

MULTISAR:

A Multi-Species Conservation Strategy for Species at Risk in the Grassland Natural Region of Alberta, 2018–2019 Report



Alberta Species at Risk Report No.164



MULTISAR: A Multi-Species Conservation Strategy for Species at Risk in the Grassland Natural Region of Alberta, 2018–2019 Report

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Disclaimer

The views and opinions expressed in this report are those of the author and do not necessarily represent the policies or positions of Alberta Environment and Parks, the Alberta Fish and Wildlife Stewardship Branch, or the Alberta Government.

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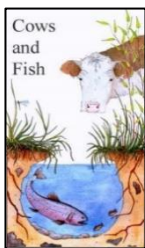
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Executive Summary

MULTISAR (multiple species at risk) is a program focused on multi-species conservation at the landscape level that promotes stewardship through voluntary participation of landholders on both Crown and private lands. MULTISAR defines species at risk as those with a provincial general status of *At Risk*, *May Be At Risk* or *Sensitive*. The program is a collaborative effort among landholders, the Alberta Conservation Association, Alberta Environment and Parks, the Prairie Conservation Forum, Cows and Fish, Canadian Cattlemen's Association, Alberta Beef Producers, the Canadian Round Table for Sustainable Beef, and Environment and Climate Change Canada.

The Habitat Conservation Program includes the development of detailed habitat conservation strategies (HCSs) in the Milk River and South Saskatchewan watersheds of southern Alberta, as well as the more compact species at risk conservation plans (SARC plans) delivered throughout the Grassland Natural Region. In 2018–2019, MULTISAR created another extension program, termed habitat management plans (HMPs). Like SARC plans, HMPs are a more condensed version of the HCS applied at the ranch level, but involve detailed wildlife surveys and simplified wildlife habitat assessments to document species at risk and habitat indicators.

In 2018–2019, a new HCS was developed on five ranches totalling approximately 56 184 acres. MULTISAR also completed two HMPs on 4649 acres of land within its priority areas. Several habitat enhancement projects were developed to improve the habitat of key wildlife species on HCS and HMP properties. These included planting of native grass plugs, building wildlife-friendly fencing, installing ferruginous hawk (*Buteo regalis*) poles, protecting trees, fencing off wetlands and dugouts and providing alternate water sources.

Despite interest from land managers, no SARC plans or beneficial management plan assessments were delivered this year for several reasons, such as the land being outside of targeted species at risk range.

The education, outreach and awareness program was achieved primarily by MULTISAR staff giving presentations and demonstration tours to landholders, wildlife and conservation groups, college students and the general public. MULTISAR partnered with the Canadian Cattlemen's Association to manage a booth during the Calgary Stampede that was potentially viewed by over 100 000 people. Communication material produced included one issue of MULTISAR's *Grassland Gazette* newsletter. MULTISAR made over 225 different types of contacts with more than 7000 individuals/groups (and an additional 100 000 people at the Calgary Stampede), including landholders, the general public, academia, industry, media, government and non-governmental organizations and other sectors.

Under the research and monitoring program, MULTISAR continued implementing its monitoring and evaluation protocol to assess the directionality of habitat improvements and management changes and the effectiveness of its HCSs. A subsample of range and riparian sites and wildlife points was revisited on five MULTISAR HCS ranches (58 672 acres), five years after their initial assessment, to determine whether management recommendations had been implemented and to monitor their effects on species at risk habitat. Roughly 50 habitat enhancement projects on participating HCS ranches were monitored in 2018 to determine whether enhancements were achieving their objectives.

MULTISAR continues to compile wildlife observation and vegetation assessment data that it has been accumulating since its first HCS. In 2019, MULTISAR will also continue to focus on determining inferences between species at risk occurrences and habitat metrics.

MULTISAR will strive to promote beneficial management practices recommendations to improve and maximize habitat quality for species at risk.

Introduction

Grasslands have evolved over thousands of years, yet over the last century we've managed to lose roughly 80% of the native grasslands in Canada (Bailey *et al.* 2010). It is, therefore, no surprise that grasslands are home to some of the most endangered and unique species in Canada. The MULTISAR program was established in 2002 to help maintain and improve habitat for these unique species by collaborating with landholders and increasing awareness of species at risk.

MULTISAR (multiple species at risk) is a program focused on multi-species conservation at the landscape level that promotes stewardship through voluntary participation of landholders on both Crown and private lands. MULTISAR defines species at risk as those with a provincial general status of *At Risk*, *May Be At Risk* or *Sensitive*. The program is a collaborative effort among landholders, Alberta Conservation Association (ACA), Alberta Environment and Parks (AEP) and the Prairie Conservation Forum (PCF). The primary goals of MULTISAR are to implement collaborative strategies to manage multiple species on a defined working landscape and to assist with their implementation. These strategies are built as landholder-specific habitat conservation strategies (HCSs), leading to the implementation of habitat enhancement activities that benefit both the farm/ranch operation and wildlife. Through these HCS relationships, MULTISAR has implemented 191 habitat enhancement projects on ~451 493 acres of land.

MULTISAR consists of three primary components:

Habitat conservation strategies, which are detailed plans developed with landholders that can be used as a tool for the management of their land.

An education, outreach and awareness program, which involves developing beneficial management practices (BMPs) for various species, publishing the annual *Grassland Gazette*, developing and delivering presentations for the public, and completing species at risk conservation (SARC) plans, which are a condensed form of HCSs and completed for landholders outside the priority landscape of the Milk River watershed and portions of the South Saskatchewan River watershed. New in 2018 was the development of habitat management plans (HMPs) for properties within the priority areas to allow additional engagement with producers with less time commitment than required for the more detailed HCSs. These plans focus on wildlife habitat and assess specific attributes like litter and cover (Robel pole measurements), and include detailed wildlife surveys. They provide producers with a higher level of detail than SARC plans, but lack the time-intensive range information collection that one would have with an HCS.

Research, monitoring and evaluation, which involves the monitoring of habitat enhancements every one to two years and evaluation of the detailed plans (HCSs) every five years to determine whether they are having the desired effect or are in need of adjustments.

The MULTISAR Program is guided by the 2015–2020 Business Plan. The MULTISAR mission, vision, and goals are as follows:

Mission: To develop and implement the MULTISAR process which directs conservation of multiple species (including species at risk) and their habitat within the Grassland Natural Region of Alberta.

Vision: Habitat for multiple species of wildlife, including species at risk, will be maintained or enhanced in the grasslands of Alberta through an integrated and collaborative process that contributes to the values of Albertans and the wellbeing and sustainability of the ranching community.

Program Area Goals:

Habitat Conservation Program:

Goal: Incorporating the values of all partners, deliver an integrated program that provides for the conservation of wildlife (species at risk) and their habitat.

Education, Outreach and Awareness:

Goal: To create awareness about the needs and habitat requirements of wildlife (focusing on species at risk) and the management practices that aid in their conservation and the sustainability of rangelands in the Grassland Natural Region.

Research and Monitoring Program:

Goal: To increase our knowledge of species at risk and their habitat using data collected through the MULTISAR process.

Education, Outreach and Awareness

MULTISAR continued to deliver its education, outreach and awareness program as time and resources permitted. Activities included everything from field training events, to presentations to school, college, community and landholder groups, and at conferences, to attendance at events with the MULTISAR display. Direct communication with landholders is ongoing, as is communication with other organizations and government agencies.

Landholder Awareness

***At Home on the Range, Grassland Gazette* and Other Informational Publications**

In total, 1337 copies of MULTISAR's flagship booklet, *At Home on the Range: Living with Alberta's Prairie Species at Risk* (Saunders *et al.* 2016), were distributed to landholder cooperators, mailed out to county and municipal district offices, provided to non-profit organizations for distribution, and given to interested members of the public at events such as the Calgary Stampede. The 13th issue of MULTISAR's newsletter, the *Grassland Gazette*, was produced in December 2018 and sent to over 575 MULTISAR contacts, including program-participating landholders. Over 6000 MULTISAR fact sheets and species at risk information cards were handed out.

Southern Alberta Grazing School for Women

The 15th annual Southern Alberta Grazing School for Women was held on July 24 and 25, 2018 in Stavely, Alberta, with 60 women in attendance. The two-day event included topics such as range and riparian health, local plant identification, verified sustainable beef program, grazing research, and utilizing electric fencing for livestock management. MULTISAR has been one of the organizing partners of this event since 2011. The MULTISAR display was set up and various brochures and the *At Home on the Range* booklets were handed out. From the annual evaluation form, we found that 98% of this year's attendees said that the school will influence their grazing management practices and 100% of the attendees said that they will be incorporating new management practices that they learned from the school on their ranches.

Southern Alberta Youth Range Days

Southern Alberta Youth Range Days was held from July 10 to 12, 2018 at Rangeview Ranch in Cardston County, Alberta. MULTISAR is one of the organizing partners of this event and had staff in attendance to help deliver presentations. The agenda included range plant identification and

quiz, a ranch management challenge, riparian management techniques, how to ID grassland birds, and black light tracking of Richardson’s ground squirrels (*Urocyon richardsonii*). Thirty youths and ten parent chaperones were in attendance. Attendees came from various backgrounds, including farm and ranch, acreage and town.

Presentations/Training to Landholder Groups

MULTISAR had numerous conversations with individual landholders (over 100) about topics such as species at risk, wildlife-friendly fencing, hawk poles, water management, native grass restoration, herbicides for invasive weeds, habitat assessments and the MULTISAR process. In addition, MULTISAR gave presentations and/or training to landholder groups on several occasions. Table 1 summarizes presentations and discussions about ranch management that involved landholder groups.

Table 1. Summary of MULTISAR activities associated with landholder groups.

Date	Event	Location	Type	Attendance
April 30, 2018	Meeting	Lethbridge, AB	Discussion about MULTISAR HMPs	4 attendees
May 11, 2018	Meeting	Barnwell, AB	Discussion about MULTISAR	4 attendees
July 24–25, 2018	Southern Alberta Grazing School for Women	Stavelly, AB	Presentation on Species at risk and grazing management	60 attendees
August 16, 2018	Ranch Board Meeting	Bow Island, AB	Discussion about MULTISAR program	8 attendees
December 5, 2018	Ranch Annual General Meeting	Enchant, AB	Discussion of MULTISAR preliminary HCS results	20 attendees
January 24, 2019	Meeting	Taber, AB	Discussion of HCS results	6 attendees

February 12, 2019	Ranch Annual General Meeting	Lethbridge, AB	Discussion of ranch management	7 attendees
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Educational Presentations

MULTISAR was involved in youth and post-secondary education activities on six occasions, reaching over 5400 individuals. Table 2 summarizes these activities.

Table 2. Summary of MULTISAR activities associated with youth and post-secondary education.

Date	Event	Location	Type	Attendance
April 24, 2018	Aggie Days	Lethbridge, AB	MULTISAR display	5800 youths and supervising adults
April 24, 2018	School Presentation	Lethbridge, AB	Presentation about grassland birds	80 youths
July 10–12, 2018	Youth Range Days	Cardston County, AB	Presentations about grassland birds, range health and plant ID; ranch plan workshop	40 (youths and parents)
September 18, 2018	Lethbridge College Field Trip	Milk River, AB	Presentation about landholder collaboration and species at risk	18 college students
September 21, 2018	High School Job Shadow	Manyberries, AB	Job shadow on snake survey	1 youth
February 28, 2019	University of Lethbridge Classroom Presentation	Lethbridge, AB	Presentation about MULTISAR and species at risk	20 university students

Public Outreach

Presentations, Demonstration Tours and Displays

In addition to MULTISAR’s involvement with landholders, youth and post-secondary students, MULTISAR delivers presentations and tours to other groups working on the landscape (such as non-governmental organizations [NGOs], not-for-profit organizations and government agencies), as well as participating in their events. At public events, MULTISAR will give presentations and take its interactive species at risk and grassland display. In 2018–2019, MULTISAR gave live presentations and set up the display on twelve occasions. Presentations and tours were also given to individuals and groups to inform them about MULTISAR and MULTISAR processes. These types of presentations and displays allowed MULTISAR to directly reach over 575 individuals and created direct and indirect exposure for at least 100 000 people who visited the Calgary Stampede Cattle Trail. At the Calgary Stampede, MULTISAR, as well as various other environmental organizations working towards engaging people in grasslands-related issues, was invited by the Canadian Cattlemen’s Association to set up displays. Table 3 summarizes MULTISAR’s public outreach activities.

Table 3. Summary of 2018–2019 public outreach activities by MULTISAR.

Date	Event	Location	Type	Attendance
April 19, 2018	Prairie Habitat Joint Venture workshop	Leduc, AB	Presentation about landholder relationships in relation to MULTISAR	30 attendees
July 6–15, 2018	Calgary Stampede; Canadian Cattlemen’s Association	Calgary, AB	MULTISAR display (general)	Over 100 000 visitors from around the world
July 12, 2018	Alberta Environment and Parks tour	Cardston County, AB	Presentation about the MULTISAR partnership	6 attendees
July 27, 2018	Country in the City	Medicine Hat, AB	MULTISAR handouts	124 handouts

September 19, 2018	Canadian Roundtable for Sustainable Beef and International Beef Alliance tour	MD of Foothills, AB	Presentation about MULTISAR	80 attendees
November 8, 2018	Milk River Watershed Council Canada science forum	Milk River, AB	Presentation about native prairie restoration	50 attendees
December 4, 2018	Transboundary workshop	Lethbridge, AB	Presentation about MULTISAR	80 attendees
January 9, 2019	Lethbridge Naturalists meeting	Lethbridge, AB	Presentation about MULTISAR	25 attendees
January 17, 2019	Prairie Conservation Forum annual general meeting	Aldersyde, AB	MULTISAR update on activities	25 attendees
February 6, 2019	Endangered Species Conservation Committee meeting	Red Deer, AB	Presentation about MULTISAR	20 attendees
February 19–21, 2019	Prairie Conservation and Endangered Species Conference	Winnipeg, MB	Four in-person presentations and three poster presentations about MULTISAR, GIS analysis and grassland birds	330 attendees
March 12, 2019	Multiple Species Management Workshop	Consul, SK	Presentation about MULTISAR	20 attendees

Website and Social Media

The MULTISAR website (www.multisar.ca) continues to be the key portal where information about the program, BMPs for species at risk, as well as related documents, news events and producer stories can be accessed. It continues to get direct feeds from both the MULTISAR Twitter and Facebook accounts, which provide current news. The number of original tweets/Facebook posts from this past year was 30.

Media and Other Publications

In addition to the MULTISAR newsletter, the *Grassland Gazette*, that was produced and sent to over 575 contacts, MULTISAR spoke to several media outlets (including CTV News 2, The Western Producer, the Lethbridge Herald, Taber Times and Let's Go Outdoors) on specific grasslands/species-related topics, including ferruginous hawk (*Buteo regalis*) poles. Two articles were written about a ferruginous hawk pole installation initiated by MULTISAR: one in the *Lethbridge Herald* titled *A place to call home; AltaLink, Alberta Conservation Association build artificial nest for at-risk ferruginous hawks* (by Greg Bobinec, March 9, 2019), and one in the *Western Producer* titled *Alta. project builds new home for hawk couple; the nest pole was erected earlier this month to lure two ferruginous hawks away from a busy road in southern Alberta* (by Barb Glen, March 14, 2019). MULTISAR also participated in a short YouTube video about species at risk in badlands areas (for Frick I Love Nature).

Contacts, Extension and Outreach

Through the course of any fiscal year, MULTISAR staff interacts on a daily basis with landholders and other individuals representative of a broad spectrum of sectors. From April 1, 2018 to March 31, 2019, 225 contacts were made with over 7000 people, plus over 100 000 people that visited the Calgary Stampede Cattle Trail and either stopped to talk with staff or walked by and saw the MULTISAR display. These contacts include organizations and agencies with which MULTISAR regularly collaborates; these discussions and meetings included approximately 82 people. Table 4 shows a breakdown of the different individuals/groups that MULTISAR reached out to, as well as how many people were involved with MULTISAR in some way because of the interaction with these contacts.

Table 4. MULTISAR contacts for 2018–2019.

Contact Type	# Contacts	# People Reached
Landholder	119	284

Landholder Group	14	57
Government	21	38
NGO	37	556
Academic (individual researchers)	3	3
School	4	5499
Individual (non-landholder)	4	7 (+ over 100,000 at the Calgary Stampede)
Industry	5	6
Media	6	Unknown
Company	4	4
Consultant	0	0
Contractor	6	575
Other (MULTISAR handouts at events and Prairie Conservation and Endangered Species Conference)	3	431
Total:	225	7465

Habitat Conservation Strategies

Conservation efforts to maintain and enhance wildlife habitat and rangelands for both species at risk and cattle production are the primary objectives of MULTISAR and habitat conservation strategies (HCSs). The majority of the province's remaining native prairie is found in the Grassland Natural Region (GNR), where over 70% of Alberta's species at risk can be found. Most of these native habitats still exist thanks to livestock production. Efforts to maintain and enhance wildlife habitat for species at risk and rangeland sustainability can be achieved through a voluntary and collaborative approach with landholders and leaseholders. An HCS team works together to balance the needs for healthy rangelands and quality fish and wildlife habitats through grazing recommendations and habitat improvement projects. Each strategy is a result of detailed range, wildlife and riparian inventories and assessments, from which management goals and objectives can be made.

HCS Process

The foundation of an HCS is its team members. Landholders, as well as both government and non-government agencies, make up the team and include members from AEP, ACA, PCF and any other organizations that are stakeholders in the property.

Management objectives and strategies for the implementation of conservation efforts are developed by the entire MULTISAR HCS team and address wildlife, habitat, range, riparian and land management objectives identified for a particular landbase. Management and habitat enhancement recommendations are based largely on the recovery and conservation management actions for species identified as a priority on the land and from MULTISAR's BMP document (Rangeland Conservation Service Ltd. 2016).

For a complete and detailed description of the entire HCS process, refer to MULTISAR's 2010–2011 progress report (Rumbolt *et al.* 2011). Information regarding the detailed survey methodologies used in HCSs can be found in MULTISAR's 2011–2012 progress report (MULTISAR 2012).

HCS Achievements for the Fiscal Year 2018–2019

To date, MULTISAR has completed 47 HCSs on 451 493 acres of land within the Milk River and South Saskatchewan watersheds (Table 5). In 2018, MULTISAR completed HCSs for five new properties in southern Alberta, totaling 56 184 acres. Work on these properties included detailed wildlife, range and riparian inventories.

Table 5. Habitat conservation strategy participant summary.

Year*	# Landholder Participants	Acres Surveyed
2004	1	62 050
2005	1	159
2006	2 [^]	32 868
2007	3	85 712
2008	2	7680
2009	3	38 630
2010	5	4720
2011	5	17 878
2012	3	13 140
2013	1	7859
2014	2	43 250
2015	2	8553
2016	5	9837
2017	7	62 973
2018	5	56 184
Total	47	451 493+

*HCSs were counted in the year in which fieldwork was initiated; however, some surveys continued for more than one year.

[^]In 2006, MULTISAR absorbed the Western Blue Flag Program (previously overseen by ACA) and its eight participating landholders. These properties did not have an HCS completed and therefore they are not included in this total.

+This number includes those smaller-sized properties originally assessed as an HCS but which are now a part of the HMP process.

To date, 21 HCSs, which have been implemented for at least five years, have been reassessed (Table 6). Furthermore, four HCSs have been reassessed for a second time. These

reassessments entailed a resurvey of a subsample of the original range, riparian and wildlife inventories. More details on these reassessments can be found in the *Habitat Conservation Strategy Evaluation and Monitoring Program* section.

Table 6. Habitat conservation strategy reassessment summary.

Year of HCS Reassessment	MULTISAR Participant	Size of Property (acres)
2011	MP_1	62 050
2012	MP_4	28 797
2013	MP_7	41 332
2013	MP_8	3479
2013	MP_9	4201
2014	MP_2	159
2014	MP_3	4071
2014	MP_6	40 547
2015	MP_5	3832
2015	MP_10	2209
2015	MP_11	3076
2015	MP_16	994
2016	MP_1	62 050
2016	MP_13	311
2016	MP_15	854
2016	MP_17	1263
2016	MP_18	1297
2016	MP_20	2026

2017	MP_4	28 797
2017	MP_19	14 271
2018	MP_7	41 332
2018	MP_9	4201
2018	MP_23	2938
2018	MP_24	958
2018	MP_25	9243
Total	21*	364 288

*This number excludes the most recent reassessment for MP_1 in 2016; MP_4 in 2017; and MP_7, MP_8 and MP_9 in 2018.

Wildlife

To date, approximately 71 587 wildlife observations have been submitted to the Fish and Wildlife Management Information System (FWMIS) since 2004, including 9977 in 2018. Sixty-four different species at risk were recorded on HCS properties in 2018. Table 7 summarizes the species at risk observed on all HCS properties assessed (or reassessed) during the 2018 field season.

Table 7. Species at risk recorded on HCS properties during the 2018 field season.

Species	General Status ¹	Legislative Status	# of Observations	Feature	Significance
Birds					
Alder flycatcher (<i>Empidonax alnorum</i>)	Sensitive	none	6		
American bittern (<i>Botaurus lentiginosus</i>)	Sensitive	none	20		

American kestrel (<i>Falco sparverius</i>)	Sensitive	none	13		
American white pelican (<i>Pelecanus erythrorhynchos</i>)	Sensitive	none	28		
Baird's sparrow (<i>Ammodramus bairdii</i>)	Sensitive	Special Concern ²	316		
Bald eagle (<i>Haliaeetus leucocephalus</i>)	Sensitive	none	9	2 nests	
Baltimore oriole (<i>Icterus galbula</i>)	Sensitive	none	42		
Bank swallow (<i>Riparia riparia</i>)	Sensitive	Threatened ²	26	2 colonies	
Barn swallow (<i>Hirundo rustica</i>)	Sensitive	Threatened ²	45	1 nest	
Black-crowned night heron (<i>Nycticorax nycticorax</i>)	Sensitive	none	11		
Black-necked stilt (<i>Himantopus mexicanus</i>)	Sensitive	none	17		
Black tern (<i>Chlidonias niger</i>)	Sensitive	none	33		
Bobolink (<i>Dolichonyx oryzivorus</i>)	Sensitive	Threatened ²	1		

Brewer's sparrow (<i>Spizella breweri</i>)	Sensitive	none	95		
Broad-winged hawk (<i>Buteo platypterus</i>)	Sensitive	none	1		
Brown creeper (<i>Certhia americana</i>)	Sensitive	none	1		
Burrowing owl (<i>Athene cunicularia</i>)	At Risk	Endangered ^{2,3}	11	3 burrows	
Caspian tern (<i>Hydroprogne caspia</i>)	Sensitive	none	1		
Chestnut-collared longspur (<i>Calcarius ornatus</i>)	Sensitive	Threatened ²	396	1 nest	
Clark's grebe (<i>Aechmophorus clarkia</i>)	May Be At Risk	none	2		
Clark's nutcracker (<i>Nucifraga columbiana</i>)	Sensitive	none	13		
Common nighthawk (<i>Chordeiles minor</i>)	Sensitive	Threatened ²	25		

Common yellowthroat (<i>Geothlypis trichas</i>)	Sensitive	none	122		
Eastern kingbird (<i>Tyrannus tyrannus</i>)	Sensitive	none	135	2 nests	
Ferruginous hawk (<i>Buteo regalis</i>)	At Risk	Endangered ³ Threatened ²	67	19 nests	
Golden eagle (<i>Aquila chrysaetos</i>)	Sensitive	none	16		
Grasshopper sparrow (<i>Ammodramus savannarum</i>)	Sensitive	none	133		
Great blue heron (<i>Ardea herodias</i>)	Sensitive	none	12		
Horned grebe (<i>Podiceps auratus</i>)	Sensitive	Special Concern ²	7		
Lark bunting (<i>Calamospiza melanocorys</i>)	Sensitive	none	4		
Least flycatcher (<i>Empidonax minimus</i>)	Sensitive	none	55	1 nest	
Loggerhead shrike (<i>Lanius ludovicianus</i>)	Sensitive	Threatened ²	9		

Long-billed curlew (<i>Numenius americanus</i>)	Sensitive	Special Concern ²	88		
McCown's longspur (<i>Rhynchophanes mccownii</i>)	May Be At Risk	Threatened ²	11		
Pied-billed grebe (<i>Podilymbus podiceps</i>)	Sensitive	none	10		
Prairie falcon (<i>Falco mexicanus</i>)	Sensitive	Special Concern ²	14	6 nests	
Sandhill crane (<i>Grus canadensis</i>)	Sensitive	none	1		
Sharp-tailed grouse (<i>Tympanuchus phasianellus</i>)	Sensitive	none	48	8 leks	
Short-eared owl (<i>Asio flammeus</i>)	May Be At Risk	Special Concern ²	3		
Sora (<i>Porzana carolina</i>)	Sensitive	none	87		
Sprague's pipit (<i>Anthus spragueii</i>)	Sensitive	Threatened ²	380		
Upland sandpiper (<i>Bartramia longicauda</i>)	Sensitive	none	43		

Western grebe (<i>Aechmophorus occidentalis</i>)	At Risk	Threatened ³ Special Concern ²	2		
Western wood-pewee (<i>Contopus sordidulus</i>)	Sensitive	none	19		
White-faced ibis (<i>Plegadis chihi</i>)	Sensitive	none	13		
White-winged scoter (<i>Melanitta deglandi</i>)	Sensitive	Special Concern ³	3		
Herpetofauna					
Bullsnake (<i>Pituophis catenifer sayi</i>)	Sensitive	none	13	1 hibernaculum	
Great Plains toad (<i>Anaxyrus cognatus</i>)	Sensitive	Special Concern ^{2,3}	47	10 breeding sites	
Northern leopard frog (<i>Lithobates pipiens</i>)	At Risk	Threatened ³ Special Concern ²	162	5 breeding sites	
Plains garter snake (<i>Thamnophis radix</i>)	Sensitive	none	10	1 hibernaculum	
Plains spadefoot (<i>Spea bombifrons</i>)	May Be At Risk	none	5		
Prairie rattlesnake (<i>Crotalus viridis</i>)	Sensitive	none	20	2 hibernacula	

Short-horned lizard (<i>Phrynosoma hernandesii</i>)	At Risk	Endangered ^{2,3}	33		
Terrestrial garter snake (<i>Thamnophis elegans</i>)	Sensitive	none	7		
Western tiger salamander (<i>Ambystoma mavortium</i>)	Secure	Special Concern ²	2	1 breeding site	
Mammals					
American badger (<i>Taxidea taxus</i>)	Sensitive	Special Concern ²	18	14 burrows	
Bobcat (<i>Lynx rufus</i>)	Sensitive	none	1		
Eastern red bat (<i>Lasiurus borealis</i>)	Sensitive	none	7		Recorded acoustically
Little brown myotis (<i>Myotis lucifugus</i>)	May Be At Risk	Endangered ²	11		Recorded acoustically
Long-tailed weasel (<i>Mustela frenata</i>)	May Be At Risk	none	1		
Pronghorn (<i>Antilocapra americana</i>)	Sensitive	none	67		
Silver-haired bat (<i>Lasionycteris noctivagans</i>)	Sensitive	none	14		Recorded acoustically

Swift fox (<i>Vulpes velox</i>)	At Risk	Endangered ³ Threatened ²	2	1 den	
Western small-footed myotis (<i>Myotis ciliolabrum</i>)	Sensitive	Special Concern ³	6		Recorded acoustically

¹General status in Alberta (AEP 2015a), ²legislative status under Canada's *Species at Risk Act* (Government of Canada [GOC] 2018), ³legislative status under Alberta's *Wildlife Act* (Government of Alberta [GOA] 2016) or designation as *Special Concern* by the Minister.

Range

The HCS properties assessed (and reassessed) across southern Alberta in 2018 displayed a wide range of diversity in the plant communities and range health found. MULTISAR conducted 284 detailed range transects (vegetation inventories), 558 range health assessments, 69 tame pasture assessments, 12 forest health assessments and 5 visual reconnaissance plots during the 2018 field season (Table 8). During these inventories, 14 species of rare plants and 1 rare plant community were observed on the properties, as listed in Table 8.

Table 8. Summary of range work completed on HCS properties by MULTISAR during the 2018 field season.

Property	Acres	Sites Assessed [*]	# of Plant Communities Assessed	Rare Plants
MP_7	41 332	100 range health assessments 20 tame pasture assessments	48	Annual lupine (<i>Lupinus pusillus</i>) Slender hawk's-beard (<i>Crepis atriobarba</i>) Pursh's milk vetch (<i>Astragalus purshii</i>) Woollyheads (<i>Psilocarphus brevissimus</i>)
MP_9	4201	27 range health assessments 4 tame pasture assessments	15	Prickly milk vetch (<i>Astragalus kentrophyta</i> var. <i>kentrophyta</i>)

MP_23	2938	8 detailed transects 26 range health assessments	15	Louisiana broom-rape (<i>Orobanche ludoviciana</i>)
MP_24	1116	2 detailed transects 5 range health assessments 3 tame pasture assessments	18	None
MP_25	9243	36 range health assessments 6 tame pasture assessments	24	None
MP_42	5519	53 detailed transects 66 range health assessments 5 visual reconnaissance plots	50	Louisiana broom-rape Red three-awn (<i>Aristida longiseta</i>) Velvety goldenrod (<i>Solidago mollis</i>)
MP_43	40 594	151 detailed transects 142 range health assessments 9 tame pasture assessments	35	None
MP_44	2546	24 detailed transects 40 range health assessments 13 tame pasture assessments	112	Limber pine (<i>Pinus flexilis</i>)
MP_45	2598	20 detailed transects 48 range health assessments	60	Blue phlox (<i>Phlox allysifolia</i>) Cock's-comb cryptantha (<i>Cryptantha celosioides</i>)

		6 tame pasture assessments 3 forest health assessments		Limber pine Silver-leaved scorpionweed (<i>Phacelia hastata</i>) Thorough-wax (<i>Bupleurum americanum</i>)
MP_46	4769	26 detailed transects 68 range health assessments 8 tame pasture assessments 9 forest health assessments	74	Western false gromwell (<i>Lithospermum occidentale</i>) Little bluestem (<i>Schizachyrium scoparium</i>)—sand grass (<i>Calamovilfa longifolia</i>) community

Riparian

The Alberta Riparian Habitat Management Society—Cows and Fish was contracted to complete six riparian health assessments within the Milk River watershed, all of which were done on reassessment properties that were assessed during the original HCS. In addition, 25 assessments were completed in the South Saskatchewan River watershed, as part of the partnership between MULTISAR and Cows and Fish.

Wildlife and Range Health Inferences

Compiling the data gathered from the wildlife, range and riparian health assessments on each property allows MULTISAR to make inferences regarding the range and riparian health of a site and the corresponding wildlife and habitat features observed. Using this information, management plans were created for each property, incorporating BMPs for each management unit that promote sustainable ranching and habitat for species at risk.

Implementation of HCS Habitat Enhancements

MULTISAR completed nine new habitat enhancements within the Milk River watershed in 2018 and early 2019, and continued work on a native reseed project at the Silver Sage Conservation Site that was initiated in previous years. This native reseed project includes the continued restoration of 1300 acres back to native grass through spraying for brome (*Bromus* spp.), Canada thistle (*Cirsium arvense*) and other weeds to ensure a clean seed bed. An additional 160 acres was overseeded with a wheatgrass/spring wheat mixture to help stabilize the soil, and 2000 needle-and-thread grass (*Hesperostipa comata*) plugs were planted on approximately 90 acres

that was seeded back to native grass in 2018. Over 11 km of tumbleweed was also removed by hand, as an alternative to mowing, during the high fire risk in 2018. At another property, 3 km of new wildlife-friendly fencing for pronghorn was installed to prevent cattle from accessing riparian areas. A portable watering unit was subsequently purchased for the cattle with the added benefit of improving habitat for amphibians and waterfowl. Enhancements on other properties included the development of a dugout to provide an alternative watering source to improve cattle distribution, repair and reinstallation of tree protection panels around a known ferruginous hawk nest, wrapping of 30+ cottonwood (*Populus balsamifera*) trees to protect them from beavers (*Castor canadensis*), and removal of old buildings from a new parcel of land.

Within the South Saskatchewan watershed, nine habitat enhancements were implemented in 2018 and early 2019 as part of the HCSs. Over 30 cottonwood trees were wrapped along the riparian areas on two properties that are home to numerous species including bats and northern leopard frogs. A water line and wet well were developed on one participant's property as alternative water locations to reduce pressure off a large northern leopard frog breeding wetland, while a second landholder received portable windbreaks to alleviate grazing pressure on a creek that also supports northern leopard frogs. A winter watering system was developed to allow more flexibility for the producer to use a pasture, thereby reducing pressure on other pastures that contain large wetland complexes. Furthermore, a portable watering unit was purchased to reduce pressure on a dugout and nearby wetlands on another HCS property. A hawk pole was installed to attract ferruginous hawks to the area to help control Richardson's ground squirrels, and another nesting site was fenced off to prevent the tree from being rubbed on by cattle. Lastly, approximately 3 km of wildlife-friendly fencing was installed to assist pronghorn movements.

In total, 191 on-the-ground enhancement projects have been completed by MULTISAR HCS participants since 2005 (Figure 1).

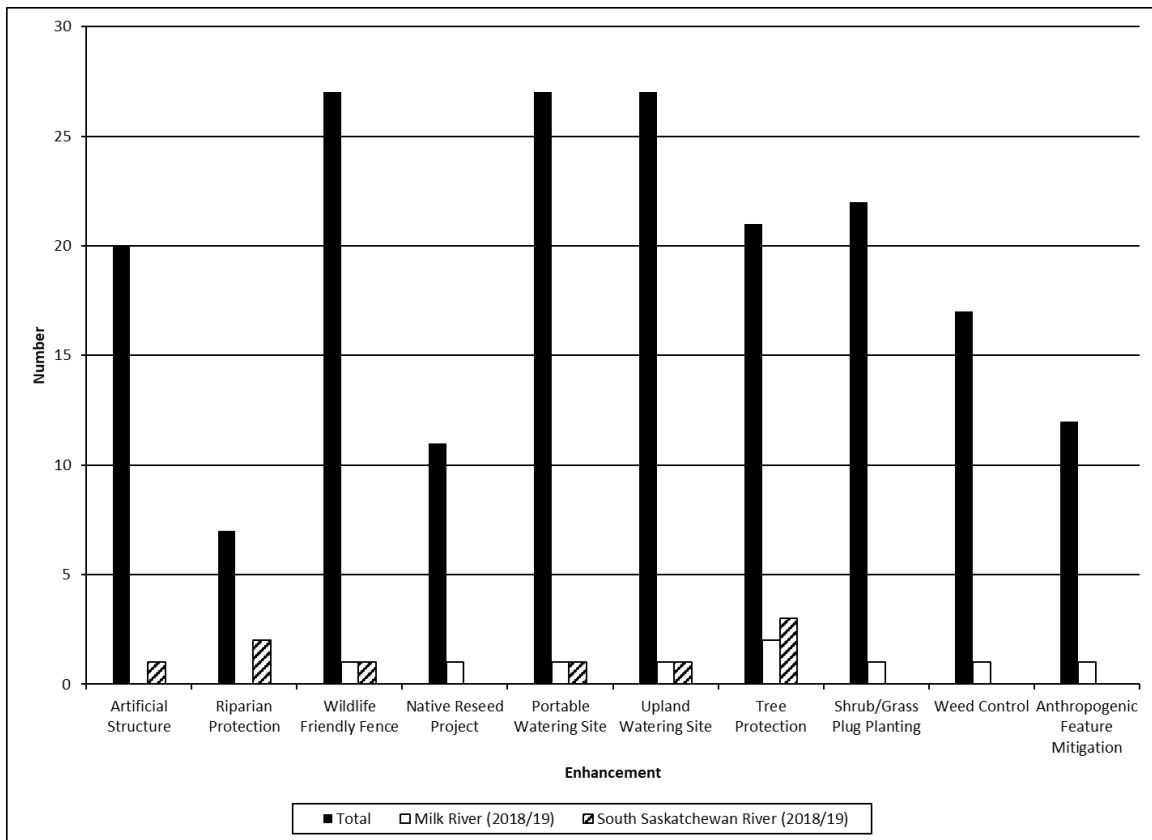


Figure 1. Habitat enhancement projects completed in the Milk River and South Saskatchewan watersheds, by category, since 2005.

Habitat enhancement projects continue to be monitored through MULTISAR’s monitoring and evaluation protocol to ensure that the enhancements are having the desired positive effects on specific habitats and wildlife. The *Habitat Conservation Strategy Evaluation and Monitoring Program* section provides more detail on MULTISAR’s monitoring and evaluation process and the positive results that are being seen on the landscape as a result of these enhancement projects.

HCS Summary

Over the last 17 years, MULTISAR has become increasingly more recognized and its HCS work has grown tremendously throughout the South Saskatchewan and Milk River watersheds. MULTISAR has developed plans for approximately 451 493 acres of land, of which a large portion is interconnected, allowing for landscape planning as well as single property initiatives. MULTISAR will continue to make efforts to increase the landbase worked on within priority areas and seek to “connect” additional properties adjacent to participating HCS landholders. MULTISAR has provided and will continue to provide open communication, information and awareness, and

team-based wildlife habitat planning, and will continue to build long-term relationships with landholders, government, NGOs and industry.

Habitat Management Plans

In 2018–2019, MULTISAR created another extension program to further influence rangeland management and benefit prairie wildlife habitats. Habitat management plans (HMPs) were introduced in 2018 as an extension of the HCSs, to focus solely on proposed habitat improvements at a given ranch and to continue collecting some wildlife and habitat data. Like SARC plans, HMPs are a more condensed version of an HCS applied at the ranch level but involving detailed wildlife surveys and simplified wildlife habitat assessments to document species at risk and habitat indicators, respectively. HMPs were implemented on new MULTISAR properties less than 4000 acres in size, and on HCS properties that are already on their second or greater reassessment. These plans will be delivered throughout the Milk River and South Saskatchewan watersheds.

HMP Process

Detailed wildlife inventories, including multi-species point count surveys, were completed following protocols outlined in Rumbolt *et al.* (2011). At each multi-species point count survey location, a Robel pole measurement and litter weight estimate were also taken following protocols by Robel *et al.* (1970) and Willoughby (2007), respectively, to gain some insight on wildlife habitat for a particular landbase.

Similar to the HCS process, HMP teams develop management objectives and strategies for the implementation of new habitat enhancement projects and the monitoring of ongoing habitat enhancements based on current wildlife, range and riparian data. Management and habitat enhancement recommendations for new HMP properties are based largely on the recovery and conservation management actions for species identified as a priority on the land and from MULTISAR's BMP document (Rangeland Conservation Service Ltd. 2016).

HMP Achievements for the Fiscal Year 2018–2019

To date, MULTISAR has completed two HMPs on 4649 acres of land within the Milk River and South Saskatchewan watersheds (Table 9). In 2018, MULTISAR completed an HMP for one new property and for one HCS property that was incorporated into the HMP process. Work on these properties included detailed wildlife and riparian inventories and simplified range health measurements.

Table 9. Habitat management plan participant summary.

Year	MULTISAR Participant	Acres Surveyed
2018	MP_8*	3479
2018	MP_47	1170
Total	2	4649

*This HCS property was incorporated into the HMP process, which entailed a resurvey of a subsample of the original riparian and wildlife inventories and the collection of new range data at point count survey locations.

Wildlife

To date, approximately 553 wildlife observations collected on HMP properties have been submitted to FWMIS. Twenty-five different species at risk were recorded on HMP properties in 2018. Table 10 summarizes the species at risk observed on all HMP properties assessed (or reassessed) during the 2018 field season.

Table 10. Species at risk recorded on HMP properties during the 2018 field season.

Species	General Status ¹	Legislative Status	# of Observations	Feature	Significance
Birds					
American kestrel	Sensitive	none	1		
American white pelican	Sensitive	none	3		
Baird's sparrow	Sensitive	Special Concern ²	4		
Bald eagle	Sensitive	none	1		
Baltimore oriole	Sensitive	none	3		
Bank swallow	Sensitive	Threatened ²	2	1 colony	
Brewer's sparrow	Sensitive	none	2		

Chestnut-collared longspur	Sensitive	Threatened ²	19		
Common nighthawk	Sensitive	Threatened ²	4		
Eastern kingbird	Sensitive	none	6		
Ferruginous hawk	At Risk	Endangered ³ Threatened ²	10	3 nests	
Golden eagle	Sensitive	none	2	1 nest	
Grasshopper sparrow	Sensitive	none	10		
Least flycatcher	Sensitive	none	4		
Long-billed curlew	Sensitive	Special Concern ²	2		
McCown's longspur	May Be At Risk	Threatened ²	1		
Sprague's pipit	Sensitive	Threatened ²	23		
Upland sandpiper	Sensitive	none	1		
Western wood-pewee	Sensitive	none	7		
Herpetofauna					
Great Plains toad	Sensitive	Special Concern ^{2,3}	1		

Northern leopard frog	At Risk	Threatened ³ Special Concern ²	4	1 breeding site	
Plains garter snake	Sensitive	none	1		
Terrestrial garter snake	Sensitive	none	3	1 hibernaculum	
Mammals					
American badger	Sensitive	Special Concern ²	1		
Pronghorn	Sensitive	none	2		

¹General status in Alberta (AEP 2015a), ²legislative status under Canada's *Species at Risk Act* (Government of Canada [GOC] 2018), ³legislative status under Alberta's *Wildlife Act* (Government of Alberta [GOA] 2016) or designation as *Special Concern* by the Minister.

Range

The HMP properties assessed (and reassessed) across southern Alberta in 2018 displayed a wide range of diversity in plant communities and habitat attributes (litter weight, standing biomass [Robel pole measurements]). MULTISAR conducted 42 Robel pole readings and 42 litter weight estimates during the 2018 field season (Table 11). During these assessments, rare plants were not observed on the properties.

Table 11. Summary of range work completed on HMP properties during the 2018 field season.

Property	Acres	# of Robel Pole Readings	# of Litter Weight Estimates	Rare Plants
MP_8	3479	21	21	None
MP_47	1170	21	21	None

Riparian

The Alberta Riparian Habitat Management Society—Cows and Fish was contracted to complete two riparian health assessments within the Milk River watershed. No riparian assessments were completed in the South Saskatchewan River watershed.

Wildlife and Range Health Inferences

Compiling the data gathered from the wildlife, range and riparian health assessments on each property allows MULTISAR to make inferences regarding the range and riparian health of a site and the corresponding wildlife and habitat features observed. Using this information, management plans were created for each property, incorporating BMPs for each management unit that promote sustainable ranching and habitat for species at risk.

Implementation of HMP Habitat Enhancements

MULTISAR completed two habitat enhancements across the Milk River and South Saskatchewan watersheds in 2018 and early 2019. One new dugout was developed on one property, and a portable watering unit was purchased for another property to provide an alternative watering source and improve livestock distribution.

Two on-the-ground enhancement projects have been completed by MULTISAR HMP participants since 2018: a portable watering site and an upland watering site.

Habitat enhancement projects continue to be monitored through MULTISAR's monitoring and evaluation protocol to ensure that the enhancements are having the desired positive effect on specific habitats and wildlife. The *Habitat Conservation Strategy Evaluation and Monitoring Program* section provides more detail on MULTISAR's monitoring and evaluation process and the positive results that are being seen on the landscape as a result of these enhancement projects.

HMP Summary

Over the last 17 years, MULTISAR has become increasingly more recognized and its HCS work has grown tremendously throughout the South Saskatchewan and Milk River watersheds. MULTISAR has begun to offer a new assessment, called an HMP, in response to the demand for having a MULTISAR assessment outstripping MULTISAR's capacity to provide HCSs. This past year, HMPs were developed for approximately 4649 acres of land. These condensed assessments allow biologists to engage with landholders that would not be able to receive an HCS, based on MULTISAR's capacity. HMPs are a viable alternative to HCSs that still allow for wildlife assessments and basic habitat surveys (litter weight and Robel pole measurements) coupled with funding for enhancements. MULTISAR has provided and will continue to provide open communication, information and awareness and team-based wildlife habitat planning, and will continue to build long-term relationships with landholders, government, NGOs and industry.

Species at Risk Conservation Plans

SARC plans were introduced in 2007 as an extension of the HCSs program. They are a more condensed version of HCSs applied at the ranch level and delivered throughout the entire GNR and the adjacent Rocky Mountain and Parkland natural regions. In 2018–2019, MULTISAR continued the use of this extension program to influence rangeland management and benefit prairie wildlife habitats.

Over the years, MULTISAR staff have been approached by several landholders who wanted to complete specific habitat improvements on their properties (e.g., installation of hawk nesting poles, water developments), but were not interested in having their entire property assessed through a traditional SARC plan. They were focused on one aspect of their operation or one species or group of species and wanted species-specific or habitat-specific management tools to use on their properties. For this reason, MULTISAR developed BMP-specific assessments in 2012–2013 that focused solely on proposed habitat improvements or on the habitat requirement of species of interest.

SARC Plan/BMP Assessment Process

MULTISAR's SARC plan process is divided into six steps: 1) identification of priority lands, 2) landholder contact, 3) preliminary background research, 4) on-site habitat assessment, 5) SARC plan development and delivery, and 6) follow up. For a complete account of the SARC plan process, please refer to the 2010–2011 MULTISAR progress report (Rumbolt *et al.* 2011).

BMP assessments follow the same process as the SARC plan, except for step one. These assessments are normally completed in response to a landholder's request as opposed to the active solicitation involved with SARC plans.

Achievements

Since the inception of the SARC plan program in 2007, 82 assessments have been completed throughout the GNR, covering a total area of 156 254 acres. No assessment requests from landholders or referrals were made in 2018; therefore, no SARC plans were completed in 2018–2019.

This was the sixth year in which BMP-specific assessments were to be completed. Since beginning these assessments in 2012, MULTISAR has completed 20 BMP assessments for a total of 56 712 acres. No BMP assessments were completed in 2018–2019, despite several landholders expressing interest in BMP assessments for ferruginous hawk nest platforms. One

assessment is currently being arranged (tentative), while three other landholder requests went unfulfilled, as their land did not provide suitable habitat to warrant a site assessment (i.e. occurring outside of the target species' range, no native prairie, existing nesting structures [trees] already on site).

Several habitat improvements have been developed as demonstration sites on SARC plan co-operator properties throughout the years and are periodically monitored to ensure that they are achieving their objectives. Habitat improvements include nesting platforms erected for ferruginous hawks, several wetland and riparian fencing projects, shelterbelt fencing and portable watering unit development.

Discussion

SARC plans were initially popular with landholders when they were introduced in 2007. This was due to the fact that the first “wave” of SARC plans was completed for people who were somewhat aware of the MULTISAR program and/or familiar with the MULTISAR staff. These established relationships led to many willing participants in the SARC plan program.

Due to reduced funding, MULTISAR lost its Education and Outreach Coordinator in 2010. This position was key to promoting SARC plans and aided in ultimately engaging participants in the program. The following few years saw the number of SARC plans slowly begin to taper off despite various attempts at garnering interest in the program (presentations, mail-outs, etc.).

Error! Reference source not found.² summarizes the number of participating SARC plan landholders/properties per year over the 12 years of the program.

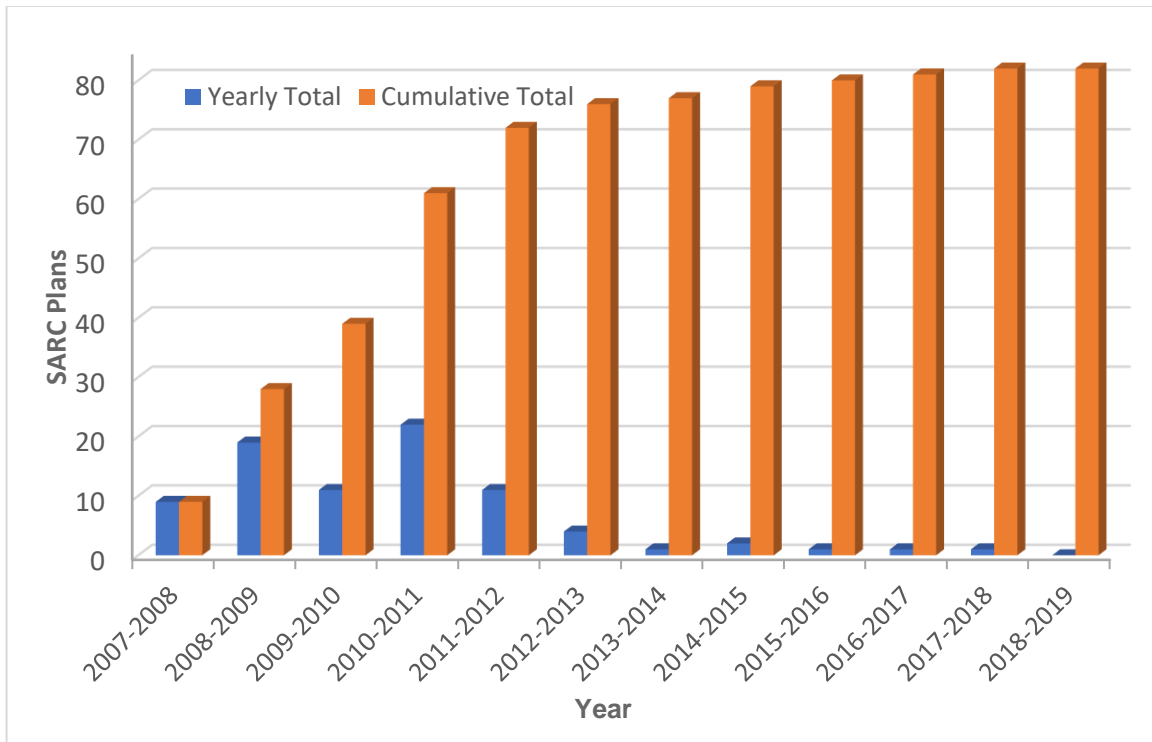


Figure 2. Number of SARC plans completed since program inception.

In 2013, an evaluation of the SARC plan program was completed. The results of this evaluation indicated that landholders who actively sought out MULTISAR and requested a SARC plan were interested in the information MULTISAR provided and in making management changes to benefit wildlife habitat. Conversely, landholders who were first approached by MULTISAR were often not as interested in the information provided and were not as likely to engage in implementing management changes that would benefit species at risk. Therefore, it was decided that SARC plans would target those landholders who approached (or were referred to) MULTISAR and requested a plan. This scenario gives MULTISAR the best “bang for its buck”, as time and resources can be focused on properties and landholders where implementation of plans is most likely.

This past year was the second with no SARC plans completed, as no landholders contacted or were referred to MULTISAR to have an assessment completed. The initial contact or knowledge of the program is typically from interactions of MULTISAR staff with landholders or other conservation organizations during various conferences, training days, tradeshow, etc.

SARC Plan Summary

Species at Risk Conservation plans are ever evolving and are still seen as an important way for MULTISAR to reach out to a large number of landholders throughout the GNR and increase awareness of species at risk BMPs. Without an Education and Outreach Coordinator, MULTISAR will continue to provide SARC plans and BMP assessments on a responsive basis and promote them at various landholder events.

Habitat Conservation Strategy Evaluation and Monitoring Program

The year 2018–2019 marks the ninth year of MULTISAR’s evaluation and monitoring program. The process of monitoring and evaluating occurs on two levels: reassessment of HCSs and monitoring of completed enhancements on properties that have an HCS. The following sections provide a summary of MULTISAR’s evaluation and monitoring accomplishments for the year.

Evaluation of the HCS component of the MULTISAR Program

An evaluation of each HCS completed for MULTISAR is scheduled to occur five years after the HCS implementation. The focus of this assessment is to measure the effectiveness of the HCS plans and recommendations in influencing habitat management decisions, improving/maintaining habitat for species at risk, and refining the landholders’ perceptions of species at risk and their associated habitats. In 2018–2019, MULTISAR evaluated five participating properties that had HCSs in place (referenced in this report with code names MP_7, MP_9, MP_23, MP_24 and MP_25).

Evaluation of the HCS Process

During HCS evaluations, the following is completed:

1. A subsample of the initial range health and riparian health assessments and wildlife point counts are reassessed and/or resurveyed.
2. The reassessment of the health of native and tame pastures is evaluated by completing range health reassessments at original assessment locations, ensuring that at least one transect is completed in each management unit of the HCS property and is, usually, associated with a wildlife point count.
 - Assessed range health is scrutinized against the HCS’s desired habitat conditions within management units or areas within a management unit (i.e., maintain range health within $\pm 10\%$, increase range health $>10\%$, or decrease range health $>10\%$).
 - To facilitate comparison of results between assessments of different years, all scoring needs to be on the same ranking scale. To accomplish this, and in particular for noxious weeds (because ranks can change between years), scores are adjusted in the current assessment year to reflect the ranking from the baseline year. As an example, in 2008

downy brome (*Bromus tectorum*) was not on the noxious weed list and did not change the range health scoring unless it caused a change in the plant community. By 2009, downy brome was listed and could affect more of the range health scoring results.

3. Riparian health is reassessed at original polygon locations. A subsample is selected if funding constraints exist.
4. Wildlife surveys are completed at specific locations (multi-species point counts and species-specific surveys). In order to make comparisons, surveys should mirror baseline methodologies as much as possible. The subsample amount varies based on property size.
 - If the property is small (5000 acres or less), roughly half of the original 100-m or 200-m point counts are completed. If the property is larger than 5000 acres, at most 100 point counts are completed using 100-m and 200-m point counts, with a focus on the 100-m counts.
 - When selecting point counts to reassess, every pasture/management area should have at least one point count completed within it. Point count boundaries falling completely within Grassland Vegetation Inventory (GVI) polygons (i.e., having similar landscape features in terms of vegetation cover and human development) are singled out first for reassessment and the following conditions are applied:
 - At least one wildlife point count falls within the same GVI polygon as a range health reassessment location.
 - If possible, point count boundaries should not span more than one GVI polygon.
 - If baseline point count surveys only completed 200-m point counts (prior to GVI's inception), emulate this unless the above criteria are not met. If 200-m point counts do not fit within GVI polygons, complete 100-m point counts or select a different point count location to survey.
5. A landholder questionnaire is completed to document perspectives on the HCS process and its recommendations and their views on species at risk.
6. Data collected during the monitoring of completed enhancements recommended in the HCS are reviewed and/or analyzed.
7. Achievement of MULTISAR's HCS goals is measured based on the following: desired range and riparian health has been established, target wildlife species are present on the site, some of the recommendations in the HCS are being implemented, enhancements are having the

desired effects, and MULTISAR is increasing awareness and knowledge about species at risk and is found to be beneficial to the ranching community.

HCS Evaluation Statistical Methods

Range

We used standard range health monitoring protocols to determine range health trends. Please refer to MULTISAR (2014), sections 5.2–5.2.2.2 for an explanation of the methodologies for evaluating this part of the HCS process.

The differences between the range health scores from baseline year and reassessment were calculated. Thereafter, the mean differences between the range health scores were looked at to see whether they were different from the following: $\pm 10\%$ for areas where the objective was to maintain range health, $>10\%$ for areas where the objective was to increase range health, and a decrease of $>10\%$ for areas where the objective was to decrease range health. This was accomplished by applying a paired t-test with the baseline and current health results within the statistical software R (R Core Team 2018). Values are reported as the mean (\bar{x}) \pm its standard deviation (SD). The null hypothesis was rejected if significance (P-value) was less than 0.05. In addition, since MP_7 and MP_9 have had a second reassessment, an analysis of variance (ANOVA) was used to determine whether the range health means across the three years were different and a Tukey test was used to depict differences among years. The ANOVA uses an F-test to determine whether the variability between yearly range health means is larger than the variability within each year's range health scores.

Riparian

There were not enough riparian sites evaluated on each property to statistically compare mean riparian health scores. Therefore, changes in riparian health were described based on changes from one health category to another between assessment years.

Wildlife

Using the R software, a paired t-test was applied to the wildlife data, comparing species richness (the number of species at a given site) and species diversity (a measure that takes into account both the number of species and their relative abundance at a given site) per multi-species point count, with values reported as $\bar{x} \pm SD$. A significance of 0.05 was used to interpret the results. At MP_7 the same point counts have been assessed during three separate years. An ANOVA was also used on this property to determine whether the variability between yearly species richness and diversity means was larger than the variability within each year's species richness and

diversity values. On properties where more than two assessments have been completed, a Tukey test was added to depict differences among years.

HCS Evaluation Results for 2018

Range Health Trend

Ninety-three native range sites were reassessed at MP_7 in 2018. Baseline assessments at these sites were conducted in 2008, and the first reassessment was conducted in 2013. Range health has changed very little over the three assessments, and means did not vary between years ($p = 0.09$, $F = 2.44$) (Figure 3A). Since 2013 there has been a slight decrease in range health category trends, with 88.2% (82 of the 93 sites) in the “healthy” and “high healthy” categories in 2013 and 77.4% (72 of 93 sites) in these same categories in 2018 (Table 12). However, the percentage of sites within these two categories remains higher than in 2008, which was 73.1% (68 of the 93 sites), and no sites were classified as “unhealthy” in 2018. The goal at 87 sites was to maintain range health from the 2013 scores. The range health mean difference in 2018 was -3.4% for these sites, which meets the goal to stay within ten percent of original scores; mean range health was statistically different among years ($p < 0.01$, $t = 2.70$). The three areas at which the 2013 goal was to increase in health did increase in percentage by an average of 20.7%. There was little change (mean = +1.0) at the three sites with the goal to decrease range health by 2018.

Twenty tame pasture range health reassessments were completed, with scores decreasing slightly from $77.8\% \pm 13.7$ in 2008 to $77.4\% \pm 13.1$ in 2013 to $72.8\% \pm 15.6$ in 2018 with trends showing non-significant changes in means across years ($p = 0.46$, $F = 0.78$) (Figure 3B).

Table 12. MP_7 assessed range health categories.

Category	2008	2013	2018
High Healthy (86–100%)	49.5%	58.1%	54.8%
Healthy (75–85%)	23.6%	30.1%	22.6%
High Healthy with Problems (61–74%)	14.0%	8.6%	15.1%
Low Healthy with Problems (50–60%)	9.7%	2.1%	7.5%
Unhealthy (<50%)	3.2%	1.1%	0%

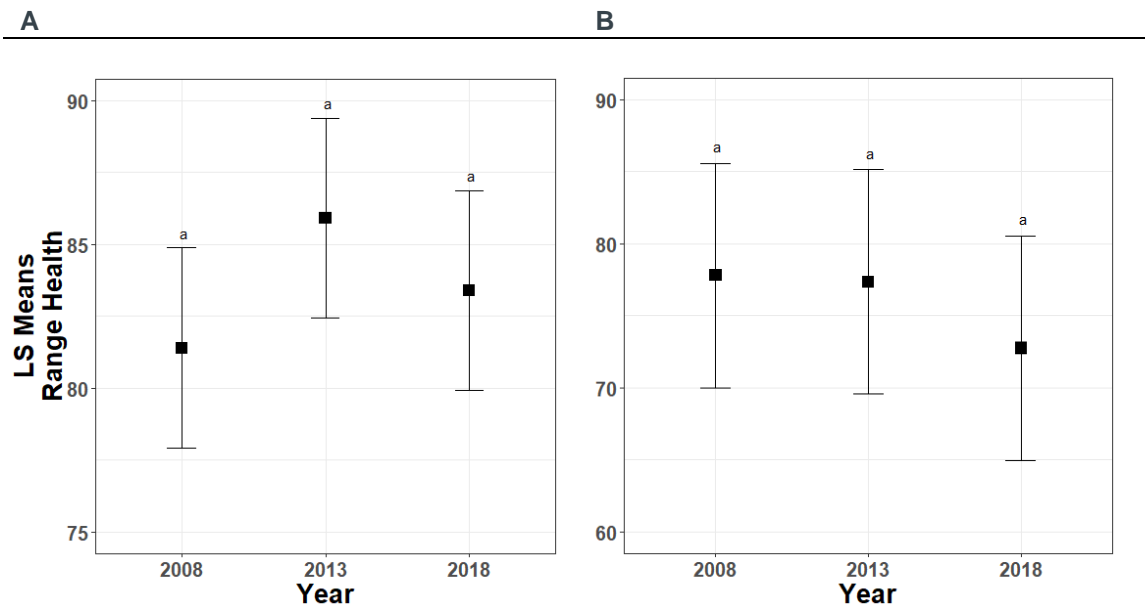


Figure 3. Least squared mean and 95% confidence limits for range health (percent) trend for native (n = 93) (A) and tame (n = 20) (B) grassland plots on MP_7 from baseline year (2008) to current year. The same letter above the bars indicates no significant difference based on Tukey test results.

Across all 27 native sites revisited at MP_9, overall range health has steadily increased from the baseline year to 2018 and there was a significant difference in mean range health between years ($p < 0.01$, $F = 7.93$) (Figure 4). There has been a shift in the range health category trend, with 70.4% (19 of the 27 sites) in the “healthy” and “high healthy” categories in 2018 from 48.1% (13 of the 27 sites) in 2013 and 37.0% (10 of 27 sites) in 2008 (Table 13). The goal at twenty-two sites was to maintain range health from the 2013 scores. The range health mean difference for these sites in 2018 was +4.1%, which meets the goal of staying within ten percent of original scores ($p = 0.16$, $t = -1.47$). The four areas having the goal to increase in health increased in percentage by an average of 12.5%, meeting goals set in 2013, although there was no significant difference between years ($p = 0.11$, $t = -2.21$). The goal at one site was to decrease range health, but it experienced no change between 2013 and 2018.

Four tame pasture range health reassessments were completed at MP_9, although only three assessments had data from all three years. Therefore, only 2013 and 2018 were compared, with scores increasing from $77.0\% \pm 12.0$ to $86.0\% \pm 4.3$ with no significant difference in means ($p = 0.13$, $t = -2.05$).

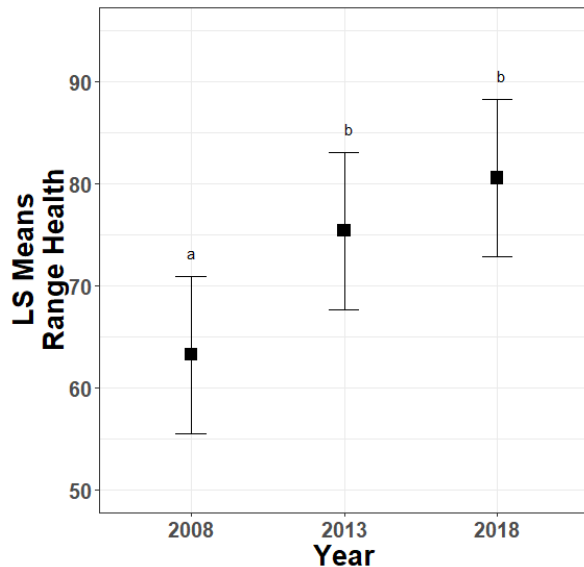


Figure 4. Least squared mean and 95% confidence limits for range health (percent) trend for MP_9 native grassland plots from baseline year (2008) to current year (n = 27). The same letter above the bars indicates no significant difference.

Table 13. MP_9 assessed range health categories.

Category	2008	2013	2018
High Healthy (86–100%)	11.1%	25.9%	51.9%
Healthy (75–85%)	25.9%	22.2%	18.5%
High Healthy with Problems (61–74%)	18.5%	37.1%	11.1%
Low Healthy with Problems (50–60%)	14.8%	7.4%	11.1%
Unhealthy (<50%)	29.7%	7.4%	7.4%

Eighteen native range points that were originally assessed at MP_23 in 2012 were reassessed in 2018. The overall health at sites decreased significantly from 75.5% ± 11.8 in 2012 to 68.5% ± 11.5 in 2018 ($p < 0.01$, $t = 4.25$). Declines in range health were most prominent at sites originally classified as “healthy” and “high healthy with problems” in 2012 (Table 14). The goal at 16 sites was to maintain range health relative to 2012 scores. Their range health mean difference in 2018 was -7.9%, which meets the goal to stay within ten percent of original scores; range health across both years was statistically different ($p < 0.01$, $t = 4.54$). Two areas had 2012 goals to increase range health, but both sites experienced no change in scores between the two assessments.

Table 14. MP_23 assessed range health categories.

Category	2012	2018
High Healthy (86–100%)	11.1%	11.1%
Healthy (75–85%)	44.4%	22.2%
High Healthy with Problems (61–74%)	38.9%	27.8%
Low Healthy with Problems (50–60%)	5.6%	33.3%
Unhealthy (<50%)	0%	5.6%

MP_24 was originally assessed in 2012. Six range health assessments were performed—four were in native grasslands and two in tame pastures. The overall health at sites changed from $52.2\% \pm 13.7$ in 2012 to $64.8\% \pm 15.6$ in 2018. The goal for all areas in 2012 was to increase range health (>10%), and on average these sites increased significantly in health by 12.7% ($p = 0.01$, $t = -3.86$). When looking at the range health from a health category classification perspective, we find that the percentage of “healthy” sites increased slightly from the baseline in 2012 to the reassessment in 2018 (Table 15). There was also a decrease in the percentage of sites in the “unhealthy” category.

Table 15. MP_24 assessed range health categories.

Category	2012	2018
High Healthy (86–100%)	0%	0%
Healthy (75–85%)	0%	33.3%
High Healthy with Problems (61–74%)	50%	33.3%
Low Healthy with Problems (50–60%)	16.7%	16.7%
Unhealthy (<50%)	33.3%	16.7%

Thirty-eight native range health reassessments were completed on MP_25 in 2018 and, on average, sites experienced no change in health from the baseline assessment in 2012 ($p = 0.93$, $t = 0.09$). Since 2012 there has been a slight decrease in range health category trends, with 76.3% (29 of 38 sites) in the “healthy” and “high healthy” categories in 2012 and 68.4% (26 of the 38 sites) in these same categories in 2018. There was also a slight increase in the percentage of “unhealthy” sites (Table 16). The goal at 33 sites was to maintain range health relative to 2012

scores. Their range health mean difference in 2018 was -4.8%, which meets the goal to stay within 10 percent of original scores, and there was no statistical difference between years ($p = 0.77$, $t = 0.29$). The 2012 goal for five areas was to increase range health, but sites increased in health by an average of only 2% and the changes were not statistically different ($p = 0.81$, $t = -0.26$).

Four tame pasture range health reassessments were completed in MP_25 in 2018, and mean range health increased to $77.5\% \pm 15.6$ from $66.0\% \pm 15.6$ in 2012, although this change was not significant ($p = 0.30$, $t = -1.25$).

Table 16. MP_25 assessed range health categories.

Category	2012	2018
High Healthy (86–100%)	34.2%	42.1%
Healthy (75–85%)	42.1%	26.3%
High Healthy with Problems (61–74%)	2.7%	10.5%
Low Healthy with Problems (50–60%)	10.5%	5.3%
Unhealthy (<50%)	10.5%	15.8%

Riparian Assessments

Riparian inventories and health assessments help to identify problems and land use issues along waterbodies. These assessments are completed using Cows and Fish assessment protocols (Cows and Fish 2017). The information collected during a riparian assessment is intended to help promote riparian functions such as water storage, forage production and provision of habitat for wildlife. The results of the assessment offer suggestions for landscape management for the landholder. In 2018, three HCS reassessment properties (MP_7, MP_23 and MP_24) had riparian health assessments completed by the Alberta Riparian Habitat Management Society (Cows and Fish).

The riparian health of two creek sites at MP_7 (Lotic 1 and Lotic 2) was previously assessed in 2008 (Table 17). One site (Lotic 2) was reassessed again in 2011, and both sites were evaluated again in 2018. The riparian health of a third creek site was assessed in 2011 and reassessed in 2018. All sites assessed in 2008 and 2018 were evaluated using Cows and Fish’s detailed lotic inventory. Sites assessed in 2011 were evaluated by ACA using the lotic riparian health assessment survey method and therefore, although the methods are similar, the results cannot be directly compared with those from the detailed inventories. In comparison to the baseline year

assessments (2008), both Lotic 1 and Lotic 2 are exhibiting an upward trend in riparian health. The third creek site, which was originally evaluated in 2011, also appears to be improving in health, but because of different survey methodologies this cannot be entirely confirmed.

Two sites were reassessed on MP_23 using Cows and Fish’s detailed lotic inventory and large river health assessment. Both sites were initially evaluated in 1999 and underwent their first reassessment in 2012. Large river health assessments were not conducted in 1999, and the extent of the second survey area (Lotic 2) changed between 1999 and 2012; therefore, lotic inventory results between these years are not directly comparable. In these instances, 2012 was used as the baseline for both inventory types (Table 17). Since evaluation of baseline conditions, both sites have witnessed a steady improvement in riparian health based on both lotic inventory and large river health scores. However, invasive species have increased at each site and overall native plant cover is decreasing, which is an ongoing concern.

One perennial stream site on MP_24 was revisited in 2018, and a detailed lotic inventory was completed. The site was originally evaluated in 2012, and is exhibiting an upward trend in riparian health, improving from “unhealthy” to “healthy with problems” (Table 17). Vegetation cover at this site has improved and the area is now almost fully vegetated. Reed canary grass (*Phalaris arundinacea*) has aggressively colonized the site, increasing from less than 1% to 50% cover, and is now one of the dominant plant species.

Table 17. Riparian health assessments for reassessed HCS properties.

Property	Inventory	Baseline Year	Reassessment #1	2018 Reassessment	Trend
MP_7	Lotic 1	82% Healthy	N/A	88% Healthy	The trend is increasing for Lotic 1 and 2
	Lotic 2	77% Healthy with Problems	57%* Unhealthy	80% Healthy	
	Lotic 3	68%* Healthy with Problems	N/A	87% Healthy	

MP_23	Lotic 1	60% Healthy with Problems	63% Healthy with Problems	75% Healthy with Problems	The trend is increasing at all sites
	Large River 1	56% Unhealthy	N/A	64% Healthy with Problems	
	Lotic 2	40%* Unhealthy	62% Healthy with Problems	73% Healthy with Problems	
	Large River 2	58% Unhealthy	N/A	64% Healthy with Problems	
MP_24	Lotic 1	52% Unhealthy	N/A	78% Healthy with Problems	Increasing

* Not assessed using the same protocols

** Baseline year and others not assessed using same protocols so not comparable

Wildlife Assessments

A subset of baseline year wildlife surveys was repeated in 2018 for properties MP_7, MP_9, MP_23, MP_24 and MP_25. For this reporting, we will focus on multi-species point count surveys, with comparisons of species richness and species diversity between the baseline and reassessment years. We also look at the top ten species recorded during each year.

One hundred and eight 100-m multi-species point counts were conducted at MP_7 in 2018 and compared with wildlife information from 2007 and 2013. Species richness has decreased significantly in the last five years, from 6.5 ± 2.3 to 5.9 ± 2.1 ($p = 0.02$, $t = 2.43$). Analysis including all three assessment years also revealed that species richness has changed significantly ($p < 0.01$, $F = 12.11$), although species richness did not differ between 2013 and 2018 and both years differed significantly from 2007 (Figure 5A). There was no significant difference in species diversity from 2013 (1.7 ± 0.4) to 2018 (1.6 ± 0.4) ($p = 0.54$, $t = 0.62$). Analysis that included all three years showed that year was an important distinguishing factor for species diversity ($p < 0.01$, $F = 14.81$). Species diversity was not different between 2013 and 2018, but species diversity for both years was significantly greater than in 2007 (Figure 5B).

Richardson’s ground squirrel and western meadowlark (*Sturnella neglecta*) were the two most frequently recorded species at MP_7 in 2018, after substantial increases in both species since the 2013 inventory (+439% and +77%, respectively) (Table 18). There was a large decrease in horned lark (*Eremophila alpestris*) numbers in 2018 (-65%), which was the second most abundant species in 2013. Species that exhibited slight increases in 2018 included vesper sparrow (*Pooecetes gramineus*), Baird’s sparrow and Brewer’s sparrow. Species that decreased and dropped from the top 10 most abundant species in 2018 were Sprague’s pipit and chestnut-collared longspur. These species were replaced by clay-colored sparrow (*Spizella pallida*) and cliff swallow (*Petrochelidon pyrrhonota*).

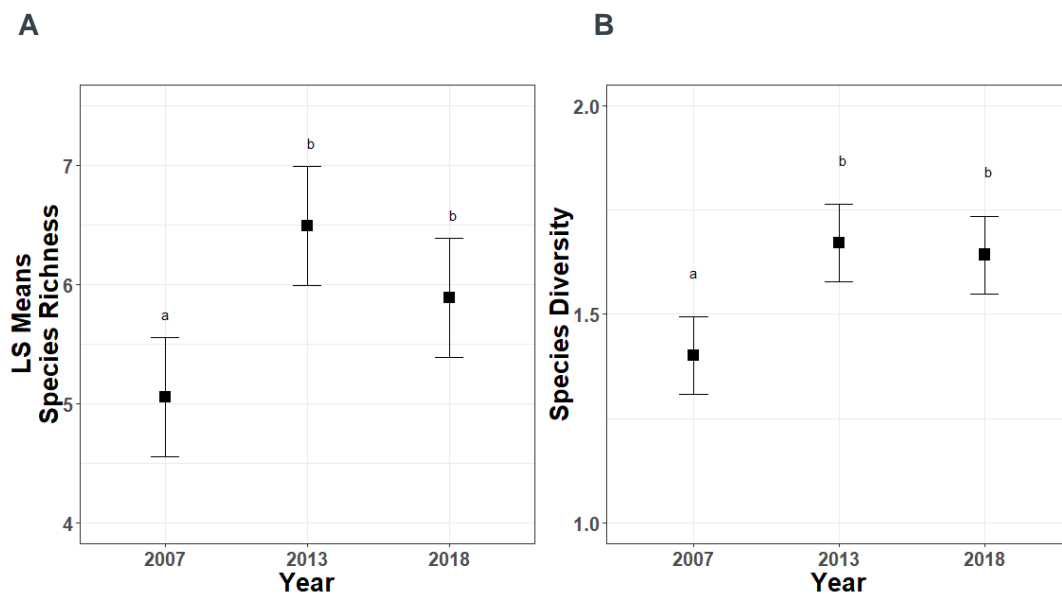


Figure 5. Least squared mean and 95% confidence limits for species richness (A) and species diversity (B) at MP_7 survey locations during baseline (2007) and reassessment years. The same letter above bars indicates no significant difference.

Table 18. Most abundant species from point count data for baseline and reassessment years on MP 7 property.

Baseline		2013 Reassessment		2018 Reassessment	
Species	Count Total	Species	Count Total	Species	Count Total
Horned lark	228	Savannah sparrow (<i>Passerculus sandwichensis</i>)	148	Richardson’s ground squirrel	350

Chestnut-collared longspur	148	Horned lark	138	Western meadowlark	189
Richardson's ground squirrel	119	Western meadowlark	107	Savannah sparrow	132
Western meadowlark	114	Vesper sparrow	97	Vesper sparrow	119
Sprague's pipit	79	Sprague's pipit	88	Baird's sparrow	105
Vesper sparrow	66	Chestnut-collared longspur	84	Brewer's sparrow	62
Lark bunting	61	Baird's sparrow	83	Horned lark	49
Savannah sparrow	55	Richardson's ground squirrel	65	Clay-colored sparrow	46
McCown's longspur	46	Red-winged blackbird (<i>Agelaius phoeniceus</i>)	55	Cliff swallow	34
Pronghorn	36	Brewer's sparrow	48	Red-winged blackbird	32

Twenty-nine point counts were completed on MP_9 in 2018 and were compared to 2013 wildlife data. MP_9 was originally assessed in 2008 and this is the second reassessment; however, additional point counts were added in 2013 to extend survey coverage and this difference in survey coverage does not allow for direct comparison between 2008 and later reassessments. Therefore, 2013 was treated as the baseline year and all wildlife comparisons at MP_9 were made between 2013 and 2018. Species richness has increased significantly in the last five years, from 4.0 ± 1.0 to 5.4 ± 1.9 ($p < 0.01$, $t = -3.44$). Species diversity has also undergone a significant increase, from 1.2 ± 0.3 in 2013 to 1.5 ± 0.3 ($p < 0.01$, $t = -3.74$) in 2018.

Savannah sparrow was the most frequently recorded species at MP_9 in 2013 (Table 19) and, along with horned lark, vesper sparrow and western meadowlark, was among the top five most

abundant species in both years (Table 19). Richardson's ground squirrel was the most recorded species in 2018, but was not among the top five most abundant species in 2013 (+333% increase). Vesper sparrow, western meadowlark and clay-colored sparrow also increased in abundance in 2018, whereas Savannah sparrow, horned lark and Canada goose (*Branta canadensis*) all declined. In 2018, Franklin's gull (*Leucophaeus pipixcan*), Sprague's pipit and mallard (*Anas platyrhynchos*) all fell from the top 10 species recorded and were replaced by cliff swallow, Baird's sparrow and Brewer's blackbird (*Euphagus cyanocephalus*).

Eighteen wildlife points were reassessed on MP_23 in 2018. Since the original assessment in 2012, species richness increased from 4.1 ± 20.3 to 5.6 ± 2.6 , although this difference was not significant ($p = 0.09$, $t = -1.79$). Species diversity also increased between 2012 and 2018, from 0.9 ± 0.6 to 1.2 ± 0.5 . This apparent increase in species diversity was also not significant ($p = 0.08$, $t = -1.88$).

The top five most abundant species remained the same on MP_23 in 2012 and 2018 but changed in order (Table 19). Vesper sparrow was the most abundant species in 2012 and western meadowlark became the most abundant species in 2018. Most species increased in number between the two surveys, with western meadowlark, clay-colored sparrow and Richardson's ground squirrel showing the greatest increases. Baird's sparrow and chestnut-collared longspur dropped out of the top 10 most abundant species in 2018 and were replaced by long-billed curlew and brown-headed cowbird (*Molothrus ater*). The only species that remained in the top 10 in 2018 and decreased in number were Sprague's pipit and horned lark, but both had only slight decreases.

From the HCS to the reassessment year, wildlife species richness and diversity have undergone some changes on the MP_24 property. Six point counts that were surveyed in 2012 and 2018 were compared, and average species richness increased marginally from 3.2 ± 1.2 to 6.5 ± 3.4 ($p = 0.05$, $t = -2.60$). Species diversity increased slightly from 0.8 ± 0.4 to 1.6 ± 0.6 between 2012 and 2018, but this was not a significant change ($p = 0.54$, $t = -2.51$).

The only species that remained one of the top three most abundant at MP_24 in both years was clay-colored sparrow, which increased by 40% in 2018 (Table 19). Other species that increased from 2012 to 2018 were vesper sparrow and chestnut-collared longspur. Boreal chorus frog (*Pseudacris maculata*) had the greatest number of detections in 2012 but was not recorded in 2018. Horned lark, McCown's longspur and Franklin's gull also fell from the top 10 most abundant species in 2018. These four species were replaced by Richardson's ground squirrel, western meadowlark, Canada goose and barn swallow.

Forty-three point counts at MP_25 that were originally surveyed in 2012 were reassessed in 2018. Average species richness decreased during this period from 6.3 ± 2.4 in 2012 to 5.9 ± 2.4

in 2018, but this change was not significant ($p = 0.43$, $t = 0.80$). Mean species diversity remained the same in both 2012 and 2018 (1.3 ± 0.4), with no statistical difference between the two years ($p = 0.60$, $t = 0.53$).

Chestnut-collared longspur remained the most abundant species at MP_25 in 2012 and 2018, but numbers decreased by approximately 40% (Table 19). Horned lark and Savannah sparrow abundance also decreased in 2018, and Sprague's pipit fell from the top 10 and was replaced by red-winged blackbird. All other species in the top 10 increased or remained stable between years. The greatest increases in numbers were observed for Richardson's ground squirrel, western meadowlark and vesper sparrow.

Table 19. Most abundant species from HCS point count data for baseline and reassessment years.

Property	Baseline Year		Reassessment Year	
	Species	Total	Species	Total
MP_9	Savannah sparrow	77	Richardson's ground squirrel	65
	Horned lark	37	Savannah sparrow	59
	Vesper sparrow	30	Vesper sparrow	51
	Western meadowlark	22	Western meadowlark	42
	Canada goose	17	Horned lark	19
	Richardson's ground squirrel	15	Cliff swallow	18
	Franklin's gull	13	Clay-colored sparrow	13
	Sprague's pipit	6	Baird's sparrow	11
	Mallard	4	Brewer's blackbird	6

	Clay-colored sparrow	3	Canada goose	5
MP_23	Vesper sparrow	20	Western meadowlark	34
	Horned lark	17	Richardson's ground squirrel	29
	Cliff swallow	15	Vesper sparrow	21
	Richardson's ground squirrel	15	Cliff swallow	21
	Western meadowlark	15	Horned lark	15
	Sprague's pipit	6	Clay-colored sparrow	10
	Baird's sparrow	6	Long-billed curlew	6
	Chestnut-collared longspur	5	Savannah sparrow	5
	Clay-colored sparrow	4	Brown-headed cowbird	4
	Savannah sparrow	4	Sprague's pipit	4
MP_24	Boreal chorus frog	50	Clay-colored sparrow	14
	Horned lark	15	Vesper sparrow	8
	Clay-colored sparrow	10	Richardson's ground squirrel	8
	McCown's longspur	5	Western meadowlark	7

	Sprague's pipit	4	Canada goose	4
	Vesper sparrow	3	Sprague's pipit	4
	Red-winged blackbird	3	Chestnut-collared longspur	4
	Savannah sparrow	3	Barn swallow	3
	Franklin's gull	2	Red-winged blackbird	3
	Chestnut-collared longspur	2	Savannah sparrow	3
MP_25	Chestnut-collared longspur	59	Chestnut-collared longspur	35
	Horned lark	47	Richardson's ground squirrel	30
	Savannah sparrow	24	Horned lark	28
	Richardson's ground squirrel	21	Western meadowlark	27
	Western meadowlark	18	Vesper sparrow	20
	Baird's sparrow	18	Baird's sparrow	19
	Vesper sparrow	14	Savannah sparrow	17
	Brewer's sparrow	9	Brewer's sparrow	13

	Sprague's pipit	7	McCown's longspur	8
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Based on changes in abundance over time from all five reassessment properties combined, four of seven species at risk, including all three species classified as *Endangered/Threatened* or *At Risk/May Be At Risk*, exhibited an overall decrease in numbers between assessments. Chestnut-collared longspur numbers have decreased on three of the four reassessment properties where chestnut-collared longspurs were one of the top 10 most abundant species during baseline surveys. On the fourth property (MP_24), chestnut-collared longspurs increased slightly from two observations in 2012 to four observations in 2018. Sprague's pipit numbers decreased on four properties and remained stable on the fifth property. On three properties where Sprague's pipit had a stable or slightly declining trend, very few pipits were observed overall (four observations on each property). McCown's longspur were observed on only one of three reassessments in 2018 where they had originally been recorded during baseline surveys. The one property where they were observed during 2018 (MP_25) had low but relatively stable numbers (six observations in 2012, eight in 2018). Baird's sparrow numbers increased or remained stable on three of the four properties where Baird's sparrow was one of the top 10 most abundant species. The only property where Baird's sparrow numbers decreased (MP_23) had low baseline numbers to begin with (six observations). Brewer's sparrow numbers increased on both properties for which it was one of the top 10 most abundant species. Lark bunting was one of the top 10 species during the baseline surveys on MP_7, but no lark buntings were observed at this property in 2018. Long-billed curlew numbers increased at MP_23, where it became one of the top 10 most abundant species in 2018.

Questionnaire

As of January 2019, 14 reassessment questionnaires have been compiled from landholders that have had their HCSs reassessed. The reassessment questionnaire consists of open-ended questions, with an opportunity to answer many of the questions with multiple responses, opinions and suggestions (Appendix A). Overall, the results of the questionnaires were very positive. The landholders valued the friendly and collaborative work that MULTISAR has provided and appreciates MULTISAR's multi-partner, multi-species and grassroots approach.

Prior to working with MULTISAR, many participants had reservations about species at risk because of their impressions of the federal government's authority regarding these species. After having worked with MULTISAR, most participants have increased their appreciation for species at risk and view them more as an asset rather than a liability (Figures 6–7).

Many of the landholders found that the HCS process helped them learn something about their property as well, as it empowered them with useful tools for their operation. Others responded

that they did not think change was needed at this time (Figure 8). All but one participant was sure that having an HCS provided the landholder with a tool acknowledging their good range management practices and the provision of habitat to protect species at risk.

All participants indicated that they had increased their knowledge of range management principles, and most were prepared to make some changes. All participants were willing to complete projects that would help benefit their cattle operations as well as wildlife, and have agreed to work voluntarily with MULTISAR for another five years.

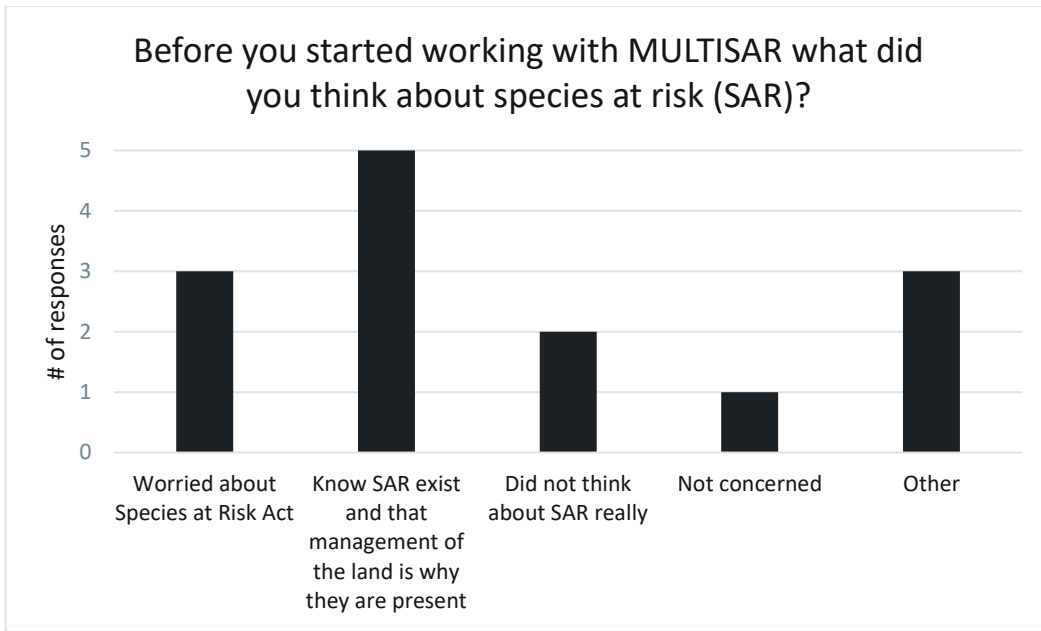


Figure 6. Landholder responses to question #3 of the MULTISAR reassessment questionnaire, 2011–2018.

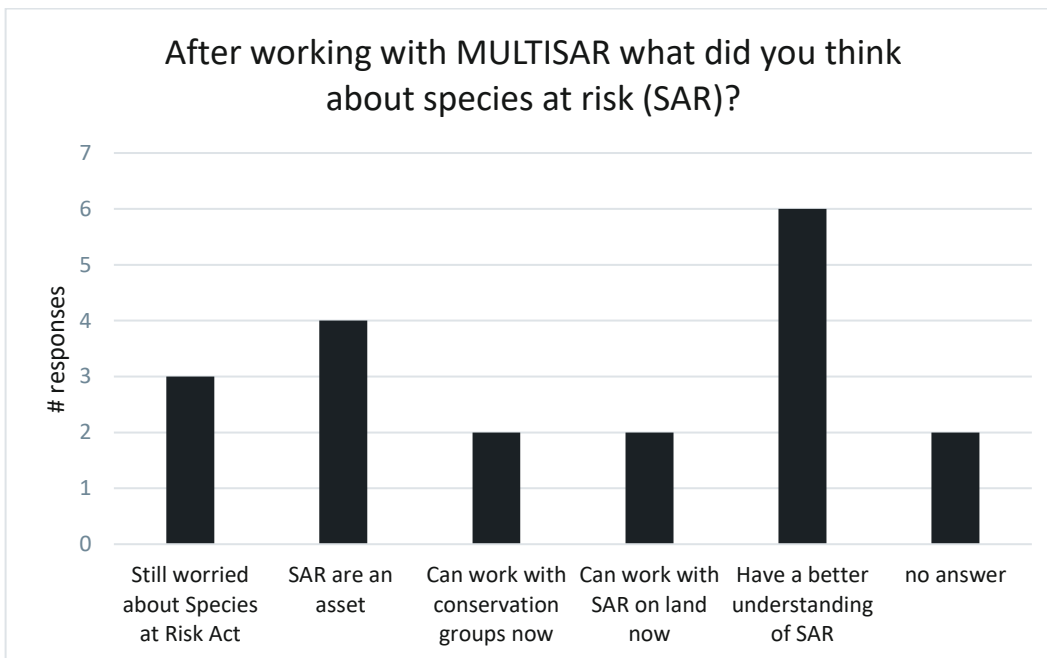


Figure 7. Landholder responses to question #3a of the MULTISAR reassessment questionnaire, 2011–2018.

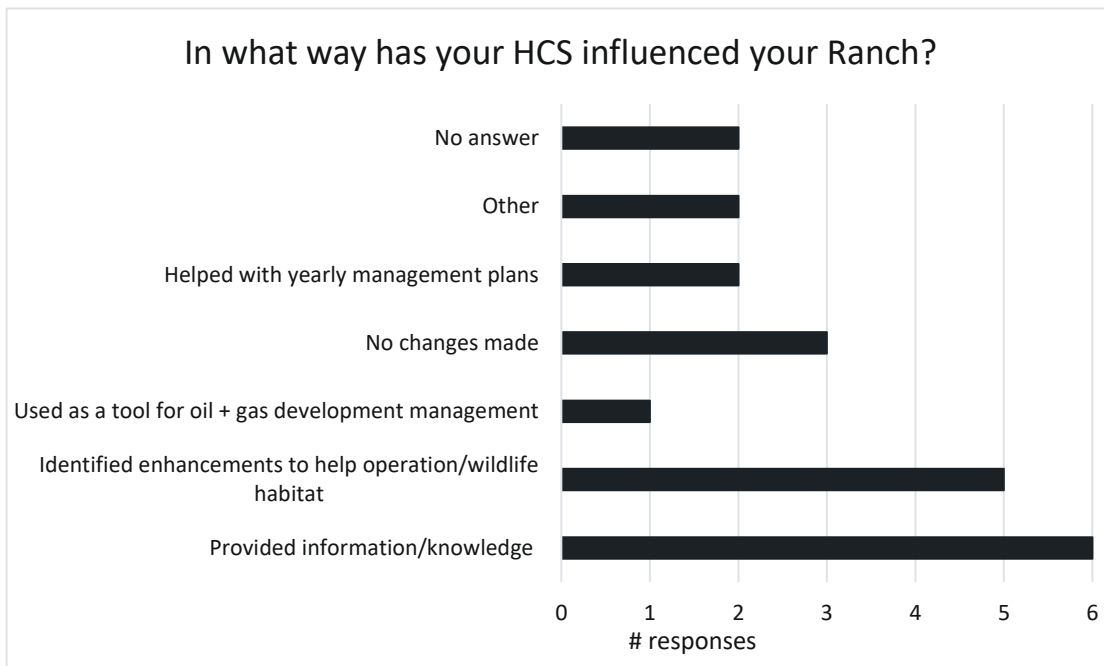


Figure 8. Landholder responses to question #7a of the MULTISAR reassessment questionnaire, 2011–2018.

HCS Reassessment Concluding Remarks

Continuing to strive for a varied landscape will benefit both the livestock producer’s operation and wild species’ habitat. For the five HCS properties that were reassessed and had range, riparian and wildlife data analyzed, most range and riparian goals were being met and health scores had either been maintained or were improving at the desired level. Even with habitat being maintained on the landscape, overall declines for most species at risk continue to be an ongoing concern. Baird’s sparrow and Brewer’s sparrow were the only species at risk that consistently exhibited stable or increasing trends at point count locations on reassessment properties in 2018. With many factors at play, including habitat type (soil type, plant communities, etc.), climatic conditions and range management, our goals may vary between assessment years. In the forthcoming years, based on knowledge acquired through the HCS re-evaluation process, modifications may be made to recommendations and desired outcomes for each property. Adjustments may also be made to allow for improved assessments and monitoring for each HCS.

Monitoring Habitat Enhancements on HCS Participant Properties

Enhancement activities are monitored periodically to determine whether project goals and objectives are being accomplished; this monitoring can help aid in the evaluation process (Margoluis and Salafsky 1998). Problems identified and corrective actions applied during monitoring can help direct future enhancements and/or monitoring protocols. However, determining the success of an enhancement can be a complex question because the habitat manipulation (enhancement) can cause a range of effects, and some observed changes may not be linked to the manipulation (Fletcher *et al.* 2007). More than 50 enhancements that were implemented on several different properties as a result of HCS recommendations were monitored in 2018. The following is a summary of the key findings for 2018.

Restoration Projects

Conversion of cropland back to native grasses can benefit a suite of wildlife species. Monitoring of enhancement projects that involve native grass restoration has been completed every year for several consecutive years. For detailed objectives and desired measures of success for MULTISAR restoration projects see Downey *et al.* (2011; Section 5.3.1). Monitoring at three MULTISAR properties and eight restoration sites was conducted in 2018. Two reseed projects were monitored on MP_7 (RP_01 and RP_02, implemented in 2008 and 2011, respectively). Two sites were monitored on MP_2. One site (RP_01) was seeded in 2010 and the other (RP_02) was seeded in 2017. Reseeding on MP_18 has occurred over several years ranging from 2011 to 2018. MP_18 is broken down into four sites for the purpose of this report (RP_01, RP_02, RP_03 and RP_04). Native restoration takes many years to accomplish; therefore, continuing to monitor these areas will be necessary to determine trends for these sites.

MP_7 RP_01 has seen an increase in litter amounts and range health since monitoring began, but experienced a slight drop in both values in 2018 (Table 20). RP_01 has had grazing incorporated into its management for eight seasons. Natural re-colonization of native forb species has begun to occur on RP_01. RP_02 has had some form of grazing each season and has had more fluctuations in range health and litter amounts; however, in 2018 there was an increase in both values (Table 21). Few native forbs have re-colonized RP_02, but good silver sagebrush (*Artemisia cana*) re-colonization was observed.

Table 20. Range information collected for restoration project MP_7 RP_01.

Total of three or four transects/range health assessments	2008	2010	2011	2012	2013	2014	2016	2017	2018
Range Health Average (%)	N/A	69.0	70.5	65.9	63.8	69.0	77.3	82.3	71.5
Total Vegetative Cover Average (%)	N/A	N/A	85.3	85.9	96.5	97.5	N/A	95.5	94.5
Litter Average (lbs)	N/A	203	483	626	388	544	435	625	372.5

Table 21. Range information collected for restoration project MP_7 RP_02.

Total of two transects/range health assessments	2012	2013	2014	2015	2016	2017	2018
Range Health Average (%)	45	40	42	72.5	63.5	55.5	71
Total Vegetative Cover Average (%)	59.2	74.1	77.2	77.4	N/A	91.2	88.5
Litter Average (lbs)	172	175	255	425	450	200	487.5

MP_2 has seen little change in the reseeded section of RP_01, although there has been a slight increase in litter, blue grama (*Bouteloua gracilis*), western wheatgrass (*Agropyron smithii*) and total vegetation cover (Table 22). 2018 was the first year of monitoring the reseeded area on RP_02; therefore, scores for all categories (range health, litter weight and grass species cover) were quite low, with the exception of total vegetative cover (89%) (Table 22).

Table 22. Range information collected for restoration project MP_2.

Total of one or two transects/range health assessments in each RP	2014 RP_01	2016 RP_01	2017 RP_01	2018 RP_01	2018 RP_02
Range Health Average (%)	51	64	61	59	21
Litter Average (lbs)	400	260	450	500	50
Total Vegetative Cover % Average	81	N/A	83	85.5	89

MP_18 RP_01 and RP_02 were reseeded in fall 2011 and spring 2012, respectively. Both reseeds have had an increase in litter weight and range health since this time (Table 23). RP_03 and RP_04 were reseeded in 2016 and 2017, respectively. Because both reseeds are relatively early in establishment, both had low range health, litter weight and total vegetation cover values in 2018 (Table 24). Some level of grazing has occurred on all MP_18 reseeds, except on RP_04.

Table 23. Range information collected for restoration project MP_18 RP_01 and RP_02.

Total of three transects/range health assessments	2012	2013	2014	2015	2016	2018
RP_01						
Range Health Average (%)	40	36	37	45.5	60	75
Litter Average (lbs)	483	467	433	475	1620	683
Total Vegetative Cover Average (%)	60	86	93	91	N/A	94
RP_02						
Range Health Average (%)	42	37	43	71.6	70.7	76
Litter Average (lbs)	371	225	308	683	662	690
Total Vegetative Cover Average (%)	69	80	87	86	N/A	96.1

Table 24. Range information collected for restoration project MP_18 RP_03 and RP_04.

Total of one or two transects/ range health assessments in each RP	2018 RP_03	2018 RP_04
Range Health Average (%)	51	19
Litter Average (lbs)	160	50
Total Vegetative Cover Average (%)	67	63.5

The wildlife component of the reseeding projects was determined by completing wildlife point counts at historical point count locations (control and reference sites were also monitored). Figures 9–14 show the changes in abundance over time for specific grassland bird species on the reseeded sites. Of particular interest are Baird’s sparrow, grasshopper sparrow, Sprague’s pipit, chestnut-collared longspur and McCown’s longspur. The graphs show total numbers of each species of interest per reseed treatment location, comparing baseline data (year of treatment or year prior to treatment) with data collected in all years. Results compare only point count information recorded, omitting any incidental sightings.

MP_7 RP_01 has seen a gradual shift to desired species, with Sprague’s pipit, Baird’s sparrow and grasshopper sparrow all recorded (Figure 9). Savannah sparrow, western meadowlark, brown-headed cowbird, willet (*Tringa semipalmata*), marbled godwit (*Limosa fedoa*), blue-winged teal (*Anas discors*) and red-winged blackbird were also observed during 2018 surveys on RP_01. Species richness at RP_01 was 10, with the native reference site and the non-native control site each having a species richness of 6. RP_02 has seen more sporadic increases in desired species (Figure 10). Sprague’s pipit, Baird’s sparrow and grasshopper sparrow seem to have established themselves, whereas longspurs have not been detected within point counts over the past four seasons. RP_02 also has a high species richness value, of 14, with the following other species recorded in 2018: vesper sparrow, clay-colored sparrow, Savannah sparrow, horned lark, western meadowlark, red-winged blackbird, Brewer’s blackbird, sharp-tailed grouse, brown-headed cowbird, Richardson’s ground squirrel and Wilson’s phalarope (*Phalaropus tricolor*). Further counts will be conducted every year to continue monitoring the establishment of species on the property and assess the influence of grazing on the sites.

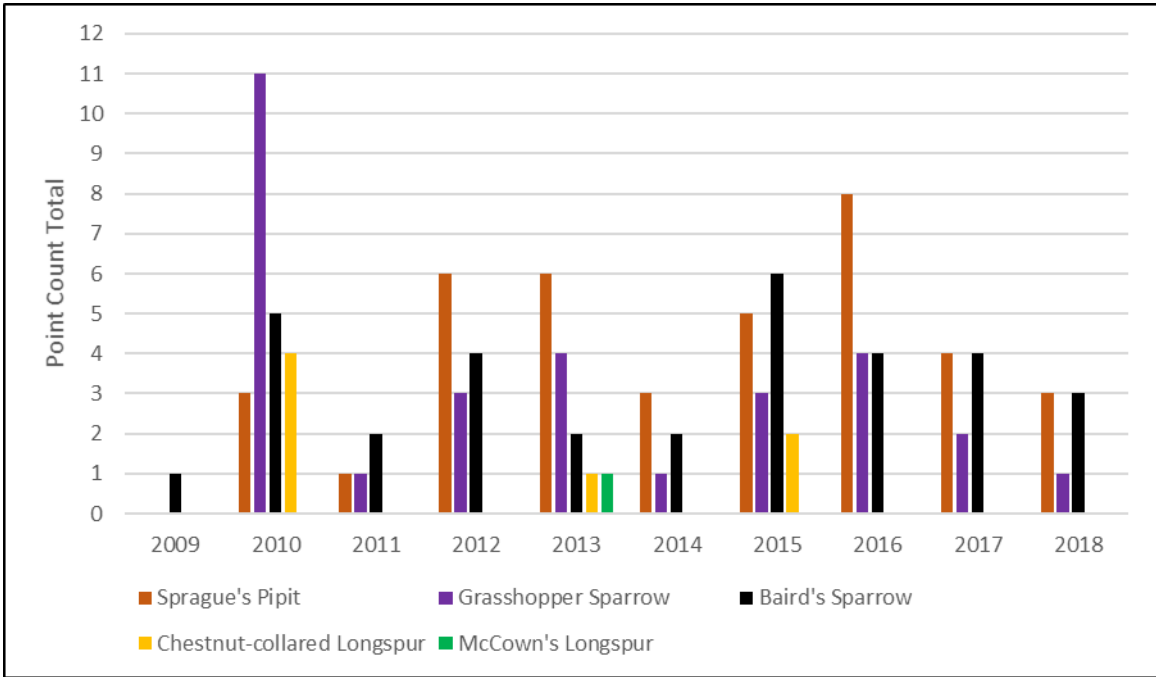


Figure 9. Abundance over time for specific grassland bird species on reseeded fields in MP_07 RP_01 (2009 was first year post reseed).

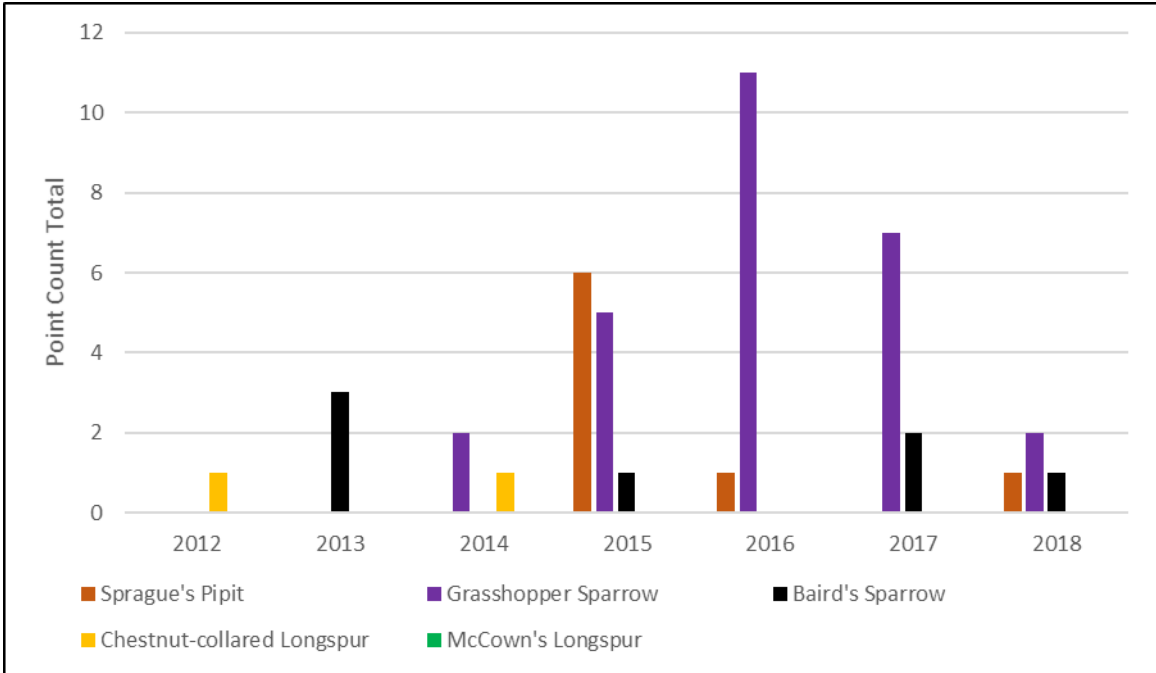


Figure 10. Abundance over time for specific grassland bird species on reseeded fields in MP_07 RP_02 (2012 was first year post reseed).

RP_01 on MP_2 was reseeded in 2010, but there have been many issues with seed establishment and weeds such as downy brome. Wildlife species observed have been varied, but desirable species such as grasshopper sparrow and Sprague's pipit are appearing with greater regularity (Figure 11). The species richness at RP_01 in 2018 was six, which was the greatest it has been in three seasons. Species detected included grasshopper sparrow, American kestrel, western meadowlark, mallard, Richardson's ground squirrel and Sprague's pipit. RP_02 was not surveyed for wildlife in 2018, but will be monitored in 2019.

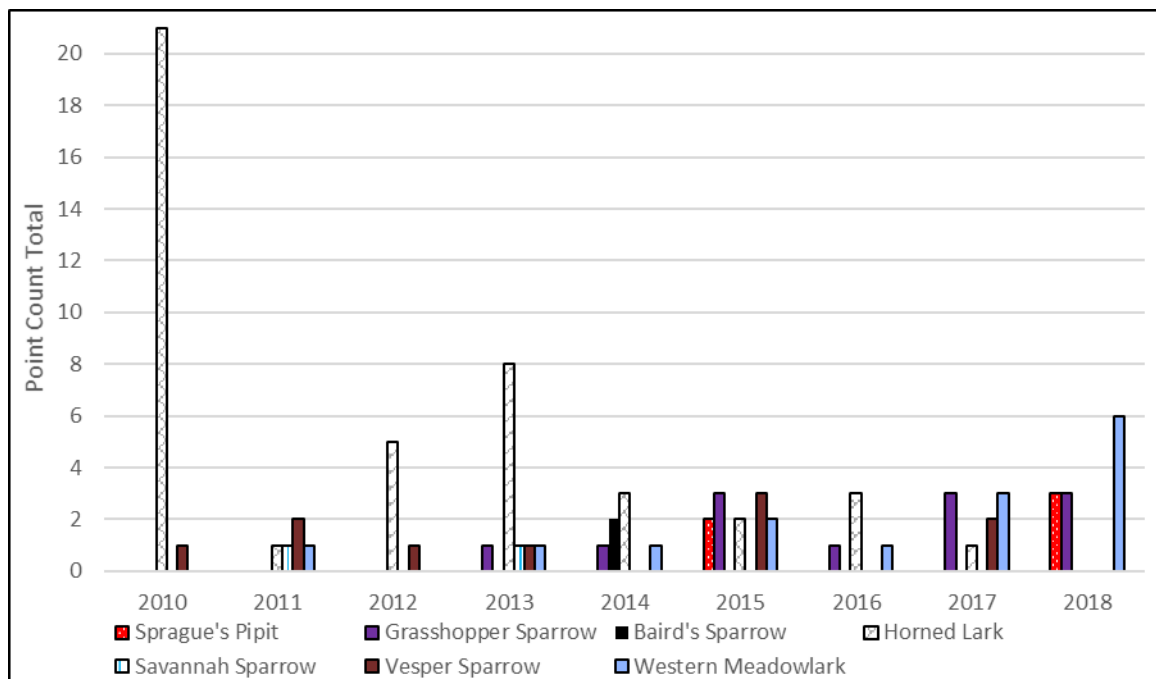


Figure 11. Abundance over time for specific grassland bird species on reseeded fields in MP_02 RP_01 (2011 was first year post reseed).

Thirteen species were recorded on MP_18 RP_01 in 2018, including notable species such as grasshopper sparrow, Baird's sparrow and common nighthawk (Figure 12). Nine species were detected on MP_18 RP_02, including Baird's sparrow, bobolink, grasshopper sparrow and Sprague's pipit (Figure 13). RP_03 was reseeded in 2016 and contained nine species in 2018, notably grasshopper sparrow and barn swallow (Figure 14A). RP_04 (Figure 14B) was reseeded one season ago and contained ten species this year; however, the only species at risk detected was ferruginous hawk. Ten species were recorded within point counts located in native grass control sites, including Baird's sparrow, grasshopper sparrow, Sprague's pipit and chestnut-collared longspur.

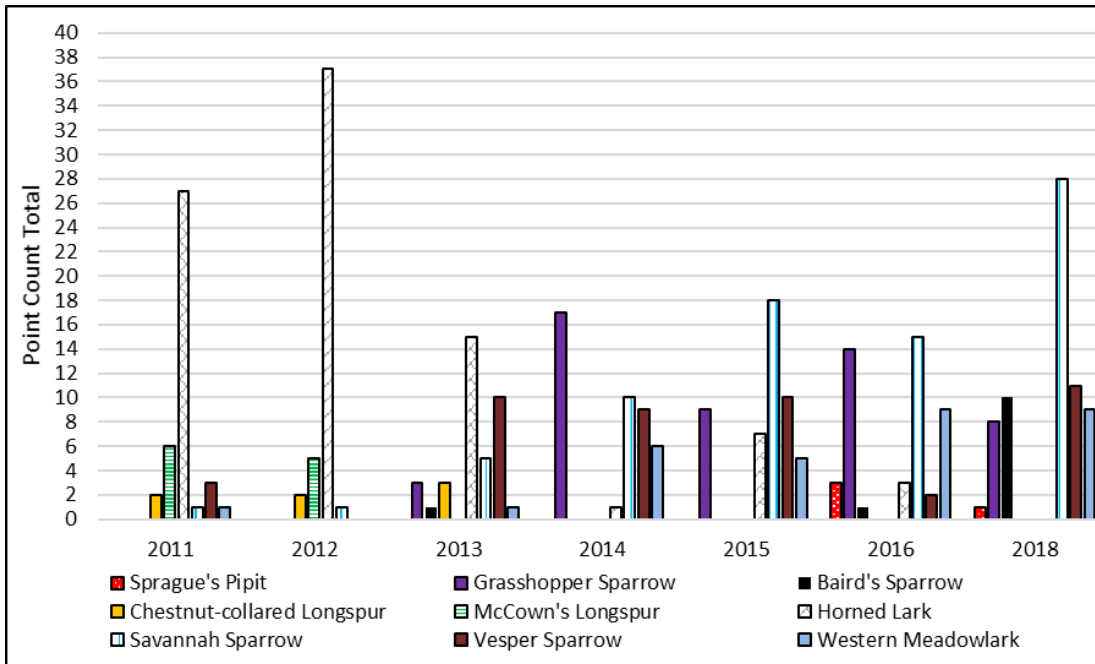


Figure 12. Abundance over time for specific grassland bird species on reseeded fields in MP_18 RP_01 (fall 2011 reseed).

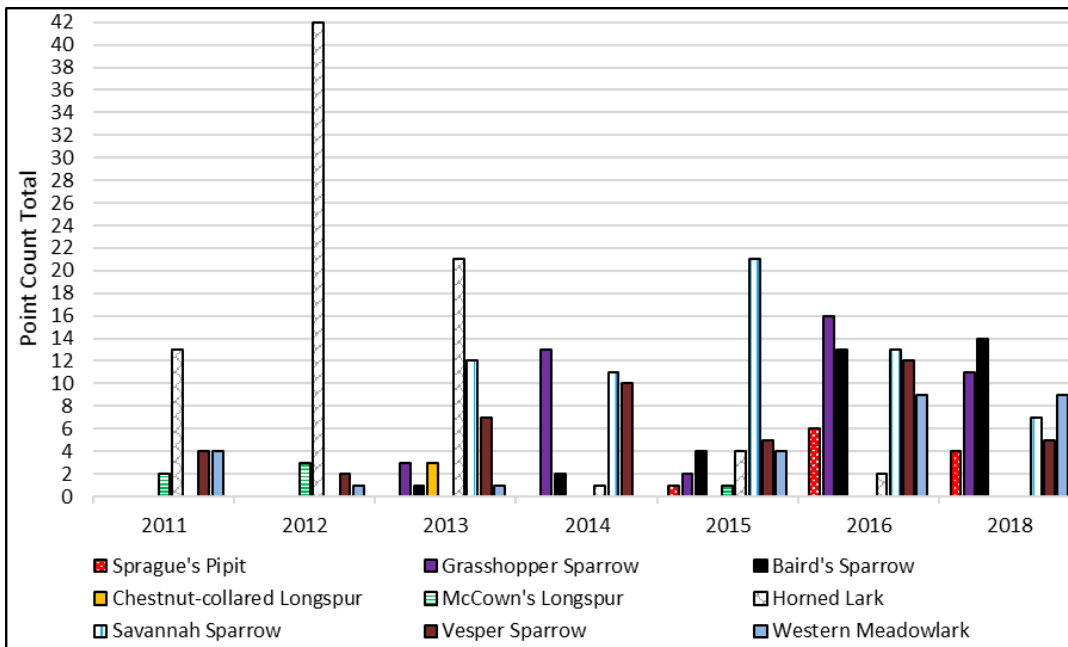


Figure 13. Abundance over time for specific grassland bird species on reseeded fields in MP_18 RP_02 (spring 2012 reseed).

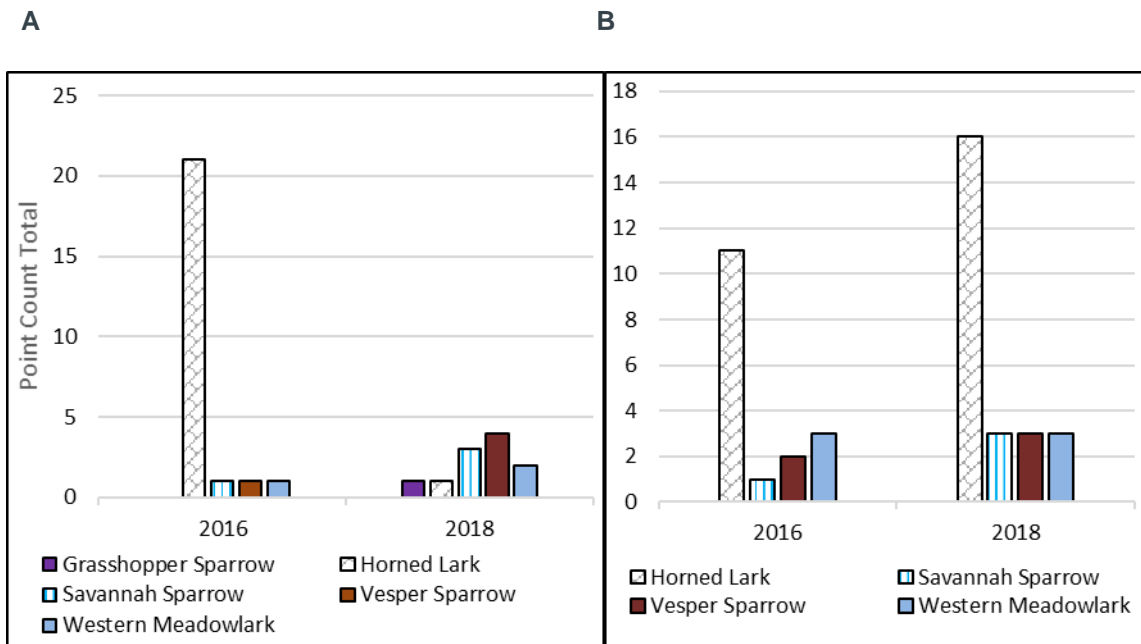


Figure 14. Abundance over time for specific grassland bird species on reseeded fields in MP_18 (2018 is first year post reseed) for RP_03 (A) and RP_04 (B).

Shrub/Forb/Grass Plantings

Shelterbelts and shrub planting can increase nesting habitat for a variety of wildlife species such as ferruginous hawks and loggerhead shrikes and increase forage/winter habitat for greater sage-grouse (*Centrocercus urophasianus*), sharp-tailed grouse and pronghorn. Plantings will be monitored yearly for the first five years (unless deemed to be thriving or not successful at all), to determine establishment and growth. See Downey *et al.* (2011; Section 5.3.2) for more detailed objectives and desired measures of success for shelterbelt and shrub planting.

Over the span of several years, MULTISAR has planted plugs of thorny buffaloberry (*Shepherdia argentea*), chokecherry (*Prunus virginiana*), silver sagebrush, American vetch (*Vicia americana*), golden bean (*Thermopsis rhombifolia*) and needle-and-thread grass. In addition, needle-and-thread grass and silver sagebrush seeds have been spread on reseeded areas. MP_18 was chosen to be monitored in 2018 and included five separate areas. Survivorship has been variable for the shrub and needle-and-thread grass plugs and broadcast seeds from the last three years (Table 25).

Table 25. Re-establishment of shrubs, forbs and grasses as of 2018.

Property	Year planted	Species	Plots or transects	Results 2017	Results 2018
MP_18 SSP_12,13,15,16	2017	Needle-and-thread plugs	4 (15x15') plots with 200 plugs in each	-	1.8% Survivorship
MP_18 SSP_17	2017	100 silver sagebrush plugs	1 (15x15') plot	-	14% Survivorship
MP_18 SSP_09	2016	Silver sagebrush seeds	63-m line intercept transect	5.2% cover	None found
MP_18 SSP_10	2016	Needle-and-thread seeds	25-m line intercept transect	11.8% cover	None found
MP_18 SSP_11	2016	Silver sagebrush seeds	53-m line intercept transect	-	Total count: 698

Artificial Nesting/Roosting Structures

Artificial structures are used by MULTISAR in areas that have the potential to support a species at risk without negatively affecting other species in the area. Artificial structures include raptor nest poles, bat boxes and burrowing owl burrows. Refer to Section 5.3.3 of Downey *et al.* (2011) for objectives and desired measures of success for all of MULTISAR's artificial structures.

Artificial nesting structures monitored in 2018 included 19 nest poles installed for ferruginous hawks. These nest poles are monitored for raptor use, and Richardson's ground squirrels are surveyed as an indicator of prey availability in the area. Ten of the 19 nest poles were "successful" (used by hawk pairs that produced young) in 2018. Six of eight properties contained at least one "successful" nest pole, which suggests that the poles are having the desired effect. Two out of three poles on each of MP_1 and MP_6 were "successful" in 2018, as were one out of two poles on each of MP_5 and MP_26, three out of four poles on MP_8, and the single pole on MP_25. The only two properties that did not have an active ferruginous hawk nest (MP_34 and MP_FEHA_01) had only had poles constructed the previous winter. Ground squirrel surveys were conducted at only one property because of late spring arrival. The one property that was

monitored experienced a decline in ground squirrel numbers, which may have been due to the late onset of spring.

Weed Control

Sites invaded by noxious and restricted weed species experience reduced range health, as the invading species quickly replace the native vegetation, reducing diversity and productivity. Refer to Section 5.3.5 of Downey *et al.* (2011) for objectives, desired measures of success and monitoring timeframes for weed control enhancement sites.

Two properties that implemented biocontrol (insects) for leafy spurge (*Euphorbia esula*) and Canada thistle were monitored by MULTISAR staff in 2018. Inoculation of the first property with insects occurred in 2016, but the leafy spurge patch still appeared to be thriving and there was no evidence of the insects. Insects were also not found at thistle patches on the second property; however, inoculation of the 13 sites occurred within the past year (three sites in fall of 2017 and 10 sites in spring 2018), and it is likely too early to see any results from the insects.

Watering Systems

In 2018, five properties with upland watering systems (MP_01, MP_08, MP_25, MP_31 and MP_38) and three properties with portable watering units (MP_05, MP_06 and MP_36) were visited for photo documentation. Wildlife surveys were completed on five of these sites and range health was surveyed on two sites (Table 26).

Wildlife surveys were completed at one upland watering site and one control site on MP_01. Four species were recorded at the watering site: chestnut-collared longspur, vesper sparrow, Richardson's ground squirrel and horned lark. The same species were observed at the control site, except for vesper sparrow.

Wildlife surveys were completed at one portable watering unit site (Hydrant #3) on MP_05. Three wildlife species were detected at the watering unit in comparison to five species recorded at the control site. A single Brewer's sparrow was detected at the watering site and one Baird's sparrow was detected within the control area. Point count surveys were completed at two hydrant sites (hook-ups for portable watering units unused at the time) and paired control sites for each hydrant. Three species were recorded at Hydrant #1, and the same three species with the addition of chestnut-collared longspur were observed at the control. The Hydrant #2 point count survey yielded four species at both the hydrant and control site. Chestnut-collared longspurs were recorded at both point counts and the only difference in species was the presence of Savannah sparrow at Hydrant #2 and killdeer (*Charadrius vociferus*) at the control.

Wildlife surveys were completed at one portable watering unit site on MP_06. Five species were detected at this site, including long-billed curlew. Three species were detected at the nearby solar panel array. Five species were detected at the two control sites, including grasshopper sparrow.

Table 26. Water enhancement sites monitored in 2018.

Site	Baseline Wildlife Within 100 m	2018 Wildlife Within 100 m	Range health trend within 50 m of watering site(s)	Range health trend 200 m from the watering site(s)
MP_1 1 site Installed in 2010	Chestnut-collared longspur Horned lark Richardson's ground squirrel	Chestnut-collared longspur Horned lark Richardson's ground squirrel Vesper sparrow	2014: 62% 2016: 69% 2018: N/A	N/A
MP_5 3 sites Installed in 2008	Baird's sparrow Chestnut-collared longspur Horned lark Killdeer Savannah sparrow Vesper sparrow Western meadowlark	Brewer's sparrow Chestnut-collared longspur Horned lark Killdeer Savannah sparrow Western meadowlark	2014: 80% 2016: 75% 2018: N/A	N/A
MP_6 Portable Watering Unit	Horned lark Grasshopper sparrow Savannah sparrow Vesper sparrow Western meadowlark	Brewer's blackbird Horned lark Long-billed curlew Savannah sparrow Vesper sparrow Western meadowlark	N/A	N/A

<p>MP_8</p> <p>1 site</p> <p>Installed in 2010</p>	<p>Baird's sparrow</p> <p>Chestnut-collared longspur</p> <p>Horned lark</p> <p>Pronghorn</p> <p>Richardson's ground squirrel</p> <p>Western meadowlark</p>	<p>Clay-colored sparrow</p> <p>Cliff swallow</p> <p>Common nighthawk</p> <p>Horned lark</p> <p>Richardson's ground squirrel</p> <p>Savannah sparrow</p> <p>Western meadowlark</p>	<p>2014: 52%</p> <p>2016: 59%</p> <p>2018: 57%</p>	<p>80% at one location</p> <p>Desired effect occurring (range health higher than at watering site)</p>
<p>MP_9</p> <p>2 sites</p> <p>Installed in 2010</p> <p>1 site was in use prior to the other</p>	<p>N/A</p>	<p>No surveys at well site, but property was reassessed in 2018</p>	<p>2014: 84%</p> <p>2016: 84%</p> <p>2018: 87</p>	<p>At native sites: 85%</p> <p>At tame pasture site: 72%</p> <p>Desired effect occurring (range health similar or higher than at watering site)</p>

Wildlife and range surveys were completed at one upland watering site and one control site at MP_08. Seven wildlife species were recorded during the survey at the watering site and seven species at the control. Three of the same species were observed at both locations. Notable species recorded at the watering site included common nighthawk and cliff swallow, which are both aerial insectivores. The control site contained a higher proportion of grassland specialists, including Baird's sparrow and chestnut-collared longspur. Range health at the watering site was low (57%), but stable in comparison to previous years (59% in 2016 and 52% in 2014). Range health was much higher at the control site (80%), which remained similar to the 2016 survey (75%).

Range surveys were completed at one of the upland watering sites on MP_9 and five other sites in the nearby vicinity. This watering unit supplies water to cattle from three separate pastures. Range health at the well continues to remain high (87%) and is comparable to previous surveys in 2016 and 2014 (84% in both years). The average range health at nearby native grass sites was 85%, which is stable in comparison to the average range health value in 2016 (81.5%). Range health at the tame pasture site improved from 62% in 2016 to 72% in 2018.

Wildlife surveys were completed at three upland watering sites on MP_25. Six species were recorded at all three troughs. Notable species include Brewer's sparrow at Trough #1, chestnut-collared longspur at Trough #1 and #2, McCown's longspur at Trough #2, and pronghorn at Trough #2 and #3.

Tree and Shrub Protection

It is generally recommended that trees and shrubs which are experiencing heavy damage by cattle should have fences or corral panels placed around them to help prevent their gradual destruction. Trees, especially lone cottonwood trees, that can be used in pastures as nesting sites by ferruginous hawks should also be protected. Sites in which the landholder implements a tree- or shrub-protection enhancement will be monitored every two years, with photos taken to document the reduced impact of cattle on trees or shrubs. Wildlife observed using the sites will also be documented. Trees in riparian areas must also be protected from excessive beaver damage. These trees are wrapped with stucco wire where possible.

Monitoring occurred at five locations in 2018. Tree protection panels were inspected at two sites. Panels on one property had been damaged by fallen branches but were replaced later in the year. A pair of eastern kingbirds was observed using the tree. Panels at the second site protected a tree containing an active ferruginous hawk nest. The third site contained a cottonwood enclosure to prevent cattle damage and to help stabilize a riverbank. The site was inspected and photos were taken. At another site, trees were beginning to outgrow the wire wrapped around their base to protect them from beaver damage. Approximately 20 of these cottonwoods were re-

wrapped to give them more room to grow. Lastly, a corral protecting a spring and its associated riparian area on one property was inspected.

Future Direction for Monitoring

In 2019, MULTISAR will continue to monitor a sub-sample of enhancement projects to determine whether desired effects are occurring. Before-after-control-impact design will continue to be utilized to build habitat representations before and after treatments as well as to look at control sites. In 2019, 58 enhancement sites are scheduled for monitoring (Table 27).

Table 27. Planned monitoring of enhancement projects in 2019.

Enhancement Type and Associated Items to Monitor	# of Sites or Participants
Artificial Structures <ul style="list-style-type: none"> • Nest poles <ul style="list-style-type: none"> ○ Incorporating 5 Richardson’s ground squirrel transects 	20
Restoration Projects <ul style="list-style-type: none"> • Range health transects • Wildlife point counts 	9
Shrub/Forb/Grass Plantings <ul style="list-style-type: none"> • Needle-and-thread grass plug sites (2) • Native seed: silver sagebrush (1) 	3
Weed Control <ul style="list-style-type: none"> • Biocontrol sites 	3
Portable Watering Sites <ul style="list-style-type: none"> • Wildlife point count • Emergent vegetation recorded • Photos 	12
Upland Watering Sites <ul style="list-style-type: none"> • Wildlife point counts • Range health transects • Photos taken 	7

Tree and Shrub Protection <ul style="list-style-type: none"> • Wildlife point count • Vegetation regrowth recorded • Photos taken 	2
Riparian Protection <ul style="list-style-type: none"> • Reference photos taken 	1

Future Direction

In 2019–2020, MULTISAR will continue to work collaboratively with its partners to achieve goals and objectives in three core program areas:

1. Habitat Conservation Program:

- 1.1 Continue to seek interested landholders in priority species at risk areas.
- 1.2 Complete six new HCSs (~57 880 acres) and three HMPs (~3640 acres). These will include detailed vegetation and wildlife inventories, and range and riparian health assessments to identify habitats, priority species and the ecological condition of the rangeland and riparian areas.
- 1.3 For those species at risk detected during inventories, use MULTISAR as a tool to implement recovery and conservation management actions identified in provincial and national recovery plans and provincial conservation management plans.
- 1.4 Secure habitat for species at risk through signed stewardship commitment agreements with landholders.
- 1.5 Assist landholders, based on priority, that have had an HCS or HMP completed, in implementing habitat enhancement recommendations outlined in their HCS or HMP.
- 1.6 Complete new SARC plans or beneficial management plan assessments upon request and continue to seek interested landholders, conduct pre-assessment interviews and research, carry out rapid assessments and deliver final reports to landholders.

2. Education, Outreach and Awareness Program:

- 2.1 When opportunities with watershed or other conservation groups, or the public, present themselves, promote the MULTISAR message and distribute relevant information to target audiences.
- 2.2 Deliver two to five formal presentations to interest groups according to demand.
- 2.3 Assemble information and images, write and distribute one issue of the *Grassland Gazette* (MULTISAR's newsletter).
- 2.4 Update and reprint MULTISAR brochures and fact sheets on species at risk and BMPs, as needed.

- 2.5 Regularly update MULTISAR's website and Facebook and Twitter accounts and ensure that posted information is relevant and accurate.
 - 2.6 Continue membership and maintain active participation in the Canadian Roundtable for Sustainable Beef.
 - 2.7 Continue collaboration with the Canadian Cattlemen's Association on the environmental display along the Cattle Trail during the Calgary Stampede.
3. Research, Monitoring and Data Management Program:
- 3.1 Assist AEP in conducting sharp-tailed grouse monitoring on leks in southeastern Alberta.
 - 3.2 Assist AEP in surveying nine ferruginous hawk quadrants.
 - 3.3 Conduct five Richardson's ground squirrel surveys in vicinity of installed ferruginous hawk nest platforms.
 - 3.4 Assist AEP in conducting surveys for loggerhead shrike on six routes in southern Alberta.
 - 3.5 Monitor the Great Plains toad and the plains spadefoot on up to 10 road transects (routes for the Researching Amphibian Numbers in Alberta program), if temperatures and precipitation allow, for evidence of emergence and reproduction.
 - 3.6 Continue to assess the relationships among wildlife species occurrences, wildlife species diversity, relative abundance, plant community type and metrics of range health.
 - 3.7 Evaluate three properties (~54 790 acres) originally assessed in 2008, 2013 and 2014, to measure how effective the HCS plan was at influencing habitat management, habitat value for species at risk and landholders' perceptions of species at risk.
 - 3.8 Monitor 58 (of approximately 193 habitat enhancement projects implemented within MULTISAR's project area since 2005.
 - 3.9 Submit all wildlife observation data collected to FWMIS annually.
 - 3.10 Conduct a review of existing provincial and federal recovery plans for *Endangered* and *Threatened* species in the GRN and actions that MULTISAR is undertaking to address them.

- 3.11 Continue to analyze MULTISAR's point count and range health data to examine habitat requirements of specific grassland bird species in the Mixedgrass and Dry Mixedgrass natural subregions of Alberta.
- 3.12 Submit all range health assessment data on Crown lands to the provincial Geographic Land Information Management Planning Systems (GLIMPS) database on an annual basis.

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Appendices

Appendix A: Sample MULTISAR Landholder Reassessment Questionnaire

Evaluation of the MULTISAR Habitat Conservation Strategy (HCS)

Landholder: _____ Interviewer: _____ Date: _____

Questions:

Why did you become involved with MULTISAR?

Do you know what the MULTISAR program is about?

Before you started working with MULTISAR what did you think about species at risk?

And now?

Had you ever heard of any of the Beneficial Management Practices recommended in your HCS prior to working with MULTISAR?

a) Which ones?

b) Did you previously use any of the BMPs recommended or discussed by MULTISAR in your operation?

Do you prefer the multispecies approach versus a single species approach when working with a conservation group?

Do you prefer working with single organizations/agencies or one multi-partner group? a) Why?

Has your HCS influenced the way you manage your ranch?

In what way?

Do you feel that your land is important in providing habitat for SAR?

How has MULTISAR influenced your understanding of species at risk and their needs?

How has MULTISAR contributed to your understanding and knowledge of range management principals (range health, grazing intensity, etc.)?

How do you feel the completion of a MULTISAR HCS has contributed to your own knowledge of your ranch, range management and wildlife in your area?

Have you talked to others about MULTISAR?

Are MULTISAR staff easy to talk to, friendly, and communicate effectively when discussing the program?

How would you prefer to communicate with us?

What do you think is the most beneficial part of having an HCS completed for your ranch?

What is the biggest disadvantage to having a HCS completed on your ranch?

Overall do you feel that MULTISAR has been a positive, neutral, or negative influence on the economy of your ranch?

What changes could be made to improve the HCS process?

Additional sections that you may have liked to see in the report?

Remove?

How is the length?

Time Commitments?

Cost?

Prior to MULTISAR were you nervous about species at risk and the potential impact there were going to have on your operations?

a) Why?

b) After MULTISAR...?

As a landholder do you feel comfortable having a HCS completed for your ranch that identifies your operations as effectively conserving species at risk habitat?

a). Do you feel that an HCS provides due diligence and acknowledged that good range management practices on your ranch have provided habitat to protect species at risk?

Are you interested in continuing to work with MULTISAR?

Appendix B: List of Abbreviations Used in MULTISAR Reports

Abbreviation	Expansion
ABP	Alberta Beef Producers
ACA	Alberta Conservation Association
AEP	Alberta Environment and Parks
CCA	Canadian Cattlemen’s Association
CRSB	Canadian Roundtable for Sustainable Beef
BACI	Before-After-Control-Impact
BMP	Beneficial Management Practice
FWMIS	Fish and Wildlife Management Information System
GNR	Grassland Natural Region
HCS	Habitat Conservation Strategy
HMP	Habitat Management Plan
HSP	Habitat Stewardship Program
MULTISAR	Multiple Species At Risk
PCF	Prairie Conservation Forum
RCS	Rangeland Conservation Service
SARC	Species at Risk Conservation
SARC Plan	Species at Risk Conservation Plan
SARPAL	Species at Risk Partnership on Agricultural Lands