



MULTISAR

A Multi-Species Conservation Strategy
for Species at Risk in the Grassland
Natural Region of Alberta, 2021–2022 report



Alberta Species at Risk Report No. 171



MULTISAR: A Multi-Species Conservation Strategy for Species at Risk in the Grassland Natural Region of Alberta, 2021–2022 Report

Published by Alberta Environment and Parks

Report prepared by the Prairie Conservation Forum and the Alberta Conservation Association

Cover Photo: Kristen Rumbolt Miller

ISBN: 978-1-4601-5473-1

ISSN: 1496-7146

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This publication is available online at <https://open.alberta.ca/publications/alberta-species-at-risk-report-171>

This publication may be cited as:

MULTISAR. 2022. MULTISAR: a multi-species conservation strategy for species at risk in the Grassland Natural Region of Alberta, 2021–2022 report. Alberta Environment and Parks. Alberta Species at Risk Report No. 171. Edmonton, AB. 47 pp.

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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.

Acknowledgements

Many individuals, agencies, organizations, programs and corporations allowed MULTISAR to successfully achieve its habitat stewardship mandate in the Grassland Natural Region in 2021–2022. We would like to convey our sincere appreciation to them.

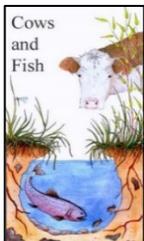
The MULTISAR program (comprising three project areas South Saskatchewan, Milk River, and West) received financial support from Alberta Conservation Association (ACA), Alberta Environment and Parks (AEP) through a grant to the Prairie Conservation Forum (PCF), the Government of Canada through the Canada Nature Fund, Habitat Stewardship for Species At Risk—Aquatics Fund to ACA, and the Species at Risk Partnership on Agricultural Lands (SARPAL—Environment and Climate Change Canada) grant to the Canadian Cattlemen’s Association (CCA). Funding was also received from AltaLink, Shell Canada Foothills Legacy Fund, Minister’s Special License Grant and private donations. Additional in-kind support was provided by Alberta Environment and Parks, Alberta Conservation Association, Prairie Conservation Forum, Canadian Cattlemen’s Association, Milk River Watershed Council, Altalink, EQUUS, Huvan Construction and private landholders.

Sasha Harriott (PCF) was instrumental in the administration of the AEP grant to PCF in support of MULTISAR, and Monica Hadarits (CCA and Canadian Roundtable for Sustainable Beef [CRSB]) was instrumental in administering the SARPAL grant to ACA in support of MULTISAR.

We are grateful to Rob Simieritsch, Mike Alexander, Craig Johnson, Brandy Downey and Sue Cotterill (AEP) for their support in championing the MULTISAR program for grant funding by Alberta Environment and Parks and to Doug Manzer, Lance Engley and Trevor Council (ACA) for their support in championing the MULTISAR program for funding by Alberta Conservation Association. We are also grateful to Larry Thomas in championing the MULTISAR Program for funding by Environment Canada via the CCA.

The MULTISAR Steering Committee, made up of Katheryn Taylor (PCF), Brad Downey (ACA), Brandy Downey (AEP), Paul Jones (ACA), Joel Nicholson (AEP), and Craig DeMaere (AEP), was responsible for the planning and the management of the MULTISAR program. The SARPAL Advisory Committee, made up of Larry Thomas (CCA), Monica Hadarits (CRSB), Brad Downey (ACA), Katheryn Taylor (PCF), and Norine Ambrose (Cows and Fish) was responsible for overseeing the SARPAL funds.

Katheryn Taylor (PCF), Brad Downey (ACA), Kristen Rumbolt Miller (PCF), Stephanie Jaffray (PCF), Mike Verhage (ACA), Julie Landry-Deboer (ACA), Adam Moltzahn (ACA), Phillip Rose (ACA), Allie Olson (ACA), Dayce Rhodes (ACA), Sarah Vriend (ACA), Ashlyn Herron (ACA), Amanda MacDonald (ACA), Mike Jokinen (ACA), Jeff Forsyth (ACA), Logan Redman (ACA), Tyler Johns (ACA), Brook Skagen (Bear Tracks Environmental Services), Leah Kovatch (Bear Tracks Environmental Services), and Alan Dodd (Longview Ecological) completed the range, wildlife and fisheries inventories and health assessments for the habitat conservation strategies and their monitoring and evaluation. Cows and Fish completed riparian vegetation inventories and health assessments. Volunteers helped survey properties for birds, snakes and short-horned lizards (*Phrynosoma hernandesii*).



This project was undertaken with the financial support of the Government of Canada.
Ce projet a été réalisé avec l'appui financier du gouvernement du Canada.



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) and habitat management plans (HMPs) delivered throughout the Grassland Natural Region.

In 2021–2022, a new HCS was developed for six ranches totalling approximately 11 532 acres. MULTISAR also completed two HMPs on 2480 acres of land within our priority areas. Fifty-one habitat enhancement projects were developed to improve the habitat of key wildlife species on HCS and HMP properties. These include the installation and implementation of artificial habitat structures, wildlife friendly fencing, portable electric fencing, portable and upland watering units, tree protection, riparian protection, shrub planting, weed control, native grassland restoration, and grazing management tools.

No SARC assessments were completed in 2021-2022, ergo no SARC plans were developed. No beneficial management plan (BMP) assessments were delivered this year as no landholders were contacted or referred to MULTISAR. MULTISAR will continue to provide SARC plans and BMP assessments and promote them as a tool for habitat improvements for species of interest.

Limitations imposed by COVID-19 on the education, outreach and awareness program continued throughout 2021-2022. In-person events continued to be limited and, in some instances, moved to online platforms. The Southern Alberta Grazing School for Women webinar series and other online presentations were attended by 246 people. Communication material produced included one issue of MULTISAR's *Grassland Gazette* newsletter, which was distributed to 159 contacts. Social media continues to be a means to share information related to MULTISAR. In 2021-2022 MULTISAR posted 79 tweets through Twitter and 57 posts on Facebook to engage the public. MULTISAR maintained direct contact with landowners, other organizations, and government agencies throughout the year with over 300 conversations (email, text, phone calls, or in-person) with landowners and over 142 conversations with government and non-government organizations.

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. In 2021 five MULTISAR HCS ranches were reassessed. Roughly 50 habitat enhancement projects on participating HCS ranches were monitored in 2021 to determine whether enhancements were achieving their objectives. Enhancements monitored include restoration sites, artificial nesting platforms, weed control, watering sites, tree protection, wildlife friendly fencing, and grazing management tools.

MULTISAR continues to compile wildlife observation and vegetation assessment data that it has been accumulating since its first HCS. In 2022, 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, the 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 the implementation of these strategies. These 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 316 habitat enhancement projects on ~559 765 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 such as litter and cover (Robel pole measurements) along with 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 to 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

The MULTISAR education, outreach and awareness program continued in a limited capacity in 2021-2022 as COVID-19 restrictions continued to limit the ability to attend events. Education events that MULTISAR would normally engage in, such as field training events, in-person presentations to school, college, community and landholder groups, conferences, and attendance at events such as the Calgary Stampede were all cancelled. Direct communication with landholders continued, as did communication with other organizations and government agencies. In some cases, on-line presentations took the place of in-person presentations.

Through the course of any fiscal year, MULTISAR staff and contractors interact on a daily basis with landholders and other individuals, representative of a broad spectrum of sectors. MULTISAR interacts the most with landholders, with over 300 conversations held between April 1, 2021 and March 30, 2022, through email, text, phone calls, or in-person. The two other groups that MULTISAR interacts with the most are the government (both provincial and federal) and non-profit environmental organizations (76 and 66 conversations/meetings, respectively). Both groups are important partners in the MULTISAR program. MULTISAR also interacts with companies (that provide materials for habitat enhancements), industry, media, schools (at all levels), academic researchers, consultants, and the general public.

Landholder Awareness

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

MULTISAR did not attend any events where informational publications could be shared in the 2021-2022 fiscal year. The 16th issue of MULTISAR's newsletter, the *Grassland Gazette*, was produced in December 2021 and emailed to 159 MULTISAR contacts, including program-participating landholders. The newsletter was also posted to the MULTISAR website and shared on MULTISAR and PCF social media platforms (1203 and 132 views, respectively).

Southern Alberta Grazing School for Women and Alberta Range Stewardship Course

The 18th annual Southern Alberta Grazing School for Women teamed up with the Alberta Range Stewardship Course again this year to offer another online webinar series for producers. There were four webinars in total offered over the summer:

- July 20, 2021: Tame Grass on Native Grasslands: Risks and Opportunities (29 attendees)
- July 22, 2021: Interpreting and Applying Stocking Rates on Rangelands (22 attendees)
- July 27, 2021: Weed Ecology, Control, and Species of Concern in Alberta (26 attendees)
- July 29, 2021: Producer Perspectives (20 attendees)

All of these webinars, except the last one, can be found on the Prairie Conservation Forum website at www.albertapcf.org.

An article titled 'Southern Alberta Grazing School for Women is Back, Just in Webinar Form', by Anna Smith for the Prairie Post, was written about the online grazing course on July 27, 2021. This article can be found at:

<https://www.thestar.com/news/canada/2021/07/27/southern-alberta-grazing-school-for-women-is-back-just-in-webinar-form.html>.

Presentations/Training to Landholder Groups

MULTISAR had numerous conversations and meetings with individual landholders and landholder groups (over 300) 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. Fifty-two of those conversations were through in-person meetings, with the remaining conversations done either through email, text, by phone, or through on-line meeting set-ups.

Educational Presentations

When requested, MULTISAR gives presentations to various different groups on topics such as the MULTISAR process, species-at-risk, range topics, habitat enhancements, etc. This year, there were only two live presentations given due to COVID-19 restrictions, and three virtual presentations (Table 1).

Table 1. Summary of 2021–2022 presentations by MULTISAR.

Date	Presented to	Presentation	Attendance
July 14, 2021	Department of Fisheries and Oceans	Presentation about MULTISAR on western properties	25 attendees
August 13, 2021	American and Canadian Ornithological Conference	Presentation about MULTISAR and species-at-risk	40 attendees
January 26, 2022	Grasslands Bird Group	Presentation about MULTISAR survey methods	24 attendees
March 24, 2022	Lethbridge College Agriculture Students	Presentation about MULTISAR	60 attendees

In addition to educational presentations, MULTISAR often participates in meetings with government and non-profit environmental organizations to not only share what MULTISAR is doing, but to learn what other organizations are doing. It allows MULTISAR to stay up-to-date, collaborate, and share what works for MULTISAR. Table 2 shows what some of those meetings were about.

Table 2. Summary of 2021–2022 meeting topics.

Meetings with	Topic
Non-government non-profit environmental organizations	Funding opportunities; youth range days; southern Alberta grazing school for women; producer Leading the Way survey; research and monitoring; landowner survey development; letters of support; collaboration discussions; data sharing; habitat attribute guide; field work methods
Government agencies	Rapid Habitat Assessments; Central Grasslands Roadmap; MULTISAR process; coordination of field work efforts; reseeding; funding; field work methods
Companies	Bat condos; watering units; electric fencing units; portable wind shelters; native seed; ferruginous hawk poles; remote access cameras
Contractors/Consultants	Carbon sequestration sampling; term easement survey; virtual collars for cattle; MULTISAR databases; insect sampling; range surveys

Public Outreach

Website and Social Media

The MULTISAR website (www.multisar.ca) continues to be the key portal where information about the program, Beneficial Management Practices 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 and Facebook posts from this past year was 79 and 57, respectively.

Media and Other Publications

In addition to the MULTISAR newsletter, the *Grassland Gazette*, MULTISAR was interviewed for two articles and mentioned in a third. One article, titled 'Using a Conservation Assessment as a Springboard' featured in the Alberta Farmer Express, was about Alberta Conservation Association's SHARP program (Species Habitat and Ranch Partnership). This article can be found at: <https://www.albertafarmexpress.ca/news/using-a-conservation-assessment-as-a-springboard/>. The second article, titled 'A Bird's-Eye View of Majestic Raptors', also featured in the Alberta Farmer Express, is about ferruginous hawks (*Buteo regalis*) and the cameras that have been set up at a couple of nests on hawk poles in southern Alberta. This article can be found at: <https://www.albertafarmexpress.ca/news/a-birds-eye-view-of-majestic-raptors/>. Alexis Kienlen wrote both articles.

MULTISAR was mentioned in a third article written by Norine Ambrose of Cows and Fish for SEAWA (South-east Alberta Watershed Alliance) titled 'Native Grassland Stewardship'. This article can be found at: <https://mailchi.mp/78b4c030f9d4/seawa-summer-news-5088421> under the heading 'From our Friends and Partners'.

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 (HCS). 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 land base. 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 2021–2022

To date, MULTISAR has completed 67 HCSs on 559 765 acres of land within the Milk River and South Saskatchewan River watersheds (Table 3). In 2021, MULTISAR completed HCSs for six new properties in southern Alberta, totalling 11 532 acres. Work on these properties included detailed wildlife, range and riparian inventories.

Table 3. 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

Year*	# Landholder Participants	Acres Surveyed
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
2019	8	63 100
2020	6	33 640
2021	6	11 532
Total	67	559 765+

*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, 27 HCSs, which have been implemented for at least five years, have been reassessed (Table 4). Furthermore, seven HCSs have been reassessed for a second time. These reassessments entailed a re-survey 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 4. Habitat conservation strategy reassessment summary.

Year of HCS Reassessment	MULTISAR Participant	Size of Property (acres)
2011	1	62 050
2012	1	28 797
2013	3	49 012
2014	3	44 777
2015	4	10 111
2016	6	67 801
2017	2	43 068
2018	6	62 151

Year of HCS Reassessment	MULTISAR Participant	Size of Property (acres)
2019	3	52 375
2020	0	0
2021	5	54 709
Total	27*	474 851

*This number excludes the most recent reassessment for MP_1 in 2016; MP_4 in 2017; MP_7, MP_8 and MP_9 in 2018; MP_6 in 2019; and MP_16 in 2021.

Wildlife

To date, approximately 85 112 wildlife observations have been submitted to the Fish and Wildlife Management Information System (FWMIS) since 2004, including 4922 in 2021. Sixty-one different species at risk were recorded on HCS properties in 2021. Table 5 summarizes the species at risk observed on all HCS properties assessed (or reassessed) during the 2021 field season.

Table 5. Species at risk recorded on HCS properties during the 2021 field season.

Species	General Status ¹	Legislative Status	Observations	Feature	Significance
Birds					
American kestrel (<i>Falco sparverius</i>)	<i>Sensitive</i>	none	1		
Baird's sparrow (<i>Ammodramus bairdii</i>)	<i>Sensitive</i>	<i>Special Concern</i> ²	81		
Bald eagle (<i>Haliaeetus leucocephalus</i>)	<i>Sensitive</i>	<i>Not At Risk</i> ²	4		
Bank swallow (<i>Riparia riparia</i>)	<i>Sensitive</i>	<i>Threatened</i> ²	127	4 colonies	
Barn swallow (<i>Hirundo rustica</i>)	<i>May Be At Risk</i>	<i>Threatened</i> ²	25	1 nest	
Black tern (<i>Chlidonias niger</i>)	<i>Sensitive</i>	<i>Not At Risk</i> ²	2		
Bobolink (<i>Dolichonyx oryzivorus</i>)	<i>Sensitive</i>	<i>Threatened</i> ²	36		
Brewer's sparrow (<i>Spizella breweri</i>)	<i>Sensitive</i>	none	30		
Broad-winged hawk (<i>Buteo platypterus</i>)	<i>Sensitive</i>	none	1		
Chestnut-collared longspur (<i>Calcarius ornatus</i>)	<i>May Be At Risk</i>	<i>Threatened</i> ²	380	2 nests	
Clark's nutcracker (<i>Nucifraga columbiana</i>)	<i>Sensitive</i>	none	17		
Common nighthawk (<i>Chordeiles minor</i>)	<i>Sensitive</i>	<i>Threatened</i> ²	19		
Common yellowthroat (<i>Geothlypis trichas</i>)	<i>Sensitive</i>	none	29		
Eared grebe (<i>Podiceps nigricollis</i>)	<i>Sensitive</i>	none	56		

Species	General Status ¹	Legislative Status	Observations	Feature	Significance
Eastern kingbird (<i>Tyrannus tyrannus</i>)	<i>Sensitive</i>	none	100		
Evening grosbeak (<i>Coccothraustes vespertinus</i>)	<i>Secure</i>	<i>Special Concern</i> ²	2		
Ferruginous hawk (<i>Buteo regalis</i>)	<i>At Risk</i>	<i>Endangered</i> ³ <i>Threatened</i> ²	38	10 nests	
Golden eagle (<i>Aquila chrysaetos</i>)	<i>Sensitive</i>	<i>Not At Risk</i> ²	7		
Grasshopper sparrow (<i>Ammodramus savannarum</i>)	<i>Sensitive</i>	none	33		
Great blue heron (<i>Ardea herodias</i>)	<i>Sensitive</i>	none	7		
Greater sage-grouse (<i>Centrocercus urophasianus</i>)	<i>At Risk</i>	<i>Endangered</i> ^{2,3}	1		
Lark bunting (<i>Calamospiza melanocorys</i>)	<i>Sensitive</i>	<i>Threatened</i> ²	2		
Loggerhead shrike (<i>Lanius ludovicianus</i>)	<i>Sensitive</i>	<i>Threatened</i> ² <i>Special Concern</i> ³	12	1 family group	
Long-billed curlew (<i>Numenius americanus</i>)	<i>May Be At Risk</i>	<i>Special Concern</i> ^{2,3}	25		
Prairie falcon (<i>Falco mexicanus</i>)	<i>Sensitive</i>	<i>Special Concern</i> ³	15	3 nests	
Red-necked phalarope (<i>Phalaropus lobatus</i>)	<i>Secure</i>	<i>Special Concern</i> ²	1		
Sandhill crane (<i>Grus canadensis</i>)	<i>Sensitive</i>	<i>Not At Risk</i> ²	4		
Sharp-tailed grouse (<i>Tympanuchus phasianellus</i>)	<i>Sensitive</i>	none	170	8 leks	
Short-eared owl (<i>Asio flammeus</i>)	<i>May Be At Risk</i>	<i>Special Concern</i> ²	1		
Sora (<i>Porzana carolina</i>)	<i>Sensitive</i>	none	8		
Sprague's pipit (<i>Anthus spragueii</i>)	<i>Sensitive</i>	<i>Threatened</i> ² <i>Special Concern</i> ³	92		
Thick-billed longspur (<i>Rhynchophanes mccownii</i>)	<i>May Be At Risk</i>	<i>Threatened</i> ²	63		
Upland sandpiper (<i>Bartramia longicauda</i>)	<i>Sensitive</i>	none	13		
Western tanager (<i>Piranga ludoviciana</i>)	<i>Sensitive</i>	none	3		
Western wood-pewee (<i>Contopus sordidulus</i>)	<i>May Be At Risk</i>	none	37		
Herpetofauna					
Bullsnake (<i>Pituophis catenifer sayi</i>)	<i>Sensitive</i>	<i>Special Concern</i> ²	1	historic hibernaculum	1 snake shed

Species	General Status ¹	Legislative Status	Observations	Feature	Significance
Columbia spotted frog (<i>Rana luteiventris</i>)	<i>Sensitive</i>	<i>Not At Risk</i> ²	102	1 breeding site	
Eastern yellow-bellied racer (<i>Coluber constrictor</i>)	<i>Undetermined</i>	<i>Threatened</i> ²	1	historic hibernaculum	1 snake shed
Northern leopard frog (<i>Lithobates pipiens</i>)	<i>At Risk</i>	<i>Special Concern</i> ² <i>Threatened</i> ³	3		
Plains garter snake (<i>Thamnophis radix</i>)	<i>Sensitive</i>	none	2		
Prairie rattlesnake (<i>Crotalus viridis</i>)	<i>Sensitive</i>	<i>Special Concern</i> ^{2,3}	10	1 hibernaculum	4 snake sheds
Wandering garter snake (<i>Thamnophis elegans</i>)	<i>Sensitive</i>	none	5		
Western painted turtle (<i>Chrysemys picta</i>)	<i>Sensitive</i>	<i>Not At Risk</i> ²	1		
Western tiger salamander (<i>Ambystoma mavortium</i>)	<i>Secure</i>	<i>Special Concern</i> ²	13		
Mammals					
Badger (<i>Taxidea taxus</i>)	<i>Sensitive</i>	<i>Special Concern</i> ²	4	2 burrows	
Hoary bat (<i>Lasiurus cinereus</i>)	<i>Sensitive</i>	none	10		recorded acoustically
Little brown myotis (<i>Myotis lucifugus</i>)	<i>May Be At Risk</i>	Endangered ^{2,3}	226	3 roost sites	recorded acoustically
Long-tailed weasel (<i>Mustela frenata</i>)	<i>May Be At Risk</i>	none	2		
Northern myotis (<i>Myotis septentrionalis</i>)	<i>May Be At Risk</i>	<i>Endangered</i> ^{2,3}	1		recorded acoustically
Pronghorn (<i>Antilocapra americana</i>)	<i>Sensitive</i>	none	74		
Red bat (<i>Lasiurus borealis</i>)	<i>Sensitive</i>	none	23		recorded acoustically
Silver-haired bat (<i>Lasionycteris noctivagans</i>)	<i>Sensitive</i>	none	9		recorded acoustically
Western small-footed myotis (<i>Myotis ciliolabrum</i>)	<i>Sensitive</i>	<i>Special Concern</i> ³	7		Recorded acoustically

¹General status in Alberta (AEP 2020), ²legislative status under Canada's *Species at Risk Act* (Government of Canada [GOC] 2022), ³legislative status under Alberta's *Wildlife Act* (Government of Alberta [GOA] 2017) or designation as *Special Concern* by the Minister.

Range

The HCS properties assessed across southern Alberta in 2021 displayed a wide range of diversity in the plant communities and range health found. MULTISAR conducted 118 detailed range transects (vegetation inventories) and an additional 336 range health assessments, 74 tame pasture assessments, 31 forest health assessments and 270 visual reconnaissance plots

during the 2021 field season (Table 6). During these inventories, 20 species of rare plants and two rare plant communities were observed on the properties, as listed in Table 6.

Table 6. Summary of range work completed on HCS properties during the 2021 field season.

Property*	Acres	Sites Assessed	Plant Communities	Rare Plants
MP_16	961	9 detailed transects 3 range health assessments	6	Cock's comb cryptantha (<i>Cryptantha celosioides</i>) Cushion everlasting (<i>Antennaria dimorpha</i>) Downy paintbrush (<i>Castilleja sessiliflora</i>) Dwarf woollyheads (<i>Psilocarphus brevissimus</i> var. <i>brevissimus</i>)
MP_28	42 713	69 range health assessments 16 tame pasture assessments	35	Green milkweed (<i>Asclepias viridiflora</i>) Pursh's milkvetch (<i>Astragalus purshii</i>) Slender hawk's-beard (<i>Crepis altibarba</i>) Small-flowered hawk's-beard (<i>Crepis occidentalis</i>) Small-flowered sand-verbena (<i>Tripterocalyx micranthus</i>) Soapweed (<i>Yucca glauca</i>)
MP_29	807	2 range health assessments 4 tame pasture assessments	6	
MP_30	7811	29 range health assessments 1 tame pasture assessment	14	
MP_31	2417	16 range health assessments 10 tame pasture assessments	17	Limber pine (<i>Pinus flexilis</i>)
		13 detailed transects	60 total	Bearded fescue (<i>Festuca subblata</i>)
		28 range health assessments	2 rare plant communities:	Crested beardtongue (<i>Penstemon eriantherus</i>)
MP_67	2670	10 tame pasture assessments	aspen / thimbleberry	Limber pine
		11 forest health assessments	Douglas fir – limber pine / ground juniper / Foothills rough fescue	Silver-leaved scorpionweed (<i>Phacelia hastata</i>)
		66 visual reconnaissance plots		Western sweet cicely (<i>Osmorhiza occidentalis</i>)

Property*	Acres	Sites Assessed	Plant Communities	Rare Plants
		24 detailed transects		
MP_69	4493	59 range health assessments 16 tame pasture assessments 177 visual reconnaissance plots	54	Cock's-comb cryptantha Western false gromwell (<i>Lithospermum occidentale</i>)
		16 detailed transects		
MP_70	2914	18 range health assessments 6 visual reconnaissance plots	7	One-spike oatgrass (<i>Danthonia unispicata</i>)
		5 detailed transects		
MP_75	166	3 range health assessments	5	Long-leaved sagewort (<i>Artemisia longifolia</i>)
		39 detailed transects		
MP_62	Assessed 1241 in 2020; assessed the remaining 2891 in 2021	18 range health assessments 7 tame pasture assessments 9 forest health assessments 8 visual reconnaissance plots	24	Limber pine
		12 detailed transects		
MP_66	Assessed 7188 in 2020; assessed the remaining 5691 in 2021	91 range health assessments 10 tame pasture assessments 11 forest health assessments 13 visual reconnaissance plots	40	Stiff yellow paint brush (<i>Castilleja lutescens</i>) Soft-hairy false gromwell (<i>Onosmodium molle</i>) Limber pine

*Range inventories were not completed by MULTISAR on MP_71 (348 acres) and MP_72 (941 acres) because they had recently been completed as part of the Southern Alberta Land Trust Society (SALTS) program.

Riparian

The Alberta Riparian Habitat Management Society—Cows and Fish completed five riparian health assessments in the Milk River watershed, as part of its partnership with MULTISAR. In addition, 19 riparian health assessments were completed within the South Saskatchewan River watershed and nine riparian health assessments were completed within the Milk River watershed by contractors.

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 MULTISAR Habitat Enhancements

MULTISAR completed 51 new habitat enhancements within the Milk River and South Saskatchewan watersheds in 2021 and early 2022. Habitat enhancement projects included: the construction of seven artificial habitat structures; installation of wildlife-friendly fencing at four new sites and installed reflectors at three additional sites; the purchase of seven portable watering units; installation or upgrades to eight upland watering sites; two tree protection enhancements; four riparian protection enhancements; three shrub plantings; four weed control initiatives; seven enhancements to improve grazing management; and two native grass reseed projects.

Artificial habitat structures included the installation of five hawk poles to assist with the recovery of the *Endangered* ferruginous hawk and to help control Richardson's ground squirrels (*Urocyon richardsonii*) and the construction of two bat condos to provide a safe roosting location for little brown myotis away from human-occupied buildings. In Total, 4.8 km of new wildlife-friendly fencing was installed, and 13.6 km of fence was converted to wildlife-friendly specifications to improve pronghorn movement and cattle distribution, as well as prevent cattle from accessing riparian areas. Reflectors were placed on the top two wires of fences to reduce injuries/fatalities to wildlife, such as greater sage-grouse and sharp-tailed grouse. Portable watering units were used to provide cattle with clean, accessible water sources and exclude them from dugouts, wetlands and creeks that provide important habitat for amphibian species like the northern leopard frog. Upland watering sites also reduced livestock pressure around riparian areas and improved grazing distribution throughout the uplands. Upland watering sites included conventional water troughs, tire troughs, solar pumps, refurbishing five dugouts and the installation of a pipeline to supply flow to upland watering sites. Tree protection was used to limit beaver damage on mature cottonwood trees at two separate sites along a creek. Riparian protection enhancements included fencing off two riparian areas and one dugout so livestock could be kept to the surrounding uplands. Rig mats were also purchased to mitigate livestock damage in the riparian area at one stream crossing. Willow stakes were planted along two riparian areas to stabilize the banks and create wildlife habitat and silver sagebrush (*Artemisia cana*) seed was planted in the uplands of a native grass restoration to enhance greater sage-grouse critical habitat. Two new native grass restorations were seeded in 2021, totalling 340 acres. Herbicide was provided to one landowner to aid in controlling noxious weeds, including leafy spurge (*Euphorbia esula*) and Canada thistle (*Cirsium arvense*). Biocontrol agents were also purchased for three landowners to aid in the control of leafy spurge along the banks of the Old Man and South Saskatchewan Rivers. Lastly, grazing management tools consisted of portable electric fencing units and temporary fencing material. These units/structures were used to exclude cattle from sensitive areas, such as dugouts, coulees and wetlands to improve habitat for amphibians, gamebirds and waterfowl and promote grazing in areas that cattle tend to avoid.

In total, 316 on-the-ground enhancement projects have been completed by MULTISAR HCS/HMP participants since 2005 (Figure 1).

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.

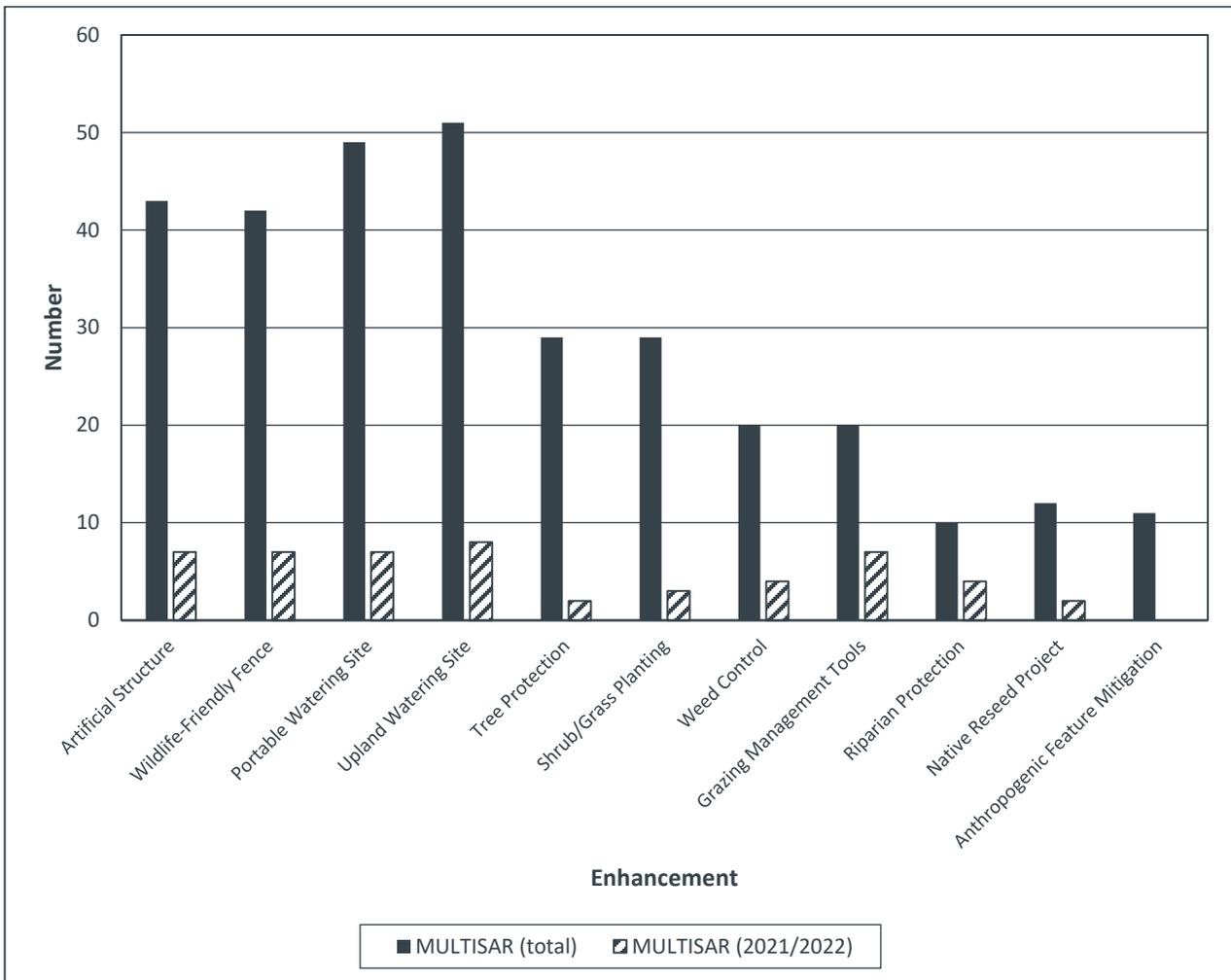


Figure 1. Habitat enhancement projects completed by category, by MULTISAR since 2005.

HCS Summary

Over the last 20 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 559 765 acres of land, of which a large portion is interconnected, allowing for landscape planning as well as with single property initiatives. MULTISAR will continue to make efforts to increase the land base 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, non-government organizations 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 are 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 occurring in a grassland area, three Robel pole measurements and litter weight estimates were taken following protocols by Robel *et al.* (1970) and Willoughby (2007) respectively. Three Robel pole measurements were also taken for multi-species point count survey locations occurring in forested areas, as well as three forest LFH¹ estimates (poke test measurements) and one plant community structure assessment as outlined by Adams *et al.* (2016). These measurements were collected to gain some insight regarding wildlife habitat for a particular land base.

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 base and from MULTISAR's Best Management Practices document (Rangeland Conservation Service Ltd. 2016).

HMP Achievements for the Fiscal Year 2021–2022

To date, MULTISAR has completed nine HMPs on 15 584 acres of land within the Milk River and South Saskatchewan watersheds (Table 7). In 2021, MULTISAR completed HMPs for two properties, which included detailed wildlife and simplified range health techniques.

Table 7. Habitat management plan participant summary.

Year	MULTISAR Participant	Acres Surveyed
2018	MP_8*	3479
2018	MP_47	1170
2019	MP_55	810
	MP_58	960
2020	MP_63	3280
	MP_64	1495

¹ Plant residue on forested sites is the collective organic layers of litter, fermenting and humidified residues above the mineral soil called LFH (Adams *et al.* 2016).

Year	MULTISAR Participant	Acres Surveyed
2021	MP_65	1910
	MP_68	880
	MP_74	1600
Total	9	15 584

*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 2 890 wildlife observations collected on HMP properties have been submitted to FWMIS. Thirty-six point counts were completed on the HMP properties in 2021 and thirty-three different species at risk were recorded. Table 8 summarizes the species at risk observed on all HMP properties assessed during the 2021 field season.

Table 8. Species at risk recorded on HMP properties during the 2021 field season.

Species	General Status ¹	Legislative Status	Observations	Feature	Significance
Birds					
American white pelican (<i>Pelecanus erythrorhynchos</i>)	<i>Sensitive</i>	N/A	5		
Baird's sparrow (<i>Ammodramus bairdii</i>)	<i>Sensitive</i>	<i>Special Concern</i>	26		
Bald eagle (<i>Haliaeetus leucocephalus</i>)	<i>Sensitive</i>	N/A	2		
Barn swallow (<i>Hirundo rustica</i>)	<i>Threatened</i>	<i>Threatened</i>	15		
Black tern (<i>Chlidonias niger</i>)	<i>Sensitive</i>	N/A	50		
Bobolink (<i>Dolichonyx oryzivorus</i>)	<i>Sensitive</i>	<i>Threatened</i>	1		
Brewer's sparrow (<i>Spizella breweri</i>)	<i>Sensitive</i>	N/A	2		
Chestnut-collared longspur (<i>Calcarius ornatus</i>)	<i>May Be At Risk</i>	<i>Endangered</i>	3		
Common yellowthroat (<i>Geothlypis trichas</i>)	<i>Sensitive</i>	N/A	3		
Eastern kingbird (<i>Tyrannus tyrannus</i>)	<i>Sensitive</i>	N/A	16		
Evening grosbeak (<i>Coccothrasustes vespertinus</i>)	<i>Secure</i>	<i>Special Concern</i>	1		Recorded Acoustically
Ferruginous hawk (<i>Buteo regalis</i>)	<i>At Risk</i>	<i>Endangered</i>	13	2 Nests	
Forster's tern (<i>Sterna forsteri</i>)	<i>Sensitive</i>	N/A	1		
Grasshopper sparrow (<i>Ammodramus savannarum</i>)	<i>Sensitive</i>	N/A	9		

Species	General Status ¹	Legislative Status	Observations	Feature	Significance
Great blue heron (<i>Ardea herodias</i>)	<i>Sensitive</i>	N/A	1		
Sandhill crane (<i>Grus canadensis</i>)	<i>Sensitive</i>	N/A	21		
Lesser yellowlegs (<i>Tringa flavipes</i>)	<i>Threatened</i>	N/A	1		
Pileated woodpecker (<i>Dryocopus pileatus</i>)	<i>Sensitive</i>	N/A	4		
Thick-billed longspur (<i>Rhynchophanes mccownii</i>)	<i>May Be At Risk</i>	<i>Threatened</i>	1		
Sharp-tailed grouse (<i>Tympanuchus phasianellus</i>)	<i>Sensitive</i>	N/A	6		
Sora (<i>Porzana Carolina</i>)	<i>Sensitive</i>	N/A	13		
Sprague's pipit (<i>Anthus spragueii</i>)	<i>Sensitive</i>	<i>Threatened</i>	5		
Western wood-pewee (<i>Contopus sordidulus</i>)	<i>May Be At Risk</i>	N/A	13		
Mammals					
Grizzly bear (<i>Ursus arctos</i>)	<i>At Risk</i>	<i>Threatened</i>	3		
Hoary bat (<i>Lasiurus cinereus</i>)	<i>Sensitive</i>	N/A	7		Recorded Acoustically
Little brown myotis (<i>Myotis lucifugus</i>)	<i>At Risk</i>	<i>Endangered</i>	11		Recorded Acoustically
Long-eared bat (<i>Myotis evotis</i>)	<i>Sensitive</i>	N/A	1		Recorded Acoustically
Pronghorn (<i>Antilocapra americana</i>)	<i>Sensitive</i>	N/A	7		
Red bat (<i>Lasiurus borealis</i>)	<i>Sensitive</i>	N/A	1		Recorded Acoustically
Silver-haired bat (<i>Lasionycteris noctivagans</i>)	<i>Sensitive</i>	N/A	7		Recorded Acoustically
Reptiles					
Plains garter snake (<i>Thamnophis radix</i>)	<i>Sensitive</i>	N/A	3		
Wandering garter snake (<i>Thamnophis elegans</i>)	<i>Sensitive</i>	N/A	1		
Amphibians					
Northern leopard frog (<i>Lithobates pipiens</i>)	<i>At Risk</i>	<i>Threatened</i>	6		

¹General status in Alberta (AEP 2020), ²legislative status under Canada's *Species at Risk Act* (GOC 2022), ³legislative status under *Alberta's Wildlife Act* (Government of Alberta [GOA] 2017) or designation as a *Special Concern* by the Minister.

Habitat

The HMP properties assessed in southern Alberta in 2021 displayed a wide range of diversity in plant communities and habitat attributes (litter weight, forest LFH thickness [poke test measurements], standing biomass [Robel pole measurements], forest plant community structure [layer assessment]). Three Robel pole readings were made at each HMP survey location, which translated into a total of 108 Robel pole readings during the 2021 field season (Table 9). Three litter weight estimates were also made at each HMP survey location occurring in grassland areas, resulting in a total of 32 litter weight estimates in 2021. For survey locations occurring in forested areas, 12 LFH thickness measurements and four plant community structure assessments were completed. During these inventories, no species of rare plants were observed on the properties.

Table 9. Summary of habitat assessment work completed on HMP properties during the 2021 field season.

Property	Acres	# of Robel Pole Readings	# of Litter Weight Estimates	# of Forest LFH Estimates	# of Forest Layer Assessments	Rare Plants
MP_68	880	63	17	12	4	None
MP_74	1600	45	15	N/A	N/A	None

Riparian

No riparian health assessments were completed for HMP properties in 2021.

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, forest, 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 has not yet completed any new habitat enhancements for HMP properties within the South Saskatchewan watershed in 2021-2022, however, there are numerous habitat enhancements being looked at for the two new properties. These potential habitat enhancements include: the purchase of a portable watering unit for the two properties, portable wind shelter fencing panels for one property, tree protection panels for one property, fencing around dugout/wetlands on both properties.

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 20 years, MULTISAR has become increasingly recognized and its HCS work has grown tremendously throughout the South Saskatchewan and Milk River watersheds. MULTISAR has developed HMPs for approximately 15 584 acres of land. These condensed assessments allow biologists to engage with more landholders sooner than would be possible if only HCSs were available, as only a limited number of detailed HCSs can be completed in a year. HMPs are a viable alternative that still allow for wildlife assessments and basic habitat surveys (litter weight, Robel pole, forest LFH, and forest layer assessment 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.

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, 83 assessments have been completed throughout the GNR and PNR, covering a total area of 156 294 acres. No SARC assessments were conducted in 2021-2022.

This was the ninth year in which BMP-specific assessments were to be completed. Since beginning these assessments in 2012, MULTISAR has completed 22 BMP assessments for a total of 58 152 acres. No BMP assessments were completed in 2021-2022, as no requests from landowners or referrals were made. 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.). Figure 2 summarizes the number of participating SARC plan landholders/properties per year over the 14 years of the program.

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.

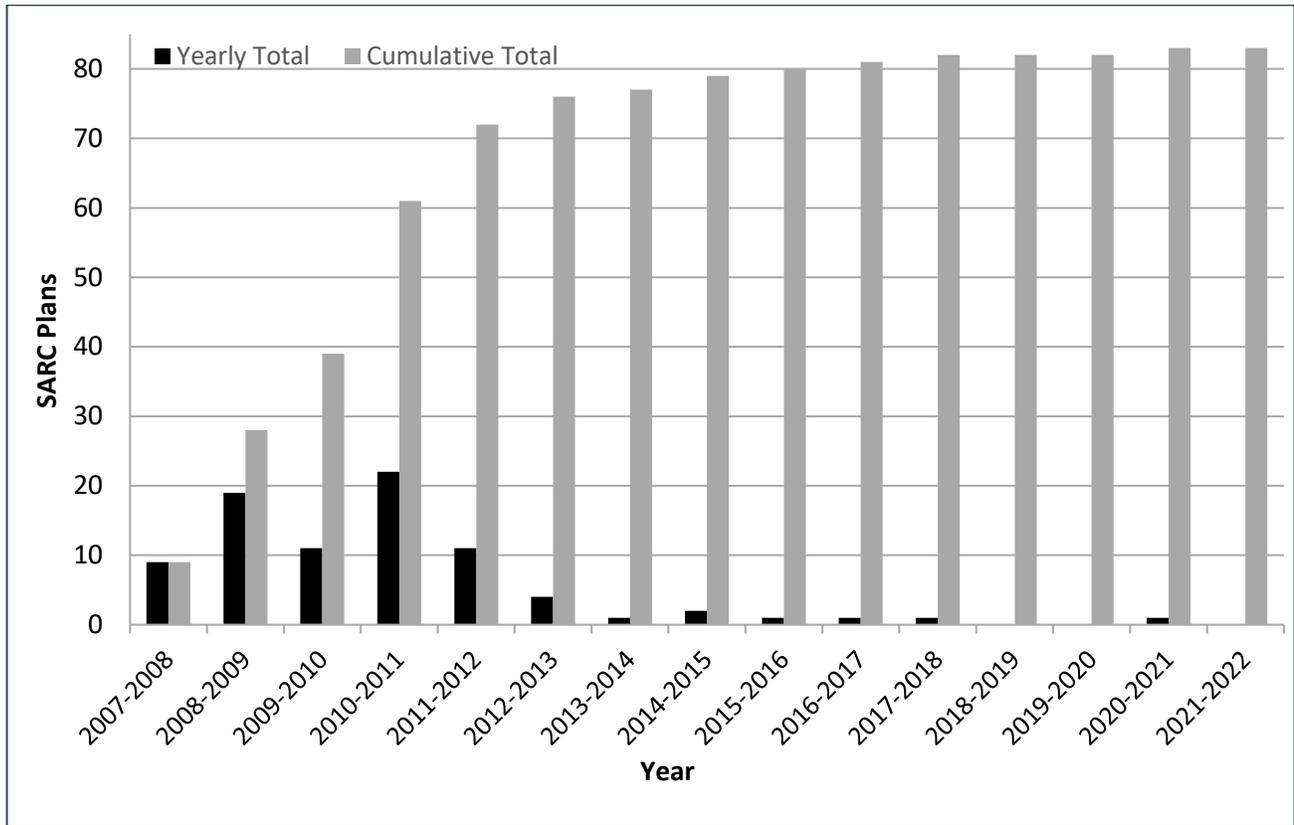


Figure 2. Number of SARC plans completed since program inception.

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 PNR 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.

Evaluation and Monitoring Program

The year 2021–2022 marks the twelfth year of MULTISAR’s evaluation and monitoring program. The process of our evaluation and monitoring program occurs on two levels: reassessment of properties that have had a HCS or a HMP for a minimum of five years and secondly, monitoring of enhancement project success on our properties with an HCS or an HMP. The following sections will provide a summary of MULTISAR’s evaluation and monitoring accomplishments for 2021–2022.

Evaluation of the HCS component of the MULTISAR Program

New HCS/HMP Participants

Commencement Questionnaire

In 2021–2022, the MULTISAR program worked with nine new participants (7 HCSs, 2 HMPs). New participants are presented with a short questionnaire that collects background information on their ranching operation as well as information on their values towards wildlife and natural habitats. The questionnaire consists of a combination of yes/no and open-ended questions with an opportunity to answer with multiple responses and opinions (Appendix A).

Since 2017, 32 new MULTISAR program participant questionnaires have been compiled and summarized. Seventy-two percent of the ranches have been managed by the same family for a minimum of 25 years, with several families having three or four generations working the same land. Prior to working with the MULTISAR program, only 13 participants had knowledge of MULTISAR’s work with species at risk and their habitat. All participants said their property was important for species at risk, with the exception of one rancher who was unsure if any species at risk occurred on their property. Surprisingly, 84% of the participants said species at risk did not hinder their operation but were a benefit to some extent (27/32). When asked what interests them the most about the MULTISAR program, respondents said they wanted advice with land management (20/32), wanted increased knowledge of range management (17/32), wanted increased knowledge of wildlife and wildlife habitat management (12/32), and were interested in how the MULTISAR program balances species at risk management and landholder interests (12/32).

HCS/HMP Participant Reassessments

An evaluation of the effectiveness of each HCS/HMP completed is scheduled to occur five years after its initiation. The focus of this assessment is to evaluate the HCS/HMP plans and recommendations to see if they are 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 2021–2022, we reassessed five MULTISAR Participant (MP) properties: MP_16, MP_28, MP_29, MP_30, and MP_31.

Evaluation of the HCS/HMP Process

During HCS/HMP evaluations, the following is completed:

- A subsample of the initial range health, riparian health assessments, and wildlife point counts are reassessed.
- The reassessment of the health of native and tame pastures is evaluated by completing range health assessments at original locations ensuring at least one transect is completed in each management unit of the property and usually associated with a wildlife point count.
 - Assessed range health is compared to the initial plan’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 $>10\%$).

- When vetting range health data, to be able to compare results, all scoring is confirmed to be on the same ranking scale. In particular, the noxious weed scores are adjusted in the current assessment year to reflect the same 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.
- Riparian health is reassessed at original polygon locations. A subsample is selected if funding constraints exist.
- Assessed wildlife surveys are completed at specific locations (multi-species point counts and species-specific surveys). In order to make comparisons, surveys should mirror as much as possible baseline methodologies. The subsample amount varies based on property size.
 - If the property is small (5000 acres or less), we complete roughly half of the original points counts. If the property is larger than 5000 acres, a maximum of 100 point counts are completed using either the 100 or 200 meter buffer size, with a preference for the 100 meter 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 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 200m point counts (prior to GVI's inception), emulate this unless the above criteria are not met. If 200m point counts do not fit within GVI polygons, complete 100m point counts or select a different point count location to survey.
- A landholder questionnaire is completed to document perspectives on the HCS process and its recommendations and their views on species at risk.
- Review and/or analysis of data collected during monitoring of completed enhancements recommended in the HCS.
- Achievement of MULTISAR's HCS goals are measured based on the following:
 - 1) desired range and riparian health is occurring,
 - 2) desired wildlife species are occurring on the site,
 - 3) some of the recommendations in the HCSs are being implemented,
 - 4) enhancements are having the desired effect, and
 - 5) MULTISAR is increasing awareness and knowledge about species at risk and is found to be beneficial to the ranching community.

HCS Participant Range Evaluation

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. Next, the difference between original and re-assessed range health scores are calculated. The mean difference between the range health scores were looked at to see if they were different than $\pm 10\%$ for areas where the objective was to “maintain” range health, greater than a 10% increase for areas where the objective was to “increase” range health, and a change of more than -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 using JMP 16.1.0). 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_16 had its second reassessment;

an Analysis of Variance (ANOVA) was used to determine whether the range health means across the 3 years are different, and if a significant difference was detected we used a Tukey test to complete among years comparisons.

MP_16

Twelve native range sites were reassessed at MP_16 in 2021. Baseline assessments at these sites were originally conducted in 2010 and the first reassessment was conducted in 2015. Over the three assessments, range health has changed, and means did vary between years (2010: 66.4%, 2015: 55.6%, 2021: 74.2%; Figure 3). Since 2015, there has been an increase in range health category trends with 66.7% of the assessments in the “Healthy” or “High Healthy” categories, and no assessments rated “Unhealthy”. In comparison, in 2015 only 8% of assessments were in the “Healthy” range and 33% were considered “Unhealthy”. Eight of the nine sites desired to increase in range health from 2015 scores did increase more than 10% in health and all areas wanting to maintain health either maintained or increased in health percentages.

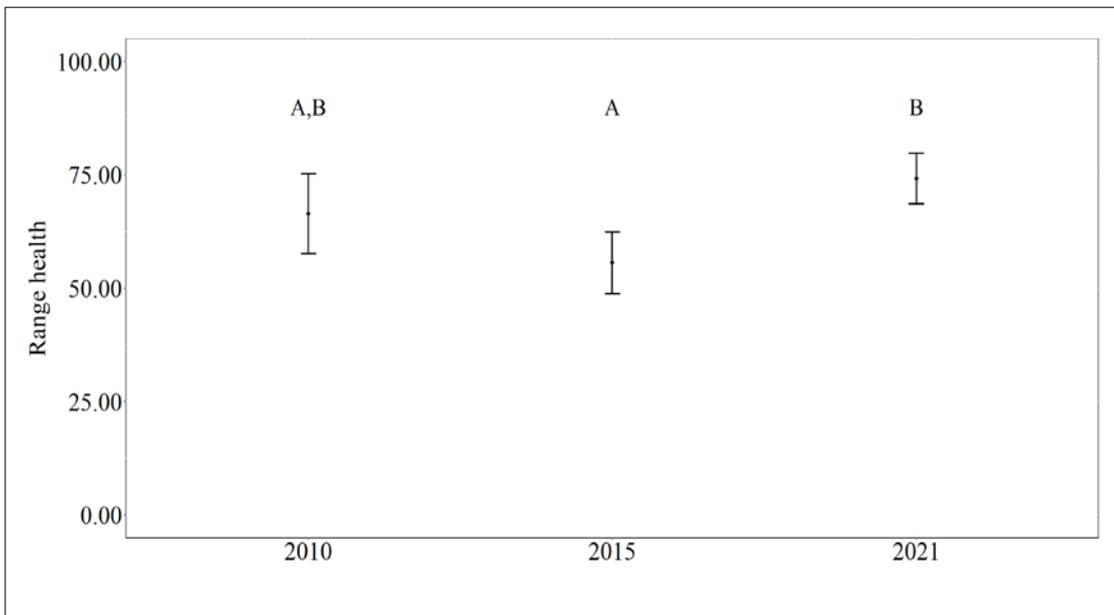


Figure 3. Range health trend in percent with upper and lower confidence intervals for MP_16 from baseline year to current year. Similar letters above indicate no significant difference based on Tukey test results.

MP_28

MP_28 had 85 range health sites reassessed in 2021, with 69 sites being native grassland areas and 16 sites of tame pasture. Baseline assessments for the health of native pastures scored 73.7% (± 17.7) and 2021 health scores averaged 76.3% (± 14.3 ; $t = 1.32$, $p = 0.19$). When looking at tame pastures, range health increased from 74.8% in 2014 to 82.6% in 2021.

MP_29

MP_29 is a small property with only six range health sites revisited with baseline assessments scoring a mean health score of 61.8% (± 9.7) and 2021 health scores averaging 74.0% (± 15.3 ; $t = 2.51$, $p = 0.05$). Four sites were desired to maintain range health and two sites desired to increase. Three of the maintain sites increased in health more than 10 percent and both increase sites maintained their scores within 1% of original evaluation.

MP_30

Twenty-nine native and one tame range sites were reassessed at MP_30 in 2021. Baseline assessments at these sites were originally conducted in 2015. The overall health at sites changed from 72.8% ± 16.2 in 2015 to 75.1% ± 13.3 in 2021 ($t = 1.13$, $p = 0.27$). The predetermined goals for the property were to increase range health (>10%) at 14 locations and on these sites, there was an increase in health by an average of 8.7% ($t = 3.38$, $p = 0.0049$) with only two sites not seeing a health

improvement. Sixteen range sites on MP_30 were aiming to maintain their range health (stay within 10%) and on average this goal was met ($t = 1.42$, $p = 0.17$) with a mean range health difference of 3.3%.

MP_31

MP_31 had 26 range health sites reassessed in 2021, with 17 sites being native grassland areas and nine sites tame pasture. Baseline assessments scoring a mean health score of 72.6% (± 18.5) and 2021 health scores averaging 81.4% (± 13.9 ; $t = 3.49$, $p = 0.0018$). When looking at native sites only the mean range health increased from 68.3% to 78.3% in 2021. When looking at tame pastures, range health increased from 80.7% in 2016 to 87.2% in 2021. Eighteen sites were desired to maintain range health and eight sites desired to increase. Eleven of the sites desired to maintain range health sites met goals with five other maintain sites increasing more than 10% in health scores. Two of the goals wanting to maintain health decreased more than 10%. Six of the eight sites need to increase in health did meet this goal with the other two locations maintaining range health within 10 percent.

HCS/HMP Participant Wildlife Evaluation

A subset of wildlife surveys from the baseline years on MP_16, MP_28, MP_30, MP_31, and MP_29 were repeated in 2021. For this reporting, we will focus on multi-species point count surveys with comparisons on species richness and species diversity between the baseline and reassessment years. We also look at the top ten species recorded during each year.

MP_16

Eight multi-species point counts were conducted at MP_16 in 2021 and compared with wildlife information from 2015 and 2009. Species richness has significantly decreased in the last six years from 4.6 ± 1.4 to 2.4 ± 1.1 ($p < 0.05$). Analysis including all three assessment years also revealed that species richness has significantly changed ($F = 8.9$, $p < 0.01$). Species richness did not differ significantly between 2009 and 2015 but both years had significantly greater richness than from 2021. There was significant difference in species diversity from 2015 (1.3 ± 0.4) to 2021 (0.7 ± 0.5 ; $p < 0.05$). Analysis that included all three years showed that year was an important distinguishing factor for species diversity ($F = 6.2$, $p < 0.01$). Species diversity was not different between 2009 and 2015, but species diversity for both years was significantly greater than in 2021.

MP_28

Eighty-one multi-species point counts were repeated at MP_28 in 2021 and compared with wildlife data from 2014. Species richness decreased significantly from 5.7 ± 2.2 to 4.0 ± 1.3 ($p < 0.001$, $t = 6.56$). Species diversity also decreased significantly from 1.4 ± 0.4 to 1.2 ± 0.4 ($p < 0.001$, $t = 4.69$).

MP_29

Fourteen multi-species point counts were repeated at MP_29 in 2021 and compared with wildlife information from 2015. Species richness has increased slightly in the last five years from 3.5 ± 1.9 to 3.6 ± 2.2 ($t = 0.13$, $p = 0.9$). There was also no significant difference in species diversity from 2015 (1.1 ± 0.6) to 2021 (0.9 ± 0.7 ; $t = 1.13$, $p = 0.28$).

MP_30

Twenty-six multi-species point counts were conducted at MP_30 in 2021 and compared with wildlife information from 2015. Species richness has increased slightly in the last five years from 4.1 ± 1.7 to 4.7 ± 1.7 ($t = 1.43$, $p = 0.17$). There was also no significant difference in species diversity from 2015 (1.2 ± 0.5) to 2021 (1.3 ± 0.4 ; $t = 0.55$, $p = 0.59$).

MP_31

Twenty-five multi-species point counts were conducted at MP_31 in 2021 and compared with wildlife information from 2016. Bird species richness has decreased in the last five years from 3.4 ± 2.2 to 1.8 ± 1.3 ($t = 3.61$, $p < 0.01$). There was also significant difference in species diversity from 2016 (1.0 ± 0.7) to 2021 (0.5 ± 0.5) ($t = 3.24$, $p < 0.01$).

Monitoring Habitat Enhancements on MULTISAR Participant Properties

To aid in the evaluation process, enhancement activities are monitored periodically to determine whether project goals and objectives are being accomplished (Margoluis and Salafsky 1998). For habitat enhancements to be effective, clearly defined measures of success are needed to allow for adaptive management (Salafsky *et al.* 2002). Problems identified and corrective actions applied during monitoring can help direct future enhancements and/or monitoring protocols. Determining the success of an enhancement can be a complex question where 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), which reinforces our conscientiousness of being adaptive.

Over 50 recommended enhancements, implemented on several MULTISAR participant properties, were monitored in 2021–2022. The following is a summary of the key findings.

Restoration Projects (RPs)

The MULTISAR program has done several types of restoration projects over the years (see Downey *et al.* 2011; Section 5.3.1). Conversion of cropland back to native grasses can benefit a suite of native wildlife species, however, native grassland restoration takes many years to accomplish. Long-term monitoring of these areas will be necessary to determine trends in wildlife species utilization and range health. In 2021–2022, a total of nine restoration sites on three MULTISAR participant properties had wildlife monitoring surveys completed: one restoration site on MP_2, three sites on MP_7, and five on MP_18.

RP_01 on MP_2 was reseeded in 2010 and there have been many issues with seed catch and weeds, such as downy brome. Wildlife species observed on this property have varied but increased desirable species like grasshopper sparrow and Sprague's pipit have appeared at times over the survey years; however, in the summer of 2021, no species at risk were recorded (Figure 4). Robel pole measurements were taken at each point count to help measure habitat cover and their results ranged from 1 cm – 5 cm.

The first reseed on MP_7, RP_01, has seen a gradual shift in fewer generalist songbird species such as horned lark (*Eremophila alpestris*) and savannah sparrow (*Passerculus sandwichensis*) and more consistent occurrences of obligate species such as Sprague's pipit seen every survey year except for one and Baird's sparrow, which was observed every year surveyed (Figure 5). Robel pole measurements were taken at each point count to help measure habitat cover and their results ranged from 3 cm – 5 cm. On the second reseeded area for MP_07 (RP_02), species such as western meadowlark (*Sturnella neglecta*) and savannah sparrow have consistently been recorded every year with horned lark, vesper sparrow (*Pooecetes gramineus*) and grasshopper sparrow most years (8/9, 8/9, 7/9 respectively; Figure 6). Sprague's pipits and Baird's sparrow have been observed five of the nine survey years. Robel pole measurement at point counts ranged from 0 cm – 4 cm. In 2021, MP_7 reseeded 120 acres of crop to native grasses. Baseline bird surveys were complete and from the six point counts assessed the only grassland songbird recorded was the horned lark in addition to one marbled godwit (*Limosa fedora*), two ring-billed gulls (*Larus delawarensis*), and one ferruginous hawk.

Re seeding on MP_18 has occurred over several years from 2011 to 2018. These re seeding projects on MP_18 are broken down into four sites for the purpose of this report. MP_18 RP_01, RP_02, RP_03, and RP_04/5 were reseeded in the fall of 2011, and spring 2012, 2016, and 2017/2018, respectively. Range health trends (in percentage) for the 9-12 sites since 2016 are shown in Table 10.

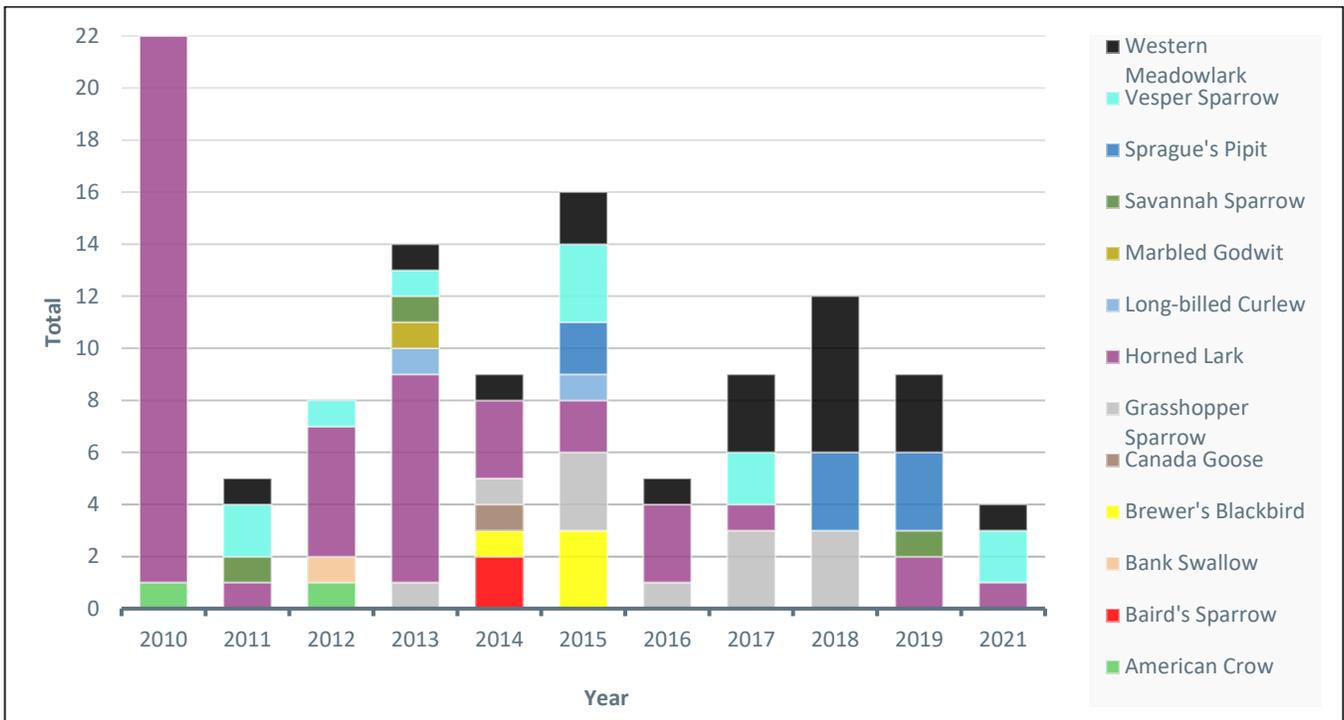


Figure 4. MP_02 RP_01 grassland bird trend in reseeded area.

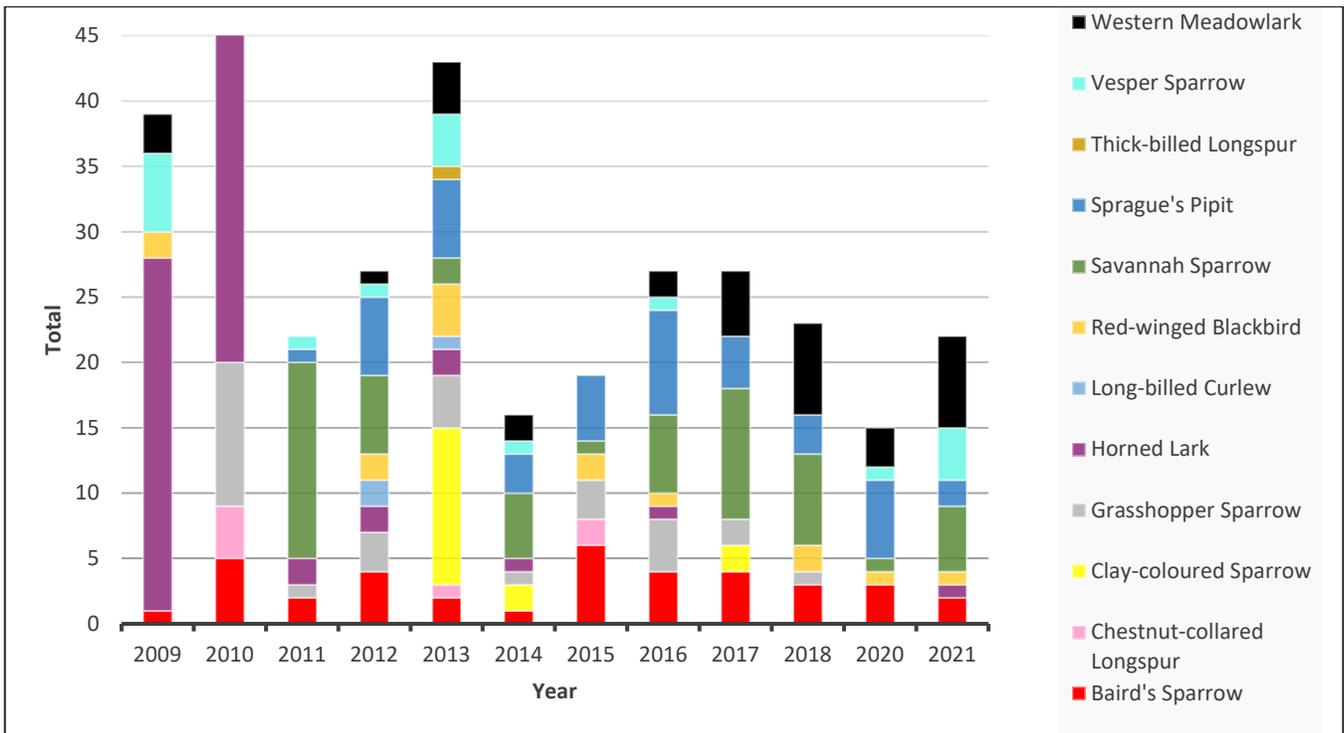


Figure 5. MP_07 RP_01 grassland bird trend in reseeded area.

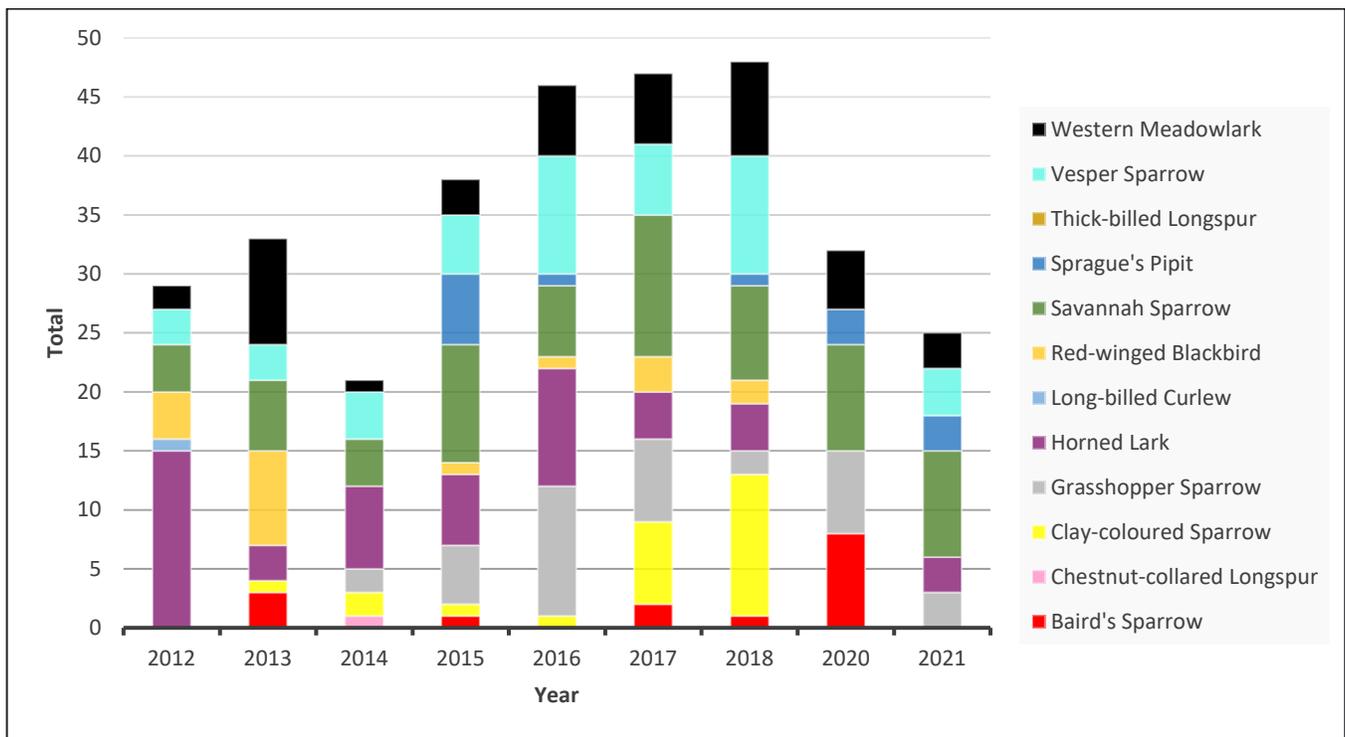


Figure 6. MP_07 RP_02 grassland bird trend in reseeded area.

Table 10. MP_18 range health trends at survey locations from 2016, 2019, and 2021.

Location	Range Health 2016	Range Health 2019	Range Health 2021	Trend 2016-2019	Trend 2019-2021
1	97	77	84	Downwards	Stable
2	75	60	72	Downwards	Upwards
3	60	70	80	Upwards	Upwards
4	58	68	75	Upwards	Upwards
5	62	67	63	Stable	Stable
6	75	85	75	Stable	Stable
7	74	87	84	Upwards	Stable
8	75	81	78	Stable	Stable
9	77	91	96	Upwards	Stable
10	N/A	42	71	N/A	Upwards
11	N/A	36	61	N/A	Upwards
12	N/A	13	41	N/A	Stable (no category change but trending up)

In 2021, 41 wildlife point counts were completed at reseed and control sites. Figures 4 to 10 show the changes in abundance over time for some of the grassland bird species at the different reseeded projects. Overall, 18 species were recorded on MP_18 RP_01 and 19 on RP_02 in 2021. Notable species include grasshopper sparrow, Baird's sparrow, Sprague's pipit, Brewer's sparrow, and sharp-tailed grouse. For RP_01, pipits and Baird's sparrows were first recorded in this reseed in 2016 and have been observed every year since. Baird's sparrows were first recorded in 2013 and Sprague's pipit in 2015 for RP_02. Chestnut-collared longspurs have been absent from RP_01 since 2013 and have only been recorded sporadically on RP_02. Robel pole measurements in RP_01 ranged from 2 cm to 5 cm and from 3 cm to 12 cm in RP_02. Baird's sparrows have been present on RP_03 for the last three years and were recorded for the first time on RP_04/5 in 2020, grasshopper sparrows were also found at both sites. The highest abundance of horned larks in 2021 on any of the reseeded areas for MP_18 was on RP_04/5. Robel pole measurements for RP_03 were from 5 cm to 8 cm and RP_04/5 was 3 cm to 6 cm.

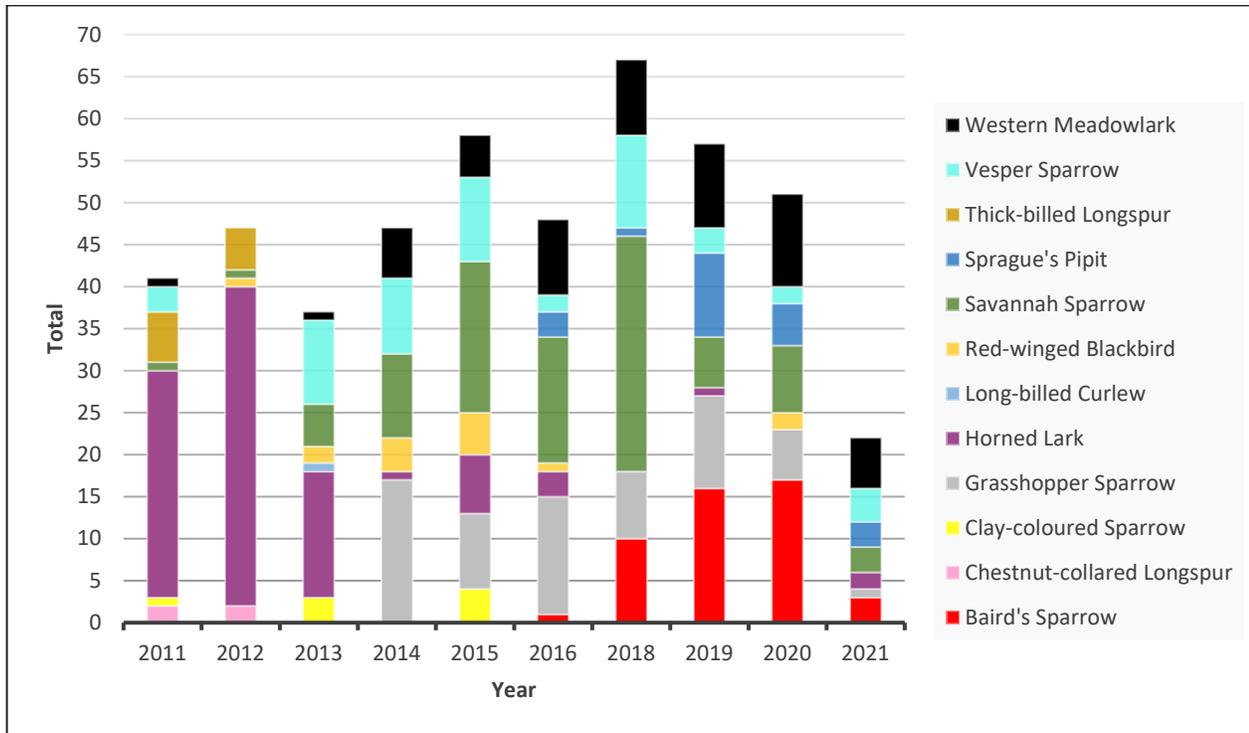


Figure 7. MP_18 RP_01 grassland bird trend in reseeded area (seeded in fall of 2011).

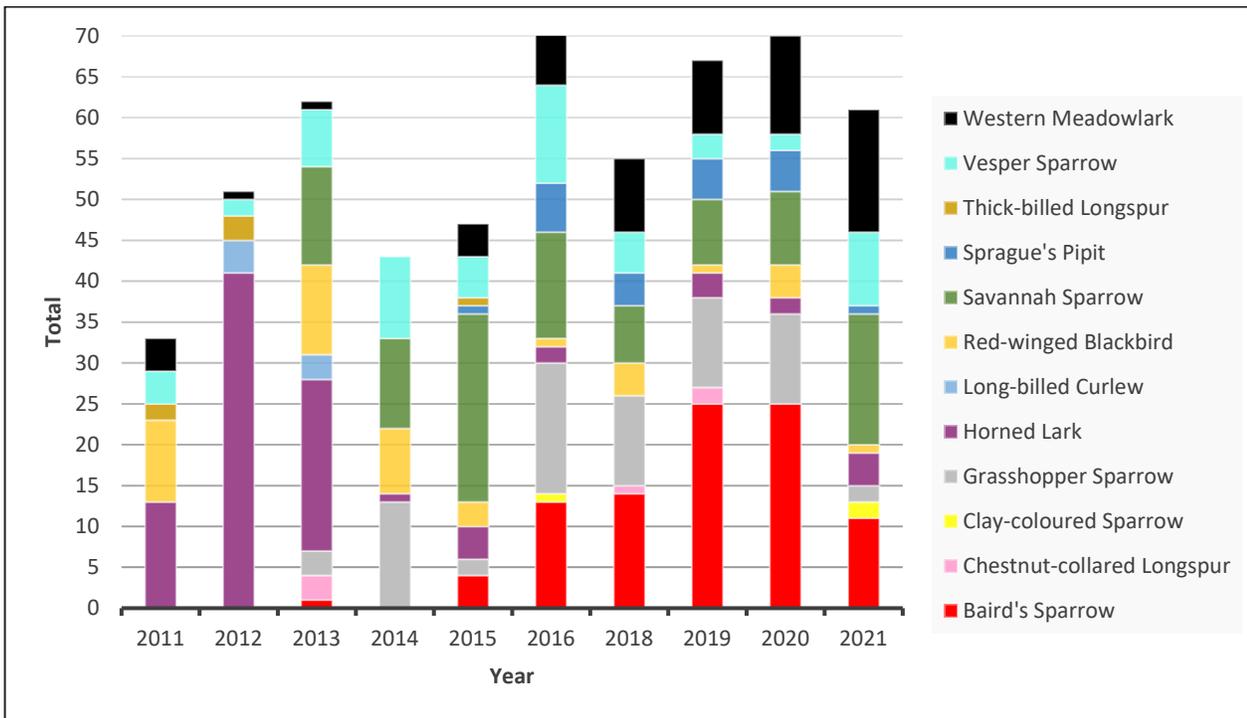


Figure 8. MP_18 RP_02 grassland bird trend in reseeded area (seeded in spring of 2012).

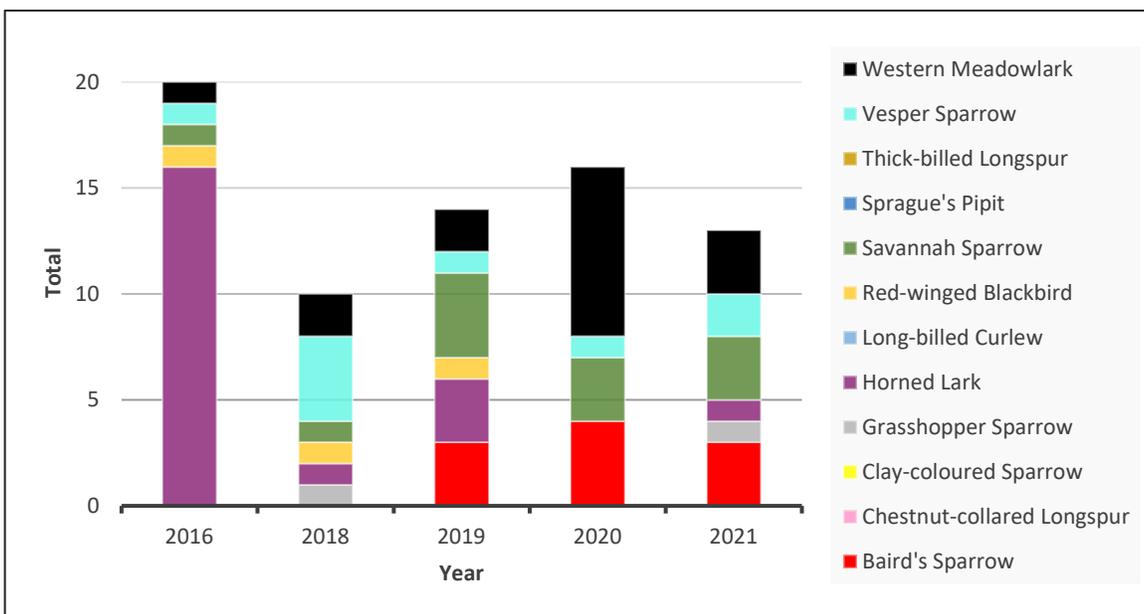


Figure 9. MP_18 RP_03 grassland bird trend in reseeded area.

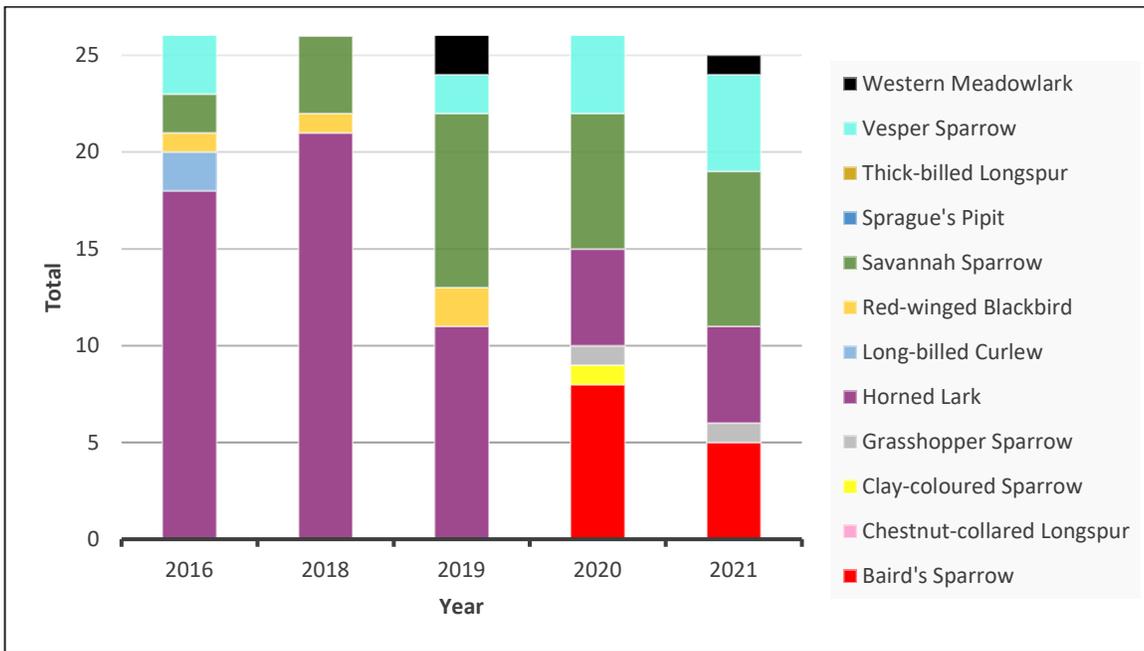


Figure 10. MP_18 RP_04/5 grassland bird trend in reseeded area.

Shrub/Forb/Grass Plantings

Over the span of several years, the MULTISAR program has planted several different native shrub, forb, and grass species in plug form (i.e., plugs of thorny buffaloberry (*Shepherdia argentea*), chokecherry (*Prunus virginiana*), silver sagebrush, willow species (*Salix sp.*), American vetch (*Vicia americana*), golden bean (*Thermopsis rhombifolia*), and needle-and-thread grass (*Hesperostipa comata*). In addition, needle-and-thread grass and silver sagebrush seeds have been spread/scattered on our native reseeded project areas. Shrub planting, in addition to helping with decreasing erosion, can increase nesting habitat for a variety of wildlife species, such as loggerhead shrikes, and increase forage and winter habitat for greater sage-grouse, sharp-tailed grouse, and pronghorn. When possible, plantings will be monitored annually 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. Four riparian shrub plantings were monitored in 2021 for one property (MP_6) with survival success for the willows ranging from 2% to 90%. At MP_44, riparian shrubs planted in 2020 were monitored and deemed to have a survival rate of 90%. This success rate was achieved in part by the age and quality of the shrubs planted (large root masses) as well as the landowner helped by weeding and watering the site.

Artificial Nesting/Roosting Structures

Artificial structures are used by the MULTISAR program 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/condos, and burrowing owl burrows. Refer to Section 5.3.3 of Downey *et al.* (2011) for objectives and desired measures of success for MULTISAR's artificial structures.

Artificial nesting structures monitored in 2021–2022 included 14 nest poles installed for ferruginous hawks. Areas in vicinity of several nest poles were also surveyed for Richardson's ground squirrels to help determine prey availability for ferruginous hawks (Table 11). Nine of the 14 poles surveyed had confirmed nesting by ferruginous hawks.

Table 11. Ferruginous hawk artificial nesting structures and corresponding Richardson's ground squirrel monitoring in 2021.

Property	2015 Survey Effort and Results	2016 Survey Effort and Results	2017 Survey Effort and Results	2019 Survey Effort and Results	2020 Survey Effort and Results	2021 Survey Effort and Results	2021 Desired Effort/Trend
MP_6	1.51 km ²			1.90 km ²	1.90 km ²		
3 nest poles 2013	142 Richardson's ground squirrels	No data	No data	124 Richardson's ground squirrels	124 Richardson's ground squirrels	No data	All six nest poles had active nesting ferruginous hawks
3 nest poles 2020							
MP_8							
3 nest poles 2012	2.39 km ² 210 Richardson's ground squirrel	2.13 km ² 228 Richardson's ground squirrel	2.13 km ² 67 Richardson's ground squirrel	2.13 km ² 131 Richardson's ground squirrel	No data	1.63 km ² 102 Richardson's ground squirrel	3 of the 4 nest poles were active and five ferruginous hawks observed
1 nest pole 2014							
MP_25	2.50 km ² 59 Richardson's ground squirrel	2.50 km ² 43 Richardson's ground squirrel	2.50 km ² 113 Richardson's ground squirrel	2.50 km ² 51 Richardson's ground squirrel	No data	2.50 km ² 57 Richardson's ground squirrel	Undetermined as nest pole was not visible
MP_26	2.39 km ² 177 Richardson's ground squirrel	2.26 km ² 95 Richardson's ground squirrel	No data	2.01 km ² 79 Richardson's ground squirrel	No data	1.88 km ² 9 Richardson's ground squirrel	Extremely large nest on one pole but could not determine if female ferruginous hawk was actively nesting
MP_42				1.38 km ²	1.51 km ²	1.51 km ²	
1 nest pole 2018	No data	No data	No data	11 Richardson's ground squirrels	12 Richardson's ground squirrels	11 Richardson's ground squirrels	Nest pole not active

Invasive Plant Control

Sites invaded by noxious and restricted weed species experience reduced range health as invading species quickly replace 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 time frames for weed control enhancement sites. No sites were monitored in 2020–2021. Biocontrol beetle release for leafy spurge control at two new sites was completed (Figure 11).



Figure 11. Leafy spurge beetle (*Aphthona* sp.) release at a large leafy spurge patch in 2021.

Watering Systems

For the MULTISAR program, water improvement monitoring can occur at two levels depending on the scale of impact. We discuss seasonal and permanent sites for the last year.

Portable Watering Units

Portable watering units are used to help reduce impacts to wetlands/riparian areas, better distribute cattle throughout the pasture, and to aid in providing a water source if not present in a pasture. Portable watering units can attract cattle away from wetlands/riparian areas thereby improving wildlife habitat by increasing emergent vegetation, reducing erosion of slopes and shoreline by livestock, and increasing the longevity of wetlands/riparian areas. Providing access to clean water results in livestock drinking more, spending more time grazing and less time resting, resulting in more weight gain and improved overall health (Willms et al. 2002).

Portable watering units are being used by several MULTISAR participants. Since they are portable, these units have been used at various locations on participating properties assisting with water distribution where needed. Many of the dugouts where these units have been in use have demonstrated an increase in bank vegetation, increased presence of shrubs, and less water turbidity (Figure 12).



Figure 12. Portable watering unit in use in conjunction with an electric fence to keep cattle out of a dugout in 2021.

Upland Watering Sites

Upland watering sites such as wells, dugouts, permanent troughs, etc. can be used to attract cattle into areas that are underutilized to create improved grazing distribution and increased grazing pressure in specific areas to benefit targeted wildlife species. In addition, upland watering sites can also help decrease impacts on natural wetlands and riparian areas in the same pasture. Refer to Section 5.3.6 of Downey *et al.* (2011) for objectives, desired measures of success, and monitoring time frames for upland watering sites. Three upland watering sites were monitored in 2021. Several wildlife species were recorded at the newer dugout on MP_7, including blue-winged teal (*Anas discors*), red-winged blackbird (*Agelaius phoeniceus*), willet (*Catoptrophorus semipalmatus*), marbled godwit, Wilson's phalarope (*Phalaropus tricolor*), and Richardson's ground squirrels using the banks of the dugout. On MP_73, three upland watering sites have been established to keep cattle out of a small creek. Species found in the vicinity of the enhancement include tree swallow (*Tachycineta bicolor*), brewer's blackbird (*Euphagus cyanocephalus*), savannah sparrow, clay coloured sparrow (*Spizella pallida*), Wilson's snipe (*Gallinago gallinago*), American robin (*Turdus migratorius*), house wren (*Troglodytes aedon*), gray jay (*Perisoreus canadensis*), brown-headed cowbird (*Molothrus ater*), Lincoln's sparrow (*Melospiza lincolni*), alder flycatcher (*Empidonax alnorum*), and northern pocket gopher (*Thomomys talpoides*).

Tree and Shrub Protection

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

Monitoring occurred at one site, MP_39, in 2021-2022. At this location, over 50 riparian trees were wrapped in 2018. Beavers are welcome on the property for their ecosystem functions of capturing and storing water abilities. To help maintain some of the larger trees and shrubs along the creek on the property, MULTISAR assisted with wrapping many more trees in 2021 (Figure 13).



Figure 13. Kristen Rumbolt Miller with a large, wrapped cottonwood tree.

Wildlife-Friendly Fencing and Fence Reflectors

All fence lines constructed with funding from MULTISAR are wildlife friendly, which includes a smooth double stranded bottom wire at least 46 cm off the ground and a top wire at a maximum height of 101 cm. Where required, vinyl markers are also installed to help avoid avian collisions. In 2021–2022, the following properties completed wildlife-friendly fencing projects: MP_1, MP_23, MP_41, MP_59, and MP_73 which will be checked in the summer of 2022 to ensure they are built to wildlife-friendly standards. Wildlife fence reflectors were installed on two properties (MP_13 and MP_51).

Grazing Management Tools

Several MULTISAR participants have enhancements to assist with grazing management. Mobile electric fence trailers are becoming popular for their ease of use and versatility to move from one pasture to another to provide temporary fencing to attain desired grass utilization or to protect an area. Two sites were monitored for the use of portable electric fencing in 2021–2022 (MP_51 and MP_57). At all sites, units were in operation and provided the rancher with a good tool to support their grazing management (Figure 14).



Figure 14. Electric fence used to subdivide a pasture for a certain desired range management condition.

Monitoring of Habitat Enhancements in 2022-2023

In 2022–2023, MULTISAR will continue to monitor a sub-sample of enhancement projects to determine whether desired effects are occurring. Table 12 lists the proposed enhancement monitoring schedule.

Table 12. Planned monitoring of enhancement projects in 2022-2023.

Enhancement Type and Associated Items to Monitor	# of Sites
Artificial Structures Nest poles/Incorporating 5 current Richardson's ground squirrel transects Bat Condos looking for bat activity	26
Restoration Projects Range health transects and wildlife point counts	10
Shrub/Forb/Grass Plantings Measure survival of planted species (count or measure patch)	3
Weed Control Biocontrol sites	6
Portable and Upland Watering Sites Wildlife point counts, range health transects, and photos taken	10
Tree and Shrub Protection Wildlife point count, vegetation regrowth recorded, photos taken	15
Grazing Management Tools Document pastures where portable electric fencer is being used. If used in same location multiple years, measure litter at one location inside fencing and one location outside fencing. Take photo reference points	5

Future Direction

In 2022-2023, 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 seven new HCSs (~39 320 acres) and four HMPs (~3120 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 (pending COVID-19 restrictions).
3. Research, Monitoring and Data Management Program:
 - 3.1 Assist AEP in conducting sharp-tailed grouse monitoring on leks in southeastern Alberta.
 - 3.2 Participate in the five-year monitoring of ferruginous hawks throughout their range in collaboration with AEP.
 - 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 one or two 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 four properties (~91 200 acres), originally assessed in 2004, 2017 and 2018 to measure how effective the HCS plan was at influencing habitat management, habitat value for species at risk and the landholders' perceptions of species at risk.
- 3.8 Monitor 75 (of approximately 316) habitat enhancement projects implemented within MULTISAR's program area since 2005.
- 3.9 Submit all wildlife observation data collected to FWMIS annually.
- 3.10 Continue to analyze MULTISAR's point count and range health data to examine habitat requirements of specific grassland bird species in the Mixedgrass, Dry Mixedgrass and Foothills Fescue Natural Subregions of Alberta.
- 3.11 Submit all range health assessment data on Crown lands to the provincial GLIMPS database on an annual basis.

Literature Cited

Adams, B.W., G. Ehlert, C. Stone, M. Alexander, D. Lawrence, M. Willoughby, D. Moisey, C Hincz, A. Burkinshaw, J. Richman, K. France, C. DeMaere, T. Kupsch, T. France, T. Broadbent, L. Blonksi, A.J. Miller. 2016. Rangeland Health Assessment for Grassland, Forest and Tame Pasture. AEP, Rangeland Resource Stewardship Section.

Alberta Environment and Parks. 2020. The general status of Alberta wild species 2020. URL: <https://extranet.gov.ab.ca/env/wild-species-status/default.aspx>. [Accessed 10 February 2022].

Bailey A., D. McCartney and M. Schellenberg. 2010. Management of Canadian prairie rangeland. Agriculture and Agri-Food Canada, Government of Canada. Swift Current, SK. 58 pp.

Downey, B.A., P.F. Jones and C.A. Koenig. 2011. MULTISAR evaluation and monitoring protocol. Pages 32–47 in Rumbolt, K.S., F. Blouin, B.A. Downey, B.L. Downey, C.A. Koenig, D.J. Jarina, P.F. Jones, J.P. Landry-DeBoer and E.R. Wesley. MULTISAR: a multi-species conservation strategy for species at risk 2010–2011 report. Alberta Sustainable Resource Development, Fish and Wildlife Division, Alberta Species at Risk Report No. 141. Edmonton, AB. 84 pp.

Fletcher, R., A. Cilimburg and R. Hutto. 2007. Evaluating habitat restoration at O’Dell Creek using bird communities: 2006 report. Avian Science Center, University of Montana. Missoula, MT. 30 pp.

Government of Alberta. 2017. Species assessed by the conservation committee: Alberta species at risk. URL: <https://open.alberta.ca/publications/species-assessed-by-the-conservation-committee-alberta-species-at-risk>. [Accessed 10 February 2022].

Government of Canada. 2022. Species at risk public registry: species list. URL: <https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry.html>. [Accessed 10 February 2022].

Margoluis, R., and N. Salafsky. 1998. Measures of success: designing, managing, and monitoring conservation and development projects. Island Press. Washington, D.C. 384 pp.

MULTISAR. 2012. MULTISAR: a multi-species conservation strategy for species at risk in the Grassland Natural Region of Alberta 2011–2012 report. Alberta Sustainable Resource Development, Fish and Wildlife Division, Alberta Species at Risk Report No. 144. Edmonton, AB. 45 pp.

MULTISAR 2014. MULTISAR: a multi-species conservation strategy for species at risk in the Grassland Natural Region of Alberta 2013–2014 report. Alberta Sustainable Resource Development, Alberta Species at Risk Report No. 152. Edmonton, AB. 60 pp.

Rangeland Conservation Service Ltd. 2016. Beneficial management practices for the Milk River Basin and South Saskatchewan watersheds, Alberta (2016 update): a component of the multiple species at risk (MULTISAR) conservation strategy. Unpublished report prepared for MULTISAR. Airdrie, AB. 526 pp.

Robel, R.J., J.N. Briggs, A.D. Dayton and L.C. Hulberts. 1970. Relationship between visual obstruction measurements and weight of grassland vegetation. *Journal of Range Management* 23: 295–297.

Rumbolt, K.S., F. Blouin, B.A. Downey, B.L. Downey, C.A. Koenig, D.J. Jarina, P. F. Jones, J.P. Landry-DeBoer and E.R. Wesley. 2011. MULTISAR: a multi-species conservation strategy for species at risk 2010–2011 report. Alberta Sustainable Resource Development, Fish and Wildlife Division, Alberta Species at Risk Report No. 141. Edmonton, AB. 84 pp.

Salafsky N R, Margoluis K, Redford H, and Robinson J G. 2002. Improving the practice of conservation: a conceptual framework and research agenda for conservation science. *Conservation Biology* 16(6) 1469-79.

Willms, W. D., O.R. Kenzie, T.A. McAllister, D. Colwell, D. Veira, J.F. Wilmshurst, and M.E. Olson. 2002. Effects of water quality on cattle performance. *Journal of Range Management*, 55(5), 452-460.

Willoughby, M.G. 2007. Range survey manual for Alberta rangelands version one. Rangeland Management Branch, Alberta Sustainable Resource Development. Edmonton, AB. 8 pp.

Appendices

Appendix A: New MULTISAR HCS Participant Questionnaire

Landholder: _____ Interviewer(s): _____ Date: _____

Questions:

How long have you owned/lived on your property?

What are the primary uses of your property?

Have you heard about the MULTISAR program prior to us contacting you?

- a) If so, what do you know about the MULTISAR program?
- b) Do you know which organizations make up the MULTISAR program?

What would you consider at “species at risk”?

- a) Can you name a few species at risk on your property or in Alberta?
- b) Do you feel that your land is important in providing habitat for species at risk?
- c) Do you feel species at risk are beneficial to your ranching operation?

Had you ever heard of the term Beneficial Management Practice (BMP)?

- a) Do you currently use any BMPs in your operation?
- b) If yes, please list some of them.

If you need help thinking of some, here are some examples of the BMPs for Burrowing Owl:

- Varying stocking rate in accordance with precipitation
- Promote heterogeneous habitat conditions (patchiness)
- Avoid intensive, high stocking rates that encourages uniform utilization of pastures
- Minimize the use of cross fencing to avoid raptor perch sites
- Remove marginal farmland from production
- Protect large tracts of native prairie
- Use water developments and salt placement to create areas of heavier grazing

What interests you the most about the MULTISAR program and what do you hope to achieve by working with us?

How would you prefer to communicate with us?

Are you interested in receiving our newsletter? If yes, by mail or electronically?

Email address: _____

Mailing address: _____