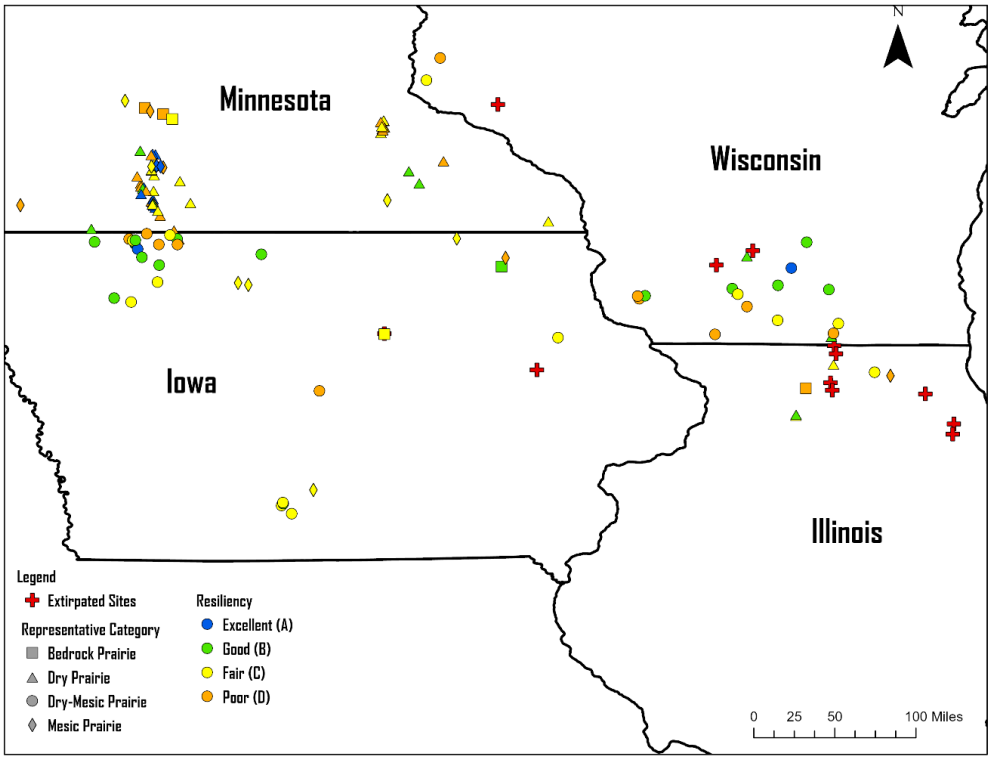

Figure 3. Map of prairie bush-clover (*Lespedeza leptostachya*) resiliency by representative category (bedrock prairie, dry prairie, dry-mesic prairie, mesic prairie) across the geographic range of the species.

In general, future resiliency is anticipated to decrease at all sites that are currently unprotected or those that are protected but with no habitat management plans in place. Approximately 40-45 (35-40%) populations are anticipated to decline in resiliency by 2060. Under both future scenarios in the SSA, 11-12 populations will have excellent resiliency and 19-20 populations will have good resiliency in 2060; populations in

excellent and good condition are anticipated to remain in three of the four prairie habitat types in 2060 (Table 4; USFWS 2021, p. 46).

Table 4. Summary table of the range of projected prairie bush-clover (*Lespedeza leptostachya*) resiliency in 2060 and 2100 under two scenarios. Resiliency is characterized by calculated element occurrence (EO) rank (see USFWS 2021, p. 31). See Appendix C in the SSA (USFWS 2021) for the resiliency condition of each population.

Resiliency	**EO Rank**	**Number of Populations 2020**	**Number of Populations 2060**
Excellent	A	12	11-12
Good	B	25	19-20
Fair	C	41	24-25
Poor	D	35	24-27
Extirpated	X	12	29-35
Total Extant Populations by Year		**113**	**78-84**

1.3 Synthesis:

The prairie bush-clover is a long-lived, resilient dry-prairie plant species. The primary threats include loss of populations due to habitat conversion and the encroachment of dominant vegetation and non-native, invasive plant species. Additional stressors (herbicide use, climate change, drought, and hybridization) were considered in our analyses but none of them were considered to be primary threats to the species. There is no known threat acting across the species' range that is causing the species to be in danger of extinction. Resilient populations exist in areas protected from land conversion with management strategies in place that promote seedling establishment.

The number of known populations of prairie bush-clover has increased from 36 populations at the time of listing in 1987 (52 FR 783) to over 100 populations today, and protection status and ongoing management activities sustain stable populations at many of those sites. There are currently 113 populations of prairie bush-clover distributed across all four states (Illinois, Iowa, Minnesota, and Wisconsin) in which the species was historically known (Fig. 1). The 12 populations rated in excellent condition and the 25 populations rated in good condition are spread across 3 of 4 prairie habitat types (Table 3). Additionally, there are 41 populations rated in fair condition that are spread across all 4 habitat types. Although the number of populations in the bedrock prairie habitat type is low, the number of populations in this habitat type has likely always been low. The wide distribution of

populations makes a catastrophic event eliminating all populations highly unlikely and distribution in multiple habitat types enhances its ability to adapt to novel changes in its environment.

Across all four states, 54 populations (48% of extant populations) are owned by a conservation organization (federal, state, or non-profit) or are permanently protected for conservation purposes, thus are protected from land conversion. Twenty-eight of those permanently protected populations are in excellent or good condition. Management that replicates natural disturbance processes (grazing, prescribed fire) at extant prairie bush-clover populations minimizes the threat of encroaching dominant vegetation and allows for seed establishment. Protection coupled with management may allow the species to persist at sites into the foreseeable future.

Although the recovery criteria have not been met as specified in the recovery plan, we believe that its intention has been met as 31 populations are permanently protected and consist of high-quality prairie habitat and/or are managed. While populations are no longer categorized as core or peripheral and were assessed by prairie type, 24 populations in the previous “core area” currently have excellent or good resiliency, and 13 populations in the former “peripheral area” currently have excellent or good resiliency. Many sites with known prairie bush-clover populations have not been surveyed in over 10 years. As a result, there is uncertainty about their current presence and whether the habitats will be managed into the future; however, it is unlikely that sites with excellent or good resiliency have become extirpated because the majority of these populations are protected and threats are managed.

Given the longevity of the species, that habitat threats (conversion and encroaching dominant vegetation) are well understood and are able to be managed to benefit the species, and the protection status of over 50 populations distributed across the geographic range and habitat types, the number, distribution, and health of the 113 extant populations is sufficient to maintain the species’ viability now and into the foreseeable future. Based on this and the fact that the number of populations throughout its range that are protected and managed to conserve the species has increased since it was listed, it is recommended that the species be considered for delisting.

2.0 RESULTS

2.1 Recommended Classification:

Given your responses to previous sections, particularly section 2.5 Synthesis, make a recommendation with regard to the listing classification of the species

____ Downlist to Threatened
____ Uplist to Endangered
_X_ **Delist** (*Indicate reasons for delisting per 50 CFR 424.11):*
____ *The species is extinct*
_X_ *The species does not meet the definition of an endangered species or a threatened species (i.e., is recovered, or new information on status and threats indicate species does not meet definitions)*
____ *The listed entity does not meet the statutory definition of a species.*
____ No change is needed

2.2 New Recovery Priority Number: 14

Brief Rationale: There is no threat acting across the species' range that is causing the species to be in danger of extinction and the two primary threats to the species, habitat conversion and the encroachment of dominant vegetation, can be minimized or eliminated through the protection and management of sites with known, extant populations.

2.3 Delisting (removal from list regardless of current classification) Priority Number: 6

Brief Rationale: The Service has not been petitioned to remove the species from the List of Threatened and Endangered Wildlife and Plants and the management burden entailed by the species being listed is low.

3.0 RECOMMENDATIONS FOR FUTURE ACTIONS

Over the next five-years, the following conservation actions are recommended to directly benefit and assist in the continued recovery of prairie bush-clover.

- Coordinate survey efforts across the geographic range of the species and assess the status of populations that have not been monitored for over 10 years (2011 or earlier) with an emphasis on populations characterized as having excellent or good resiliency.

- Increase the number of protected populations across representative categories. This may include implementing and/or increasing outreach efforts with private landowners.

- Manage habitat to support prairie bush-clover populations through practices that duplicate the natural processes of the prairie ecosystem (prescribed burns, grazing, or other methods to manage non-native, invasive species and/or encroaching woody vegetation).

- Encourage and support research focused on identifying and documenting prairie bush-clover pollinators, their abundance, and life histories.

4.0 REFERENCES

Sather, N.P. 1991. *Lespedeza leptostachya* in Minnesota, A 1991 update on status, inventory and monitoring. Minnesota Natural Heritage Program, Biological Report No. 34.

U.S. Fish and Wildlife Service (USFWS). 1988. *Lespedeza leptostachya* Recovery Plan. U.S. Fish and Wildlife Service, Twin Cities, Minnesota. 41pp.

U.S. Fish and Wildlife Service (USFWS). 2021. Species Status Assessment Report for Prairie Bush-Clover (*Lespedeza leptostachya*). August 2021 (Version 1.0). Great Lakes Region, Bloomington, Minnesota. 58pp. + appendices.

Vitt, P., T.M. Knight, M. Schutzenhofer, W. Kleiman, K. Havens, and T. Bittner. 2017. Experimental grazing and grass-specific herbicide application benefit rare forb recruitment. Natural Areas Journal. 37: 161-169.

U.S. FISH AND WILDLIFE SERVICE
5-YEAR REVIEW of Prairie Bush-Clover (*Lespedeza leptostachya*)

Current Classification:

Recommendation resulting from the 5-Year Review:

____ Downlist to Threatened
____ Uplist to Endangered
_X_ Delist
____ No change needed

Appropriate Listing/Reclassification Priority Number, if applicable: 6

REGIONAL OFFICE APPROVAL:

Assistant Regional Director, Ecological Services, U.S. Fish and Wildlife Service, Midwest Region 3

Approve LORI NORDSTROM Digitally signed by LORI NORDSTROM Date: 2021.09.23 15:42:35 -05'00'