MULTISAR

A Multi-Species Conservation Strategy
for Species at Risk in the Grassland
Natural Region of Alberta, 2022–2023 report

Alberta Species at Risk Report No. 172

MULTISAR

Alberta

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Disclaimer

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Acknowledgements

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 Protected Areas, the Prairie Conservation Forum, Cows and Fish, Canadian Cattle Association, Alberta Beef Producers, the Canadian Roundtable 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 2022–2023, a new HCS was developed for eight ranches totaling approximately 44 012 acres. MULTISAR also completed three HMPs on 1601 acres of land within our priority areas. Sixty-eight 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, riparian protection, shrub planting, and grazing management tools.

No SARC assessments were completed in 2022-2023, 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 on request and promote them as a tool for habitat improvements for species of interest.

MULTISAR was able to resume a nearly pre-pandemic level of event participation following two years of limited outreach activities during the COVID-19 restrictions. The Southern Alberta Grazing School for Women was held in July 2022 in Oyen, Alberta with 45 attendees present for the two-day event. MULTISAR also presented to 855 individuals through eight presentations/display from June 2022 to March 2023. One issue of MULTISAR's *Grassland Gazette* newsletter was produced and distributed to 110 contacts. Additional publications distributed include *At Home on the Range: Living with Alberta's Prairie Species at Risk,* and various MULTISAR factsheets and handouts with 160 and 489 copies being distributed, respectively. Social media continues to be a means to share information related to MULTISAR. In 2022-2023 MULTISAR posted 38, 40, and 36 times on Twitter, Facebook, and Instagram, respectively, to promote public engagement. Other media MULTISAR contributed to included two blog posts for 'Let's Go Outdoors' and two interviews for the Conservation Magazine produced by the Alberta Conservation Association. MULTISAR maintained direct contact with landholders, other organizations, and government agencies throughout the year with over 567 conversations (email, text, phone calls, or in-person presentations). MULTISAR also took on a large role assisting the Prairie Conservation Forum with organizing the Prairie Conservation and Endangered Species Conference which was held in Calgary, Alberta in February 2023. The conference was at capacity with 250 attendees and three MULTISAR partner landholders attended the conference and participated in the ranchers panel plenary session.

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 2022 five MULTISAR HCS ranches were reassessed. Roughly 29 habitat enhancement projects on participating HCS ranches were monitored in 2022 to determine whether enhancements were achieving their objectives. Enhancements monitored include restoration sites, shrub/forb/grass plantings, artificial nesting platforms, watering sites, tree and shrub protection, and grazing management tools. To date MULTISAR has implemented 384 habitat enhancements.

MULTISAR continues to compile wildlife observation and vegetation assessment data that it has been accumulating since its first HCS. In 2023-2024, 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 Protected Areas (EPA) 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 375 habitat enhancement projects on ~603 777 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 2022-2027 MULTISAR 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.

Goal: Collaborate with landholders on over 1 million acres by 2027.

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 though the MULTISAR process.

Goal: To develop and implement an evaluation strategy for the MULTISAR program areas.

Goal: To assist EPA in the monitoring of species at risk and keystone species in the Grassland Natural Region.

Goal: Data management.

Education, Outreach and Awareness

The MULTISAR education, outreach and awareness program is getting back on track after reduced activities during COVID-19 restrictions in 2020 and 2021. While not all of MULTISAR's outreach activities resumed (such as the Calgary Stampede cattle trail display), MULTISAR was able to resume most educational activities in 2022. Direct communication with landholders, as well as communication with other organizations and government agencies was never disrupted and continued in 2022.

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 330 conversations held between April 1, 2022 and March 31, 2023, 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 (122 and 115 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 handed out 120 copies of its flagship booklet, *At Home on the Range: Living with Alberta's Prairie Species at Risk* (Saunders *et al.* 2016), as well as 489 copies of other MULTISAR factsheets and handouts. These were mainly handed out at events MULTISAR participated in. The 17th issue of MULTISAR's newsletter, the *Grassland Gazette*, was produced in December 2022 and emailed to approximately 110 MULTISAR contacts, most of which are program-participating landholders. The newsletter was also posted to the MULTISAR website and shared on MULTISAR and PCF social media platforms (920 views).

Southern Alberta Grazing School for Women and Alberta Range Stewardship Course

The 19th annual Southern Alberta Grazing School for Women was held on July 13 and 14, 2022 in Oyen, Alberta. Topics included grazing principles and practices, soil health, hands-on plant ID, range health assessments, livestock behaviour, pasture diseases, nutrition and more. Forty-five women were in attendance for the 2.5-day school. MULTISAR helped organize the event and lead plant ID sessions in the field.

Presentations/Training to Landholder Groups

MULTISAR had numerous conversations and meetings with individual landholders and landholder groups (over 330) 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. MULTISAR had in-person meetings with all landholder participants that had HCS/HMP plans and reassessments completed in 2022. In total, 32 conversations/presentations were held 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 five live presentations given to groups (Table 1). MULTISAR also takes its educational display to events when requested. Although MULTISAR was unable to attend the Calgary Stampede Cattle Trail in 2022, there were three other events that MULTISAR was able to attend with the display (Table 1).

Table 1. Summary of 2022-2023 presentations by MULTISAR.

Date	Presented to	Presentation	Attendance
June 3, 2022	4H event at Lethbridge Exhibition Grounds	MULTISAR Display	80 attendees
September 14, 2022	Wheatland County	Presentation about MULTISAR	20 attendees
September 26, 2022	Lethbridge College	Presentation on species at risk and landholder interactions	20 attendees
February 22, 2023	Prairie Conservation and Endangered Species Conference	Presentation on connecting the dots between grassland birds, insects and vegetation	60 attendees
February 22-23, 2023	Prairie Conservation and Endangered Species Conference	MULTISAR Display	250 attendees
February 22-23, 2023	Prairie Conservation and Endangered Species Conference	Poster presentation on MULTISAR: a multi-species habitat stewardship project	250 attendees
February 28-March 2, 2023	Agriculture Expo and North American Seed Fair	MULTISAR Display	50 attendees at booth
March 27, 2023	Milk River Watershed Council landholder appreciation event	Gratitude for Grass and Grazing	125 attendees

In addition to educational presentations, MULTISAR often participates in meetings with government and non-profit environmental organizations not only to 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. Notably in 2022-2023, MULTISAR staff and contractors took a large role in helping the Alberta Prairie Conservation Forum plan the Prairie Conservation and Endangered Species Conference that was held at the Calgary Zoo/Wilder Institute in Calgary from February 21-23, 2023. The conference was capped at 250 attendees and was sold out. Three landholders that MULTISAR works with attended and were highlighted in a ranchers panel plenary session.

Table 2 shows topics of various meetings that were held with non-profit organizations, government, companies, consultants, and contractors in 2022-2023.

Table 2. Summary of 2022-2023 meeting topics.

Meetings with	Topic
Non-government non-profit environmental organizations	Prairie Conservation and Endangered Species Conference; bird friendliness index and MULTISAR; living labs insect collection and biodiversity; funding opportunities; Youth Range Days; Southern Alberta Grazing School for Women; research and monitoring; collaboration discussions; data sharing; field work methods
Government agencies	MULTISAR West overview; Central Grasslands Roadmap; MULTISAR process; summary of species at risk findings; water well requirements; coordination of field work efforts; reseeding; funding; field work methods

Meetings with	Topic
Companies	Bat condos; riparian shrub planting; oil well remediation in grasslands; watering units; electric fencing units; portable wind shelters; native seed; ferruginous hawk poles; remote access cameras; dugout clean outs
Contractors/Consultants	MULTISAR databases; insect sampling and ID; 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, Facebook and Instagram posts from this past year was 38, 40, and 36, respectively.

Media and Other Publications

In addition to the MULTISAR newsletter, the *Grassland Gazette,* MULTISAR was interviewed for two blog posts for 'Let's Go Outdoors'; one on ferruginous hawks (posted August 5, 2022) and one on restoring native grasslands (posted January 26, 2023). MULTISAR also did two interviews for the ACA Conservation Magazine; one on 'All about owls and why we should give a hoot' (Fall 2022, pages 52-55) and one on 'What does conservation mean?' (coming Spring 2023).

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 EPA, 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 2022–2023

To date, MULTISAR has completed 75 HCSs on 603 777 acres of land within the Milk River and South Saskatchewan River watersheds (Table 3). In 2022, MULTISAR completed HCSs for eight new properties in southern Alberta, totaling 44 012 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
2012	3	13 140
2013	1	7859
2014	2	43 250
2015	2	8553

Year*	# Landholder Participants	Acres Surveyed
2016	5	9837
2017	7	62 973
2018	5	56 184
2019	8	63 100
2020	6	33 640
2021	6	11 532
2022	8	44 012
Totals	**75**	**603 777+**

*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, 31 HCSs, which have been implemented for at least five years, have been reassessed (Table 4). Furthermore, six HCSs have been reassessed for a second time and one has been reassessed for the third 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
2019	3	52 375
2020	0	0
2021	5	54 709
2022	5	93 310
Totals	**31***	**568 161**

*This number excludes the most recent reassessment for MP_1 in 2016 and 2022; 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 93 157 wildlife observations have been submitted to the Fish and Wildlife Management Information System (FWMIS) since 2004, including 8045 in 2022. Fifty-nine different species at risk were recorded on HCS properties in 2022. Table 5 summarizes the species at risk observed on all HCS properties assessed (or reassessed) during the 2022 field season.

Table 5. Species at risk recorded on HCS properties during the 2022 field season.

Species	General Status[1]	Legislative Status	Observations	Feature	Significance
Birds					
American kestrel (*Falco sparverius*)	*Sensitive*	none	6		
Baird's sparrow (*Ammodramus bairdii*)	*Sensitive*	*Special Concern[2]*	79		
Bald eagle (*Haliaeetus leucocephalus*)	*Sensitive*	*Not At Risk[2]*	15		
Bank swallow (*Riparia riparia*)	*Sensitive*	*Threatened[2]*	26	2 colonies	
Barn swallow (*Hirundo rustica*)	*May Be At Risk*	*Threatened[2]*	36		
Black-crowned night heron (*Nycticorax nycticorax*)	*Sensitive*	none	1		
Black tern (*Chlidonias niger*)	*Sensitive*	*Not At Risk[2]*	2		
Bobolink (*Dolichonyx oryzivorus*)	*Sensitive*	*Threatened[2]*	25		
Brewer's sparrow (*Spizella breweri*)	*Sensitive*	none	68		
Brown creeper (*Certhia americana*)	*Sensitive*	none	1		
Burrowing owl (*Athene cunicularia*)	*At Risk*	*Endangered[2,3]*	5		
Chestnut-collared longspur (*Calcarius ornatus*)	*May Be At Risk*	*Threatened[2]*	263	2 nests	5 eggs
Clark's nutcracker (*Nucifraga columbiana*)	*Sensitive*	none	3		
Common nighthawk (*Chordeiles minor*)	*Sensitive*	*Threatened[2]*	4		
Common yellowthroat (*Geothlypis trichas*)	*Sensitive*	none	69		
Eared grebe (*Podiceps nigricollis*)	*Sensitive*	none	35		1 pair with young
Eastern kingbird (*Tyrannus tyrannus*)	*Sensitive*	none	146		
Eastern phoebe (*Sayornis phoebe*)	*Sensitive*	none	1		
Evening grosbeak (*Coccothraustes vespertinus*)	*Secure*	*Special Concern[2]*	12		
Ferruginous hawk (*Buteo regalis*)	*At Risk*	*Endangered[3]* *Threatened[2]*	61	12 nests	5 hawk platforms
Golden eagle (*Aquila chrysaetos*)	*Sensitive*	*Not At Risk[2]*	22	2 nests	
Grasshopper sparrow (*Ammodramus savannarum*)	*Sensitive*	none	24		
Great blue heron (*Ardea herodias*)	*Sensitive*	none	16		
Greater sage-grouse (*Centrocercus urophasianus*)	*At Risk*	*Endangered[2,3]*	1	roost site	pellet/scat
Lark bunting (*Calamospiza melanocorys*)	*Sensitive*	*Threatened[2]*	1		

Species	General Status[1]	Legislative Status	Observations	Feature	Significance
Loggerhead shrike (*Lanius ludovicianus*)	*Sensitive*	*Threatened[2]* *Special Concern[3]*	63	2 nests	
Long-billed curlew (*Numenius americanus*)	*May Be At Risk*	*Special Concern[2,3]*	90		
Northern goshawk (*Accipiter gentilis*)	*Sensitive*	*Not At Risk[2]*	1		
Olive-sided flycatcher (*Contopus cooperi*)	*May Be At Risk*	*Threatened[2]*	2		
Pied-billed grebe (*Podilymbus podiceps*)	*Sensitive*	none	1		
Pileated Woodpecker (*Dryocopus pileatus*)	*Sensitive*	none	1		
Prairie falcon (*Falco mexicanus*)	*Sensitive*	*Special Concern[3]*	10	3 nests	
Sandhill crane (*Grus canadensis*)	*Sensitive*	none	13		
Sharp-tailed grouse (*Tympanuchus phasianellus*)	*Sensitive*	none	804	17 leks	
Short-eared owl (*Asio flammeus*)	*May Be At Risk*	*Special Concern[2]*	2		pellet/scat
Sora (*Porzana carolina*)	*Sensitive*	none	8		
Sprague's pipit (*Anthus spragueii*)	*Sensitive*	*Threatened[2]* *Special Concern[3]*	93		
Thick-billed longspur (*Rhynchophanes mccownii*)	*May Be At Risk*	*Threatened[2]*	40		
Upland sandpiper (*Bartramia longicauda*)	*Sensitive*	none	36		
Western wood-pewee (*Contopus sordidulus*)	*May Be At Risk*	none	21		
White-winged scoter (*Melanitta deglandi*)	*Sensitive*	*Special Concern[3]*	53		
Herpetofauna					
Bullsnake (*Pituophis catenifer sayi*)	*Sensitive*	*Special Concern[2]*	9	20 eggshells	2 snake sheds
Greater short-horned lizard (*Phrynosoma hernandesi*)	*At Risk*	*Endangered[2,3]*	23		
Northern leopard frog (*Lithobates pipiens*)	*At Risk*	*Special Concern[2]* *Threatened[3]*	1		
Plains garter snake (*Thamnophis radix*)	*Sensitive*	none	14		
Prairie rattlesnake (*Crotalus viridis*)	*Sensitive*	*Special Concern[2,3]*	10	7 hibernacula	23 snake sheds
Wandering garter snake (*Thamnophis elegans*)	*Sensitive*	none	3		
Western tiger salamander (*Ambystoma mavortium*)	*Secure*	*Special Concern[2]*	2		
Mammals					
Badger (*Taxidea taxus*)	*Sensitive*	*Special Concern[2]*	15		

Species	General Status[1]	Legislative Status	Observations	Feature	Significance
Grizzly bear (*Ursus arctos horribilis*)	*At Risk*	*Threatened[3]* *Special concern[2]*	1		
Hoary bat (*Lasiurus cinereus*)	*Sensitive*	none	10		recorded acoustically
Little brown myotis (*Myotis lucifugus*)	*May Be At Risk*	*Endangered[2,3]*	9	3 roost sites	recorded acoustically
Western long-eared bat (*Myotis evotis*)	*Sensitive*	none	2		recorded acoustically
Long-tailed weasel (*Mustela frenata*)	*May Be At Risk*	*Not At Risk[2]*	5		
Pronghorn (*Antilocapra americana*)	*Sensitive*	none	203		
Eastern Red bat (*Lasiurus borealis*)	*Sensitive*	none	10		recorded acoustically
Silver-haired bat (*Lasionycteris noctivagans*)	*Sensitive*	none	13		recorded acoustically
Swift fox (*Vulpes velox*)	*At Risk*	*Endangered[3]* *Threatened[2]*	7	2 dens	
Western small-footed myotis (*Myotis ciliolabrum*)	*Sensitive*	*Special Concern[3]*	3		recorded acoustically

[1]General status in Alberta (AEP 2020), [2]legislative status under Canada's *Species at Risk Act* (Government of Canada [GOC] 2022), [3]legislative status under Alberta's *Wildlife Act* (Government of Alberta [GOA] 2023) or designation as *Special Concern* by the Minister.

Range

The HCS properties assessed across southern Alberta in 2022 displayed a wide range of diversity in the plant communities and range health found. MULTISAR conducted 229 detailed range transects (vegetation inventories) and an additional 405 range health assessments, 62 tame pasture health assessments, 61 forest health assessments and 216 visual reconnaissance plots during the 2022 field season (Table 6). During these inventories, 13 species of rare plants and one rare plant community was observed on the properties, as listed in Table 6.

Table 6. Summary of range work completed on HCS properties during the 2022 field season.

Property	Acres	Sites Assessed	Plant Communities	Rare Plants
MP_1	62 050	94 range health assessments	47	Cushion everlasting (*Antennaria dimorpha*) Red three-awn (*Aristida purpurea*) Velvety goldenrod (*Solidago mollis*)
MP_36	22 171	73 range health assessments 37 tame pasture assessments 23 forest health assessments	36	Limber pine (*Pinus flexilis*)
MP_38	2196	22 range health assessments 3 tame pasture assessments 3 forest health assessments	11	Limber pine
MP_46	4867	28 detailed transects	9	Western false gromwell (*Lithospermum occidentale*)

Property	Acres	Sites Assessed	Plant Communities	Rare Plants
			1 rare plant community Little bluestem – sandgrass (*Schizachyrium scoparium – Calamovilfa longifolia*)	
MP_73	13 158	14 detailed transects 81 range health assessments 21 tame pasture assessments 35 forest health assessments 81 visual reconnaissance plots	19	
MP_76	13 395	67 detailed transects 52 range health assessments 100 visual reconnaissance plots	47	Spiny milkvetch (*Astragalus kentrophyta*)
MP_77	1734	14 detailed transects 25 range health assessments 1 tame pasture assessment 3 visual reconnaissance plots	6	One-spike oatgrass (*Danthonia unispicata*)
MP_78	7047	76 detailed transects 50 range health assessments 24 visual reconnaissance plots	48	Purple three-awn (*Aristida purpurea*)
MP_83	1890	26 detailed transects 8 range health assessments 5 visual reconnaissance plots	16	Smooth goosefoot (*Chenopodium subglabrum*) Western spiderwort (*Tradescantia occidentalis*)
P_85	157	4 detailed transects 3 visual reconnaissance plots	6	Cushion milkvetch (*Astragalus gilviflorus*) Tufted evening primrose (*Oenothera caespitosa*) Evening starflower (*Mentzelia decapetala*)

*Range inventories were not completed in 2022 by MULTISAR on MP_20 (2026 acres) and MP_80 (2119 acres) because they had recently been completed by Alberta Environment and Protected Areas (EPA) and Southern Alberta Land Trust Society (SALTS), respectively. Range inventories were not finished on MP_79 (4512 acres) in 2022 and will be completed in 2023 (range results for this property will be summarized in the 2023-24 report).

Riparian

The Alberta Riparian Habitat Management Society—Cows and Fish completed seven riparian health assessments in the Milk River and South Saskatchewan River watersheds as part of its partnership with MULTISAR. An additional 69 riparian health assessments were completed by MULTISAR staff and 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 68 new habitat enhancements within the Milk River and South Saskatchewan watersheds in 2022 and early 2023. Habitat enhancement projects included: the construction of five artificial habitat structures; installation or purchase of supplies for wildlife-friendly fencing at five new sites; the purchase of eight portable watering units; installation or upgrades to 31 upland watering sites; three riparian protection enhancements; one shrub planting; two weed control initiatives; and 13 enhancements to improve grazing management.

Artificial habitat structures included the installation of four hawk poles to assist with the recovery of the *Endangered* ferruginous hawk and to help control Richardson's ground squirrels (*Urocitellus richardsonii*) and the construction of one bat condo to provide a safe roosting location for little brown myotis away from human-occupied buildings. In total, 0.8 km of new wildlife-friendly fencing was installed, and 1.6 km of fence was converted to wildlife-friendly specifications to improve pronghorn movement and cattle distribution. Materials have been purchased to replace an additional nine miles of conventional fence with wildlife-friendly fence later in 2023. Reflectors will be placed on the top two wires of the new fence 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 reduce their impacts on 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 22 dugouts and the installation of two pipelines to supply flow to upland watering sites. Riparian protection enhancements included fencing off two riparian areas so livestock could be kept to the surrounding uplands. A single span bridge was also constructed to facilitate livestock crossing at a creek on another property. Shrubs were planted along a stretch of creek to help stabilize the banks of the riparian area and create wildlife habitat. Herbicide was provided to two landholders to aid in controlling noxious weeds, including common burdock (*Arctium minus*) and Canada thistle (*Cirsium arvense*). Lastly, grazing management tools consisted of two 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. Grazing management tools also include 10 portable windbreaks that will be used to help keep cattle in the tame grass of a field during the winter as opposed to the surrounding native grassland and riparian areas.

In total, 384 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.
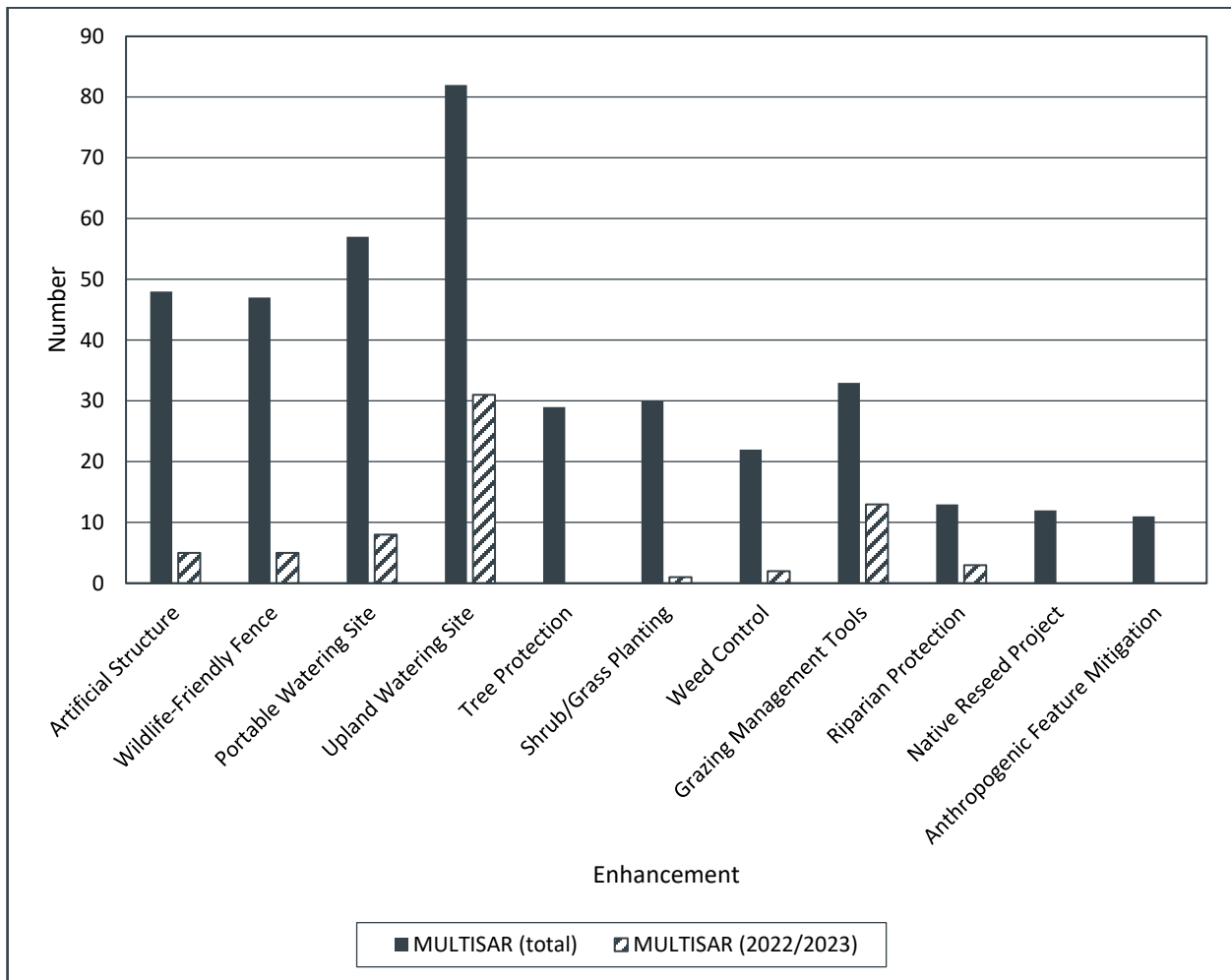
Figure 1. Habitat enhancement projects completed by category, by MULTISAR since 2005.

HCS Summary

Over the last 21 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 603 777 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 HCS, 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 later 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 LFH[1] 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 2022–2023

To date, MULTISAR has completed 12 HMPs on 17 185 acres of land within the Milk River and South Saskatchewan watersheds (Table 7). In 2022, MULTISAR completed HMPs for three properties, which included detailed wildlife and simplified range health techniques.

Table 7. Habitat management plan participant summary.

Year	MULTISAR HMP Participants	Acres Surveyed
2018	2*	4649
2019	1	810
2020	4	7645
2021	2	2480
2022	3	1601
Totals	**12**	**17 185**

*Includes one HCS property that 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.

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[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).

Wildlife

To date, approximately 3211 wildlife observations collected on HMP properties have been submitted to FWMIS. Thirty-six point counts were completed on the HMP properties in 2022 and nineteen different species at risk were recorded. Table 8 summarizes the species at risk observed on all HMP properties assessed during the 2022 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					
Bald eagle (*Haliaeetus leucocephalus*)	*Sensitive*	N/A	5		
Bank swallow (*Riparia riparia*)	*Sensitive*	*Special Concern*	26		
Bobolink (*Dolichonyx oryzivorus*)	*Sensitive*	N/A	2		
Common yellowthroat (*Geothlypis trichas*)	*Threatened*	*Threatened*	15		
Eastern kingbird (*Tyrannus tyrannus*)	*Sensitive*	N/A	50		
Ferruginous hawk (*Buteo regalis*)	*Sensitive*	*Threatened*	1		
Great blue heron (*Ardea herodias*)	*Sensitive*	N/A	2		
Prairie falcon (*Falco mexicanus*)	*May Be At Risk*	*Endangered*	3		
Pileated woodpecker (*Dryocopus pileatus*)	*Sensitive*	N/A	3		
Sharp-tailed grouse (*Tympanuchus phasianellus*)	*Sensitive*	N/A	16		
Western wood-pewee (*Contopus sordidulus*)	*Secure*	*Special Concern*	1		Recorded Acoustically
Mammals					
Grizzly bear (*Ursus arctos*)	*At Risk*	*Threatened[3] Special Concern[2]*	4		1 sow and 2 cubs
Hoary bat (*Lasiurus cinereus*)	*Sensitive*	none	5		recorded acoustically
Little brown myotis (*Myotis lucifugus*)	*At Risk*	*Endangered[2,3]*	8		recorded acoustically
Western long-eared bat (*Myotis evotis*)	*Sensitive*	none	1		recorded acoustically
Red bat (*Lasiurus borealis*)	*Sensitive*	none	4		recorded acoustically
Silver-haired bat (*Lasionycteris noctivagans*)	*Sensitive*	none	9		recorded acoustically
Western small-footed myotis (*Myotis ciliolabrum*)	*Sensitive*	*Special Concern[3]*	2		recorded acoustically

Species	General Status[1]	Legislative Status	Observations	Feature	Significance
Reptiles					
Plains garter snake *(Thamnophis radix)*	*Sensitive*	none	1		

[1]General status in Alberta (AEP 2020), [2]legislative status under Canada's *Species at Risk Act* (GOC 2022), [3]legislative 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 2022 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 105 Robel pole readings during the 2022 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 84 litter weight estimates in 2022. For survey locations occurring in forested areas, 11 LFH thickness measurements and five plant community structure assessments were completed. During these inventories, one species of rare plant was observed on the properties.

Table 9. Summary of habitat assessment work completed on HMP properties during the 2022 field season.

Property	Acres	# of Robel Pole Readings	# of Litter Weight Estimates	# of Forest LFH Estimates	# of Forest Layer Assessments	Rare Plants
MP_81	473	42	30	2	2	Limber pine
MP_82	808	36	36	None	None	None
MP_84	320	27	18	9	3	None

Riparian

No riparian health assessments were completed for HMP properties in 2022.

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.

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 17 185 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

Species at Risk Conservation (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 2022-2023.

This was the tenth 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 2022-2023, as no requests from landholders 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.

As a result of 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 15 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.
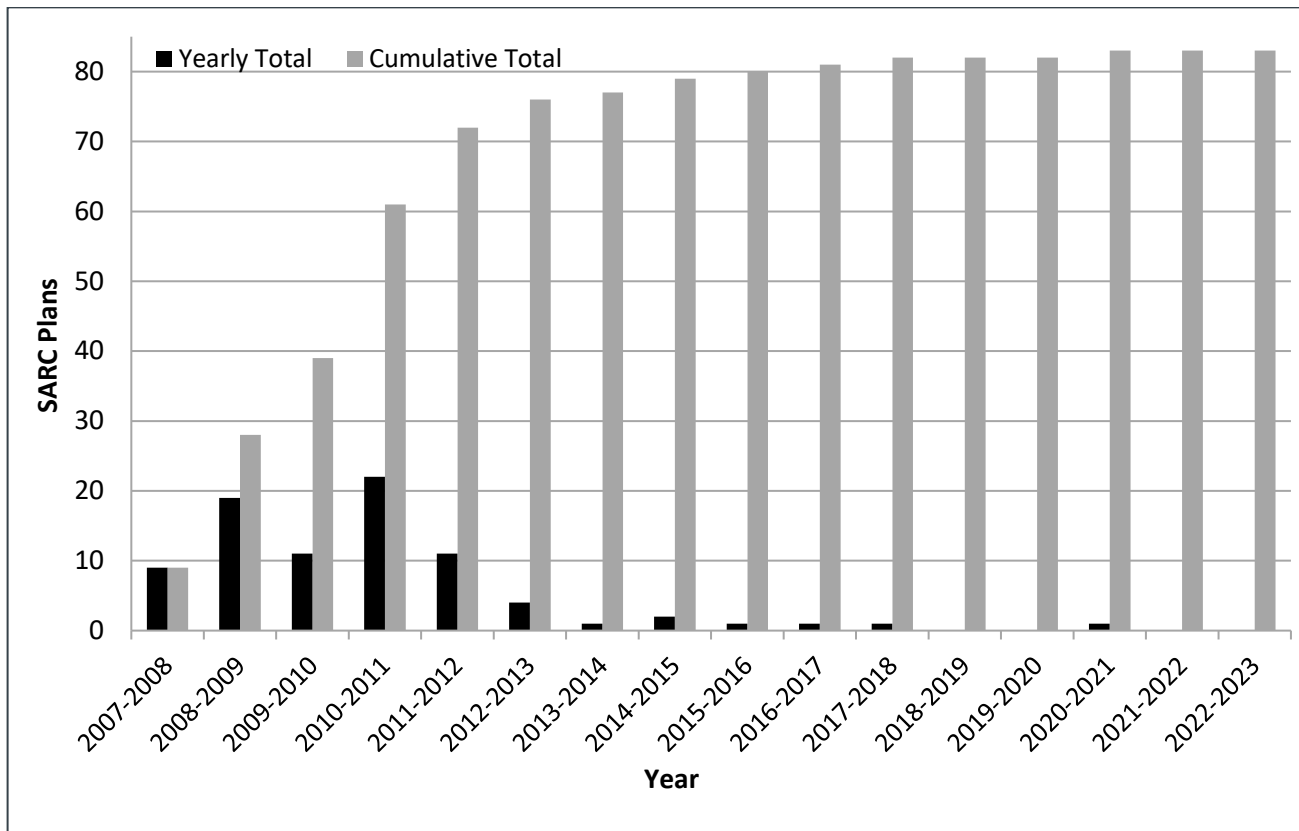
Figure 2. Number of SARC plans completed since program inception.

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 2022–2023 marks the 13th 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 an HCS or an 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 the last fiscal year.

Evaluation of the HCS component of the MULTISAR Program

New HCS/HMP Participants

Commencement Questionnaire

In 2022–2023, the MULTISAR program worked with 11 new participants (eight HCSs, three 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.

Since 2017, 37 new MULTISAR program participant questionnaires have been compiled and summarized. Sixty-eight 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 53% of participants had knowledge of MULTISAR's work with species at risk and their habitat. All participants said their property was important or used to be important for species at risk. Surprisingly, 84% of the participants said species at risk did not hinder their operation but were a benefit to some extent (31/37).

When asked what interests them the most about the MULTISAR program, respondents said they wanted advice with land management (22/37), wanted increased knowledge of range management (18/37), wanted increased knowledge of wildlife and wildlife habitat management (14/37), and were interested in how the MULTISAR program balances species at risk management and landholder interests (12/37).

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 2022–2023, we reassessed five MULTISAR Participant (MP) properties: MP_1, MP_20, MP_36, MP_38, and MP_46.

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 ± 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), roughly half of the original points counts are completed. 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 were calculated. The mean difference between the range health scores were looked at to see if they were different than ± 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 ($\bar{x}$) ± its standard deviation (SD). The null hypothesis was rejected if significance (P-value) was less than 0.05. In addition, since MP_1 had its third reassessment; an

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

MP_1

Ninety-four sites were reassessed at MP_1 in 2022. Baseline assessments at these sites were originally conducted in 2004/2005, with the first reassessment conducted in 2011, and the second in 2016. Over the four assessments, range health has changed, and means did vary between years (2004/05: 81%, 2011: 74%, 2016: 73%, 2022: 81%; Figure 3). Since 2004/05, there has been an increase in range health category trends with 69.2% of the assessments in the "Healthy" or "High Healthy "categories, and no assessments rated "Unhealthy" (Table 10). In 2016 it was desired that 40 sites increase in range health and this goal was reached in 31 of the 40 sites (78%). The goal for fifty-four sites was to stay within 10% (+/-) of the health scores from 2016. Thirty-six sites stayed within 10% (67%), ten sites increased more than 10% (19%), and eight sites lost more than 10% range health (15%). A paired t-test comparing 2016 to 2022 found that the two years range health scores were significantly different from each other ($\pm$; t = -5.14, p <.0001).

Table 10. Range health categories for MP_1 from first HCS to current assessment.

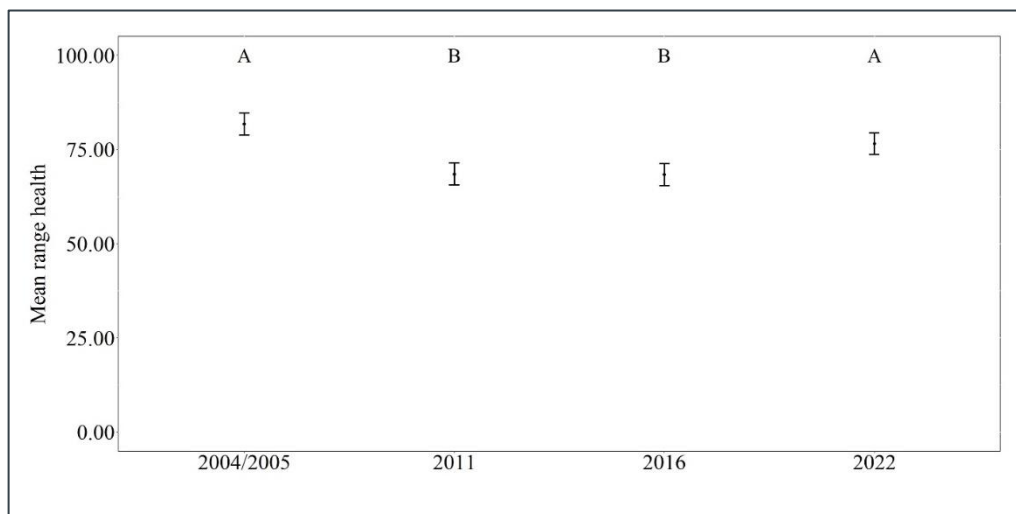| Category	2004/05 Percent	2011 Percent	2016 Percent	2022 Percent
Unhealthy <50%	3.19%	6.38%	8.51%	0.00%
Low Healthy with Problems 50-60%	8.51%	14.89%	11.70%	4.26%
High Healthy with Problems 61-74%	30.85%	20.21%	22.34%	26.60%
Healthy 75-85%	17.02%	24.47%	29.79%	23.40%
High Healthy >85%	40.43%	34.04%	27.66%	45.74%
Healthy and High Healthy Combined	57.45%	58.51%	57.45%	69.15%

Figure 3. Range health trend in percent with upper and lower confidence intervals for MP_1 from baseline year to current year. Similar letters above indicate no significant difference based on Tukey test results.

MP_36

MP_36 had 133 range health and forest health sites reassessed in 2022, with 47 sites being native grassland areas, 36 sites of tame pasture, 23 sites of forest assessments and 27 modified tame or native grasslands sites. Baseline assessments for the health of native pastures scored 67.17% (± 10.2) and 2022 health scores averaged 58.79% (± 12.8; t = -5.18, p < 0.0001). When looking at tame pastures, range health went from 76.4% (± 7.61) in 2016 to 66.2% (± 9.78, t = -6.06, p < 0.0001) in 2022. Of the 23 forest health assessments completed, baseline scores were 60.43% (±13.97) and decreased to 58.70% (±11.86) but were not considered statistically different (t = -0.80, p = 0.78).

MP_38

MP_38 is a small property with only 28 range health/forest sites revisited with baseline assessments scoring a mean health score of 49.86% (±13.7) and 2022 health scores averaging 62% (± 12.2; t = 5.55, p < 0.0001). Five sites were desired to maintain range health and 23 sites were desired to increase. Two of the maintain sites increased in health more than 10 percent and nine of the sites wanting to increase health maintained, but 13 sites desired to increase in health, all improved by more than 10%.

HCS/HMP Participant Wildlife Evaluation

A subset of wildlife surveys from the baseline years for MULTISAR participants were repeated in 2022. For this reporting, we will only focus on multi-species point count surveys with comparisons on species richness and species diversity between the baseline and reassessment years for MP_1 and MP_36. We also look at the top ten species recorded during each year for MP_1. We only looked at species richness for MP_46 and MP_38.

MP_1

In 2022, ninety wildlife survey point counts were compared with wildlife recorded in previous years. *Endangered/At Risk* species were recorded at 34% of the survey points in 2022, which included the chestnut-collared longspur, ferruginous hawk, and burrowing owl. This increase in *Endangered/At Risk* species is due to COSEWIC's uplisting of chestnut-collared longspur to Endangered. Numbers of chestnut-collared longspurs have declined on the property from 135 in 2011 to 110 in 2016 to 86 in the current year (down 22% from last reassessment). *Threatened/May be at Risk* species were recorded at 36.5% of the wildlife points surveyed (similar to 2016 which was 35%). *Special Concern/Sensitive* species were observed at 30% of the wildlife survey points in 2022, which is down from 44% in 2016. *Secure* species were observed at all but one survey point (comparable to 96% of points in 2011 and 98% in 2016). Richardson's ground squirrel observations were down 36% from 2016 but still up by 45% from 2011 numbers. Western meadowlark (*Sturnella neglecta*) were down by 6% from 2016 but still up by 242% from 2011, while horned larks (*Eremophila alpestris*) have also seen an increase from 2011 (100) and 2016 (92) to 126 (increase of 37% from 2016) in 2022. Table 11 shows the 10 most abundant wildlife species at point counts for the three assessment years.

Table 11. Ten most abundant species at monitored point counts in 2011, 2016, and 2022 for MP_1.

2011		2016		2022	
Species	**Count**	**Species**	**Count**	**Species**	**Count**
Richardson's ground squirrel (*Urocitellus richardsonii*)	164	Richardson's ground squirrel (*Urocitellus richardsonii*)	369	Richardson's ground squirrel (*Urocitellus richardsonii*)	237
Chestnut-collared longspur (*Calcarius ornatus*)	135	Chestnut-collared longspur (*Calcarius ornatus*)	>110*	Horned lark (*Eremophila alpestris*)	126
Horned lark (*Eremophila alpestris*)	100	Western meadowlark (*Sturnella neglecta*)	113	Western meadowlark (*Sturnella neglecta*)	106
Savannah sparrow (*Passerculus sandwichensis*)	84	Horned lark (*Eremophila alpestris*)	92	Chestnut-collared longspur (*Calcarius ornatus*)	86
Baird's sparrow (*Ammodramus bairdii*)	36	Savannah sparrow (*Passerculus sandwichensis*)	>88*	Canada goose (Branta canadensis)	70
Western meadowlark (*Sturnella neglecta*)	31	Brewer's blackbird (*Euphagus cyanocephalus*)	62	Vesper sparrow (*Pooecetes gramineus*)	66

	2011		2016		2022	
Species	**Count**	**Species**	**Count**	**Species**	**Count**	
Sprague's pipit (*Anthus spragueii*)	29	Vesper sparrow (*Pooecetes gramineus*)	52	Sprague's pipit (*Anthus spragueii*)	20	
Vesper sparrow (*Pooecetes gramineus*)	26	Baird's sparrow (*Ammodramus bairdii*)	22	Thick-billed longspur (*Rhynchophanes mccownii*)	17	
Marbled godwit (*Limosa fedoa*)	11	Clay-colored sparrow (*Spizella pallida*)	18	Pronghorn (*Antilocapra americana*)	17	
Thick-billed longspur (*Rhynchophanes mccownii*)+	10	Pronghorn (*Antilocapra americana*)	14	Brown-headed cowbird (*Molothrus ater*)	15	

*During point counts some individuals are estimated/recorded as 1-20 or 21-50 if they are particularly numerous/challenging to get an exact count. * Thick-billed longspur was formerly known as McCown's longspur.

Species diversity was not different between 2011 (0.99 ±0.49) and 2016 (0.97 ±0.49), but these two years were different than what was observed in 2022, which had significantly higher species diversity (1.19 ±0.44, p = 0.006 and p = 0.017). Species richness has increased in the last eleven years from 3.4 ± 1.6 in 2011 to 4.3 ± 1.8 in 2022 (p < 0.05), however, species richness did not differ significantly between 2016 and 2022.

MP_36

Fifty-seven multi-species point counts were conducted at MP_36 in 2022 and compared with wildlife information from 2017. Species richness has not changed significantly in the last five years from 5.98 ± 3.2 to 5.65 ± 2.5 (t = -0.78, p = 0.4). There was also no significant difference in species diversity from 2017 (1.52 ± 0.6) to 2022 (1.55 ± 0.5; t = 0.29, p = 0.7).

MP_38

Nineteen multi-species point counts were reassessed in 2022 on MP_38 and compared with wildlife information from 2017. Species richness has not changed significantly in the last five years from 3.63 ± 3.0 to 3.68 ± 2.3 (t = -0.06, p = 0.9).

MP_46

Twenty-nine multi-species point counts were conducted on MP_46 in 2022 and compared with wildlife information from 2018. Species richness has increased slightly from the original assessment from 3.3 (± 1.95) to 3.74 (± 2.17, t = 1.25, p = 0.2).

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. The following is a summary of the key findings of the recommended enhancements implemented on several MULTISAR participant properties that were monitored in 2022–2023.

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 2022–2023, a total of five restoration sites on MP_18 had wildlife monitoring surveys completed as well as range health assessments.

Reseeding on MP_18 has occurred over several years from 2011 to 2018. These reseeding projects on MP_18 are broken down into four groupings 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 all the sites assessed within the reseed groups since 2016 are depicted in Table 12.

Table 12. MP_18 range health trends at survey locations from 2016, 2019, 2021, and 2022.

Location	Range Health 2016	Range Health 2019	Range Health 2021	Range Health 2022	Trend 2016-2019	Trend 2019-2021	Trend 2021-2022
1	97	77	84	84	Downwards	Stable	Stable
2	75	60	72	59	Downwards	Upwards	Downwards
3	60	70	80	66	Upwards	Upwards	Downwards
4	58	68	75	80	Upwards	Upwards	Upwards
5	62	67	63	78	Stable	Stable	Upwards
6	75	85	75	80	Stable	Stable	Upwards
7	74	87	84	84	Upwards	Stable	Stable
8	75	81	78	84	Stable	Stable	Upwards
9	77	91	96	100	Upwards	Stable	Stable
10	N/A	42	71	76	N/A	Upwards	Upwards
11	N/A	36	61	64	N/A	Upwards	Stable
12	N/A	13	41	72	N/A	Stable (no category change but trending up)	Upwards

In 2022, 42 wildlife point counts were completed at reseed and control sites. Figures 4 to 7 show the changes in abundance over time for some of the grassland bird species at the different reseeded projects. Overall, 13 wildlife species were recorded on MP_18 RP_01 and 11 on RP_02 in 2022. Notable species include grasshopper sparrow, Baird's sparrow, Sprague's pipit, Brewer's sparrow, sharp-tailed grouse, and healthy populations of Richardson's ground squirrel. For RP_01, Sprague's pipits and Baird's sparrows were first recorded in this reseed in 2016 and have been observed every year since. In 2022, one chestnut-collared longspur was recorded, of which none have been seen or heard on surveys in RP_01 since 2012. Baird's sparrows were first recorded in 2013 and Sprague's pipit in 2015 for RP_02. One chestnut-collared longspur was detected following the species' absence since 2019. Baird's sparrows had been present on RP_03 for three consecutive years but were not recorded at this reseed in 2022. In contrast, Baird's sparrows have been detected on RP_04/05 for the last three years (Figure 7). The highest abundance of grasshopper sparrows in 2022 on any of the reseeded areas for MP_18 was on RP_04/5 with eight recorded.
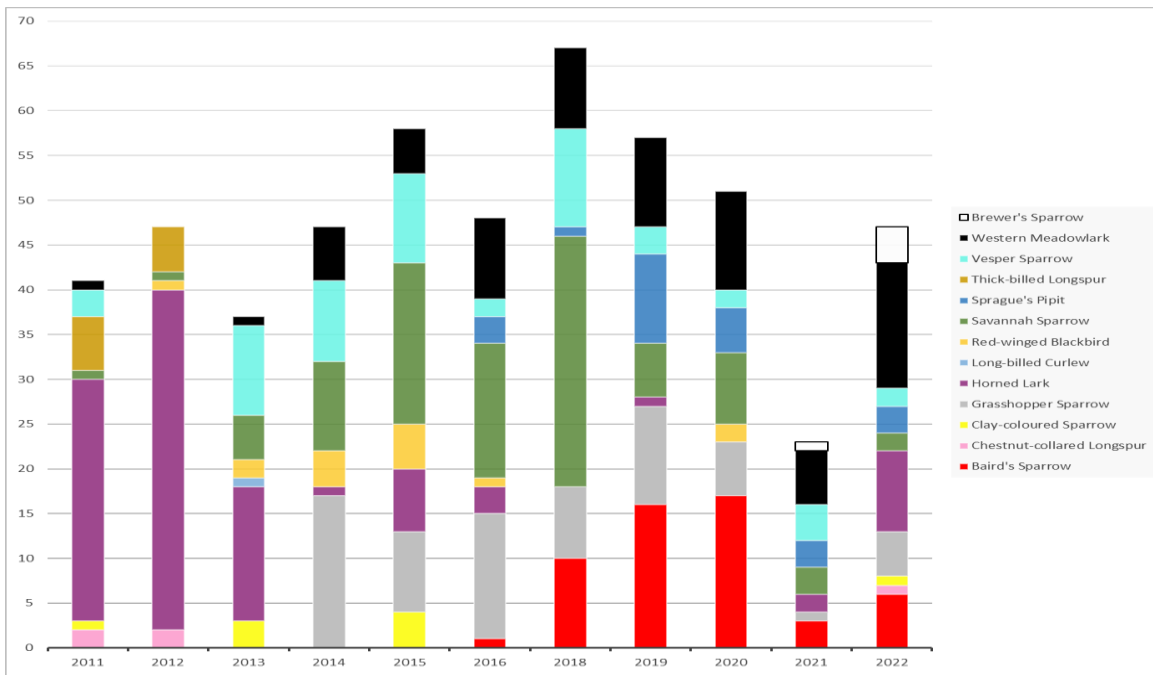
Figure 4. MP_18 RP_01 grassland bird trend in reseeded area (seeded in fall of 2011).
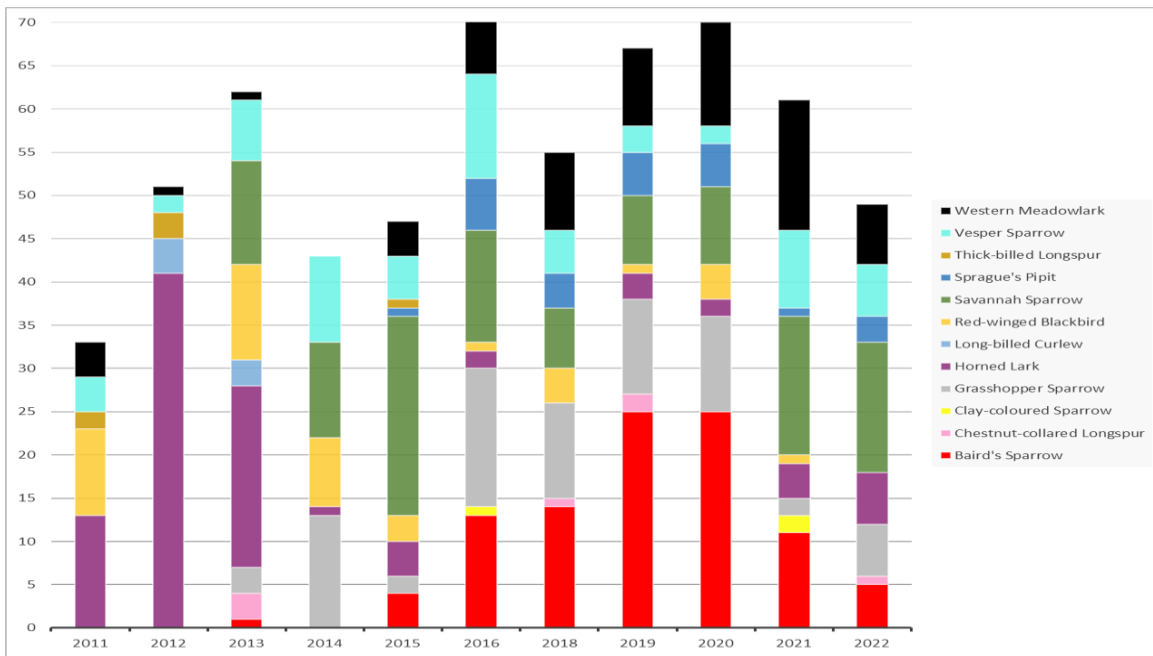

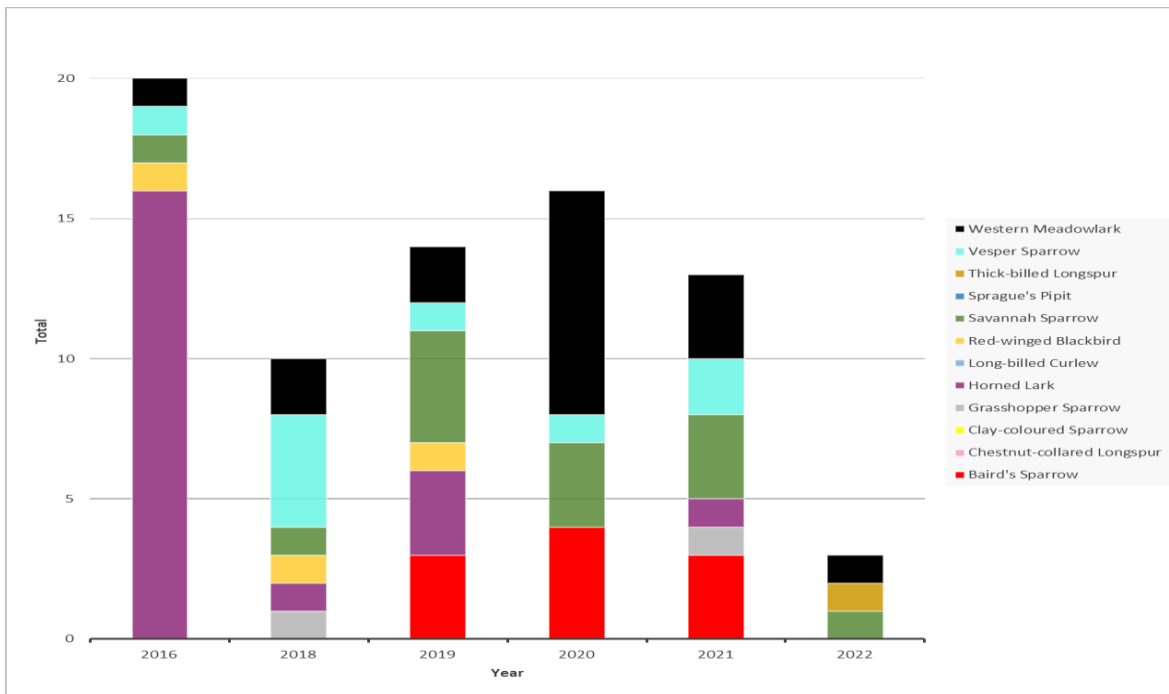**Figure 5.** MP_18 RP_02 grassland bird trend in reseeded area (seeded in spring of 2012).

Figure 6. MP_18 RP_03 grassland bird trend in reseeded area.
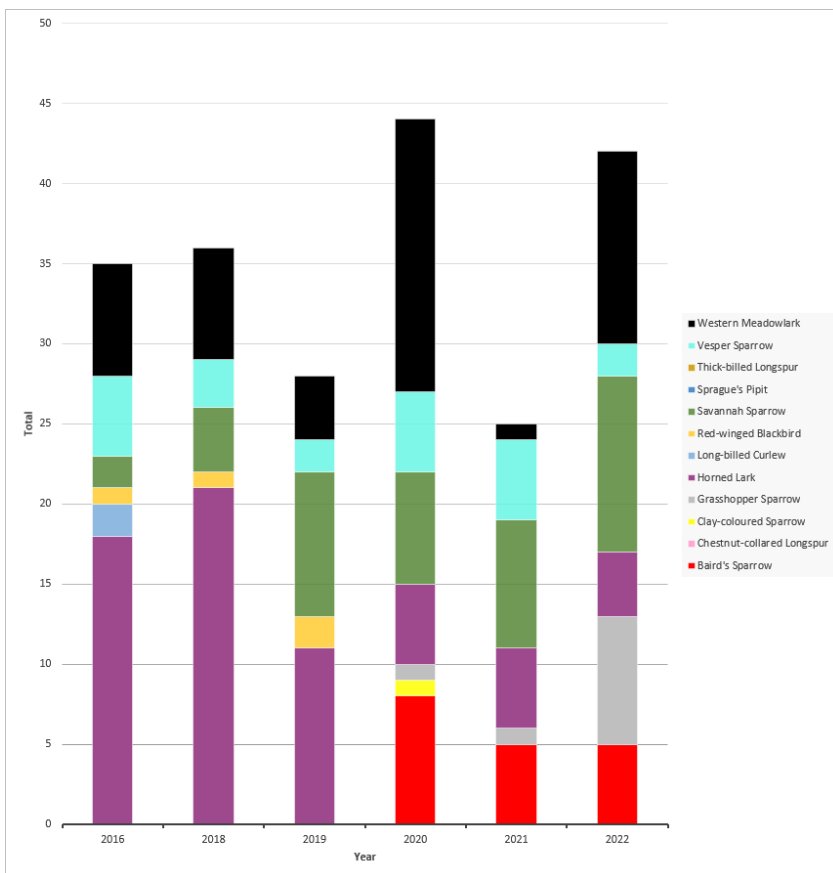

Figure 7. MP_18 RP_04/5 grassland bird trend in reseeded area.

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 (*Artemisia cana*), 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 broadcast-seeded 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.

Two riparian shrub plantings were monitored in 2022 for one property (MP_6). Survival success was low but some of the willows that have survived are doing well (Figure 8).

Figure 8. Willow stake plantings on MP_6, surveyed in 2022.

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 2022–2023 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 13). Eight of the 14 poles surveyed had confirmed nesting by ferruginous hawks.

Table 13. Ferruginous hawk artificial nesting structures and corresponding Richardson's ground squirrel monitoring in 2022.

Property Nest Pole # Year installed	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	2022 Survey Effort and Results	2022 Desired Effort/Trend
MP_6 3 Nest poles 2013 3 Nest poles 2020	1.51 km^2 142 Richardson's ground squirrels	No data	No data	1.90 km^2 124 Richardson's ground squirrels	1.90 km^2 124 Richardson's ground squirrels	No data	1.76 km^2 133 Richardson's ground squirrels	Yes, four of the six poles with active ferruginous hawk nesting
MP_8 3 Nest poles 2012 1 Nest pole 2014	2.39 km^2 210 Richardson's ground squirrels	2.13 km^2 228 Richardson's ground squirrels	2.13 km^2 67 Richardson's ground squirrels	2.13 km^2 131 Richardson's ground squirrels	No data	1.63 km^2 102 Richardson's ground squirrels	2.00 km^2 77 Richardson's ground squirrels	Yes, two of the four poles checked had active ferruginous hawks nesting
MP_25 1 Nest Pole 2013	2.50 km^2 59 Richardson's ground squirrels	2.50 km^2 43 Richardson's ground squirrels	2.50 km^2 113 Richardson's ground squirrels	2.50 km^2 51 Richardson's ground squirrels	No data	2.50 km^2 57 Richardson's ground squirrels	2.50 km^2 40 Richardson's ground squirrels	Yes, Active ferruginous hawk nesting
MP-26 2 Nest Poles 2013	2.39 km^2 177 Richardson's ground squirrels	2.26 km^2 95 Richardson's ground squirrels	No data	2.01 km^2 79 Richardson's ground squirrels	No data	1.88 km^2 9 Richardson's ground squirrels	2.39 km^2 82 Richardson's ground squirrels	Yes, one pole with active ferruginous hawks nesting
MP_42 1 Nest pole 2018	No data	No data	No data	1.38 km^2 11 Richardson's ground squirrels	1.51 km^2 12 Richardson's ground squirrels	1.51 km^2 11 Richardson's ground squirrels	1.51 km^2 31 Richardson's ground squirrels	No, pole still not actively used by ferruginous hawks.

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 2022.

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. One portable watering site was monitored in 2022 with large use by cattle.

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.

One upland watering site was monitored in 2022. The unit was in good condition and was well used by cattle. Wildlife using the area adjacent to the trough included red-winged blackbirds (*Agelaius phoeniceus*) and vesper sparrows. The site directly around the water trough has unfortunately seen an increase in disturbance weeds.

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. 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 five properties in 2022. MP_23 has had huge success with fencing out a portion of a riparian zone with only limited issues with beaver activity. Figure 9 portrays what the site looked like early on in protection and 10 years later. In August when the site was visited, several riparian species were recorded within the exclosure: yellow warbler (*Setophaga petechia*), eastern kingbird, and cedar waxwing (*Bombycilla cedrorum*).
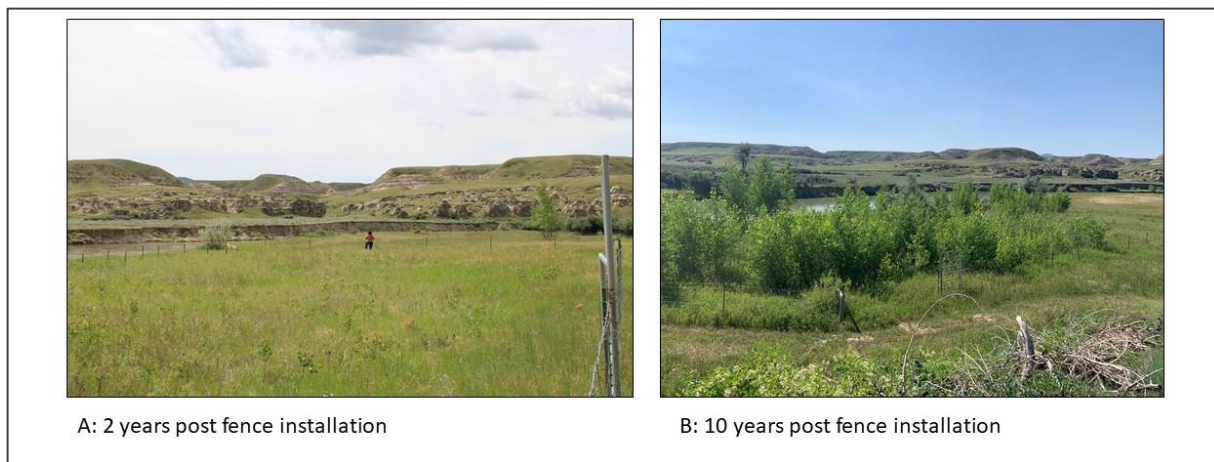
A: 2 years post fence installation   B: 10 years post fence installation

Figure 9. Riparian tree protection at MP_23.

At MP_43 the tree protection and tree were found to be blown down by the wind. Ferruginous hawks did attempt to renest in adjacent trees and shrubs but were unsuccessful this past breeding season. At one of the trees protected on MP_4 there was an active ferruginous hawk nest. The tree is still in good health, but it was determined that the protection panels are in need of repair from cattle rubbing. The second tree on MP_4 has a historic nest but was found to be inactive or failed. At MP_25 the tree seems to have deteriorated in health, but ferruginous hawks were seen still nesting there. At MP_7, two sites are protected but none of the nests were active this year.

Wildlife-Friendly Fencing and Fence Reflectors

All fence lines constructed with funding from MULTISAR are recommended to be constructed to wildlife-friendly specifications, 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. No fence lines were monitored in 2022.

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. One site was monitored for the use of portable electric fencing in 2022 (MP_43). The land manager was happy with the ease of use of the unit and the flexibility it has given him to target areas or management or keep cattle out of certain spots.

Monitoring of Habitat Enhancements in 2022-2023

In 2023–2024, our aim is to revisit many of our enhancement sites for every property, with our goal of monitoring 75% of all enhancements. It will be our largest monitoring year since monitoring and evaluation of enhancements began in 2009 as currently, we have 384 enhancements (Table 14).

Table 14. Enhancements completed by MULTISAR since inception.

Enhancement Type	Number of Sites
Artificial Structures Nest poles, bat boxes, bat condo, calf shelters, oilers, etc.	48
Wildlife-Friendly Fence	47
Portable Watering Site	57
Upland Watering Site	82
Tree Protection	29

Enhancement Type	Number of Sites
Shrub/Grass Planting	30
Grazing Management Tools	33
Weed Control	22
Riparian Protection	13
Native Reseed	12
Anthropogenic feature mitigation	11
Total	**384**

Future Direction

In 2023-2024, 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 (~110 060 acres) and one HMP (~1095 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 Cattle Association on the environmental display along the Cattle Trail during the Calgary Stampede.

3. Research, Monitoring and Data Management Program:

   3.1 Assist EPA in conducting sharp-tailed grouse monitoring on leks in southeastern Alberta.

   3.2 Assist EPA in the monitoring of ferruginous hawks throughout their range by conducting nine ferruginous hawk quadrants.

   3.3 Conduct five Richardson's ground squirrel surveys in vicinity of installed ferruginous hawk nest platforms.

   3.4 Assist EPA 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 three properties (~22 960 acres), originally assessed in 2012, 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 384) 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.

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