MULTISAR

A Multi-Species Conservation Strategy for Species at Risk in the Grassland Natural Region of Alberta

2016-2017 Report

Alberta Species at Risk Report No. 161

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March 2017

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MULTISAR is very fortunate to be working with a ranching community that has embraced the project and the continued stewardship of rangeland and wildlife habitat. The working relationships established with landholders over the years provide the essential foundation for which the MULTISAR program can be successful.

EXECUTIVE SUMMARY

MULTISAR 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. 2016 marked the first year in an expansion of the program and the addition of multiple new project management and funding partners. The program is a collaborative effort among landholders, the Alberta Conservation Association, Alberta Environment and Parks, the Prairie Conservation Forum, Canadian Cattlemen's Association, Alberta Beef Producers, and the Canadian Round Table for Sustainable Beef.

The Habitat Conservation Program includes the development of detailed Habitat Conservation Strategies (HCS) in the core project area of southern Alberta, as well as the more compact Species at Risk Conservation Plans (SARC Plans) delivered throughout the Grassland Natural Region. In 2016 the core project area was expanded to included areas throughout the South Saskatchewan Basin. In 2016-2017, a new HCS was developed on five ranches totalling approximately 9,837 acres. Associated habitat enhancement projects were also developed to improve the habitat of key wildlife species. A number of habitat projects were developed on HCS properties. These varied from planting of native grass plugs, wildlife-friendly fencing, windbreaks, Japanese and smooth brome control, installation of a pasture pipeline, tree protection and portable watering unit use.

The Education, Outreach and Awareness program was achieved primarily by MULTISAR staff that were able to give presentations and demonstration tours to landowners, wildlife and conservation groups, college students, and the general public. MULTISAR partnered with the Canadian Cattlemen's Association to man a booth during the Calgary Stampede that was viewed by over 100,000 people. Communication material included one issue of MULTISAR's newsletter. In total, MULTISAR made over 141 different contacts with more than 1,669 people (and an additional 100,000 people at the Calgary Stampede) including landholders, the general public, academia, industry, media, government and non-government organizations and other sectors.

Under the Research and Monitoring Program, MULTISAR continued implementing its monitoring and evaluation protocol to assess the directionality of habitat improvements and management changes and the effectiveness of its habitat conservation strategies. A subsample of range and riparian sites and wildlife points were revisited on six MULTISAR HCS ranches (~67,800 acres), five years after their initial assessment, to determine if management recommendations had been implemented and their impact on species at risk habitat.

MULTISAR began compiling the wildlife observation and vegetation assessment data it has been accumulating since its first Habitat Conservation Strategy. 2017 will be focused on determining inferences between species at risk occurrences and habitat metrics and that Beneficial Management Practices recommendations can be improved to maximize habitat quality.

1.0 INTRODUCTION

Grasslands have evolved over thousands of years, yet over the last century we've managed to lose roughly 80% of our 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 landowners and increasing awareness of species at risk.

MULTISAR 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. The program is a collaborative effort among landholders, Alberta Conservation Association, Alberta Environment and Parks, Prairie Conservation Forum, Canadian Cattlemen's Association, Alberta Beef Producers, Canadian Roundtable for Sustainable Beef, and Cows and Fish. The primary goals of MULTISAR are to implement collaborative strategies to manage multiple species on a defined working landscape and to assist with their implementation. These strategies are built as landholder-specific Habitat Conservation Strategies (HCS), leading to the implementation of habitat enhancement activities that benefit both the farm or ranch operation and wildlife. Through these relationships MULTISAR has implemented 155 habitat enhancement projects on over 332,000 acres of land.

MULTISAR consists of three primary components:

1) Habitat Conservation Strategies which are detailed plans developed with the landholder(s) that can be used as a tool for the management of their land.

2) Education, Outreach, and Awareness Program which involves developing Beneficial Management Practices for various species, development of the annual Grassland Gazette, development of presentations for the public, and completion of Species at Risk Conservation Plans, which are a condensed form of the HCS and completed for landholders outside the priority landscapes of the Milk River Watershed and portions of the South Saskatchewan River Watershed.

3) Research, Monitoring, and Evaluation which involves the monitoring of habitat enhancements every one to two years and evaluation of the detailed plans (HCS) every 5 years to determine if they are having the desired effect or are in need of adjustments.

The following chapters outline the accomplishments for MULTISAR under these project components for 2016-2017.

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

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.

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.

Goal: To assist landowners and lessees to manage land to benefit provincial and federal species at risk habitat, while maintaining an economically viable operation.

2.0 EDUCATION, OUTREACH & AWARENESS

2.1 Introduction

MULTISAR continued to deliver its Education, Outreach and Awareness program as time and resources permitted. Activities included everything from field training events, to presentations to school, community and landowner groups, to attendance at events with the MULTISAR display. Direct communication with landowners is ongoing, as is communication with other organizations and government agencies.

2.2 Landholder Awareness

2.2.1 At Home on the Range, Grassland Gazette and other Information Brochures

A total of 1,132 copies of MULTISAR's flagship booklet, *At Home on the Range: Living with Alberta's Prairie Species at Risk,* was distributed to landholder cooperators, mailed out to county and municipal district offices, provided to non-profit organizations for distribution, and given to interested members of the public at events such as the Calgary Stampede. The 11th issue of MULTISAR's newsletter, the *Grassland Gazette*, was produced in December 2016 and sent to 633 MULTISAR contacts, including program participating landowners. Over 950 MULTISAR fact sheets and species at risk information cards were handed out.

2.2.2 Southern Alberta Grazing School for Women

The 13th Annual Southern Alberta Grazing School for Women was held on July 27-28, 2016 in Elkwater, Cypress Hills Provincial Park. It was once again sold out, with 55 women in attendance. The two day "school" included topics such as species at risk, grazing principles and perspectives from a new generation woman rancher. Time was also spent in the field honing plant ID skills, learning why range and riparian health is important and how to assess this on individual range units. MULTISAR is one of the organizing partners of this event, and this year also delivered presentations on stocking rates and assisted with field sessions on plant identification. The MULTISAR display was also set up and various brochures and the At Home on the Range booklet were handed out.

2.2.3 Southern Alberta Youth Range Days

Southern Alberta Youth Range Days was held on July 5–7, 2016 in Elkwater, Cypress Hills Provincial Park. MULTISAR is one of the organizing partners of this event and had staff in attendance to deliver a presentation about bats, do Eastern short-horned lizard surveys, hold a range workshop, and assist supervising the youth. Fifty people were attendance, including youth and parents. Attendees came from various backgrounds, including farm and ranch, acreage and town.

2.2.4 Presentations/Training to Landholder Groups

MULTISAR had numerous conversations with individual landowners (over 60) about topics such as species at risk, wildlife friendly fencing, hawk poles, water management, native grass restoration, herbicides for invasive weeds, habitat assessments, the MULTISAR process, and so on. In addition to these conversations with landowners, MULTISAR also gave presentations and/or training to landowner groups on several occasions. Table 1 summarizes presentations and training that were given to landowner groups.

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

Date	Event	Location	Type	Attendance
May 3, 2016	Spruce Ranch Grazing Coop Annual General Meeting	Nanton, AB	Presentation about MULTISAR	40 attendees
July 7, 2016	The Journey of Holistic Decision Making, Shipwheel Feeders	Taber, AB	Presentation about MULTISAR	30 attendees
July 27-28, 2016	Southern Alberta Grazing School for Women	Elkwater, Cypress Hills Provincial Park	Part of organizing committee, presented on stocking rates, and aided with field exercises	55 attendees
September 23, 2016	Livingstone Landowners Guild Information Session	Lundbreck, AB	MULTISAR display and handouts were taken. Short 5 minute presentation about MULTISAR	40 attendees

2.3 Youth Education

MULTISAR was involved in youth education activities on nine occasions, reaching a total of 217 individuals. Table 2 summarizes these activities.

Table 2. Summary of activities by MULTISAR associated with youth education.

Date	Event	Location	Type	Attendance
April 6, 2016	Lethbridge College Field Trip	Elkwater, AB	Presentation on MULTISAR enhancements	25 College students
July 5, 2016	Youth Range Days	Elkwater, AB	Presentation on range, SAR (such as short horned lizard, plains spadefoot, and bats)	50 (youth and parents)
August 2 and 4, 2016	Kids Horse Camp	Lethbridge, AB	PCF Deep Roots presentation; Species at Risk; Amazing Race species at risk game	20 youths
August 31, 2016	Jennie Emery School Summer Youth Program	Coaldale, AB	Pokémon Go Raptors presentation	40 youths
September 14, 2016	Lethbridge College Field Trip	Elkwater, AB	Presentation on MULTISAR Enhancements	40 College students
September 20, 2016	Lethbridge College Field Trip	Private Ranch, AB	Toured students around property and discussed enhancements	12 College students
September 22, 2016	Lethbridge College	Lethbridge, AB	Bat lecture and night time survey at Henderson Lake	8 College students
November 16, 2016	Medicine Hat College	Medicine Hat, AB	Presentation on restoration activities at Silver Sage	15 College students
November 21, 2016	Lethbridge College	Lethbridge, AB	Presentation on MULTISAR wildlife surveys	7 College students

2.4 Public Outreach

2.4.1 Presentations, Demonstration Tours and Displays

In addition to MULTISAR's involvement with landowners and youth, MULTISAR delivers presentations and tours to other groups working on the landscape (such as non-government organizations, not-for-profit organizations, and government agencies), as well as participating in their events. At public events, MULTISAR will give presentations and take its interactive species at risk and grassland display. In 2016-2017, MULTISAR gave live presentations and set up the display on ten occasions. Presentations and tours were also given to individuals of groups to inform them about MULTISAR and MULTISAR processes. These types of presentations and displays allowed MULTISAR to directly reach over 400 individuals, and received direct and indirect exposure from at least 100,000 people who visited the Calgary Stampede Cattle Trail. At the Calgary Stampede, MULTISAR, as well as various other environmental organizations working towards engaging people in grasslands related issues, was invited by the Canadian Cattlemen's Association to set up displays. Table 3 summarizes MULTISAR's public outreach activities.

Table 3. Summary of 2016-2017 public outreach activities by MULTISAR.

Date	Event	Location	Type	Attendance
April 6, 2016	Agricultural and Environmental Services Spring Open House	Pincher Creek, AB	MULTISAR display (general)	50
April 14, 2016	MULTISAR meeting with Alberta Environment and Parks	Lethbridge, AB	Presentation to AEP agrologists about MULTISAR (gov't)	8
May 31, 2016	Milk River Watershed Council Canada Annual General Meeting	Milk River, AB	MULTISAR display (NGO)	60
June 23, 2016	Prairie Conservation Forum General Meeting	Oyen, AB	MULTISAR update on activities (NGO)	20
June 27, 2016	SARPAL Funding Ranch Tour	Private Ranch, AB	Tour of ranch to talk about MULTISAR (gov't)	10
July 8 – 17, 2016	Calgary Stampede; Canadian Cattlemen's Association	Calgary, AB	MULTISAR display (general)	Over 100,000 visitors from around the world
July 17 – 20, 2016	International Rangeland Congress	Saskatoon, SK	2 presentations about MULTISAR, and one staff member chaired a concurrent session (academic)	100
July 29, 2016	Country in the City	Medicine Hat, AB	MULTISAR display (general)	Over 100 people

Date	Event	Location	Type	Attendance
October 4, 2016	Global Roundtable for Sustainable Beef Meeting and Tour	Private Ranch, AB	Presentation about MULTISAR work (industry)	110
October 5, 2016	Prairie Conservation Forum General Meeting	Waterton, AB	MULTISAR update on activities (NGO)	30
November 22, 2016	MD of Taber	Taber, AB	Presentation on MULTISAR	16

2.4.2 Web Site and Social Media

The MULTISAR website (www.multisar.ca) continues to be the key portal where information about the project, beneficial management practices (BMPs) for species at risk, as well as related documents, news events, and producer stories can be accessed. It continues to get direct feeds from both the MULTISAR Twitter and Facebook accounts, which provide current news. The number of original tweets/Facebook posts from this past year was 50.

MULTISAR produced a short, five minute informational video showcasing what MULTISAR does and why. This video features MULTISAR cooperators and their ranches and the rich native biodiversity that exists on them. The video was posted to the MULTISAR YouTube channel and currently has 532 views. This video has been widely shared by partner organizations such as the Government of Alberta, Prairie Conservation Forum, Alberta Conservation Association, Canadian Cattlemen's Association, Alberta Beef Producers, and the Canadian Roundtable for Sustainable Beef.

2.4.3 Media and other Publications

In addition to the MULTISAR newsletter, the *Grassland Gazette*, that was produced and sent to over 600 contacts, MULTISAR received media attention by three other sources (Table 4).

Table 4. Media exposure MULTISAR received in 2016-2017.

Media Name	Topic of Story	Date
Prairie Post	Southern Alberta Grazing School for Women Returns to Elkwater	June 4, 2016
Alberta Environmental Farm Plan (blog on website)	MULTISAR	January 26, 2017
Alberta Farmer	Fifteen years later, conservation program is an overnight sensation	February 13, 2017
Lethbridge News Now	Local organization protecting species at risk while helping ranchers	March 20, 2017

2.4.4 Contacts, Extension and Outreach

Through the course of any fiscal year MULTISAR staff interacts on a daily basis with landholders and other individuals representative of a broad spectrum of sectors. Between April 1, 2016 and March 31, 2017, a total of 141 contacts were made with 1,669 people, plus over 100,000 people that visited the Calgary Stampede Cattle Trail and either stopped to talk with staff or walked by and saw the MULTISAR display. Table 5 shows a breakdown of the different individuals/groups that MULTISAR reached out to, as well as how many people were involved with MULTISAR in some way.

Table 5. MULTISAR contacts for 2016-2017.

Contact Type	# Contacts	# People Reached
Academic	8	94
Company	1	1
Consultant	0	0
Contractor	5	615
Government	17	41
Individual (non-landholder)	0	Over 100,000 at the Calgary Stampede
Industry	3	3
Landholder	74	204
Landowner Group	9	161
Media	4	unknown
NGO	8	198
School	1	40
Other	11	312
Total:	**141**	**1,669**

3.0 HABITAT CONSERVATION STRATEGIES

3.1 Introduction

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 the Habitat Conservation Strategy (HCS). The majority of the province's remaining native prairie is found in the Grassland Natural Region, 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 landowners and lease holders. The HCS team works together to balance the needs for healthy rangelands and quality fish and wildlife habitats through grazing recommendations and habitat improvement projects. The strategy is a result of detailed range, wildlife and riparian inventories and assessments, from which management goals and objectives can be made.

3.2 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 Alberta Environment and Parks, Alberta Conservation Association, Prairie Conservation Forum 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 actions for species identified as a priority on the land and from MULTISAR's Beneficial Management Practices document (RCS 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).

3.3 HCS Achievements for the Fiscal Year 2016-2017

To date, MULTISAR has completed 35 HCSs on 332,334 acres of land within the Milk River and South Saskatchewan watersheds (Table 6). In 2016, MULTISAR completed an HCS for five new properties in southern Alberta, totaling 9,837 acres. Work on these properties included detailed wildlife, range and riparian inventories.

Table 6. 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	7,680
2009	3	38,630
2010	5	4,731
2011	5	17,878
2012	3	13,127
2013	1	7,859
2014	2	43,250
2015	2	8,553
2016	5	9,837
Total	35	332,334

*HCS were counted in the year in which field work was initiated, however, some surveys continued for more than one year.
^ In 2006, MULTISAR absorbed the Western Blueflag Program and its 8 participating landholders. These properties did not have an HCS completed and therefore they are not included in this total.

To date, 17 HCSs that have been implemented for at least five years were reassessed (Table 7). These reassessments entailed a resurvey of a subsample of the original range, riparian and wildlife inventories. More details on these reassessments can be found in Section 5.0.

Table 7. Habitat conservation strategy reassessment summary.

Year of HCS Reassessment	MULTISAR Participant	Size of Property (ac)
2011	MP_1	62,050
2012	MP_4	28,797
2013	MP_7	41,332
2013	MP_8	3,479
2013	MP_9	4,201
2014	MP_2	159
2014	MP_3	4,071
2014	MP_6	40,547
2015	MP_5	3,832
2015	MP_10	2,209
2015	MP_11	3,055
2015	MP_16	1005
2016	MP_1	62,050
2016	MP_13	311
2016	MP_15	854
2016	MP_17	1,263
2016	MP_18	1,297
2016	MP_20	2,026
Totals	17*	262,538

*This number excludes the most recent reassessment for MP_1 in 2016.

3.3.1 Wildlife

To date, approximately 54,023 wildlife observations have been submitted to the Fish and Wildlife Management Information System (FWMIS) since 2004, including 4,526 in 2016. Forty-nine (49) different species at risk were recorded on HCS properties in 2016. Table 8 summarizes the species at risk observed on all HCS properties assessed (or reassessed) during the 2016 field season.

Table 8. Species at risk recorded during the 2016 Habitat Conservation Strategy field season.

Species	General Status[1]	Legislative Status[2]	# of Observations	Feature	Significance
BIRDS					
Alder flycatcher	Sensitive	N/A	2		
American kestrel	Sensitive	N/A	17		
American white pelican	Sensitive	N/A	4		
Baird's sparrow	Sensitive	Special Concern	86		
Bald eagle	Sensitive	N/A	2		
Baltimore oriole	Sensitive	N/A	22		
Bank swallow	Sensitive	N/A	15		
Barn swallow	Sensitive	N/A	17		
Bobolink	Sensitive	N/A	2		
Brewer's sparrow	Sensitive	N/A	27		
Chestnut-collared longspur	At Risk	Threatened	81		
Clark's nutcracker	Sensitive	N/A	24		
Common nighthawk	Sensitive	Threatened	21	1 nest	
Common yellowthroat	Sensitive	N/A	52		
Eastern kingbird	Sensitive	N/A	63	1 nest	
Ferruginous hawk	At Risk	Endangered	47	11 nests	2 nests found outside of known range
Golden eagle	Sensitive	N/A	15	3 nests	
Grasshopper sparrow	Sensitive	N/A	54		
Great blue heron	Sensitive	N/A	6		
Horned grebe	Sensitive	Special Concern	1		
Lark bunting	Sensitive	N/A	8		
Least flycatcher	Sensitive	N/A	37		

[1] Alberta General Status (AEP 2015)
[2] Legislative Status for Canada's Species at Risk Act (GOC 2016) or Alberta's Wildlife Act (GOA 2014)
N/A = Not Assessed

Species	General Status[1]	Legislative Status[2]	# of Observations	Feature	Significance
Loggerhead shrike	Sensitive	Threatened	15	1 nest	
Long-billed curlew	Sensitive	Special Concern	50		
McCown's longspur	May Be At Risk	Special Concern	9		
Olive-sided flycatcher	May Be At Risk	Threatened	1		
Osprey	Sensitive	N/A	1		
Pied-billed grebe	Sensitive	N/A	2		
Pileated woodpecker	Sensitive	N/A	1		
Prairie falcon	Sensitive	Special Concern	12	3 nests	
Sandhill crane	Sensitive	N/A	2		
Sharp-tailed grouse	Sensitive	N/A	45	2 nests & 8 leks	
Short-eared owl	May Be At Risk	Special Concern	1		
Sora	Sensitive	N/A	13		
Sprague's pipit	Sensitive	Threatened	86		
Upland sandpiper	Sensitive	N/A	25		
Western tanager	Sensitive	N/A	5		
Western wood-pewee	May Be At Risk	N/A	33		
HERPETOFAUNA					
Bullsnake	Sensitive	N/A	7	1 Hiberna -culum	
Greater short-horned lizard	At Risk	Endangered	3		
Northern leopard frog	At Risk	Threatened	6		Breeding area present
Plains garter snake	Sensitive	N/A	16		
Prairie rattlesnake	Sensitive	Special Concern	21	7 Hiberna -cula	
Wandering garter snake	Sensitive	N/A	1		
MAMMALS					

Species	General Status[1]	Legislative Status[2]	# of Observations	Feature	Significance
American badger	Sensitive	Data Deficient	3		
Grizzly bear	At Risk	Threatened	4		
Little brown bat	May Be At Risk	Endangered	1		
Long-tailed weasel	May Be At Risk	N/A	2		
Pronghorn	Sensitive	N/A	74		

3.3.2 Range

The HCS properties assessed (and reassessed) across southern Alberta in 2016 displayed a wide range of diversity in the plant communities and range health found. MULTISAR conducted a total of 101 detailed range transects (vegetation inventories), 369 range health assessments and 66 tame pasture assessments during the 2016 field season (Table 9). During these inventories, 12 species of rare plants were observed on the properties, which are listed in Table 9.

Table 9. Summary of range work completed by MULTISAR during the 2016 Habitat Conservation Strategy field season.

Property	Acres	Sites Assessed*	# Plant Communities	Rare Plants
MP_1	62,050	97 range health assessments	30	None
MP_18^	1608	15 range health assessments 2 tame pasture assessments.	N/A	None
MP_15	854	8 range health assessments	8	None
MP_17	1,263	7 range health assessments 6 tame pasture assessments	12	Western blue flag
MP_20	2,026	21 range health assessments 2 tame pasture assessments	12	None
MP_31	2,417	20 detailed transects 30 range health assessments 20 tame pasture assessments	80	Intermediate hawk's beard Limber pine Rare Plant Community Limber pine/common bearberry – creeping juniper

Property	Acres	Sites Assessed*	# Plant Communities	Rare Plants
MP_32	987	10 detailed transects 13 range health assessments 4 tame pasture assessments	28	Intermediate hawk's beard Limber pine Rare Plant Community Limber pine/common bearberry – creeping juniper
MP_33	2,609	26 detailed transects 35 range health assessments 23 tame pasture assessments	94	Yellow angelica Intermediate hawk's beard Cock's-comb cryptantha Crested beardtongue Limber pine Western ribgrass Rare Plant Community Limber pine/common bearberry – creeping juniper
MP_34	3,024	36 detailed transects 32 range health assessments 4 tame pasture assessments	32	None
MP_18 (new lands)	480	9 detailed transects 10 range health assessments 5 tame pasture assessments	16	Round woollyheads Tumble grass Cock's-comb cryptantha Smooth boisduvalia Low yellow evening primrose Slender cress Rare Plant Community Peach-leaved willow woodland

* The number of detailed transects includes corresponding range health assessments.
^ MP_13 and MP_18 have been combined together as one HCS property (MP_18). Any adjacent lands to MP_18 that are purchased in later years will be added to MP_18 and be indicated as such.

3.3.3 Riparian

The Alberta Riparian Habitat Management Society – Cows and Fish was contracted to complete 10 riparian health assessments in 2016 and completed an additional 22 assessments as part of the new partnership between MULTISAR and Cows and Fish. Nine sites that were completed on reassessment properties were sites that were assessed during the original HCS, which gives MULTISAR excellent comparison data over the years.

3.3.4 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 beneficial management practises for each management unit that promote sustainable ranching and habitat for species at risk.

3.3.5 Implementation of HCS Habitat Enhancements

MULTISAR completed 19 new habitat enhancements within the Milk River watershed in 2016 and continued on with another two enhancements initiated in previous years, including the continued restoration of 1,300 acres back to native grass through spraying for brome, Canada thistle, and other weeds to ensure a clean seed bed.. MULTISAR seeded 90 acres back to native grass and seeded another 250 acres to lentils to help control weeds in preparation for seeding in the spring of 2017. A producer partnered with MULTISAR on a 70 acre seeding project by planting western wheatgrass, a native species, to reduce the spread of non-native species in a riparian area. Another producer with the MULTISAR program is removing 34 acres of crested wheatgrass, a non-native species, and planting a simple four species native mix. Five kilometres of new wildlife friendly fencing was installed by MULTISAR and one other landowner also installed one kilometre of smooth wire on the bottom of their fence. Fence line reflectors were installed on an additional landowner's property to increase fence visibility for wildlife. MULTISAR continued work on test plots using ®Simplicity to control Japanese and downy brome grass at two sites. MULTISAR developed three upland watering sites and purchased two portable watering sites to be used around dugouts and wetlands. Other enhancements include: planting needle-and-thread grass plugs at one property, supplying fence materials to protect cottonwood trees on two landowners' properties, installing a road sign to caution drivers to reduce their speed near a ditch side ferruginous hawk nest, and MULTISAR collaborated with one landowner to remove an old building in sage grouse range.

Within the South Saskatchewan watershed, 15 habitat enhancements have been implemented in 2016 or will be completed by summer 2017 as part of the Habitat Conservation Strategies. These enhancements include four upland watering sites and one pasture pipeline to reduce cattle pressure on riparian areas that support northern leopard frogs and loggerhead shrikes. Also, eight portable watering units are being used at wetlands and dugouts to reduce cattle pressure and improve habitat for amphibians. Wildlife friendly fence lines were installed on two HCS properties to protect springs and wetlands.

In total, 155 on-the-ground enhancement projects have been completed by MULTISAR participants since 2005 (Figure 1).

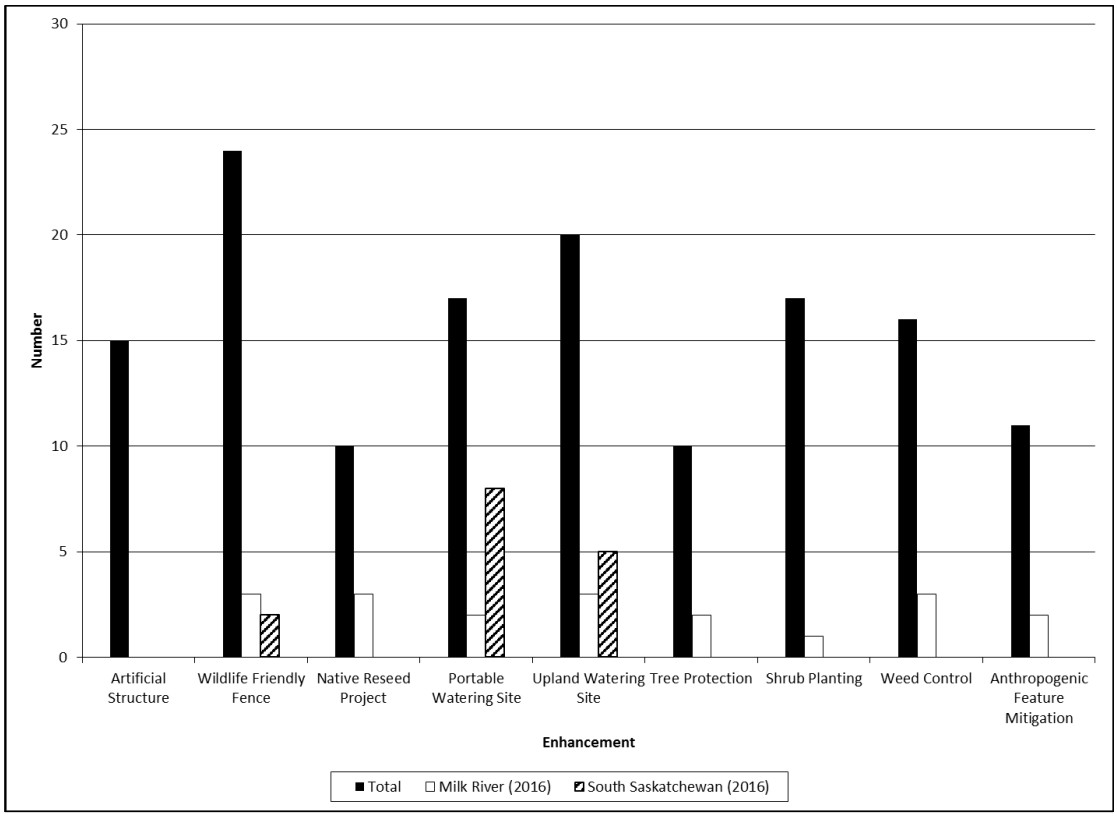


Figure 1. Habitat enhancement projects completed in the Milk River and South Saskatchewan watersheds, by category, since 2005.

Habitat enhancement projects continue to be monitored through MULTISAR's monitoring and evaluation protocol to ensure that the enhancements are having the desired positive impact on specific habitat and wildlife. Section 5.0 discusses MULTISAR's monitoring and evaluation process in more detail and the positive results that are being seen on the landscape as a result of these enhancement projects.

3.4 Conclusion

Over the last 15 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 332,334 acres of land, of which a large portion is interconnected, allowing for landscape planning versus 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 and will continue to provide open communication, information and awareness, team based wildlife habitat planning, and will continue to build long-term relationships with landholders, government, non-government organizations, and industry.

4.0 SPECIES AT RISK CONSERVATION PLANS

4.1 Introduction

In 2016-2017, MULTISAR continued the use of its extension program to influence rangeland management and benefit prairie wildlife habitats. Species at Risk Conservation (SARC) Plans were introduced in 2007 as an extension of the MULTISAR Habitat Conservation Strategy (HCS). They are a more condensed version of the HCS applied at the ranch level and delivered throughout the entire Grassland Natural Region (GNR) and the adjacent Rocky Mountain and Parkland Natural Regions.

Following a large demand for species specific or habitat specific management tools, MULTISAR introduced its Beneficial Management Practices (BMP) assessments in 2012-2013. Over the years, MULTISAR staff have been approached by landowners wanting to complete specific habitat improvements on their properties (e.g., installation of hawk nesting poles, water developments, etc.), 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 guidance on that specific topic. For this reason, BMP specific assessments were developed that focused solely on the proposed habitat improvements or on the habitat requirement of species of interest.

4.2 SARC Plan/BMP Assessment Process

The MULTISAR 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).

Of the six steps noted above, the BMP assessment follows the same process as the SARC Plan, except for step one. These assessments are normally completed in response to a landowner's request as opposed to the active solicitation involved with the SARC Plan program.

4.3 Achievements

Since the inception of the SARC Plan program in 2007, 81 assessments (one in 2016-2017) have been completed throughout the GNR covering a total area of 156,174 acres. The SARC that was completed in 2016 was located just southwest of Calgary, AB. This SARC was recommended to the landowner by Cows and Fish after they completed an assessment of the property. The landowner is also interested in potentially installing a hawk nesting platform.

This was the fourth year that BMP specific assessments were completed. Two BMP assessments (on 7263 acres) were completed this year for landowners who wanted to install artificial hawk nesting platforms, with interest in controlling Richardson's ground squirrels on their property in an ecological manner. Since beginning these assessments in 2012, MULTISAR has completed 18 BMP assessments for a total of 21,528 acres.

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.

4.4 Discussion

Since their inception in 2007, SARC Plans initially were popular with landowners. This was due to the fact that the first 'wave' of SARC Plans were 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 summarises the number of participating SARC Plan landowners/properties per year over the ten years of the program.

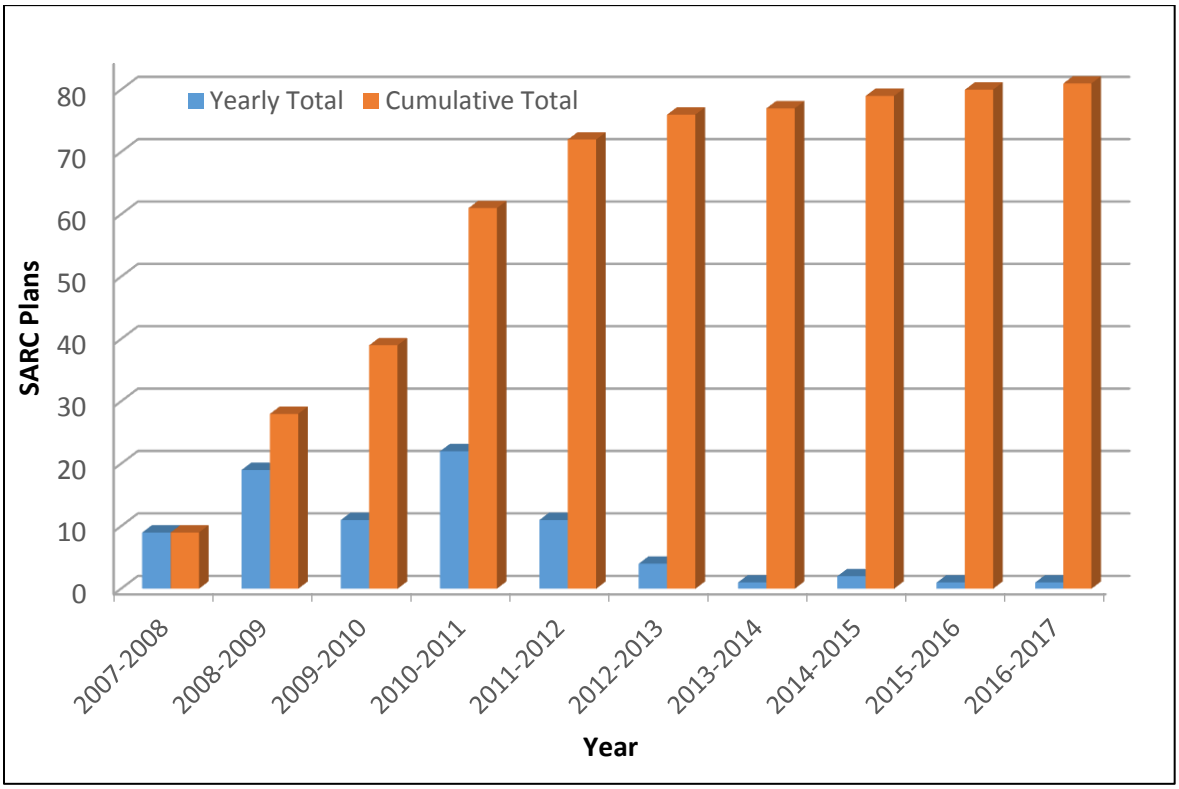


Figure 2. Number of SARC Plans completed since program inception.

In 2013, an evaluation of the SARC Plan program was completed. The results of this evaluation indicated that landowners 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, landowners 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 will benefit species at risk. Therefore, it was decided that SARC Plans would target those landowners who approached (or were referred to) MULTISAR and requested a plan. This scenario gives MULTISAR the best "bang for their buck", as time and resources can focus on properties and landowners where the information passed on to them will be most useful.

This past year, all three plans that were completed were for landowners who contacted MULTISAR after hearing about the program and services that MULTISAR offers. The initial contact or knowledge of the program is typically from interactions of MULTISAR staff with landowners or other conservation organizations during various conferences, training days, tradeshows, etc.

4.5 Conclusion

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 landowners throughout the Grassland Natural Region and increase awareness of species at risk beneficial management practices. Without an Education and Outreach Coordinator, MULTISAR will continue to provide SARC and BMP plans on a responsive basis and promote them at various landowner events.

5.0 HABITAT CONSERVATION STRATEGY EVALUATION & MONITORING PROGRAM

5.1 Introduction

The year 2016-2017 marks the seventh year of MULTISAR's evaluation and monitoring program. The process of monitoring and evaluating occurs on two levels: Re-assessment of Habitat Conservation Strategies (HCS) and monitoring of completed enhancements on properties that have an HCS. The following sections will provide a summary of MULTISAR's evaluation and monitoring accomplishments for the year.

5.2 Evaluation of the HCS component of the MULTISAR Project

An evaluation of each HCS completed for the MULTISAR project is scheduled to occur five years after the HCS implementation. The focus of this assessment is to measure the effectiveness of the HCS plan and recommendations in influencing habitat management decisions, improving/maintaining habitat for species at risk, and refining the landholders' perceptions of species at risk and their associated habitats. In 2016-2017, MULTISAR evaluated five participating properties that had HCS plans in place and will be referenced in this report with code names (such as MP_1, etc.).

5.2.1 HCS Evaluation Results for 2016

5.2.1.1 Range Health Trend

MULTISAR uses 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 including survey minimum requirements, and statistical procedures for evaluating this part of the HCS process.

MP_16 was reassessed in 2015 but not reported on last fiscal due to time constraints. Twelve sites were revisited from the original eighteen range health assessment locations in 2010. Baseline goals were comprised of having 7 sites maintaining range health and 5 sites increasing in range health. On average, range health decreased from 66.4% to 55.6% at these sites. The sites with an increase in range health goal on average maintained the same scores within 10%, and the sites with a goal to maintain range health have decreased in health. This property is slated to have a change in grazing management and will be monitored closely for trending changes.

MP_1 was originally assessed in 2004, and subsequently had its first reassessment completed in 2011, and its second reassessment in 2016. From the ninety-four (n=94) native grassland range health assessment sites revisited in 2016, the overall health changed from 73.5% (SD=14.4) in 2011 to 72.7% (SD=11.5). The thirty-nine areas with goals to “increase” (>10%) in range health from 2011 did on average increase in health by 3.8%. Native sites with goals to “maintain” range health (within ±10%) had a mean difference of -4% between the two years.

Across all native sites revisited for MP_15, overall health changed from 57.5% (SD=9) in 2010 to 58.4% (SD=15) in 2016 (n=8). The five areas with goals to “maintain” range health did maintain health, with a mean difference of 1.2% from the scores in 2010. Scores from the three areas having goals to “increase” in health had a mean difference of 0.3%.

On MP_17, 13 range health locations were reassessed. Seven sites were native or modified native areas and six were within tame pastures. Overall health changed from 62.2% (SD =16.7) in 2011 to 65.6% (SD = 14.7) in 2016, with 62% of the transects falling within categories of Healthy with Problems or better. Native sites with an “increase” in health goal did increase and sites with a “maintain” goal did maintain health within 10%.

On MP_20, 23 range health locations were reassessed. Nineteen (19) sites were native, and two were tame pastures. Overall health changed from 71.3% (SD=8.6) in 2011 to 66.9% (SD=15.7) in 2016. Native sites with an “increase” in health goal (n=2) did increase and sites with a “maintain” goal (n=19) did maintain, with a mean difference of -7.6%. The sample size for tame areas reassessed was very small (n=2) with both tame areas having goals to “decrease” in health to help rest native grasses. These sites however actually increased in health scores in 2016.

5.2.1.2 Riparian Assessments

Riparian inventories and health assessments help to identify problems and land use issues along waterbodies. The results of a riparian assessment offer suggestions for landscape management improvements. In 2016, two HCS reassessment properties had riparian inventories and health assessments completed by the Alberta Riparian Habitat Management Society (Cows and Fish).

MP_1 had riparian health inventories reassessed on six sites with sites assessed using Large River Health Assessment and Lotic protocols. All sites on MP_1 saw health improvements or maintenance of health (Table 10). Two of the sites increased in scores enough to change health categories with one, Lotic large river #4, moving out of the Unhealthy category to Healthy but with Problems.

On MP_17, one lotic, one large river and one lentic site were assessed. Lotic site #1 saw the most change improving from 63% to 75%, which is only five percent from the "Healthy" category. The large river site saw no change and the lentic site decreased in score primarily due to weed distribution and lack of shrubs and tree regeneration.

Table 10. Riparian health reassessments for assessed HCS properties.

Property	Inventory*	Baseline Year(s)	Reassessment Year	Trend
MP_1	Lotic: large river 1	62%, 67%	74% "Healthy but with Problems"	Improving
	Lotic: large river 2	64%, 67%	65% "Healthy but with Problems"	No change
	Lotic: large river 3	58%	56% "Unhealthy"	No change
	Lotic: large river 4	51%	63% "Healthy but with Problems"	Improving
	Lotic 1	77%	85% "Healthy"	Improving
	Lotic 2	80%	82% "Healthy"	No change
MP_17	Lotic 1	63%	75% "Healthy but with Problems"	Improving
	Lotic: large River	65%	64% "Healthy but with Problems"	No change
	Lentic 1	75%	70% "Healthy but with Problems"	Slight change

* Name changed for landowner privacy

5.2.1.3 Wildlife Assessments

Wildlife surveys from the baseline years on MP_1, MP_15, MP_17, MP_18, and MP_20 were repeated in 2016. For this report we will focus on multi-species point count surveys with comparisons on species richness and species diversity between baseline year to assessment year. We also look at the top ten species recorded for each year (Table 11).

Table 11. Most abundant wildlife species from point count data for baseline and reassessment years.

Property	Baseline year		Reassessment year	
	Species	**Count**	**Species**	**Count**
MP_1	Richardson's Ground Squirrel	164	Richardson's Ground Squirrel	369
	Chestnut-collard Longspur	150	Chestnut-collared Longspur	117
	Horned Lark	105	Horned Lark	91
	Savannah Sparrow	96	Savannah Sparrow	91
	Baird's Sparrow	41	Western Meadowlark	86
	Boreal Chorus Frog	40	Brewer's Blackbird	64
	Sprague's Pipit	34	Vesper Sparrow	42
	Western Meadowlark	33	Baird's Sparrow	22
	Vesper Sparrow	30	Clay-Colored Sparrow	18
	Marbled Godwit	14	McCown's Longspur	12
MP_15	Chestnut-collared longspur	68	Canada Goose	65
	Horned Lark	37	Horned Lark	43
	Brown-headed Cowbird	31	Brown-headed Cowbird	31
	Savannah Sparrow	24	Chestnut-collared Longspur	31
	Franklin's Gull	12	Western Meadowlark	26
	Western Meadowlark	9	Savannah Sparrow	14
	Brewer's Blackbird	6	Grasshopper Sparrow	12
	Vesper Sparrow	6	Brewer's Blackbird	10
	Grasshopper Sparrow	6	Lark Bunting	9
	Baird's Sparrow	5	Vesper Sparrow	7
MP_17	Richardson's Ground Squirrel	37	Richardson's Ground Squirrel	22
	Savannah Sparrow	20	Savannah Sparrow	22
	Vesper Sparrow	14	Cliff Swallow	16
	Clay-Colored Sparrow	10	Canada Goose	13
	Horned Lark	9	Vesper Sparrow	13
	Mallard	4	Clay-Colored Sparrow	11
	Red-winged Blackbird	4	Mallard	8
	Brewer's Blackbird	3	Western Meadowlark	6
	Northern Pintail	3	Blue-winged Teal	5

Property	Baseline year		Reassessment year	
	Western Meadowlark Bank Swallow Eastern Kingbird	2	Black-billed Magpie	4
	European Starling Marbled Godwit Ring-billed Gull	2		
MP_18	Horned Lark	53	Canada Goose	75
	Richardson's Ground Squirrel	28	Savannah Sparrow	46
	Vesper Sparrow	20	Western Meadowlark	45
	Baird's Sparrow	14	Grasshopper Sparrow	31
	Savannah Sparrow	14	Baird's Sparrow	30
	Western Meadowlark	13	Vesper Sparrow	26
	McCown's Longspur	11	Sprague's Pipit	17
	Chestnut-collared Longspur	10	Brown-headed Cowbird	15
	Canada Goose	9	Richardson's Ground Squirrel	13
	Northern Pintail	9	Horned Lark	10
	Western Meadowlark Bank Swallow Eastern Kingbird	2	Black-billed Magpie	4
	European Starling Marbled Godwit Ring-billed Gull	2		
MP_20	Sprague's Pipit	26	Western Meadowlark	75
	Western Meadowlark	24	Savannah Sparrow	30
	Horned Lark	17	Sprague's Pipit	28
	Savannah Sparrow	13	Richardson's Ground Squirrel	21
	Vesper Sparrow	12	Brewer's Blackbird	18
	Baird's Sparrow	12	Horned Lark	18
	Mallard	4	Baird's Sparrow	17
	Chestnut-collard Longspur Marbled Godwit	3	Vesper Sparrow	11
	Mule Deer Pronghorn	2	Cliff Swallow	11
	Sharp-tailed Grouse Willet	2	Grasshopper Sparrow	11

Ninety-two point counts were completed on MP_1 in 2016 and were compared to 2011 wildlife information. Species richness has increased slightly in the last 5 years from 3.43 (SD=2.56) to 3.66 (SD=1.76) but the change is not significant (t=0.94, p=0.35). Species diversity has seen a slight decrease changing from 0.99 (SD=0.5) to 0.96 (SD=0.5; t=-0.32, p=0.75). The species recorded most frequently in 2011 and 2016 was the Richardson's ground squirrel (*Urocitellus richardsonii*) with 2016 seeing a 125% increase in ground squirrel numbers. In 2016, horned lark (*Eremophila alpestris*), Baird's sparrow (*Ammodramus bairdii*), chestnut collared longspur (*Calcarius ornatus*), and Sprague's pipit (*Anthus spragueii*) all saw decreases in numbers, with Sprague's pipit not being present in the top 10 species list.

From the HCS to the reassessment year, wildlife species richness and diversity have not seen much change (p=0.29, p=0.68 respectively) on MP_15. Seventeen point counts were compared and average species richness was 5.7 (SD=1.8) and species diversity was 1.4 (SD=0.4) for 2016. In 2010, species richness was 5.1 (SD=1.5) and species diversity was 1.4 (SD=0.3). On this property in 2016, we saw a large increase in western meadowlark (*Sturnella neglecta*) (+188%) and grasshopper sparrow (*Ammodramus savannarum*) (+100%) numbers. Chestnut-collared longspurs saw a 54% decline.

Sixteen point counts were compared on MP_17 and average species richness was 3.4 (SD=1.7) and species diversity was 0.9 (SD=0.5) for 2010. In 2016, the average species richness was 3.8 (SD = 2.1) and the average species diversity was 1 (SD=0.6). Even though both species diversity and richness increased, the change was not significant (p=0.78, p=0.59 respectively), which is reflected in the top ten species in Table 11. Horned larks were only recorded two times in 2016.

MP_18 has two different sites where MULTISAR has done some reseeding. This property has seen the largest change in species composition. There have been large increases in Baird's sparrow, savannah sparrow (*Passerculus sandwichensis*), grasshopper sparrow, and western meadowlark. In addition, Sprague's pipits are starting to be seen on the property. There was, however, an absence of chestnut-collared longspurs and McCown's longspurs (*Rhynchophanes mccownii*) at point counts where they were seen in baseline years. Species richness increased significantly from 3.3 (SD=1.9) in the baseline year to 5.0 (SD=2.10) in 2016 (t=3.71, p=0.0007). Species diversity calculations revealed an increase from 0.96 (SD=0.53) in the baseline year to 1.41 (SD=0.5) in the reassessment year (t=3.83, p=0.0005).

MP_20 detailed a major shift in range health as well as in wildlife richness and diversity. Both measurements of diversity and richness increased significantly. From 2011 to 2016 species richness increased from 2.5 (SD=1.3) to 3.8 (SD=1.6) (t=3.59, p=0.0010) and species diversity increased from 0.73 (SD=0.56) to 1.14 (SD=0.49) (t=3.27, p=0.0023). On this property, numbers of western meadowlark, savannah sparrow and grasshopper sparrow increased.

5.2.1.4 Questionnaire

To date we have completed 11 reassessment questionnaires with three questionnaires being filled out and returned in 2016. Overall, the results of the questionnaires completed were very positive. The landholders valued the friendly and collaborative work that MULTISAR has provided and appreciates MULTISAR's multi-partner, multi-species and grassroots approach.

Prior to working with MULTISAR, many participants had reservations about species at risk because of their impressions of the federal government's authority on these species. After having worked with MULTISAR, most participants have increased their appreciation for species at risk and view them more as an asset and not a liability.

On every questionnaire it was noted that all participants increased their knowledge of range management principals and were prepared to make some changes. All participants were willing to complete projects that help benefit their cattle operations as well as wildlife and have agreed to voluntarily work with MULTISAR for another 5 years.

5.2.2 HCS Reassessment Concluding Remarks

For the five HCS properties that were reassessed and had range and wildlife data analyzed, there were varied results for their pre-determined objectives and goals. Continuing to strive for a varied landscape will benefit both the livestock producer's cattle and wild species' habitat.

In the forthcoming years, based on knowledge acquired through the HCS re-evaluation process, modifications may be made to recommendations and desired outcomes for each property. In addition, adjustments may also be made to allow for improved assessments and monitoring for each HCS. In 2017, it is expected that MP_4 and MP_19 will be reexamined. In addition, roughly 17 properties will have been reassessed at least twice, which will allow MULTISAR to evaluate the HCS program more collectively as opposed to individually.

5.3 Monitoring Habitat Enhancements on HCS Participants

Monitoring is the periodic collection of data to determine if activities are accomplishing the project goals and objectives. Monitoring enhancements can help aid in the evaluation process (Margoluis and Salafsky 1998). Problems and corrective actions identified during monitoring can help direct future enhancements and/or monitoring protocols. However, determining the success of an enhancement can be a complex question since the habitat manipulation (enhancement) can cause varied effects and effects may not be linked to the manipulation (Fletcher et al. 2007). Approximately 57 enhancements, which were implemented on several different properties as a result of HCS recommendations, were monitored in 2016. The following will be a summary of the key findings for this year.

5.3.1 Restoration Projects

Conversion of cropland back to native grasses can benefit a suite of species. Monitoring of enhancement projects that involve native grass restoration is completed every year for several consecutive years. For detailed objectives and desired measures of success for MULTISAR restoration projects see Downey et al. (2011; Section 5.3.1). Monitoring at four MULTISAR restoration sites were conducted in 2016. One of the 2 reseeding projects on MP_7 (RP_02 implemented in 2011), two of the three projects on MP_18 (RP_01, fall 2011, and RP_02 spring 2012), and one reseeding project on MP_2 (RP_01).

MP_7 RP_02 was reseeded in 2011 and has seen an increase in litter amounts, a slight increase in desired vegetative species, as well as maintenance of range health within 10% of prior years (Table 12). Native restoration takes many years to accomplish goals, therefore continuing to monitor the area will help determine any trends for this site.

For the fall reseed (RP_01) on MP_18, we see an increase in range health and a substantial increase in litter amounts (Table 13). The spring reseed (RP_02) is showing signs of increased

desirable wheat grasses while maintaining range health in the High Healthy with Problems category.

Since MP_2 was reseeded in 2010, we have seen an increase in range health, desired vascular plants and now have incorporated grazing to help with weed control. There are two different treatment areas for this restoration project (Field 1 and 2; Table 14).

Table 12. Range information collected for restoration project MP_7_RP_02.

Total of 2 transects/range health assessments	2012	2013	2014	2015	2016
Range Health % Average	45	40	42	72.5	63.5
Total Vegetative Cover % Average	59.2	74.1	77.2	77.4	N/A
Litter Average (lbs)	172	175	255	425	450
Needle and Thread Grass% Average	0.1	0.15	0.1	0.5	1
June Grass % Average	4.5	4.95	4.55	6.4	10.5
Blue Grama Grass % Average	3.8	2.6	2.3	2.8	4.5
Northern Wheatgrass % Average	N/A	8.9	4.55	7.1	N/A
Western Wheatgrass % Average	N/A	3.7	3.3	4.9	N/A
Silver Sagebrush % Average	<1	1.5	<1	<1	1
Average Wheatgrasses species %*	5.5	N/A	N/A	N/A	10

Table 13. Range information collected for restoration project MP_18_RP_01 and PR_02.

Total of 3 transects/range health assessments in each RP	RP_01 2012	RP_01 2013	RP_01 2014	**RP_01 2015	RP_01 2016	RP_02 2012	RP_02 2013	RP_02 2014	RP_02 2015	RP_02 2016
Range Health % Average	40	36	37	45.5	60	42	37	43	71.6	70.7
Litter Average (lbs)	483	467	433	475	1620	371	225	308	683	662
Total Vegetative Cover % Average	60	86	93	91	N/A	69	80	87	86	N/A
Needle and Thread Grass% Average	0.17	0.23	0.23	0.1	0.5	0.4	0.5	0.9	0.07	0.33
June Grass % Average	0.1	2.2	4.5	7.95	7.5	1.2	3.9	5.6	5.1	2.2
Blue Grama Grass % Average	0.6	1.9	2.3	2.6	2.7	1.3	4.1	3.3	5.7	10
Northern Wheatgrass% Average	N/A	2.6	4	7.4	5.6	N/A	4.2	5.4	10	14.2
Western Wheatgrass% Average	N/A	1.3	1.4	3.6	3.3	N/A	5	4.3	7.1	11.8
Silver Sagebrush% Average	0	0	0	<1	<1	0	0	0	<1	<1
Average Wheatgrasses species%*	2.1	N/A	N/A	N/A	N/A	2.5	N/A	N/A	N/A	N/A

*combined when they were not discerned to individual species **only 2 range health areas were evaluated in 2015 due to weed spraying.

Table 14. Range information collected for restoration project MP_2.

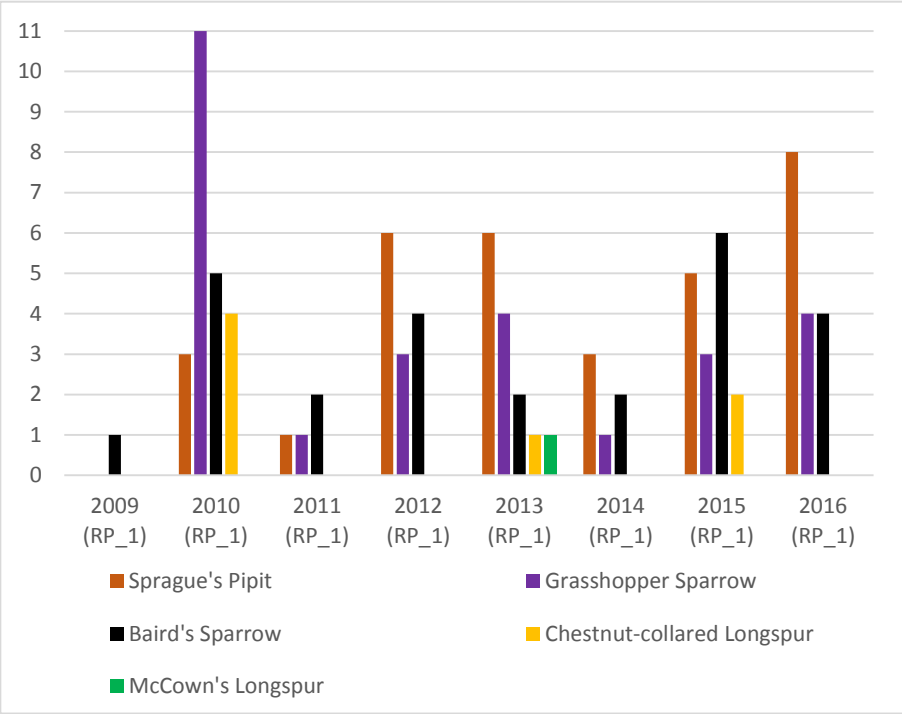
Total of 2 transects/range health assessments in each RP	RP_01 2014 Field 1	RP_01 2016 Field 1	RP_01 2014 Field 2	RP_01 2016 Field 2
Range Health % Average	51%	64%	60%	62.5%
Litter Average (lbs)	400	260	300	162.5
Total Vegetative Cover % Average	81	N/A	99.4	N/A
Needle and Thread Grass % Average	0	0	1.1	4.8
June Grass % Average	0	0	1.8	0.75
Blue Grama Grass % Average	25.7	36.9	1.7	4.6
Northern Wheatgrass % Average	0.05	0.3	0.25	1.1
Western Wheatgrass % Average	3.1	3.5	0.85	0
Silver Sagebrush % Average	0	0	0	0

The wildlife component of the reseeding projects was determined by completing wildlife point counts at historic point count locations (control and reference sites were also monitored but not discussed here). The following graphs look at the trends for different grassland bird species. Of particular interest are Baird's sparrow, grasshopper sparrow, Sprague's pipit, chestnut-collared longspur, and McCown's longspur. The graphs look at total numbers of each species per reseed treatment location comparing baseline data (year of treatment or year prior to treatment) with data collected in 2016, and only compares point count data, omitting any incidental sightings (Figures 3 to 5).

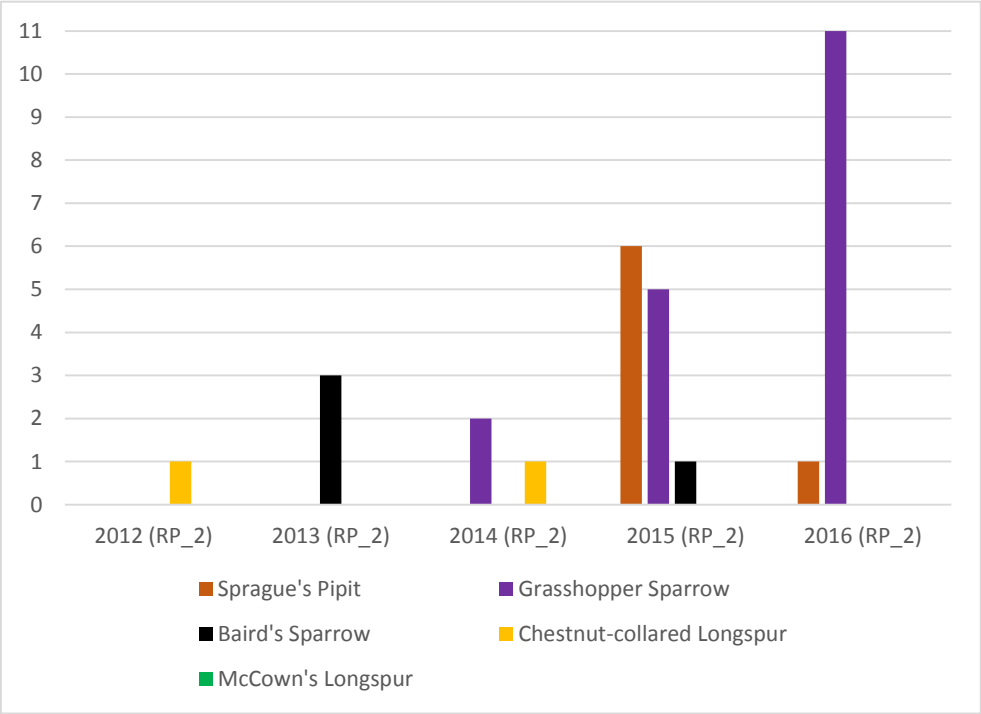
MP_7 RP_01 has seen a gradual increase in the number of desirable species (Figure 3a) while RP_02 has seen more sporadic increases in desirable species. However, we only have four years of data (Figure 3b). Further monitoring will be conducted every year as grazing of the sites has been incorporated. Sprague's pipits are present at both sites.

In both treatment sites for MP_18 we see a decline in horned larks and for RP_02 we are seeing the establishment of other species such as Sprague's pipit and McCown's longspur. Additional years of monitoring are recommended at these sites to assess trends (Figure 4 a, b).

MP_2 was reseeded in 2010 but there have been many issues with seed catch and weeds such as downy brome. Wildlife species observed have been varied, but an increase in desirable species is occurring (Figure 5).

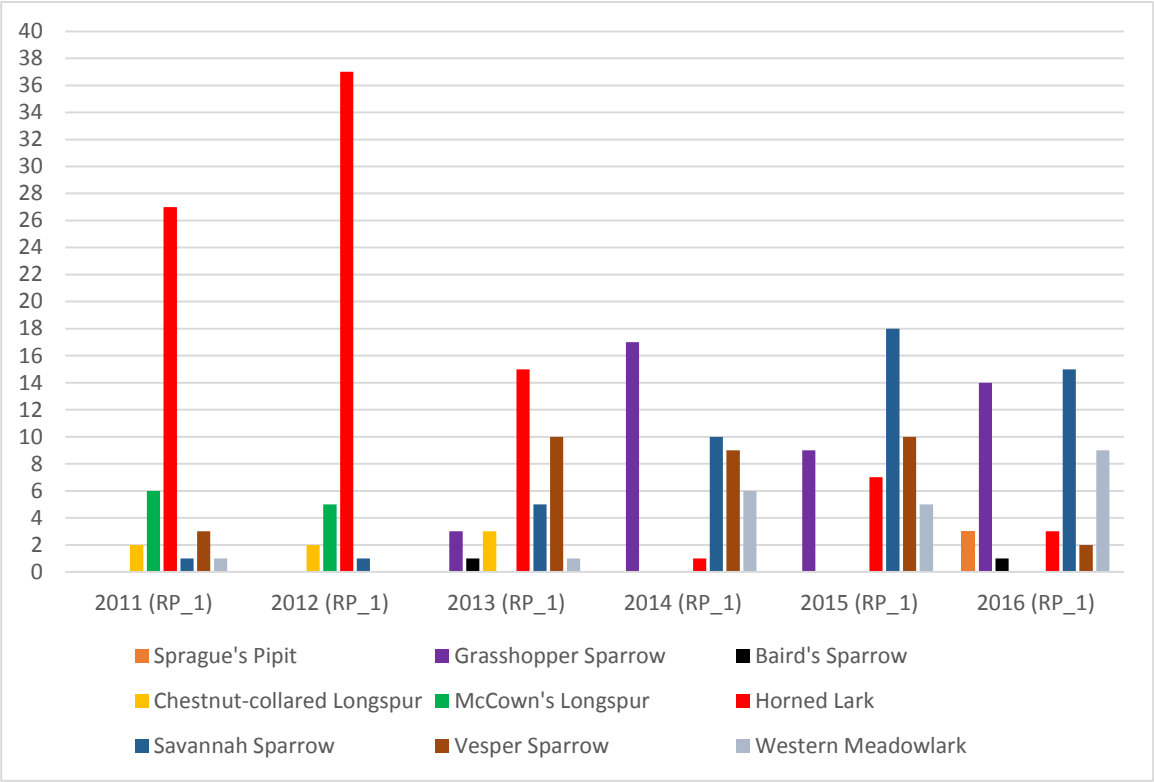


a. RP_01: 2009 was first year post reseed.

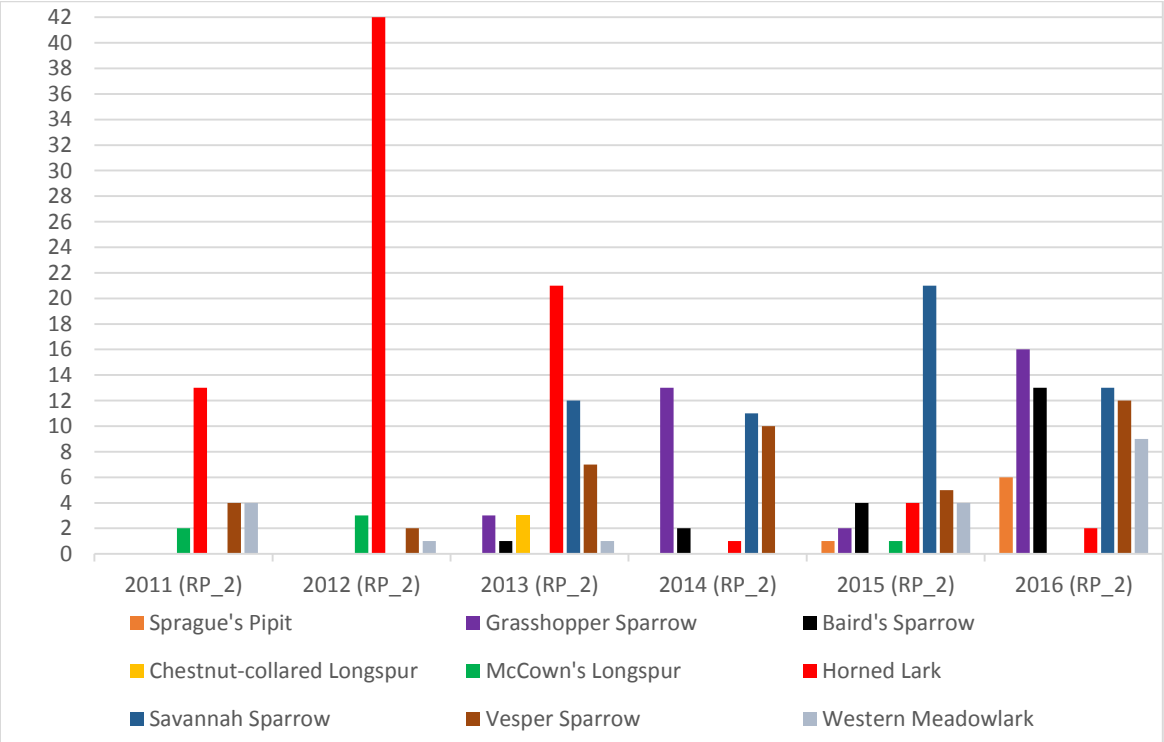


b. RP_02: 2012 was first year post reseed

Figure 3. MP_7_RP_01 and RP_02 grassland bird trend in reseeded areas.



a. RP_01 Fall reseed.



b. RP_02 Spring reseed.

Figure 4. MP_18 RP_01 and RP_022 grassland bird trend in reseeded areas. Year 2011 was prior to reseeding.

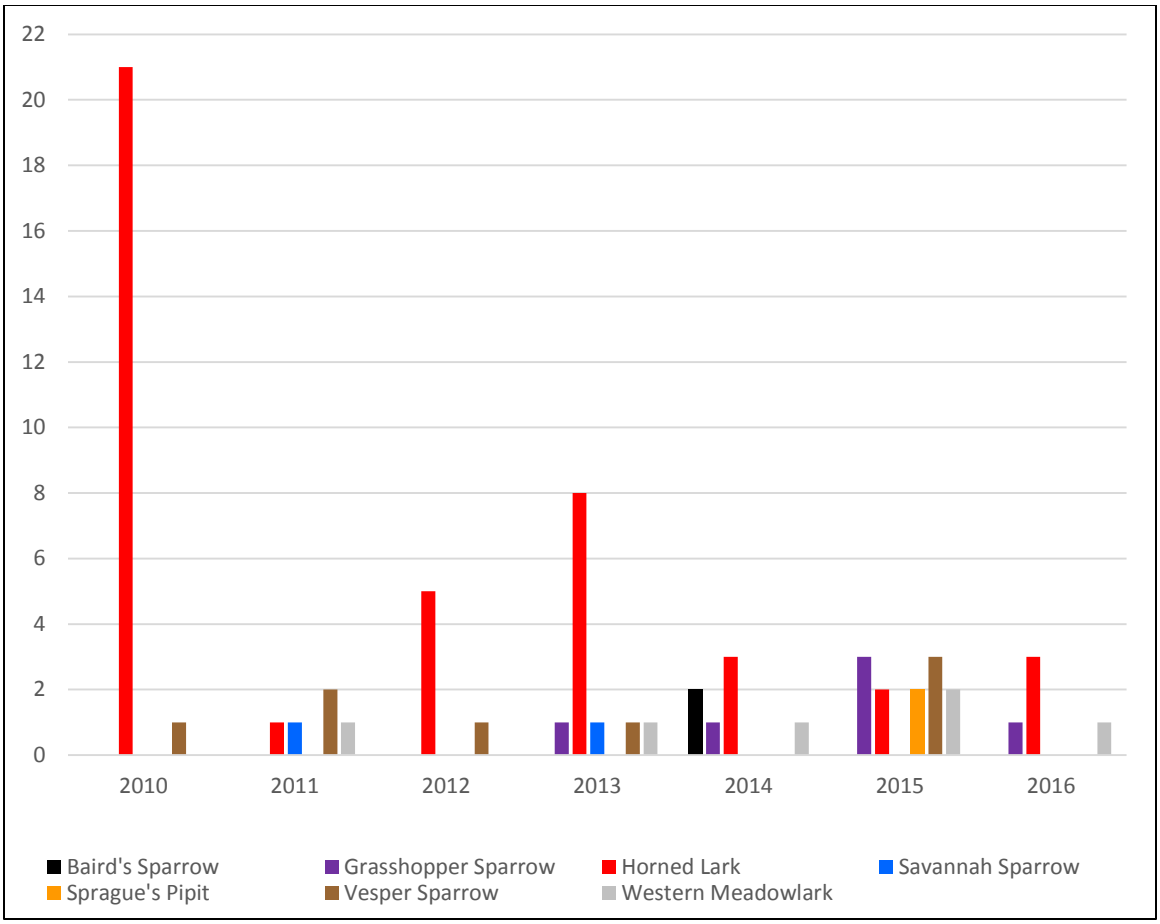


Figure 5. MP_02 RP_01 grassland bird trend in reseeded areas. Year 2010 was prior to reseeding.

5.3.2 Shrub/Forb/Grass Plantings

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

Three previously planted sites were monitored to record shrub and forb presence (Table 15). It may take multiple years for newly planted species to establish substantially as they must compete with other vegetative species, adjust to local moisture levels, and are at risk of being browsed considerably by wildlife.

In 2014, MULTISAR planted silver sagebrush plugs, American vetch (*Vicia americana ssp*), golden bean (*Thermopsis rhombifolia*) and silver sagebrush plugs at MP_13 and MP_18. Two hundred plugs of one species were planted in 15x15 foot marked plots. For the time being, since survival has been determined low for the last several monitoring years, 2014 marks the last year

of planting of shrubs and forbs with the use of plugs. Continuing portions of this enhancement type will be based on results found during monitoring of those sites planted in 2014.

Table 15. Shrub, forb and grass monitoring in 2016.

Property	Year planted	Species	Number of plots	Percent survivorship 2015	Percent survivorship 2016
MP_18_SSP_06	2014	Silver Sagebrush plugs	1	48%	39.5%
MP_18_SSP_07	2014	Golden bean plugs	1	0%	None found in area
MP_18_SSP_08	2014	Vetch plugs	1	0%	None found
MP_13_SSP_02	2014	Silver Sagebrush plugs	2	7.8%	2.8%

5.3.3 Artificial Nesting/Roosting Structures

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

Artificial nesting structures monitored in 2016 included 12 nest poles installed for ferruginous hawks. These nest poles are monitored for raptor use and Richardson's ground squirrels are surveyed as an indicator of prey availability in the area (Table 16). Eight of the twelve nest poles produced young in 2016. Ground squirrel numbers vary depending on region.

We also monitored a bat box and two burrowing owl artificial nesting dens. Neither the bat box nor the owl dens were active in 2016.

5.3.4 Weed Control

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

Two properties that implemented bio-control (insects) for leafy spurge (*Euphorbia esula*) and Dalmatian toadflax (*Linaria dalmatica*) were monitored for weed control (Table 17). The oldest (2009) treatment site for toadflax seems to no longer have viable insects. The newer site (2011) for leafy spurge unfortunately was chemically sprayed, which did disturb the insects. We did a new release of spurge insect in the summer of 2016 which will be monitored in 2017.

Table 16. Artificial nesting structure monitoring in 2016.

Participant And year	Enhancement and desired species	2013 RGSQ Adults	2014 RGSQ Adults	2015 RGSQ Adults	2016 RGSQ Adults	2016 Desired Effect/Trend Occurring
MP_8 2012/2014	4 Nest Poles Ferruginous Hawk	3.4 km^2 surveyed **288** RGSQ*	3.6 km^2 surveyed **258** RGSQ	3.8 km^2 surveyed **210** RGSQ	3.4 km^2 surveyed **228** RGSQ	Yes Three of 4 nest poles active with Ferruginous hawks and young
MP_26 2013	2 Nest Poles Ferruginous Hawk	3.4 km^2 surveyed **71** RGSQ	3.8 km^2 surveyed **84** RGSQ	3.8 km^2 surveyed **177** RGSQ	3.6 km^2 surveyed **95** RGSQ	Yes 1 of 2 nest poles active with Ferruginous hawk
MP_6 2013	3 Nest Poles Ferruginous Hawk	N/A	3.0 km^2 surveyed **138** RGSQ	2.4 km^2 surveyed **142** RGSQ	Not completed, young of the year seen	1 of 3 poles being used by Ferruginous hawk
MP_25 2013	1 Nest Pole Ferruginous Hawk	N/A	4.0 km^2 surveyed **32** RGSQ	4.0 km^2 surveyed RGSQ	4.0 km^2 surveyed **43** RGSQ	Yes: nest active with Ferruginous hawk
MP_5 2007	2 Nest Poles Ferruginous Hawk	N/A	N/A	N/A	N/A	Yes: Both poles active with Ferruginous hawk with 3 young on each nest in 2016.

*RGSQ = Richardson's ground squirrel

Table 17. Weed control monitoring in 2016.

Property	Year Implemented	Species of Weed	Control Method	If Bio-Control used, are larvae present?	Desired Effect/Trend Occurring
MP_8_WC_01	June 2011	Leafy Spurge	Bio-control/Spray	No adults/larvae found during inspection	Some resurgence of spurge due to lack of insects present
MP_9_WC_01	June 2009	Dalmatian Toadflax	Bio-control/Spray	No larvae/adults found during inspection	Large toadflax infestation found, perhaps new release of agents is necessary
MP_8_WC_02	July 2016	Leafy Spurge	Bio-control: *Aphthona lacertosa* x 4000 at 2 release sites	N/A	To be monitored in 2017
MP_1_WC_01	2014	Downy Brome	Spray	N/A	Only second year of treatment-need more time to determine trend
MP_23_WC_01	2014	Downy Brome	Spray	N/A	Only second year of treatment-need more time to determine trend

Downy brome is a large problem on the prairies as once it is established it is tenacious and can out-compete native perennial seedlings (AB Invasive Species Council 2014). MULTISAR is working with two properties on different methods of control with one method using Simplicity®. At these sites we have seen varied results over the last two seasons and will continue to monitor to document trends.

5.3.5 Watering Systems

Water improvement monitoring will occur at two levels depending on the scale of impact.

A) Portable Watering Units

Portable Watering Units are used to help reduce impacts to wetlands/riparian areas and to better distribute cattle throughout the pasture. Portable watering units can attract cattle away from wetlands/riparian areas thereby improving wildlife habitat by increasing emergent vegetation, reducing erosion of the slopes and shoreline by cattle, and increasing the longevity of wetlands/riparian areas.

Portable watering units are used with several MULTISAR participants. These units, because of their portability, have been used at various locations on these properties assisting with water distribution. Upon investigating their last known locations, many of the dugout locations have seen increased bank vegetation, increased presence of shrubs, and less water turbidity. Emergent vegetation observations, photos, and wildlife observations were recorded at all portable watering units in use on MULTISAR participant properties in 2016.

B) Upland Watering Sites

Upland watering sites such as wells, permanent troughs, etc. can be utilized to attract cattle into an area which is seldom used, in order to create heavier grazing pressure to benefit targeted wildlife species. Upland watering sites can also help decrease impacts on other 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. In 2016, wildlife and range surveys were conducted at upland watering sites (Table 18). All upland watering sites monitored in 2016 were being used by cattle.

5.3.6 Tree and Shrub Protection

Trees and shrubs which have been or have the potential to be heavily impacted by cattle are generally recommended to have fence lines or corral panels placed around them to help prevent their gradual destruction and subsequent loss. Trees, especially lone cottonwood trees, in pastures that can be used as nesting sites by ferruginous hawks should also be protected. Sites in which the landholder implements this enhancement will be monitored every two years with photos taken to document the reduced impact of cattle on trees or shrubs. Wildlife observed using the sites is also documented.

Monitoring occurred at five locations in 2016 with improved foliage and bark retention of trees and shrubs noted at most locations. One tree that has been monitored since 2012 had an active ferruginous hawk nest in it in 2016.

Table 18. Upland watering sites monitored in 2016.

Site	Baseline Wildlife within 100m	2016 Wildlife within 100m	Range health trend within 50m of watering site(s)	Range health trend within 200m from the watering site(s)	Desired Effect/Trend Occurring
MP_1 1 site Installed in 2010	Brewer's Blackbird Horned Lark Richardson's Ground Squirrel Sprague's Pipit Vesper Sparrow	Chestnut-collared longspur Richardson's Ground Squirrel Savannah Sparrow	2014: 62% 2016: 69%	96% at one location	Yes Range health improves as you get further away from the well site.
MP_5 3 sites Installed in 2008	Horned Lark Richardson's Ground Squirrel Savannah Sparrow Western Meadowlark	Brewer's Sparrow Clay-coloured Sparrow Horned Lark Richardson's Ground Squirrel Savannah Sparrow Vesper Sparrow Western Meadowlark	2014: 80% 2016: 75%	Trend is stable with two sites scoring an average of 63%	Yes This area still seeing effects from a wild fire.
MP_8 1 site Installed in 2010	Brewer's Blackbird Savannah Sparrow Vesper Sparrow Western Meadowlark	Brown-headed Cowbird Horned Lark Killdeer Clay-coloured Sparrow Western Meadowlark Vesper Sparrow	2014: 52% 2016: 59%	75% at one location	Yes Cattle were seen using watering site.
MP_9 2 sites Installed in 2010 1 site was in use prior to the other	Richardson's Ground Squirrel Savannah Sparrow Vesper Sparrow	Barn Swallow Cliff Swallow Horned Lark Red-winged Blackbird Richardson's Ground Squirrel Savanna Sparrow Western Meadowlark	2014: 84% 2016: 84%	At native sites: 81.5% At tame pasture site: 62%	Cattle using watering site which services three pastures

5.4 Future Direction

In 2017, MULTISAR will continue to monitor a sub-sample of enhancement projects to determine if desired effects are occurring. Before-After-Control-Impact design (BACI) will continue to be utilized to build habitat representations before and after treatments as well as look at control sites. In 2017, an estimated 45 enhancement sites are scheduled for monitoring (Table 19).

Table 19. Monitoring of enhancement projects in 2017.

Enhancement Type and associated items to monitor	Number
Artificial Structures: • Nest poles (12) ○ Incorporating 4 Richardson's ground squirrel transects	**12 sites**
Restoration Projects: • Range health transects • Wildlife point counts	**8 Sites (4 properties)**
Shrub/Forb and Shelterbelt planting: • Grass plug sites (2) • Native Seed: Silver sagebrush/ needle and thread grass (1)	**3 sites**
Weed Control • 2 Brome spraying trails • 2 bio-control sites	**4 sites**
Portable Watering Sites: • Wildlife point count • Emergent vegetation recorded • Photos	**8 sites**
Upland Watering Sites: • Wildlife point counts • Range health transects • Photos taken	**7 sites**
Tree and Shrub protection: • Wildlife point count • Vegetation regrowth recorded • Photos taken	**3 sites**

6.0 FUTURE DIRECTION

In 2016-2017, MULTISAR will continue to work to achieve its goals and objectives in its three core program areas:

1. Habitat Conservation Program:

    1.1. Continue to seek interested landholders in priority species at risk areas, and complete seven new Habitat Conservation Strategies (~ 65,320 acres) with their cooperation and with Alberta Environment and Parks, the Alberta Conservation Association, Prairie Conservation Forum, Cows and Fish, Canadian Cattlemen's Association, Alberta Beef Producers and Canadian Roundtable for Sustainable Beef. This includes detailed vegetation and wildlife inventories, as well as range and riparian health assessments to identify habitats, priority species and the ecological condition of the rangeland and riparian areas.

    1.2. For those species at risk detected during inventories, use MULTISAR as a tool to implement recovery actions identified in provincial and national recovery plans.

    1.3. Secure habitat for species at risk through signed stewardship commitment agreements.

    1.4. Assist landholders, based on priority, that have had a Habitat Conservation Strategy completed, in implementing habitat enhancement recommendations outlined in their HCS.

    1.5. Complete new Species at Risk Conservation Plans or Beneficial Management Plans 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 and other conservation groups present themselves, promote the MULTISAR message and distribute relevant information to target audiences.

    2.2. Deliver 2-5 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 or fact sheets on species at risk and beneficial management practices, as needed.

    2.5. Regularly update MULTISAR's website, Facebook and Twitter accounts and ensure relevancy and accuracy of posted information.

    2.6. Continue membership and maintain active participation in the Canadian Roundtable for Sustainable Beef.

    2.7. Continue collaboration with the Canadian Cattlemen's Association on the environmental display along the Cattle Trail during the Calgary Stampede.

3. Research, Monitoring and Data Management Program:

    3.1. Assist Alberta Environment and Parks in conducting sharp-tailed grouse monitoring on leks in southeastern Alberta.

    3.2. Monitor loggerhead shrike on one to two routes in southern Alberta.

3.3. Monitor amphibians on up to ten road transects (RANA Routes), if temperatures and precipitation allow for the great plains toad and the plains spadefoot to emerge and reproduce.

3.4. Assess the relationship between wildlife species occurrences, wildlife species diversity, relative abundance, plant community type and metrics or range health.

3.5. Evaluate two properties (~40,000 acres) originally assessed in 2006/2007 and 2011, to measure how effective the HCS plan was at influencing habitat management, habitat value for species at risk and landholders' perceptions of species at risk.

3.6. Monitor habitat enhancement projects at 45 (of +155) enhancement sites implemented within the MULTISAR's project area since 2005.

3.7. Submit all wildlife observation data collected to the FWMIS (Fish and Wildlife Information System) annually.

3.8. Submit all range health assessment data on Crown lands into the provincial database on an annual basis.

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APPENDIX A: LIST OF ACRONYMS

ABP	Alberta Beef Producers
ACA	Alberta Conservation Association
AEP	Alberta Environment and Parks
CCA	Canadian Cattlemen's Association
CRSB	Canadian Roundtable for Sustainable Beef
BACI	Before After Control Impact
BMP	Beneficial Management Practice
FWMIS	Fish and Wildlife Management Information System
GNR	Grassland Natural Region
HCS	Habitat Conservation Strategy
HSP	Habitat Stewardship Program
MULTISAR	Multiple Species At Risk
NFWF	U.S. National Fish and Wildlife Foundation
PCF	Prairie Conservation Forum
SARC	Species at Risk Conservation
SARC Plan	Species at Risk Conservation Plan
SARPAL	Species at Risk Partnership on Agricultural Lands

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