

TO: Rusty Sydnor, CSKT Restoration Botanist
Jim Boyd, USFWS Biologist

FROM: Andrea Pipp, MTNHP Botanist

DATE: May 21, 2020

SUBJECT: Grant No. F17AP00806 – 2019 Spalding’s Catchfly (*Silene spaldingii*) Data Collection in Montana

INTRODUCTION

The objective of the *Spalding’s Catchfly Data Collection in Montana* grant (number F17AP00806) is to make demonstrable progress towards the recovery plan goals for Spalding’s Catchfly by initiating the required monitoring at two potential Key Conservation Areas (KCAs) on land owned by the Confederated Salish and Kootenai Tribes (CSKT) of the Flathead Indian Reservation (**Figure 1**). This grant’s objective resulted in three reports:

- Three-Year Baseline Monitoring Studies for *Silene spaldingii* on the Flathead Indian Reservation: Year 2017 (Pipp 2018a)
- Three-Year Baseline Monitoring Studies for *Silene spaldingii* on the Flathead Indian Reservation: Year 2018 (Pipp 2019a)
- Three-Year Baseline Monitoring Studies for *Silene spaldingii* on the Flathead Indian Reservation: Year 2019 and 2017-2019 Summary (Pipp 2020a)

A portion of the contractual budget was not used in 2017 or 2018, and approval was given by the U.S. Fish and Wildlife Service (USFWS) to use some of it to re-visit known species occurrences of Spalding’s Catchfly (*Silene spaldingii*) in 2018 and 2019 to order to obtain current information. This re-distribution of grant funds resulted in a memorandum documenting the 2018 re-visits to Species Occurrences (SOs) 7, 8, 45, 46, 47, 48, and 49 by Rusty Sydnor (CSKT’s Restoration Botanist) and Andrea Pipp (Montana Natural Heritage Program [MTNHP] Botanist) (Pipp 2019b).

This memorandum documents the 2019 re-visits to SOs 21, 22, 34, 35, and 50, including the existing information, field methods, and survey findings. Species occurrences 34 and 35 occur on Montana State Trust Lands managed by the Montana Department of Resources and Conservation and are located about three-quarters of a mile north of the Flathead Indian Reservation (**Figure 2**). Species occurrences 21 and 22 occur on the Flathead Indian Reservation on land owned by the CSKT (**Figure 2**). Species occurrence 50 occurs primarily on the Flathead Indian Reservation on land owned by the CSKT with a small portion occurring Montana State Trust Lands (**Figure 2**).

Figure 1. Locational map for Flathead Indian Reservation, Montana.

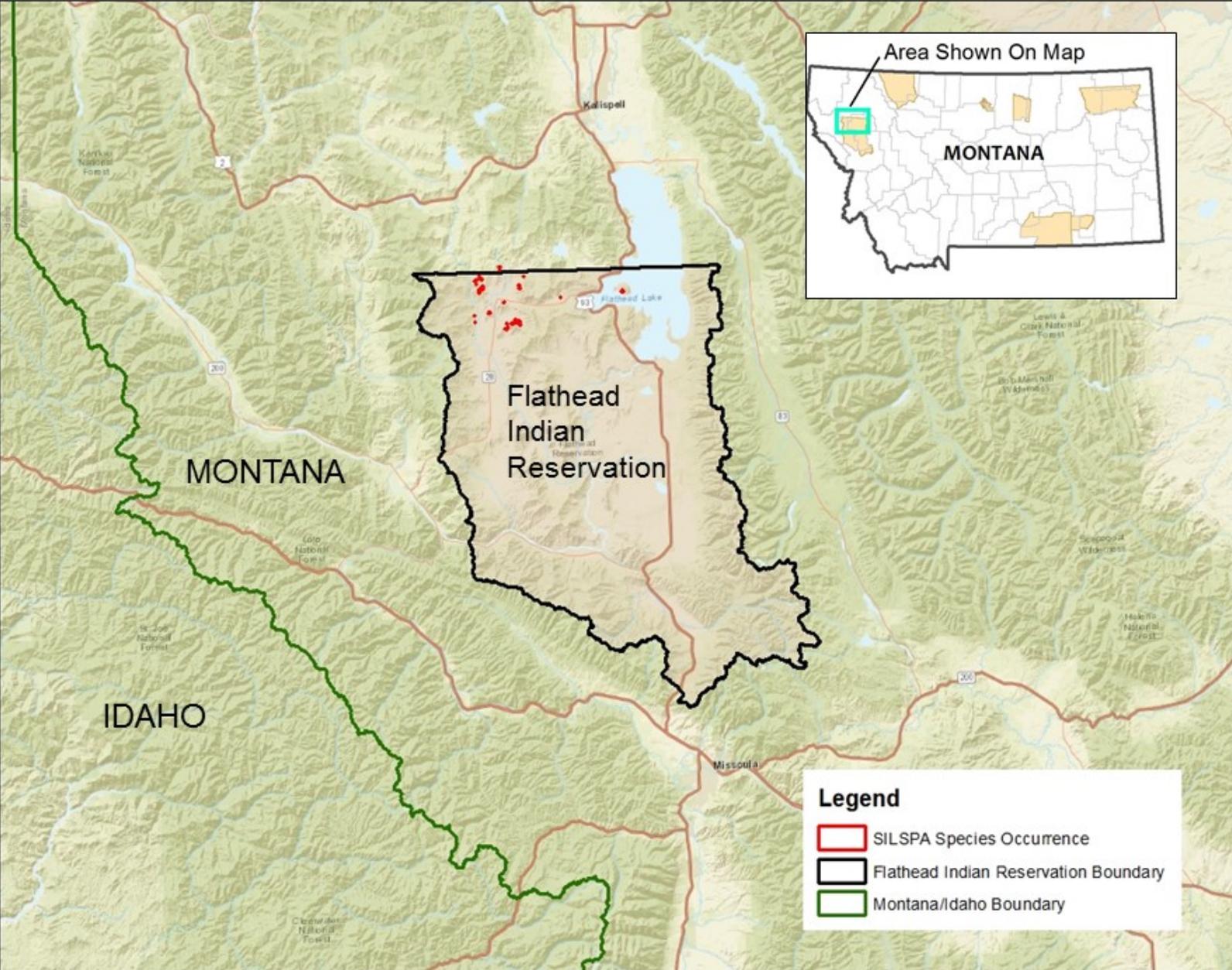
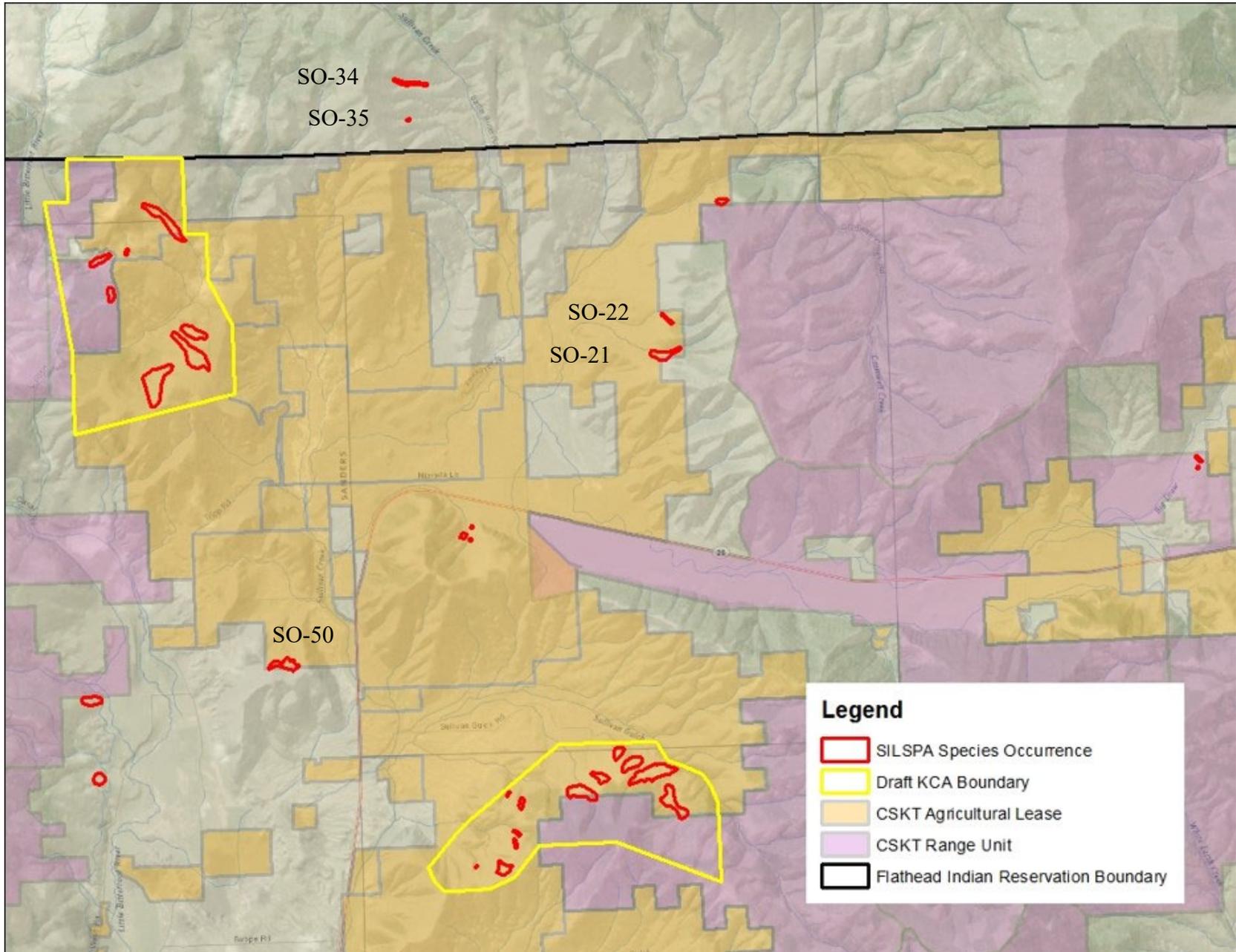


Figure 2: Locations for most of the *Silene spaldingii* Species Occurrences on the Flathead Indian Reservation. Those that are numbered were re-visited in 2019.



METHODS

Each species occurrence (SO) polygon was surveyed by Andrea Pipp, MTNHP botanist, and Emma Heydenberk, MTNHP botany assistant on July 25th or 26th of 2019. The botanists zigzagged through each entire SO polygon walking different, but closely paralleled paths. Within the SO polygon Spalding's Catchfly plants were counted when found. The outside of each polygon was also surveyed in order to map the plant's SO distribution. Plants were mapped using a global positioning system (GPS) unit. Searches continued until a reasonable amount of time had passed with no additional Spalding's Catchfly plants encountered. Observation data on total number of Spalding's Catchfly plants, their phenology, threats to plants or habitat, dominant associated species, and habitat conditions were recorded. The observation data is stored in tabular and spatial formats in the Montana Natural Heritage Program (MTNHP) botany databases. An update to the Spalding's Catchfly data-set is provided to the Confederated Salish Kootenai Tribes (CSKT). Data is also available upon request from the MTNHP.

At some SOs no Spalding's Catchfly plants were found within the previously delineated boundaries. If plants were found outside the SO in 2019, then the entire SO was re-drawn to include past and current observations. A delineated SO should be surveyed thoroughly during the flowering season for at least 3 consecutive years before a determination of extirpation is made. Thus, some SOs will appear to have expanded, though the plant counts may not support the expansion.

Information from the MTNHP botany observation database was used with the 2019 re-visit data to create or re-assess the rank of the SO (also called an Element Occurrence [EO] by NatureServe). Ranking of an SO follows NatureServe's methodology, *Ranking Element Occurrences*¹ - *A Generic Approach*. To understand the relevance of these SO ranks and what was observed in 2019, all information about the species and habitat pertinent to the SO was queried from the MTNHP botany observation database. This memorandum presents the queried data with minor modifications to the plant names while keeping the original format and grammar of the data.

¹ NatureServe uses the term of Element Occurrence (EO) while the MTNHP uses the term of Species Occurrence (SO). They are essentially the same, but MTNHP maps SOs at a higher precision.

SPALDING'S CATCHFLY RESULTS AND RE-VISIT ASSESSMENT

Silene spaldingii SO-21

Plants at the SO polygon were originally found in 1988 and the SO has been observed four times (Figures A-1 and A-2 in Appendix A).

- 1988, JUL 27: 12 plants counted in flower with normal vigor and good reproduction. Populations appear to be affected by the drought this year. Grazing on site. Small population that is overgrazed. Additional Associated Species: *Festuca* sp.
- 2004, AUG 27: 154 plants counted: 20% flowering and 80% fruiting/dispersed. Spotted Knapweed (*Centaurea stoebe*) and Tall Tumble-mustard (*Sisymbrium altissimum*) in dense patches throughout the immediate area. Cheatgrass (*Bromus tectorum*) and Sulphur Cinquefoil (*Potentilla recta*) also common. Suitable habitat in sections 3, 10 and 15 surveyed². Periodic grazing at the site.
- 2010, SEP 01: 17 plants observed during a late season survey. Plants in fruit/post-fruit. More plants likely flowered this season, but were likely missed due to the late-season survey and the limited search of the area. Spotted knapweed abundant, particularly within the lower two-thirds of the occurrence.
- 2019, JUL 26: **Photos 1-4 in Appendix B**
- 342 plants in flower/fruit counted. Plants occur in scattered patches or as scattered individuals throughout the polygon as mapped in 2010 and beyond. Polygon was re-mapped. Plants found in grassland and along forest edge (mixed Ponderosa Pine (*Pinus ponderosa*) and Douglas-fir (*Pseudotsuga menziesii*). Grassland is moderately to heavily grazed with the shrubs heavily grazed. Habitat is a patchwork of native intact grassland, dense patches of exotics with ground disturbance, and mixed native and exotic plants with less soil disturbance. Where exotics plants become denser, Spalding's Catchfly was found to be sparser. Drainage was dry during survey. Remnants of a two-track road and trench digging can be seen in places. Associated species: Rough Fescue (*Festuca campestris*; abundant), Pursh's Silky Lupine (*Lupinus sericeus*; common), Sulphur Cinquefoil (common), Spotted Knapweed (*Centaurea stoebe*; common) with bio-control, Western Gromwell (*Lithospermum ruderale*; common), Fanleaf Cinquefoil (*Potentilla gracilis*; frequent), Tall Cinquefoil (*Drymocallis arguta*; common), Cheatgrass (scattered small patches); Dense Silky Bentgrass (*Apera interrupta*), Missouri Goldenrod (*Solidago missouriensis*), and Rose (*Rosa* sp.; frequent).
 - Knapweed Seedhead Weevils (*Larinus* spp.) were feeding on the Spotted Knapweed flowers.

² This 2004 survey did not find additional (new) *Silene spaldingii* locations.

Silene spaldingii SO-21 RANK

Based on all observation data for SO-21 the rank of BC (good to fair viability) is retained by the MTNHP Botanist. The 2019 observation found a very large population spread over a larger area than previously mapped. However, the prevalence of exotic plants, particularly Spotted Knapweed and Sulphur Cinquefoil has degraded the native habitat which creates some uncertainty to its long-term persistence. Bio-control insects targeting Spotted Knapweed is present and widespread in the SO (**Figure A-2 in Appendix A**).

Silene spaldingii SO-22

Plants at the SO polygon were originally found in 2004 and the SO has been observed 3 times (**Figures A-1 and A-2 in Appendix A**):

2004, AUG 27: 19 plants counted; 20% in flower and 80% fruiting/dispersed. Plants are clustered at the lower end of mapped area but are scattered up the draw almost to the forest edge.

2010, SEP 01: Only 1 plant observed near the upper end of the mapped occurrence. Surrounding habitat is infested with spotted knapweed and is actively grazed.

2019, JUL 26: **Photos 5-7 in Appendix B**

- 28 plants in flower/fruit observed. Plants occur primarily in the upper half of polygon. Plants found on southern side of drainage in grassland. An old two-track road traverses through polygon and population. Most plants were found in the upper elevations of polygon despite the fact that exotic plant populations and native forbs decrease with decreasing elevation. Grassland slope north of drainage and paralleling SO-22 were surveyed, but *Silene spaldingii* was not found and habitat was mostly native grasses with some *Potentilla recta* and a little *Centaurea stoebe*. Also with *Rosa* species.
- An adult Knapweed Root Weevil (*Cyphocleonus achates*) was found (**Photo 7 in Appendix B**). Knapweed Seedhead Weevils (*Larinus* spp.) were feeding on the Spotted Knapweed flowers.

Silene spaldingii SO-22 RANK

Based on all observation data SO-8 is re-ranked from C (Fair Viability) to BC (good to fair viability) by the MTNHP Botanist. The population is small and habitat is degrading, but has few threats and appears to be stable over the last 14 years (**Figure A-2 in Appendix A**). Threats from livestock grazing are low and from noxious weeds are moderate.

Silene spaldingii SO-34

The SO polygon was originally mapped in 2005 and has been observed 2 times (**Figure A-3** and **A-4** in **Appendix A**).

2005, AUG 24: 6 plants counted. 90% fruiting/dispersed and 10% flowering/budding. Minor draws on an east-facing slope. Most of the area with *Silene spaldingii* is being heavily grazed and weeds are prevalent. Douglas' Hawthorn (*Crataegus douglasii*) and Saskatoon Serviceberry (*Amelanchier alnifolia*) common along draws.

2019, JUL 25: **Photos 8-10** in **Appendix B**

No (0) plants were found within the boundaries of SO-34 as mapped in 2005. At its upper end the survey found no plants on the north side of the fence and drainage. 10 flowering/fruiting plants were observed near the SO's mid-point and immediately outside the southern border. Another 3 flowering/fruiting plants were found immediately outside of the SO's upper southern boundary. Total SO count is 13 plants. The SO boundary was enlarged to accompany the observed plants, though no plants were found in the original SO. SO-34 occupies a drainage of riparian vegetation and Ponderosa Pine forest surrounded by grassland slopes. Ponderosa pine are encroaching into the grassland slopes. Lower half of drainage is used heavily by livestock (cattle). Livestock use decreases in drainage and on adjacent slopes with increasing elevation. (**Photos 12-14** in **Appendix B**).

Silene spaldingii SO-34 RANK

Based on all observation data SO-34 is re-ranked from D? (Poor Viability?) to CD (fair to poor viability) by the MTNHP Botanist. The observations indicate an extremely small population size that is widely scattered and habitat that is over-used by livestock grazing; however, where the plants occur native species still predominate and the ability to restore or change management is likely. Stochastic events that could extirpate the population could occur within 20-30 years.

Silene spaldingii SO-35

The SO polygon was originally mapped in 2005 and has been observed 2 times (**Figure A-3** and **A-4** in **Appendix A**).

2005, AUG 24: 1 plant counted; 90% fruiting/dispersed and 10% flowering/budding. Minor draws on an east-facing slope. Most of the area with the *Silene spaldingii* plant is being heavily grazed and weeds are prevalent. *Crataegus douglasii* and *Amelanchier alnifolia* common along draws.

2019, JUL 25: **Photos 11-14** in **Appendix B**

No plants were found despite the area being well-surveyed. SO-35 occupies a drainage of riparian vegetation surrounded by grassland slopes. The SO is heavily used by livestock. On the adjacent grassland slopes to the southeast one plant was found and to the southwest one plant found. Total SO count is 2 plants. The SO boundary was enlarged to accompany the observed plants.

Silene spaldingii SO-35 RANK

Based on all observation data SO-35 is re-ranked from D? (Poor Viability?) to CD (Fair to Poor Viability) by the MTNHP Botanist. The site has a history of extremely few plants, degraded but still native habitat, and a stochastic event could extirpate the population within 20-30 years. However, restoration in the form of changing the grazing management timing and/or intensity could be plausible.

***Silene spaldingii* SO-50**

The SO polygon was originally mapped in 2011 and has been observed 3 times (**Figures A-5 and A-6 in Appendix A**).

2011, SEP 15: 343 plants observed, most in fruit or post-fruit though some plants still in flower. Total population size is estimated to be approximately 500+ plants when including overlooked plants, small amount of habitat which was unsurveyed on the lower elevation side of the population and dormant plants. Spotted knapweed common on state lands and on adjacent tribal land. State land dominated by Idaho fescue due to heavy grazing pressure. Lower extent, particularly near the draw has not been adequately established.

2015, JUL24: Counted 289 plants (288 on CSKT land and 1 plant on MT-DNRC land). Most plants were flowering while only a couple of them were grazed. The population occupies a swale in a heavily grazed mesic grassland. Site straddles State of Montana (Department of Natural Resources and Conservation) and tribal lands. The land was very heavily grazed on both the State land and CSKT land. Rough fescue and spotted knapweed present.

2019, JUL 25: **Photos 15-18 in Appendix B**
Counted 954 plants (721 on CSKT land and 233 plant on MT-DNRC land), which enlarged the size of the SO as mapped in 2015. Most plants were in flower and fruit. Found a few grazed plants. Found a few plants with insect herbivory on the developing seed pods. Plants are succulent and healthy. Many multi-stemmed plants with some bearing 5-6 stems. All comments apply to both land ownerships. Mesic grassland that is grazed by livestock (cattle) - perhaps in the fall/winter because no current use by livestock was observed. Site straddles State of Montana (Department of Natural Resources and Conservation) and CSKT tribal land. In comparison to 2015, vegetation was lush with dominant grasses being knee high, green, and mostly developing seeds. Many of the forbs were green, succulent, and in flower or developing seeds. Grassland consists of primarily native vegetation; even *Potentilla recta* and *Centaurea maculosa* were not observed. In general, the CSKT land had more forbs and less bunched grasses than the State land.

Silene spaldingii SO-50 RANK

SO-50 had not been previously ranked. Based on all observation data SO-47 is ranked as an AB (Excellent to Good Viability) by the MTNHP Botanist. The site is large in both size and *Silene spaldingii* population. Although heavily grazed, the management appears to promote *Silene spaldingii* and discourage noxious weed infestations. It is unknown when grazing occurs.

Appendix A

Maps: *Silene spaldingii* Species Occurrences re-visited in 2019

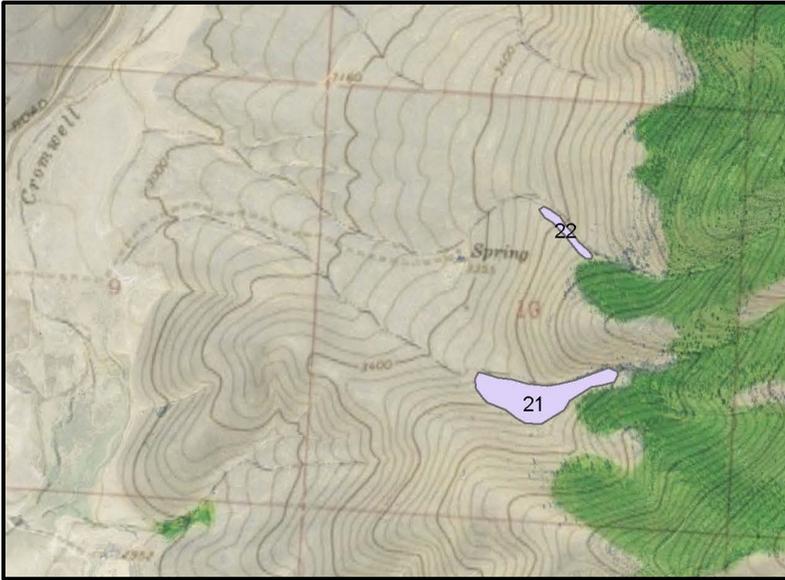


Figure A-1: *Silene spaldingii* SO-21 and SO-22 occurrences as mapped in 2004.



Figure A-2: *Silene spaldingii* SO-21 (southern polygon) and SO-22 (northern polygon) occurrences as mapped in 2019.

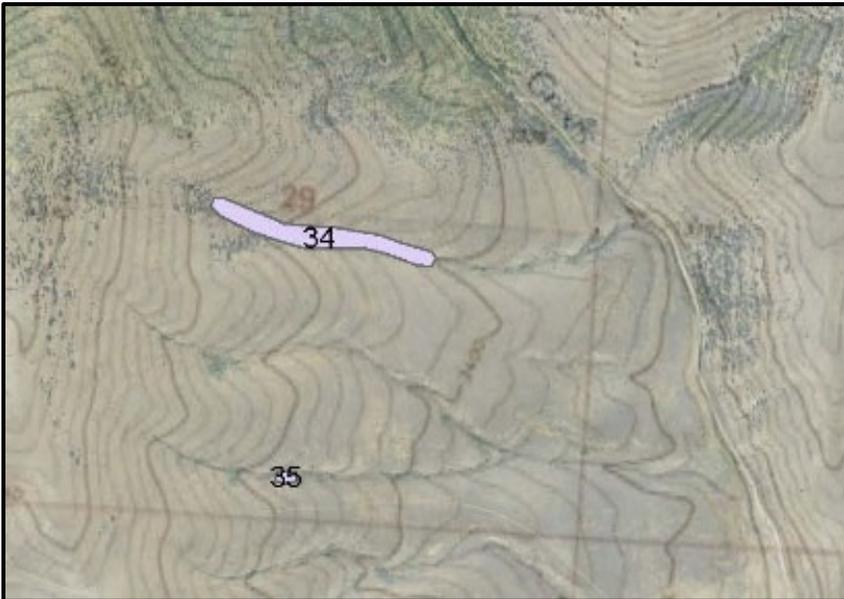


Figure A-3: *Silene spaldingii* SO-34 and SO-35 as mapped in 2005.

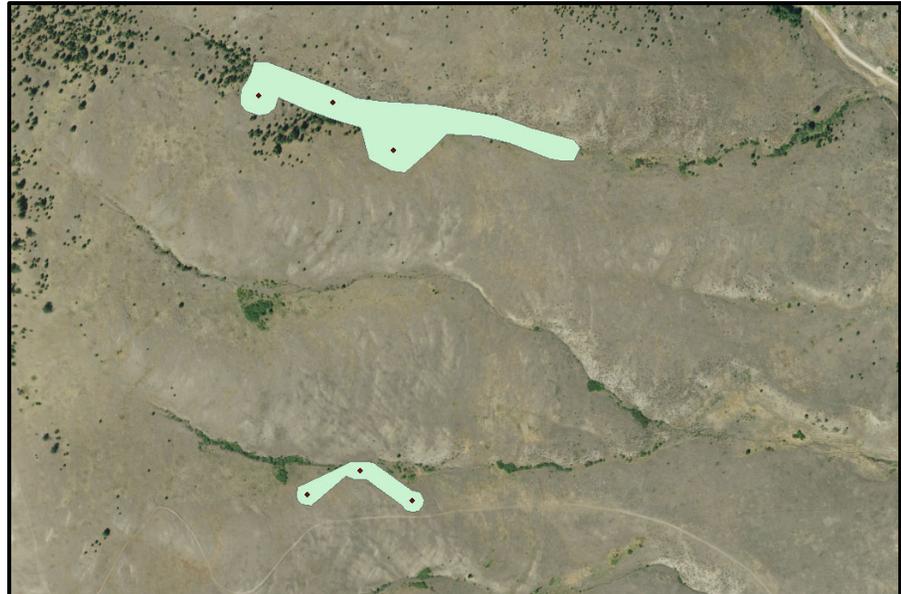


Figure A-4: *Silene spaldingii* SO-34 (northern polygon) and SO-35 (southern polygon) as mapped in 2019.



Figure A-5: *Silene spaldingii* SO-50 as mapped in 2015.



Figure A-6: *Silene spaldingii* SO-50 as mapped in 2019.

Appendix B

2019 Photographs

RE-VISITS TO SPALDING'S CATCHFLY SPECIES OCCURRENCES – 2019 PHOTOGRAPHS



Photo 1: View is east northeast at Spalding's Catchfly and SO-21, which continues towards the drainage and forest edge.



Photo 2: View is west northwest at Spalding's Catchfly Plant growing in fairly native habitat of SO-21.



Photo 3: SO-21 showing native plants invaded by dense Patches of Sulphur Cinquefoil and Spotted Knapweed.



Photo 4: View is southwest in upper end of SO-21. Spalding's Catchfly plants were sparse in dense Spotted Knapweed patches.



Photo 5: View is southeast at SO-22 on photo's right side of drainage.

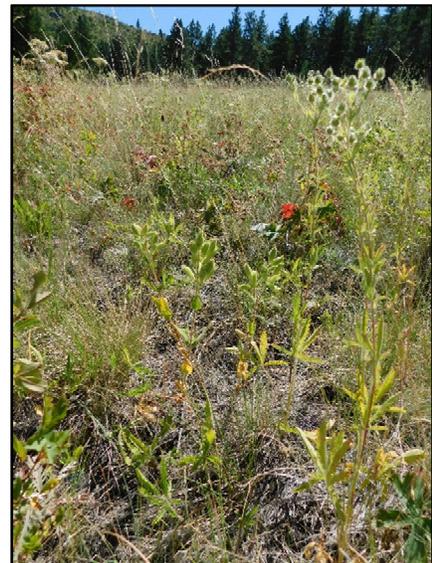


Photo 6: Spalding's Catchfly and Sulphur Cinquefoil plants in SO-22.

RE-VISITS TO SPALDING'S CATCHFLY SPECIES OCCURRENCES – 2019 PHOTOGRAPHS



Photo 7: This Knapweed Root Weevil (*Cyphocleonus-achates*) was found in SO-22.



Photo 8: View is westerly at SO-34 which occupies the drainage.



Photo 9: View is of riparian habitat heavily used by livestock in SO-34.



Photo 10: View is westerly at native grassland with *Silene spaldingii* in SO-34 (red oval).



Photo 11: View is northeast at SO-35 that is grazed by livestock.



Photo 12: View is northeast at Spalding's Catchfly plant (red oval) and SO-35 in background.

RE-VISITS TO SPALDING'S CATCHFLY SPECIES OCCURRENCES – 2019 PHOTOGRAPHS



Photo 13: View is easterly in SO-35 that is heavily used by livestock.



Photo 14: View is northwest at Spalding's Catchfly plant with SO-35 in the background.



Photo 15: View is west at SO-50. Fence divides DNRC land (upslope) and CSKT land (downslope).



Photo 16: View is west on DNRC side of SO-50 with Spalding's Catchfly plants in foreground (red oval).

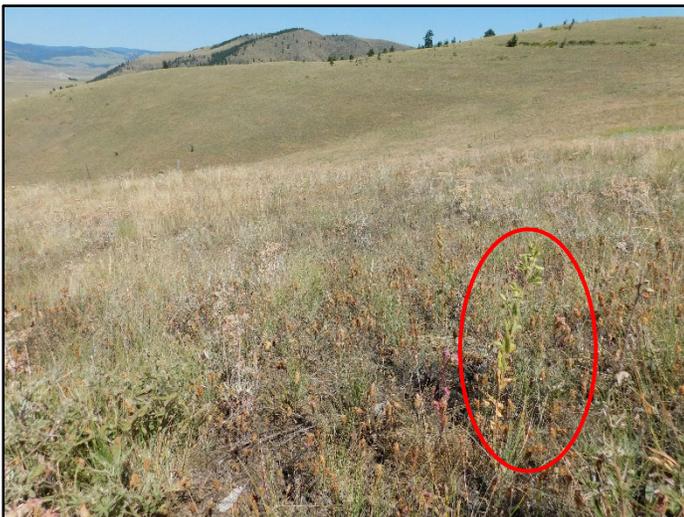


Photo 17: View is east on CSKT side of SO-50. Spalding's Catchfly plant in red oval.



Photo 18: View is southerly within SO-50 on CSKT land. Spalding's Catchfly plants (arrows) occur with mostly native plants.