



United States Department of Agriculture



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# **Biennial Monitoring Evaluation Report**

**USDA Forest Service  
Midewin National Tallgrass Prairie**

**For Years 2019-2020**

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## 4 EXECUTIVE SUMMARY

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This is the second biennial monitoring evaluation report (covering CY2019-20) for Midewin National Tallgrass Prairie since the monitoring plan was revised in 2016 as required from the 2012 Planning Rule. The monitoring revision resulted in questions that were asked in eight topic areas and indicators to monitor and aid in answering those questions. As future reports add to the tabular data presented here, there may be more opportunities to add to the data which could be monitored and the established indicators based on the management actions.

## 5 INTRODUCTION

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### 5.1 PURPOSE

The purpose of this biennial monitoring evaluation report is to facilitate the determination by the responsible official of whether a change in plan components or other plan content that guide management of resources on the plan area may be needed (36 CFR 219.12(a)(1)). This report represents one part of the Forest Service's overall monitoring program for this forest unit. This report is not a decision document [36 CFR 219.12(d)(4)]. Rather, this report evaluates the monitoring questions and indicators presented in the Plan Monitoring Program (PMP) chapter of the Forest Plan, in relation to management actions carried out in the plan area, and in conjunction with the Region's Broader-scale Monitoring Strategy.

Monitoring and evaluation are continuous learning tools that inform the backbone of adaptive management (36 CFR 219.12(d)(2)). This report indicates if a change to the Forest Plan, management activities, plan monitoring program or forest assessment may be warranted based on the new information.



## 5.2 OBJECTIVES

The monitoring evaluation report objectives include:

- Assess the current condition (i.e., status) and trend of selected prairie resources.
- Recommendations for remedial action, if necessary.
- Make management activities and their effects consistent with the Prairie Plan.
- Data collected for each monitoring item will be aggregated and evaluated on a biennial basis, unless otherwise noted.
- Specific monitoring questions are developed to provide information essential to measuring accomplishments and effectiveness.

## 5.3 HOW TO USE THIS REPORT

This report is a tool and a resource for the Forest Service to assess the condition of forest resources in relation to Forest Plan direction and management actions. It is also a tool and a resource for the public to learn more about how the Forest Service is managing forest resources.

Members of federally recognized Indian Tribes or Native Alaska Corporations and the public can use this report to understand how the Forest Service collected and evaluated monitoring data in the forest plan area and the basis for conclusions reached. The term “public” used in this document is a broad term that includes private citizens but also local, state, regional and national government entities, formal collaborative groups, cooperating agencies, special interest groups, community groups, and others.

## 5.4 PUBLIC MATERIAL

The Prairie Supervisor is responsible for coordinating the preparation of a monitoring evaluation report. This report addresses each of the monitoring questions listed in our monitoring plan and evaluate the results.

Members of federally recognized Indian Tribes or Native Alaska Corporations and the public can use this report to see the collected and evaluated monitoring data. The term “public” used in this document is a broad term that includes private citizens but also local, state regional and national government entities, formal collaboratives groups, cooperating agencies, special interest groups, community groups, nongovernmental organizations and others.

## 6 PLAN MONITORING PROGRAM

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Monitoring and evaluation requirements have been established through the National Forest Management Act (NFMA) at 36 CFR 219.

Additional direction is provided by the Forest Service in Chapter 30 – Monitoring – of the Land Management Handbook (FSH 1909.12).

The Midewin National Tallgrass Prairie monitoring program was updated in April 2016 for consistency with the 2012 planning regulations [36 CFR 219.12 (c)(1)]. The Midewin National Tallgrass Prairie Land and Resource Management Plan (Prairie Plan) was administratively changed to include the updated monitoring program (Chapter 6). For a copy of the current monitoring program go [here](#).

Monitoring questions and indicators were selected to inform the management of resources on the plan area and not every plan component was determined necessary to track [36 CFR 219.12(a)(2)].

## 6.1 STATUS OF SELECT WATERSHED CONDITIONS

### 6.1.1 How are the watersheds at MNTTP changing over time?

**Indicators:** Feet of field tile management; Square feet of structures removed; Acres of road/railbed removed; Acres of active native vegetation restoration; Miles of surface drainages improved/restored; Acres of row crops converted to pasture/prairie

Some data unavailable at time of this report.

*Table 1. Indicators for field tile management, structures removed, and road/railbed removed by year.*

Fiscal Year	Feet of field tile management	Square feet of structures removed	Acres of road/railbed removed
2015	12,044	6,391	3.04
2016	0	28,951	1.38
2017	4,833	39,546	13.3
2018	0	91,752	33.73
2019	0	131,084	23.4
2020	0	14,167	5.8

*Table 2. Indicators for native vegetation restoration per Prairie Plan, drainages improved/restored, and row crops converted to pasture/prairie by year.*

Fiscal Year	Acres of active native vegetation restoration#	Miles of surface drainages improved/restored	Acres of row crops converted to pasture/prairie*
2015	No data	No data	859
2016	7,323	No data	0
2017	7,323	No data	0
2018	7,486	No data	164
2019	7,989	No data	503
2020	7,989	No data	0

#Entries include areas that are currently in tallgrass prairie, woodland/forest/savanna and grazing land use as per the Prairie Plan. New areas added when they are first seeded/planted to the new land use.

\*Entries are the year areas were first seeded/planted to the new land use.

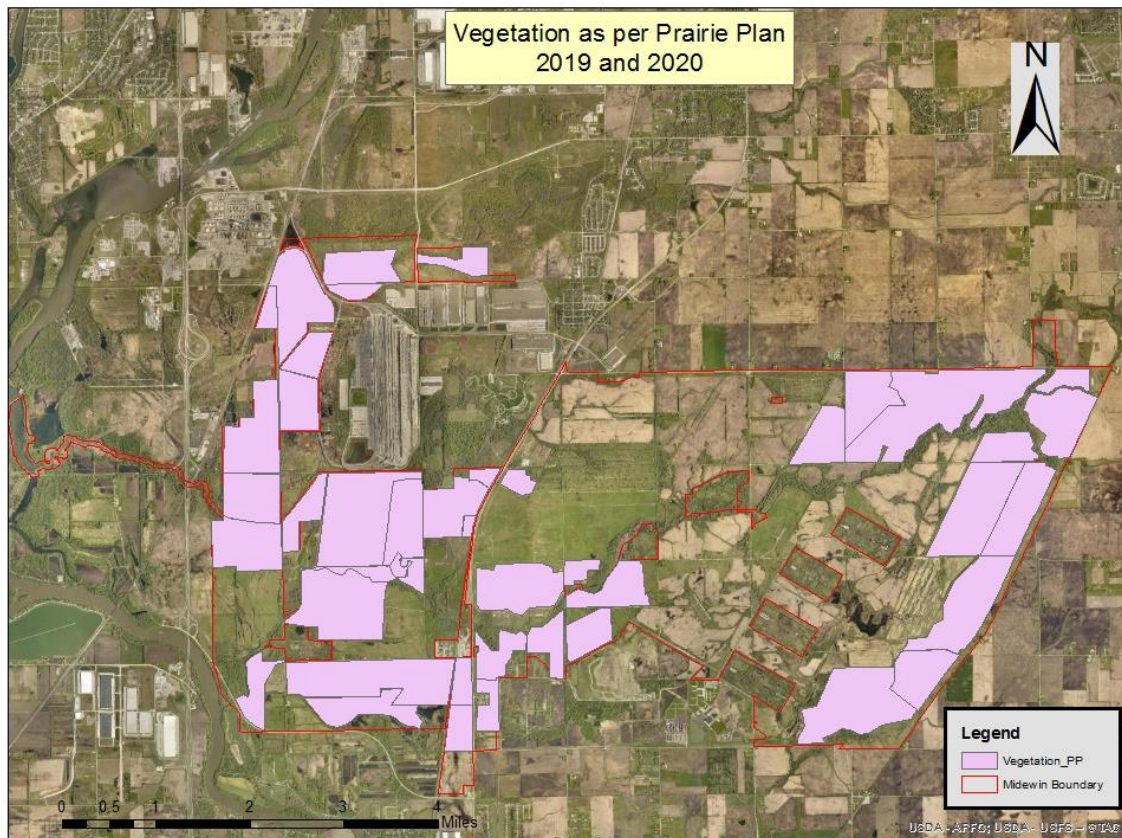


Figure 1. Map showing acres of active native vegetation restoration land use per the Prairie Plan for 2019 and 2020.

#### 6.1.2 What is the water quality of streams at MNTTP?

**Indicators:** Macroinvertebrates (Riverwatch) - MBI, Taxa Richness, EPT Taxa Richness; Temperature (Degrees Celsius); Dissolved Oxygen (parts per million); pH; Turbidity (Jackson Turbidity Unit), Nitrate (parts per million); Flow Rate (cubic feet per second)

##### Macroinvertebrates

Macroinvertebrate data is collected through the Illinois Riverwatch Network and its volunteers. The Covid-19 pandemic prevented the collection of macroinvertebrate data for the 2020 field season. Macroinvertebrate data collected between 2016-2019 shows no significant trends as to whether prairie restoration has improved water quality through biological indicators. Anthropogenic and natural variations could be present within the creeks of Midewin National Tallgrass Prairie but data collection and analyses on these factors has not yet been conducted.

Table 3. Macroinvertebrate data collected at four locations on Prairie Creek from 2016-2020.

Site Name	Field Date	Taxa Richness	EPT Taxa Richness	MBI
Prairie Creek at Cherry Hill Rd	6/15/2016	13	5	5.1
Prairie Creek at Cherry Hill Rd	6/12/2017	11	3	5.51
Prairie Creek at Cherry Hill Rd	6/6/2018	15	6	5.6
Prairie Creek at Road 1N	5/20/2016	15	5	5.07
Prairie Creek at Road 1N	5/16/2017	14	7	4.4
Prairie Creek at Road 1N	5/9/2018	11	5	5.74
Prairie Creek at Road 1N	5/15/2019	10	5	4.31
Prairie Creek at West Patrol Rd	6/4/2016	16	8	4.65
Prairie Creek at West Patrol Rd	6/17/2017	14	7	5.15
Prairie Creek at West Patrol Rd	5/19/2018	21	8	4.79
Prairie Creek at West Patrol Rd	6/15/2019	17	7	4.64
Prairie Creek at River Rd	5/22/2016	21	8	4.43
Prairie Creek at River Rd	6/3/2017	18	8	5.15
Prairie Creek at River Rd	6/3/2018	18	9	4.71
Prairie Creek at River Rd	6/9/2019	16	6	4.28

Table 4. Macroinvertebrate data collected at two locations on Grant Creek from 2016-2020.

Site Name	Field Date	Taxa Richness	EPT Taxa Richness	MBI
Grant Creek at A Line	5/20/2016	8	4	4.33
Grant Creek at A Line	6/2/2017	14	6	5.81
Grant Creek at A Line	5/22/2018	10	4	5.47
Grant Creek at A Line	6/3/2019	7	3	4.04
Grant Creek at West Patrol Rd	5/18/2016	12	4	4.03
Grant Creek at West Patrol Rd	5/26/2017	9	3	4.66
Grant Creek at West Patrol Rd	5/22/2018	11	5	5.74
Grant Creek at West Patrol Rd	6/3/2019	10	5	3.4

Table 5. Macroinvertebrate data collected at two locations on Jackson Creek from 2016-2020.

Site Name	Field Date	Taxa Richness	EPT Taxa Richness	MBI
Jackson Creek at Baseline Rd	6/28/2016	11	4	5.18
Jackson Creek at Baseline Rd	6/10/2017	17	4	5.41
Jackson Creek at Baseline Rd	5/29/2018	15	5	5.96
Jackson Creek at Baseline Rd	6/1/2021	15	5	5.2
Jackson Creek at Drummond	6/18/2016	22	6	5.55
Jackson Creek at Drummond	6/10/2017	17	3	5.67

Table 6. Macroinvertebrate data collected at one location on Jordan Creek from 2016-2020.

Site Name	Field Date	Taxa Richness	EPT Taxa Richness	MBI
Jordan Creek at South Arsenal	6/10/2016	5	3	4.9
Jordan Creek at South Arsenal	6/20/2017	12	3	5.96

### Water Monitoring

Discharge and water quality data was collected by volunteers through Midewin National Tallgrass Prairie's Water Monitoring Program. The Covid-19 pandemic prevented the collection of discharge and water quality data for the 2020 field season. Depth data was collected either instream by wading using the FlowProbe or by bridge using tape-downs. The FlowProbe was used to collect velocity data in the stream by wading or on the bridge.

WaterWorks or similar pH strips were used to collect pH data. Turbidity data was collected using LaMotte Standard Turbidity Reagent or a similar reagent. WaterWorks or similar Nitrate and Nitrite (as N) strips were used to collect the nitrate and nitrite data. Temperature and dissolved oxygen data were collected using a YSI ProPlus instrument for the 2016 season, and a YSI ProODO instrument for the 2017-2019 seasons. The YSI ProPlus and ProODO were not checked before or after visits but was assumed to be accurate as it was a new purchase at the start of the 2017 season. Data was submitted for the monitoring report as collected without corrections.

Table 7. Water monitoring data collected at Prairie Creek and Cherry Hill Road from 2016-2020.

Date	Time	Discharge	Temperature Avg.	DO Avg.	pH	Total Nitrate	Nitrite	Turbidity
		(ft <sup>3</sup> /s)	(deg. C)	(ppm)	(units)	(ppm)	(ppm)	(JTU)
4/13/2016	12:45	44.67	10.70	15.30	7.50	***	***	5.00
4/30/2016	11:15	23.59	10.00	11.53	6.50	5.00	0.00	10.00
5/11/2016	11:45	192.56	13.60	9.07	6.50	10.00	0.00	80.00
5/20/2016	10:45	312.35	14.80	10.37	7.00	5.00	0.00	5.00



Date	Time	Discharge	Temperature Avg.	DO Avg.	pH	Total Nitrate	Nitrite	Turbidity
		(ft <sup>3</sup> /s)	(deg. C)	(ppm)	(units)	(ppm)	(ppm)	(JTU)
6/15/2016	11:00	20.96	23.40	8.37	8.00	5.00	0.00	15.00
6/25/2016	10:30	23.51	22.27	8.33	7.50	5.00	0.00	10.00
7/13/2016	11:30	2.00	25.37	9.53	7.50	0.50	0.00	5.00
7/23/2016	10:45	33.69	23.53	6.70	8.00	2.00	0.00	10.00
8/27/2016	10:45	918.13	21.10	6.70	7.50	0.00	0.00	***
8/31/2016	10:30	122.86	21.50	6.60	7.50	0.00	0.00	60.00
9/10/2016	10:15	43.72	20.50	6.83	7.00	0.50	0.00	30.00
10/29/2016	10:45	38.08	14.37	9.67	7.50	2.00	0.00	20.00
4/5/2017	12:30	94.07	8.43	***	6.00	5.00	0.00	30.00
4/22/2017	***	***	***	***	7.50	2.00	0.00	5.00
5/13/2017	11:45	46.61	15.93	11.05	7.00	5.00	0.00	10.00
6/1/2017	12:00	***	18.17	10.01	7.00	2.00	0.00	10.00
6/14/2017	11:00	***	26.60	9.14	8.00	2.00	0.00	10.00
6/24/2017	10:45	***	22.60	10.85	7.50	0.50	0.00	5.00
7/7/2017	11:30	***	27.77	8.73	7.00	0.00	0.00	0.00
7/21/2017	10:30	7.86	25.63	6.47	7.50	0.50	0.00	10.00
8/9/2017	11:00	18.60	21.97	8.81	7.50	0.50	0.00	0.50
8/26/2017	10:15	0.00	19.10	8.41	7.00	0.00	0.00	5.00
9/13/2017	10:45	0.00	18.33	9.04	7.00	0.00	0.00	10.00
9/23/2017	10:30	0.00	23.83	6.43	6.50	0.00	0.00	0.00
10/18/2017	10:45	36.24	12.90	9.67	6.50	2.00	0.00	10.00
10/28/2017	10:15	69.58	9.00	10.54	6.50	5.00	0.00	15.00
4/14/2018	10:45	***	8.37	10.63	6.50	2.00	0.00	15.00
5/26/2018	10:45	2.74	23.07	12.48	9.00	0.50	0.15	5.00
6/13/2018	10:15	6.81	22.63	6.15	7.50	0.00	0.00	5.00
6/30/2018	10:45	23.80	24.93	7.49	7.00	2.00	0.00	20.00
7/11/2018	10:45	2.72	24.10	8.05	8.00	2.00	0.00	10.00
7/21/2018	10:30	3.15	22.03	7.13	7.00	0.50	0.00	10.00
8/7/2018	10:30	0.00	25.40	5.60	7.50	0.00	0.00	0.00
8/18/2018	10:30	0.00	24.03	5.73	6.50	0.00	0.00	15.00
9/29/2018	10:30	0.00	13.17	9.93	6.50	0.00	0.00	5.00
10/19/2018	9:30	0.00	8.20	11.22	6.50	0.50	0.15	5.00
10/27/2018	10:30	0.00	8.80	11.41	6.50	0.00	0.00	10.00
4/27/2019	10:30	10.68	10.00	10.80	7.50	2.00	0.00	10.00
5/18/2019	10:30	44.29	13.93	9.97	7.50	2.00	0.00	10.00

Date	Time	Discharge	Temperature Avg.	DO Avg.	pH	Total Nitrate	Nitrite	Turbidity
		(ft <sup>3</sup> /s)	(deg. C)	(ppm)	(units)	(ppm)	(ppm)	(JTU)
5/29/2019	11:00	1022.09	13.97	8.42	6.50	0.50	0.15	320.00
6/22/2019	10:15	95.02	16.77	8.88	8.00	2.00	0.00	30.00
7/20/2019	9:30	9.69	25.77	7.39	8.50	2.00	0.00	10.00
8/21/2019	9:30	18.49	20.87	8.12	8.00	2.00	0.15	15.00
8/31/2019	11:15	0.00	20.10	9.29	8.00	0.50	0.00	10.00
10/26/2019	10:15	1.79	8.07	10.78	7.50	0.50	0.00	5.00

\*\*\* = Data not available

Table 8. Water monitoring data collected at Prairie Creek and Chicago Road from 2016-2020.

Date	Time	Discharge	Temperature Avg.	DO Avg.	pH	Total Nitrate	Nitrite	Turbidity
		(ft <sup>3</sup> /s)	(deg. C)	(ppm)	(units)	(ppm)	(ppm)	(JTU)
4/13/2016	13:30	42.46	11.70	15.80	8.00	***	***	5.00
4/30/2016	11:30	57.70	9.27	11.43	6.50	5.00	0.00	10.00
5/11/2016	11:30	443.84	13.33	9.27	8.00	10.00	0.00	100.00
5/20/2016	11:15	110.34	15.93	11.10	7.50	5.00	0.00	10.00
6/15/2016	11:45	34.05	25.50	7.60	8.00	5.00	0.00	10.00
6/25/2016	10:45	58.20	22.70	8.73	7.50	10.00	0.00	10.00
7/13/2016	12:00	0.00	25.93	7.73	7.50	2.00	0.00	5.00
7/23/2016	11:00	142.15	22.60	7.60	8.00	2.00	0.00	20.00
8/27/2016	11:15	1478.46	21.00	6.57	7.00	0.00	0.00	100.00
8/31/2016	11:00	332.63	21.33	7.03	7.50	0.00	0.00	70.00
9/10/2016	10:45	135.53	19.90	7.37	7.00	2.00	0.00	30.00
10/29/2016	***	640.93	14.50	10.07	7.50	2.00	0.00	15.00
4/5/2017	12:00	0.00	8.50	***	6.50	5.00	0.00	20.00
4/22/2017	12:45	***	11.27	***	7.00	2.00	0.00	0.00
5/13/2017	11:15	112.49	15.50	10.02	7.50	2.00	0.00	15.00
6/1/2017	11:15	***	17.73	9.86	7.50	2.00	0.00	5.00
6/14/2017	11:15	***	26.60	8.37	7.50	2.00	0.00	10.00
6/24/2017	11:15	***	22.90	8.80	8.00	0.50	0.00	5.00
7/7/2017	11:00	***	27.23	5.48	7.50	0.00	0.00	10.00
7/21/2017	11:00	***	26.43	7.66	6.50	0.00	0.00	5.00
8/9/2017	11:30	0.00	22.13	9.23	7.50	2.00	0.00	5.00



Date	Time	Discharge	Temperature Avg.	DO Avg.	pH	Total Nitrate	Nitrite	Turbidity
		(ft <sup>3</sup> /s)	(deg. C)	(ppm)	(units)	(ppm)	(ppm)	(JTU)
8/26/2017	10:45	0.00	18.93	7.23	7.00	0.00	0.00	15.00
9/13/2017	11:15	0.00	19.07	9.34	7.50	0.00	0.00	5.00
9/23/2017	11:45	0.00	26.13	7.14	7.50	0.00	0.00	10.00
10/18/2017	11:15	105.74	13.43	10.00	7.00	2.00	0.00	10.00
12/28/2017	10:45	96.60	9.07	10.56	6.50	2.00	0.00	15.00
4/14/2018	11:00	40.20	8.67	10.74	7.00	2.00	0.00	5.00
5/26/2018	11:15	7.27	23.70	11.11	9.00	0.50	0.00	15.00
6/13/2018	10:30	0.00	22.77	7.82	7.50	2.00	0.00	10.00
6/30/2018	11:15	***	25.53	7.73	7.00	5.00	0.00	10.00
7/11/2018	11:15	5.86	24.23	8.58	7.50	2.00	0.00	5.00
7/21/2018	10:45	0.00	22.13	7.32	6.50	0.00	0.00	10.00
8/7/2018	11:00	0.00	26.37	5.75	7.50	0.00	0.00	10.00
8/18/2018	10:30	0.00	25.03	6.08	7.00	0.00	0.00	10.00
9/29/2018	11:00	0.00	13.77	8.71	6.00	0.00	0.00	5.00
10/18/2018	9:45	0.00	7.90	11.05	6.50	0.50	0.00	5.00
10/27/2018	11:00	0.00	8.60	10.65	6.50	0.00	0.00	0.00
4/27/2019	11:00	26.37	10.13	10.97	7.50	2.00	0.00	5.00
5/18/2019	10:45	73.21	14.27	10.00	7.50	2.00	0.00	20.00
5/29/2019	11:30	618.41	14.33	8.85	7.00	2.00	0.00	320.00
6/22/2019	10:45	170.16	16.63	9.15	7.00	5.00	0.00	30.00
7/20/2019	10:00	18.38	26.83	7.75	8.00	2.00	0.00	10.00
8/21/2019	10:15	26.35	21.77	8.56	8.00	2.00	0.15	10.00
8/31/2019	11:45	0.00	19.33	10.00	7.50	0.50	0.00	10.00
10/26/2019	11:00	5.61	7.97	10.00	8.00	0.50	0.00	5.00

\*\*\* = Data not available

Table 9. Water monitoring data collected at Prairie Creek and West Patrol Road from 2016-2020.

Date	Time	Discharge	Temperature Avg.	DO Avg.	pH	Total Nitrate	Nitrite	Turbidity
		(ft <sup>3</sup> /s)	(deg. C)	(ppm)	(units)	(ppm)	(ppm)	(JTU)
4/13/2016	11:45	1738.45	9.87	15.73	8.00	***	***	5.00
4/30/2016	10:30	136.36	10.57	10.57	6.50	5.00	0.00	5.00
5/11/2016	10:15	583.59	13.10	8.93	8.00	10.00	0.00	40.00
5/20/2016	9:30	54.39	14.63	9.97	7.50	5.00	0.00	5.00

Date	Time	Discharge	Temperature Avg.	DO Avg.	pH	Total Nitrate	Nitrite	Turbidity
		(ft <sup>3</sup> /s)	(deg. C)	(ppm)	(units)	(ppm)	(ppm)	(JTU)
6/15/2016	10:15	40.76	24.47	6.07	8.00	0.05	0.00	10.00
6/25/2016	9:45	59.57	22.97	7.20	7.50	10.00	0.00	20.00
7/13/2016	10:15	5.67	25.50	4.43	7.50	2.00	5.00	5.00
7/23/2016	9:45	***	23.23	7.07	7.50	2.00	0.00	20.00
8/13/2016	9:45	0.00	21.33	7.27	7.50	0.00	0.00	60.00
8/27/2016	10:00	808.13	20.80	7.27	7.50	0.00	0.00	120.00
8/31/2016	9:45	406.01	21.33	7.27	7.50	0.00	0.00	60.00
9/10/2016	9:30	173.84	20.13	7.37	7.50	0.50	0.00	20.00
10/12/2016	10:20	129.77	16.20	9.13	7.50	2.00	0.00	5.00
10/29/2016	10:00	98.22	13.60	9.60	7.50	2.00	0.00	10.00
4/5/2017	10:45	216.88	8.60	***	6.50	2.00	0.00	20.00
4/22/2017	11:15	***	4.60	***	7.00	2.00	0.00	5.00
5/13/2017	1000	81.55	14.20	10.29	7.00	5.00	0.00	10.00
6/1/2017	9:30	54.25	17.09	8.81	7.00	5.00	0.00	5.00
6/14/2017	9:45	***	25.90	5.70	8.00	2.00	0.00	10.00
6/24/2017	9:30	***	22.87	7.21	7.00	0.00	0.00	5.00
7/7/2017	10:00	***	27.30	6.35	7.50	0.00	0.00	5.00
7/21/2017	9:30	12.96	25.77	5.79	6.50	0.00	0.00	5.00
8/9/2017	10:00	***	21.23	8.51	7.50	5.00	0.00	5.00
8/26/2017	9:30	0.00	18.80	7.45	7.00	0.00	0.00	5.00
9/13/2017	9:45	0.00	17.83	6.46	7.50	0.00	0.00	10.00
9/23/2017	10:00	0.00	23.87	3.11	7.00	0.00	0.00	5.00
10/18/2017	9:45	43.28	12.37	9.45	6.50	2.00	0.00	5.00
10/28/2017	9:30	72.81	8.50	11.05	6.50	2.00	0.00	10.00
4/14/2018	9:30	11.52	9.50	9.47	7.50	0.50	0.00	5.00
5/26/2018	9:45	18.34	23.37	7.40	9.00	0.50	0.15	0.00
6/13/2018	9:15	12.19	22.83	6.80	9.00	0.50	0.15	0.00
6/30/2018	9:15	23.21	25.17	7.43	8.00	2.00	0.00	10.00
7/11/2018	9:30	12.26	24.07	7.75	7.50	2.00	0.00	5.00
7/21/2018	9:15	0.00	22.53	6.51	7.00	0.00	0.00	10.00
8/7/2018	9:30	0.00	24.93	4.86	8.00	0.00	0.00	10.00
8/18/2018	9:30	0.00	22.83	4.42	7.00	0.00	0.00	10.00
9/29/2018	9:15	0.00	13.00	8.86	6.50	0.00	0.00	5.00
10/19/2018	8:15	0.00	8.40	11.02	6.00	0.00	0.00	5.00
10/27/2018	9:15	0.00	8.47	10.46	6.50	0.00	0.00	0.00
4/27/2019	9:30	23.25	11.83	9.17	7.50	2.00	0.00	5.00
5/18/2019	9:30	67.10	12.90	10.40	8.00	2.00	0.00	20.00

Date	Time	Discharge	Temperature Avg.	DO Avg.	pH	Total Nitrate	Nitrite	Turbidity
		(ft <sup>3</sup> /s)	(deg. C)	(ppm)	(units)	(ppm)	(ppm)	(JTU)
5/29/2019	10:15	635.75	14.73	9.35	7.00	0.50	0.15	120.00
6/22/2019	9:30	188.44	16.20	9.19	7.50	2.00	0.00	30.00
7/20/2019	8:30	3.94	26.90	5.72	8.00	2.00	0.00	5.00
8/21/2019	11:30	8.38	23.07	8.37	8.50	0.50	0.00	10.00
8/31/2019	9:30	6.15	19.20	6.55	8.00	0.00	0.00	10.00
9/27/2019	10:45	7.18	17.03	8.16	8.00	0.50	0.00	0.00
10/26/2019	9:15	21.20	8.40	10.82	7.50	0.00	0.00	0.00

\*\*\* = Data not available

Table 10. Water monitoring data collected at Grant Creek and West Patrol Road from 2016-2020.

Date	Time	Discharge	Temperature Avg.	DO Avg.	pH	Total Nitrate	Nitrite	Turbidity
		(ft <sup>3</sup> /s)	(deg. C)	(ppm)	(units)	(ppm)	(ppm)	(JTU)
4/13/2016	11:15	238.89	10.67	14.23	8.50	***	***	0.00
4/30/2016	10:15	9.89	10.30	10.33	6.50	0.50	0.00	10.00
5/11/2016	9:45	71.09	13.87	8.83	8.00	2.00	0.00	60.00
5/21/2016	10:00	8.30	14.73	9.90	7.50	0.50	0.00	5.00
6/15/2016	9:30	20.77	21.43	6.47	7.50	0.05	0.00	240.00
6/25/2016	9:30	17.39	22.40	6.80	7.50	0.50	0.00	20.00
7/13/2016	10:45	3.74	22.13	9.80	7.50	0.00	0.00	0.00
7/23/2016	9:30	44.91	24.50	6.57	7.50	0.50	0.00	30.00
8/27/2016	9:45	471.02	21.20	7.37	7.50	0.00	0.00	320.00
8/31/2016	9:15	47.42	22.23	6.60	7.50	0.00	0.00	40.00
9/10/2016	9:45	35.11	20.90	6.67	7.50	0.50	0.00	20.00
10/12/2016	9:30	3.05	15.83	8.83	7.50	0.00	0.00	55.00
10/29/2016	9:30	16.12	13.40	9.37	7.00	0.50	0.00	0.00
4/5/2017	11:00	25.27	8.60	***	6.50	2.00	0.00	30.00
4/22/2017	11:30	***	12.70	***	7.00	0.50	0.00	5.00
5/13/2017	9:45	23.12	14.40	9.75	7.50	0.50	0.00	5.00
6/1/2017	9:45	9.41	16.55	10.76	7.00	0.00	0.00	0.50
6/14/2017	10:15	***	25.10	14.03	7.50	0.00	0.00	0.00
6/24/2017	10:00	***	21.33	11.31	7.00	0.00	0.00	0.00
7/7/2017	9:30	***	25.67	9.90	7.50	0.00	0.00	0.00
7/21/2017	10:00	23.39	24.00	6.65	7.50	0.00	0.00	1.00
8/9/2017	10:15	2.20	20.57	10.14	7.00	0.00	0.00	0.50

Date	Time	Discharge	Temperature Avg.	DO Avg.	pH	Total Nitrate	Nitrite	Turbidity
		(ft <sup>3</sup> /s)	(deg. C)	(ppm)	(units)	(ppm)	(ppm)	(JTU)
8/26/2017	9:45	0.00	17.60	9.88	7.00	0.00	0.00	0.00
9/13/2017	10:00	0.00	17.17	9.99	8.00	0.00	0.00	5.00
9/23/2017	10:00	0.66	23.23	8.86	8.00	0.00	0.00	0.00
10/18/2017	10:15	10.71	12.97	9.45	6.50	0.00	0.00	5.00
10/28/2017	9:45	5.35	7.83	11.01	6.50	0.50	0.00	5.00
4/14/2018	10:00	9.22	8.00	10.77	7.50	0.50	0.00	10.00
5/26/2018	10:15	5.15	21.83	9.06	9.00	0.00	0.00	5.00
6/13/2018	9:45	3.18	22.27	8.35	7.50	0.00	0.00	5.00
6/30/2018	10:00	13.15	24.53	8.13	8.00	0.50	0.00	20.00
7/11/2018	10:00	3.36	22.07	11.76	9.00	0.50	0.00	5.00
7/21/2018	9:45	2.96	21.00	8.51	7.00	0.00	0.00	5.00
8/7/2018	10:00	0.00	23.83	9.13	8.00	0.00	0.00	5.00
8/18/2018	10:00	0.01	22.60	8.61	6.50	0.00	0.00	0.00
9/29/2018	9:45	0.83	11.43	11.20	6.50	0.00	0.00	0.00
10/19/2018	8:45	2.14	7.50	11.82	6.00	0.00	0.00	5.00
10/27/2018	10:00	0.84	8.60	12.92	6.50	0.00	0.00	0.00
4/27/2019	10:00	2.25	9.83	10.97	7.50	0.50	0.00	5.00
5/18/2019	9:45	7.57	13.50	11.57	8.00	0.50	0.00	5.00
5/29/2019	9:45	61.81	14.90	9.14	7.00	0.50	0.15	80.00
6/22/2019	9:45	12.19	17.37	8.79	7.50	0.50	0.00	10.00
7/20/2019	8:45	5.10	24.80	7.28	8.50	0.50	0.00	5.00
8/21/2019	12:00	4.01	22.87	10.29	8.50	0.50	0.00	5.00
8/31/2019	9:45	0.00	17.07	10.45	8.00	0.50	0.00	0.00
9/27/2019	10:30	3.41	15.80	8.91	8.00	0.00	0.00	0.00
10/26/2019	9:45	1.75	8.40	10.74	7.00	0.00	0.00	5.00

\*\*\* = Data not available

Table 11. Water monitoring data collected at Jordan Creek and South Arsenal Road from 2016-2020.

Date	Time	Discharge	Temperature Avg.	DO Avg.	pH	Total Nitrate	Nitrite	Turbidity
		(ft <sup>3</sup> /s)	(deg. C)	(ppm)	(units)	(ppm)	(ppm)	(JTU)
4/13/2016	14:15	7.20	11.33	15.57	8.00	***	***	5.00
4/30/2016	12:15	36.64	8.90	11.47	6.50	10.00	0.00	5.00

Date	Time	Discharge	Temperature Avg.	DO Avg.	pH	Total Nitrate	Nitrite	Turbidity
		(ft <sup>3</sup> /s)	(deg. C)	(ppm)	(units)	(ppm)	(ppm)	(JTU)
5/11/2016	11:00	67.97	11.70	8.37	7.50	10.00	0.00	30.00
5/20/2016	11:45	7.88	13.53	12.23	7.50	10.00	0.00	10.00
6/15/2016	12:15	21.97	19.87	7.70	8.00	10.00	0.00	20.00
6/25/2016	11:15	12.85	18.60	8.87	8.00	10.00	0.00	15.00
7/13/2016	12:30	0.00	25.10	2.67	8.00	2.00	0.00	60.00
7/23/2016	11:30	18.57	20.57	7.40	8.00	5.00	0.00	20.00
8/27/2016	11:45	589.84	21.00	5.63	7.00	0.50	0.00	***
8/31/2016	11:45	12.77	20.77	5.97	8.00	5.00	0.00	20.00
9/10/2016	10:15	47.43	19.03	6.50	7.50	0.50	0.00	20.00
10/29/2016	12:00	0.00	15.60	9.23	7.50	2.00	0.00	15.00
4/5/2017	11:30	24.48	7.50	***	6.00	2.00	0.00	10.00
4/22/2017	***	***	12.77	***	7.00	2.00	0.00	5.00
5/13/2017	10:45	***	12.70	9.84	2.50	5.00	0.00	10.00
6/1/2017	10:45	0.00	14.90	9.24	7.00	5.00	0.00	10.00
6/14/2017	11:45	***	23.97	5.97	7.50	2.00	0.00	30.00
6/24/2017	11:45	***	21.50	6.75	7.50	2.00	0.00	40.00
7/7/2017	10:30	***	26.03	3.91	7.00	3.00	0.00	60.00
7/21/2017	11:30	***	24.93	3.65	8.00	0.00	0.00	60.00
8/9/2017	12:00	0.00	21.57	10.29	7.00	2.00	0.15	10.00
8/26/2017	11:15	0.00	18.60	4.69	8.50	0.00	0.00	135.00
9/13/2017	11:45	0.00	17.70	5.26	7.50	0.00	0.00	80.00
9/23/2017	11:15	0.00	23.23	1.94	8.00	0.00	0.00	50.00
10/18/2017	11:45	18.37	13.80	9.20	7.00	5.00	0.00	20.00
10/28/2017	11:15	13.07	10.50	9.93	6.50	5.00	0.00	15.00
4/14/2018	11:30	0.00	7.67	10.57	7.00	2.00	0.00	5.00
5/26/2018	11:45	***	22.80	10.24	9.00	2.00	0.30	10.00
6/13/2018	11:00	0.00	21.33	8.66	8.00	10.00	0.15	10.00
6/30/2018	11:45	2.90	22.93	9.87	7.00	5.00	0.15	50.00
7/11/2018	11:45	0.00	23.17	6.92	8.00	5.00	0.00	20.00
7/21/2018	11:15	0.00	21.67	7.45	6.50	0.50	0.00	15.00
8/7/2018	11:30	0.00	25.60	4.61	7.50	0.00	0.00	40.00
8/18/2018	11:30	0.00	23.27	3.10	7.50	0.00	0.00	40.00
9/29/2018	11:30	0.00	11.53	7.75	6.50	0.00	0.00	15.00
10/18/2018	10:15	0.00	8.43	11.45	6.50	0.50	0.15	15.00
10/27/2018	11:45	0.00	8.77	12.03	6.50	0.05	0.00	15.00

Date	Time	Discharge	Temperature Avg.	DO Avg.	pH	Total Nitrate	Nitrite	Turbidity
		(ft <sup>3</sup> /s)	(deg. C)	(ppm)	(units)	(ppm)	(ppm)	(JTU)
4/27/2019	11:30	0.00	8.10	11.43	7.00	5.00	0.00	5.00
5/18/2019	11:15	9.50	13.67	10.73	8.00	5.00	0.00	15.00
5/29/2019	12:15	124.41	14.90	7.23	7.00	2.00	0.00	80.00
6/22/2019	11:00	19.49	16.40	8.29	7.50	10.00	0.15	15.00
7/20/2019	10:30	0.00	23.83	8.65	8.50	5.00	0.00	10.00
8/21/2019	11:00	0.00	20.77	8.87	8.00	5.00	0.15	15.00
8/31/2019	12:15	***	19.90	12.39	8.00	0.50	0.00	10.00
10/26/2019	11:15	0.00	9.13	11.36	7.50	0.50	0.00	10.00

\*\*\* = Data not available

## 6.2 STATUS OF SELECT ECOLOGICAL CONDITIONS

### 6.2.1 What is the condition of streams at MNTF?

**Indicators:** Macroinvertebrates (Riverwatch) - MBI, Taxa Richness, EPT Taxa Richness

See question 6.1.2 above for data and analysis of MBI, taxa richness and EPT taxa richness.

### 6.2.2 What is ecosystem status of select restoration areas?

**Indicators:** Frequency analysis showing native richness and invasive richness (Random Vegetation Sampling); Acres of actively managed areas; Total acres in some stage of restoration; List of when restoration areas are managed with prescribed fire

See question 6.3.2 below for data and analysis of native richness and invasive richness.

A measure of actively managed restoration areas can show how much management is occurring over time. Management would include prescribed fire, invasive control, seeding/planting, grazing (bison and cattle), etc. Reporting acres would include the entire management unit even if some of these activities are taking place only within portions of the unit.

Table 12. Indicators for managed areas treated and prairie restoration by year.

Fiscal Year	Acres of actively managed areas	Total acres in some stage of restoration#
2016	8,763	3,192
2017	8,564	3,192
2018	9,200	3,192

Fiscal Year	Acres of actively managed areas	Total acres in some stage of restoration#
2019	10,899	3,816
2020	9,687	3,866

#Entries include areas that are restored to tallgrass prairie, dolomite prairie, or savanna as per the Prairie Plan. New areas added when they are first seeded/planted to the new land use.

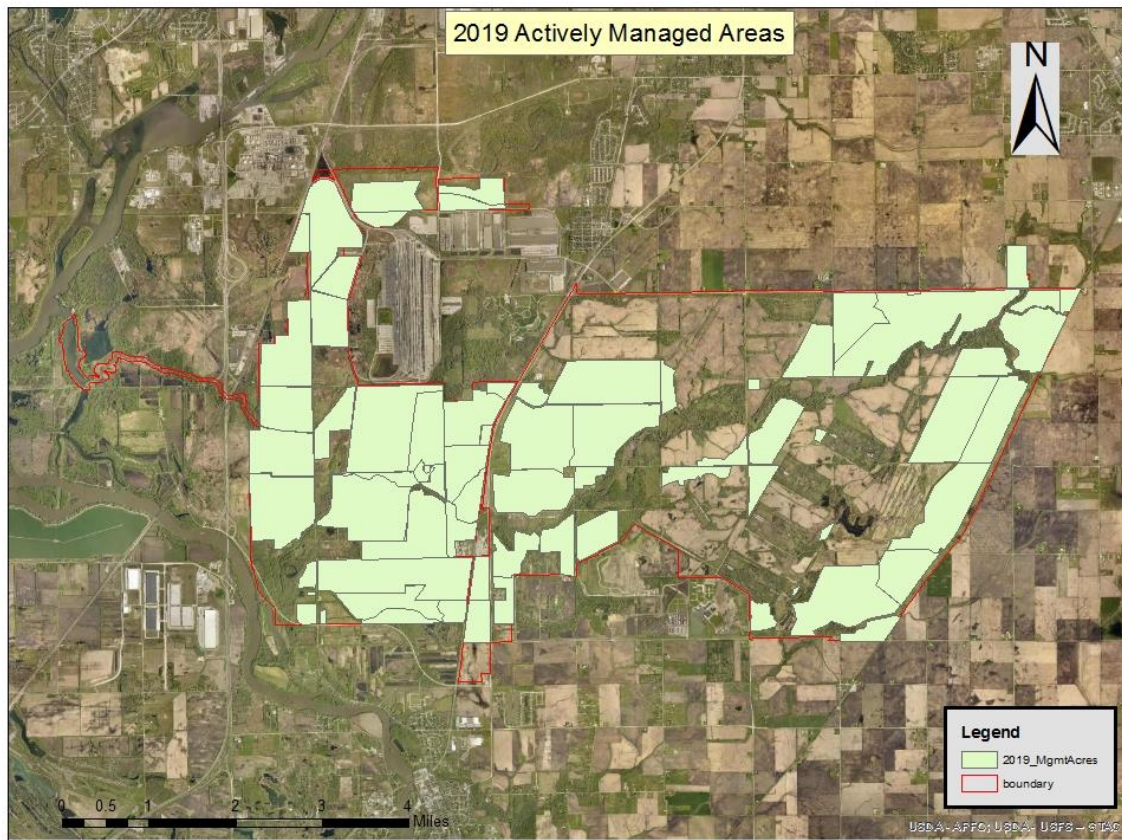


Figure 2. Map showing acres of all actively managed acres treated in 2019. Active management includes prescribed fire, invasive control, seeding/planting, grazing, mowing and other activities.



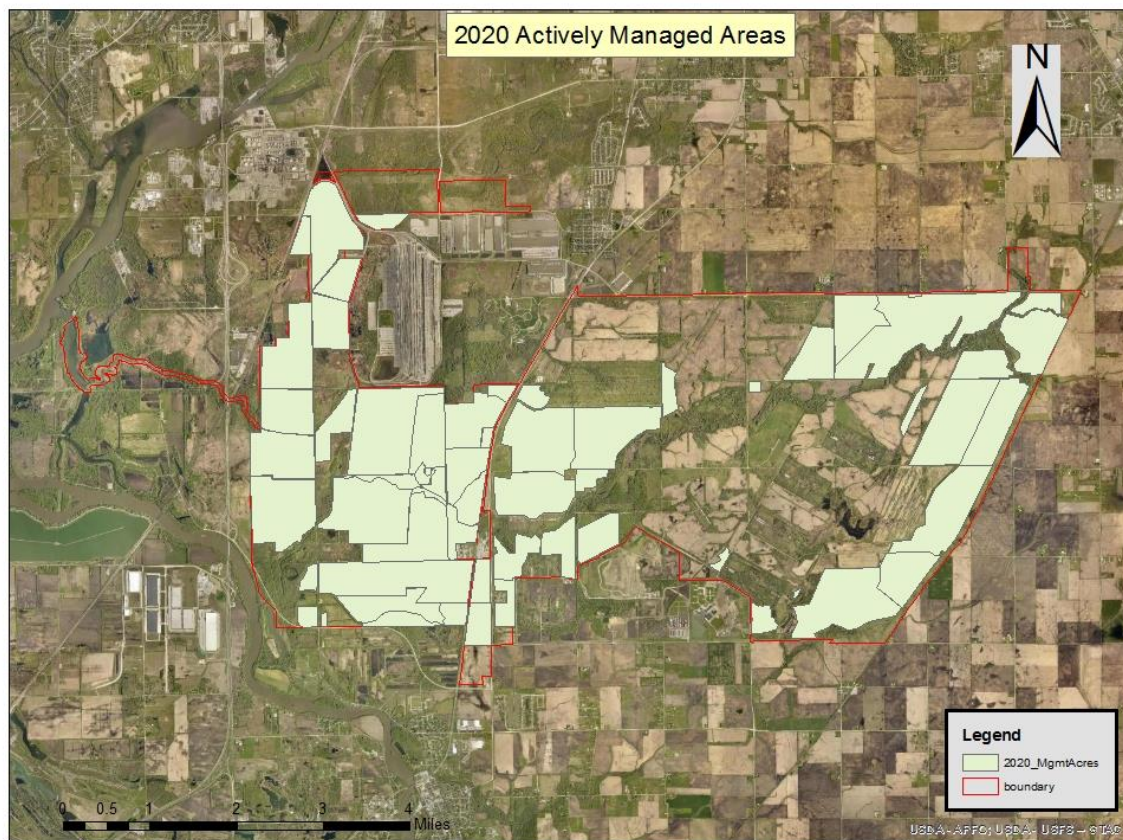


Figure 3. Map showing acres of all actively managed acres treated in 2020. Active management includes prescribed fire, invasive control, seeding/planting, grazing, mowing and other activities.

Monitoring the total acres under restoration will track how much of the land is undergoing prairie restoration. This is the answer to the frequent question of how much of MNTP is in restoration status. Restoration is defined as converting land use from agriculture (crop, hay and grazing), idle fields, young secondary woody growth, etc. to native vegetation.



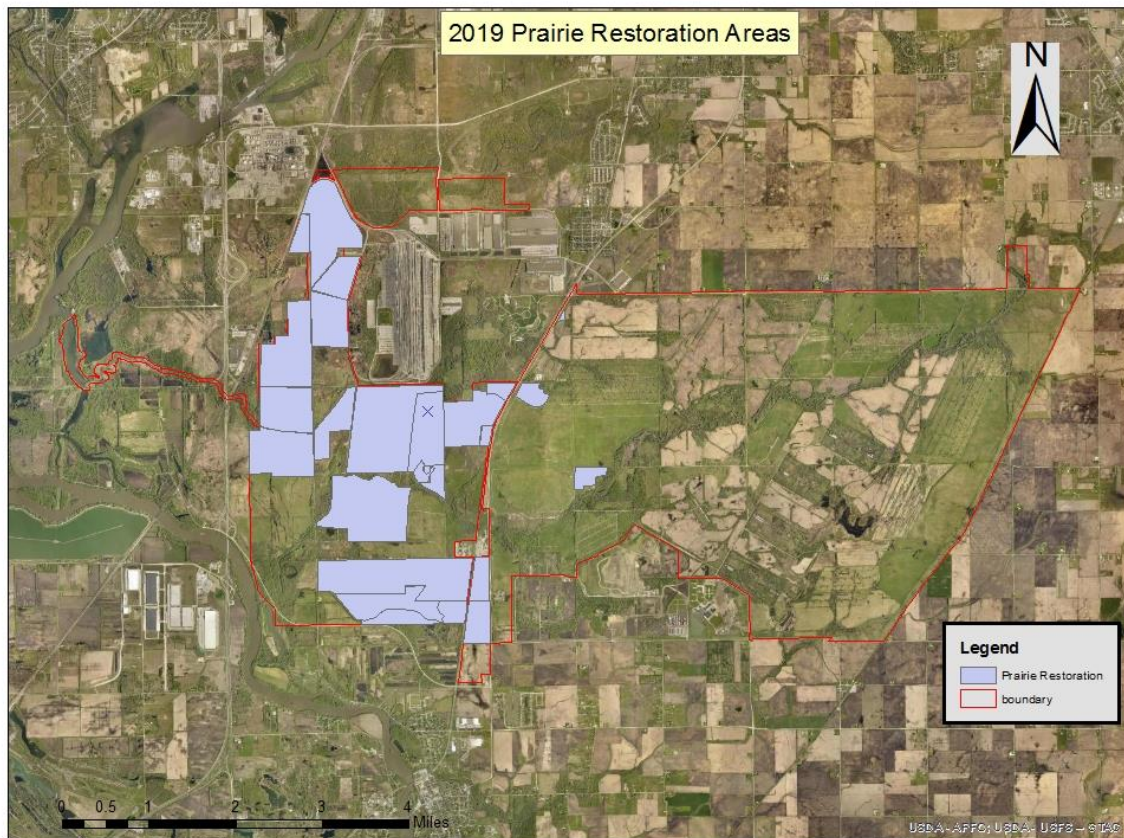


Figure 4. Map showing acres of prairie restoration in 2019. Prairie restoration includes tallgrass prairie, dolomite prairie and savanna areas.

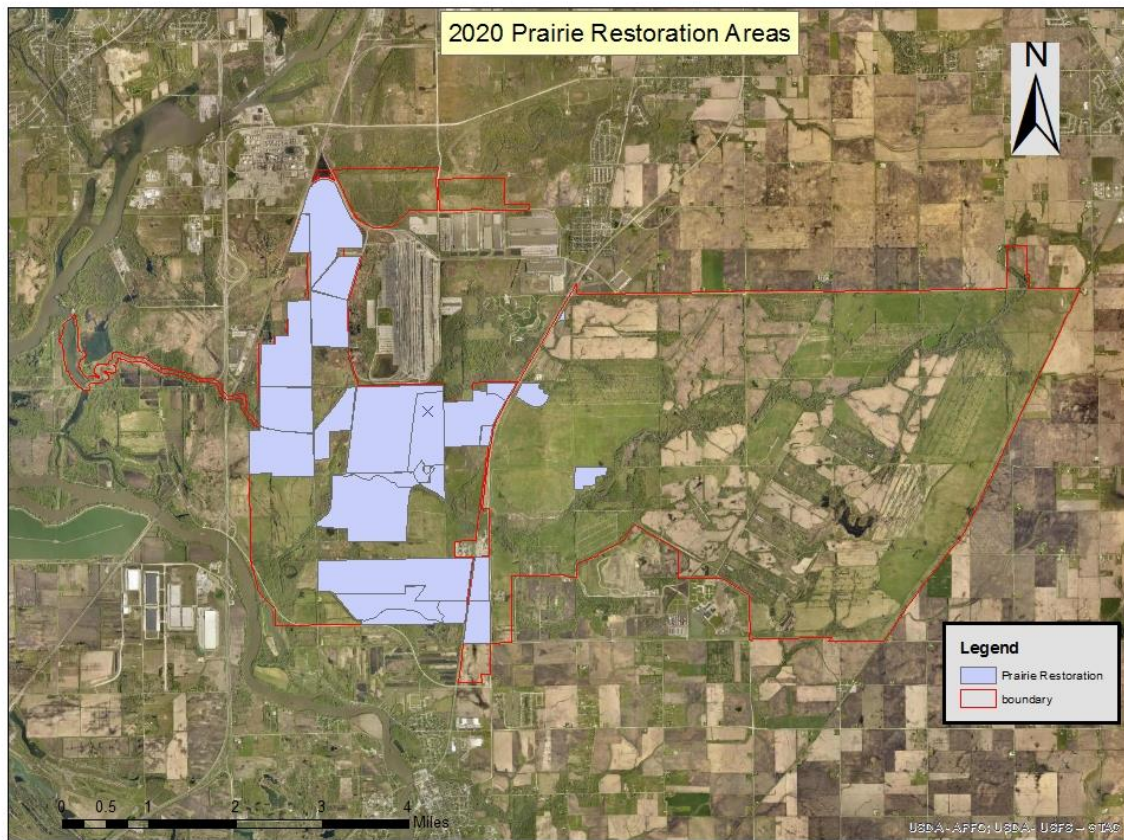


Figure 5. Map showing areas of prairie restoration in 2020. Prairie restoration includes tallgrass prairie dolomite prairie and savanna areas.

Prescribed fire is an important component of restoring the prairie landscape. This indicator could track what restoration areas receive prescribed fire treatment and when the fire occurred. Tracking over time could show those areas not receiving enough fire treatment and plan for higher priority in upcoming burns.

Table 13. Indicators for prescribed fire burns in administrative areas, agricultural grasslands, dolomite prairie, prairie restoration areas, fuels management areas, prairie restoration areas, and savanna by year.

Fiscal Year	Acres of prescribed fire in Admin Units	Acres of prescribed fire in Ag Grasslands	Acres of prescribed fire in Dolomite Prairie
2016	45	0	262
2017	55	711	842
2018	55	1,366	558

Fiscal Year	Acres of prescribed fire in Admin Units	Acres of prescribed fire in Ag Grasslands	Acres of prescribed fire in Dolomite Prairie
2019	55	1,983	841
2020	51	0	331

#Acres do not include those conducted in dolomite prairie or savanna.

*Table 14. Indicators for prescribed fire burns in fuels management areas, prairie restoration areas, and savanna by year.*

Fiscal Year	Acres of prescribed fire for fuels management	Acres of prescribed fire in prairie restoration#	Acres of prescribed fire in Savanna
2016	516	1,514	0
2017	127	1,709	0
2018	516	2,153	0
2019	1,026	2,198	0
2020	0	0	0

#Acres do not include those conducted in dolomite prairie or savanna.



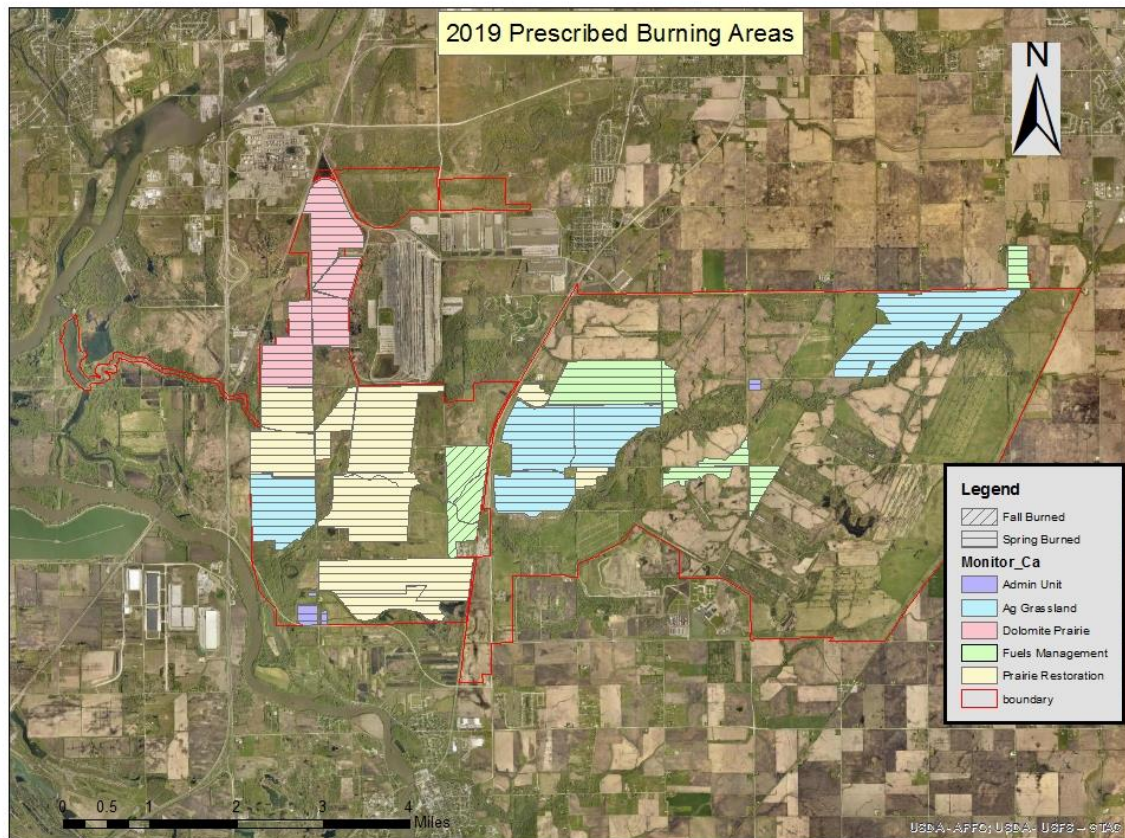


Figure 6. Map showing prescribed fire areas burned in 2019.

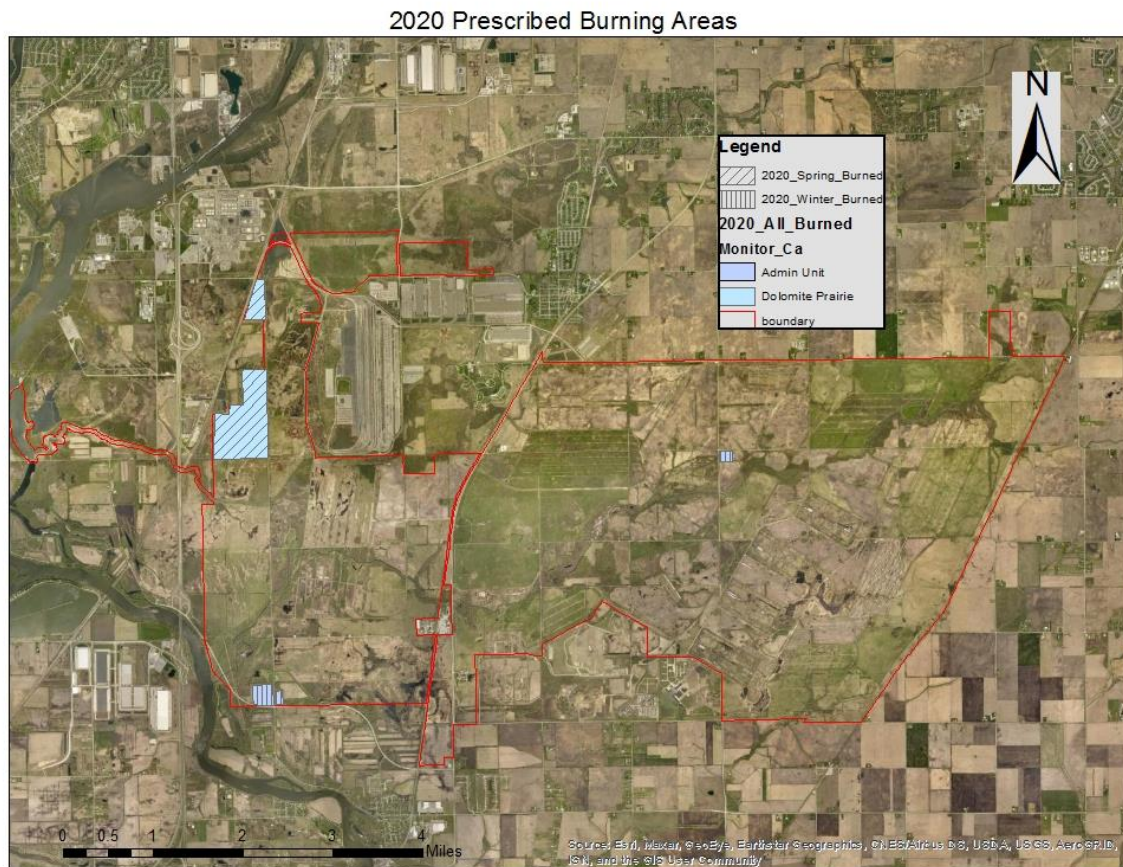


Figure 7. Map showing prescribed fire areas burned in 2020.

### 6.3 STATUS OF FOCAL SPECIES TO ASSESS THE ECOLOGICAL CONDITIONS

#### 6.3.1 What is the status of grassland birds at MNTP?

**Indicator:** Population estimates from bird surveys

Grassland birds at Midewin were monitored using two different surveys. The first is an incidental walking survey completed in early May and is designed to target nesting of two Regional Forester Sensitive Species, Migratory Loggerhead Shrike (*Lanius ludovicianus migrans*) and Upland Sandpipers (*Bartramia longicauda*). The second grassland survey is a formal point count survey that involves Forest Service staff, volunteers, and local partners working in teams to conduct point-count surveys at randomly selected fixed point positions. Only birds observed within 100 meters of the GPS determined point are included in sampling and statistical analysis. Birds outside of 100m or flying are still recorded but not included in the formal analysis.

Table 15 shows the number of birds per 100 points for the years 2015 to 2020 along with the 10-year average for grassland specific birds at Midewin as reported in past monitoring reports. Vesper Sparrows (*Pooecetes gramineus*) and Western Meadowlarks (*Sturnella neglecta*) were not seen during the 2018-2020 surveys but were both seen during 2017 and sporadically in earlier years. Upland Sandpipers have not been seen nesting at Midewin since 2013 but are occasionally seen by volunteers and staff outside of the official surveys. Savanna Sparrows (*Passerculus sandwichensis*) have been observed in lower-than-average numbers in 2019 and 2020 and have declined since 2015 but remain present. Except for Savanna Sparrows, the rest of the grassland bird species have remained relatively stable in number of birds per 100 points since 2015. Grassland bird surveys will continue to be conducted annually.

Table 15. Counts of grassland birds per 100 survey points from 2015 to 2020 Grassland Bird Point Count Surveys and the Loggerhead Shrike and Upland Sandpiper survey, including the 10 year averages.

Species	2015	2016	2017	2018	2019	2020	10yr mean
Bobolink	121.1	143.2	128.8	177.9	165.4	114.8	134.0
Dickcissel	198.0	239.3	282.1	279.8	226.5	279.4	236.3
Eastern Meadowlark	133.6	147.5	123.1	158.3	137.7	120.1	150.5
Grasshopper Sparrow	109.2	116.4	93.9	101.2	101.2	91.0	108.3
Henslow's Sparrow	30.9	37.2	51.9	33.1	48.1	39.2	36.7
Loggerhead Shrike		0.5		0.6		0.5	0.3
Savannah Sparrow	17.1	23.0	12.7	10.4	6.2	5.8	14.7
Upland Sandpiper							0.7
Vesper Sparrow		1.1	0.9				1.1
Western Meadowlark	1.3		1.9				0.3

### 6.3.2 What is the status of prairie restoration at Midewin NTP?

**Indicator:** Frequency analysis showing native richness and invasive richness (Random Vegetation Sampling)

In 2006, The Nature Conservancy helped Midewin staff establish a protocol (Plotwise Floristic Quality Assessment) to gather vegetation frequency data from restoration areas. This protocol established four permanent vegetation monitoring transects in each restoration area. Transects are monitored on a rotational basis. Currently, three of thirteen restorations are monitored in most calendar years. Four sites are monitored every fifth year. South Patrol Road (SPR), Blodgett (BL), Grant Creek North (GCN) and Gravel Ridge (GR) restoration areas were monitored in 2019. While in 2020, South Prairie Creek Outwash Plain (SPCOP), Exxon (EX) and Lower Drummond (LD) were monitored. Additional restoration areas will be added to the monitoring rotation each year until all areas are monitored on a five-year rotational basis.

As part of implementing the 2012 Planning Rule, we determined frequencies of select species may help us understand the quality and ecosystem function of our restorations perhaps better than floristic quality data used in the past. Select species were chosen based on their difficulty in establishment, among other factors. The frequency data gathered from transect monitoring is



shown in Table 16. Our select graminoids were well represented in the data, while no hemi-parasitic species were recorded at any locations. Rattlesnake master (*Eryngium yuccifolium*) had the highest frequency encountered among all species groups, while shooting star (*Dodecatheon meadia*) was not recorded at any location.

Table 16 also lists the native and non-native species richness data from transect monitoring. The highest frequency of native species and the lowest frequency of non-native species amongst sites monitored in this cycle were both found in South Patrol Road.

As many restoration areas have a high degree of environmental heterogeneity, permanent vegetation monitoring transects are likely to miss species otherwise present in a restoration. Species may also be missed if bloom times are either early or late as some species are difficult to distinguish when not in flower or are ephemeral in nature. To increase our knowledge and understanding of restoration progression, random vegetation meander surveys are conducted in the spring and fall in addition to transect monitoring. Table 17 shows the results of meander surveys for the restorations monitored during this reporting cycle.

For meander survey data, South Patrol Road exhibited the greatest value in both native species richness and presence of select species. Blodgett and Lower Drummond contained a few less select species than South Patrol Road. Blodgett was just slightly lower than South Patrol Road in native species richness. The select graminoid species were well represented in all restorations, while the hemi-parasitic species were picked up in just one. The conservative species lead plant (*Amorpha canescens*), prairie violet (*Viola pedatifida*) and shooting star (*Dodecatheon meadia*) were notably absent from many restorations while all were present in South Patrol Road. Non-native species richness detected during meander surveys was similar across all restorations.

Table 16. Frequency data, native species richness, and non-native species richness gathered from transect monitoring.

Scientific Name	Common Name	SPR 2017	SPR 2018	SPR 2019	BL 2019	GCN 2019	GR 2019	SPCOP 2020	EX 2020	LD 2020
Graminoid Group										
<i>Carex bicknellii</i>	Bicknell's sedge	2%	1%	4%	3%	5%	-	2%	-	12%
<i>Sorghastrum nutans</i>	Indian grass	23%	32%	19%	48%	9%	37%	-	8%	8%
<i>Sporobolus heterolepis</i>	Prairie dropseed	2%	-	1%	4%	2%	-	2%	6%	4%
Hemi-parasite Group										
<i>Commandra umbellata</i>	Bastard toadflax	-	-	-	-	-	-	-	-	-
<i>Pedicularis canadensis</i>	Wood betony	-	-	-	-	-	-	-	-	-
Other species of ecological concern										
<i>Asclepias sullivantii</i>	Prairie milkweed	-	-	-	-	-	-	-	2%	1%
<i>Amorpha canescens</i>	Lead plant	-	-	-	-	-	-	2%	-	-
<i>Dodecatheon meadia</i>	Shooting star	-	-	-	-	-	-	-	-	-
<i>Eryngium yuccifolium</i>	Rattlesnake master	61%	62%	46%	22%	11%	3%	8%	-	35%
<i>Viola pedatifida</i>	Prairie violet	-	-	-	-	-	-	-	-	6%
Native species richness		103	93	92	106	110	103	114	102	96
Frequency of native species		87.3%	86.9%	85.2%	79.7%	78.6%	72.5%	72.2%	80.3%	78.0%
Non-native species richness		15	14	16	27	30	39	39	25	27
Frequency of Non-native species		12.7%	13.1%	14.8%	20.3%	21.4%	27.5%	24.7%	19.7%	22.0%

SPR = South Patrol Road, BL = Blodgett, GCN = Grant Creek North, SPCOP = South Prairie Creek Outwash Plain, EX = Exxon, LD = Lower Drummond



Table 17. Meander survey results for the restorations monitored during this reporting cycle.

Scientific Name	Common Name	SPR	SPR	SPR	BL	GCN	GR	SPCOP	EX	LD
		2017	2018	2019	2019	2019	2019	2020	2020	2020
Graminoid Group										
<i>Carex bicknelli</i>	Bicknell's sedge	P	P	P	P	A	A	A	A	P
<i>Sorghastrum nutans</i>	Indian grass	P	P	P	P	P	P	P	P	P
<i>Sporobolus heterolepis</i>	Prairie dropseed	P	P	P	P	P	P	A	P	P
Hemi-parasite Group										
<i>Commandra umbellata</i>	Bastard toadflax	A	A	A	A	A	A	A	A	A
<i>Pedicularis canadensis</i>	Wood betony	A	A	P	A	A	A	A	A	A
Other species of ecological concern										
<i>Asclepias sullivantii</i>	Prairie milkweed	P	P	A	P	A	P	P	P	P
<i>Amorpha canescens</i>	Lead plant	P	P	P	P	A	A	P	A	A
<i>Dodecatheon meadia</i>	Shooting star	P	P	P	A	A	A	A	A	P
<i>Eryngium yuccifolium</i>	Rattlesnake master	P	P	P	P	P	P	P	A	P
<i>Viola pedatifida</i>	Prairie violet	A	P	A	A	A	A	A	P	A
Native species richness		162	153	166	144	108	136	134	93	106
Non-native species richness		43	36	39	44	40	38	49	36	31

SPR = South Patrol Road, BL = Blodgett, GCN = Grant Creek North, SPCOP = South Prairie Creek Outwash Plain, EX = Exxon, LD = Lower Drummond

## 6.4 STATUS OF SELECT ECOLOGICAL CONDITIONS FOR T&E, CANDIDATE, AND SPECIES OF CONSERVATION CONCERN

### 6.4.1 What is the ecosystem status for grassland bird habitat?

**Indicators:** Acres of short-stature unfragmented grass dominated habitat; Acres of medium-stature unfragmented grass dominated habitat; Acres of tall-stature unfragmented grass dominated habitat; Acres of bison-grazed grass dominated habitat

*Table 18. Indicators for short-grass, medium-grass, tall-grass habitats, and bison grazed grassland by year.*

Fiscal Year	Acres of short grass habitat@	Acres of medium grass habitat#	Acres of tall grass habitat&	Acres of bison grazed grassland*
2016	3,250	1,456	3,192	361
2017	4,034	0	3,192	973
2018	3,859	0	3,192	973
2019	3,859	297	3,617	973
2020	3,859	460	3,667	973

@ Includes acres grazed by cattle. These areas may also have been mowed. Acres are inclusive, so may include areas where cattle are fenced out from such as drainages.

# Includes acres mowed, hayed or fallow only

& Includes acres of dolomite prairie and tallgrass prairie only

\* Includes areas where bison are known to have grazed during part of the year.

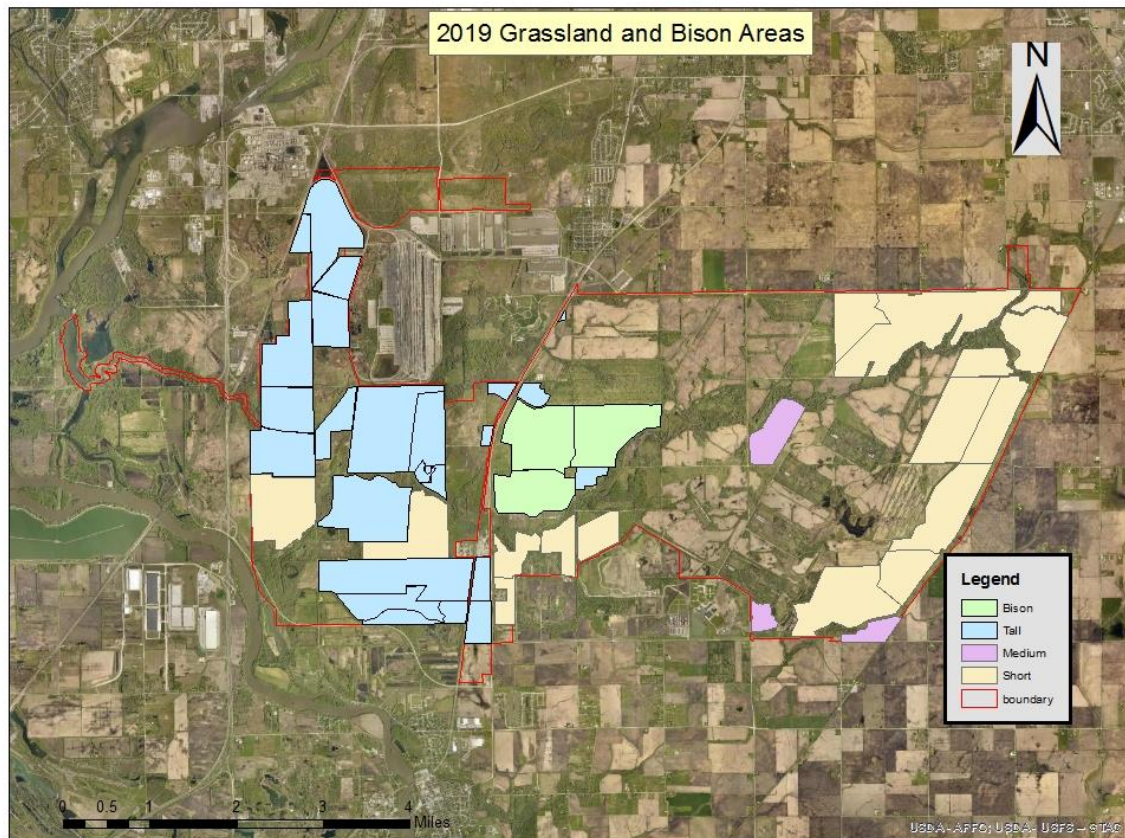


Figure 8. Map showing areas of short stature, medium stature, and tall stature grasslands and bison grazed grassland for 2019. For definitions of these areas, see Table 8.

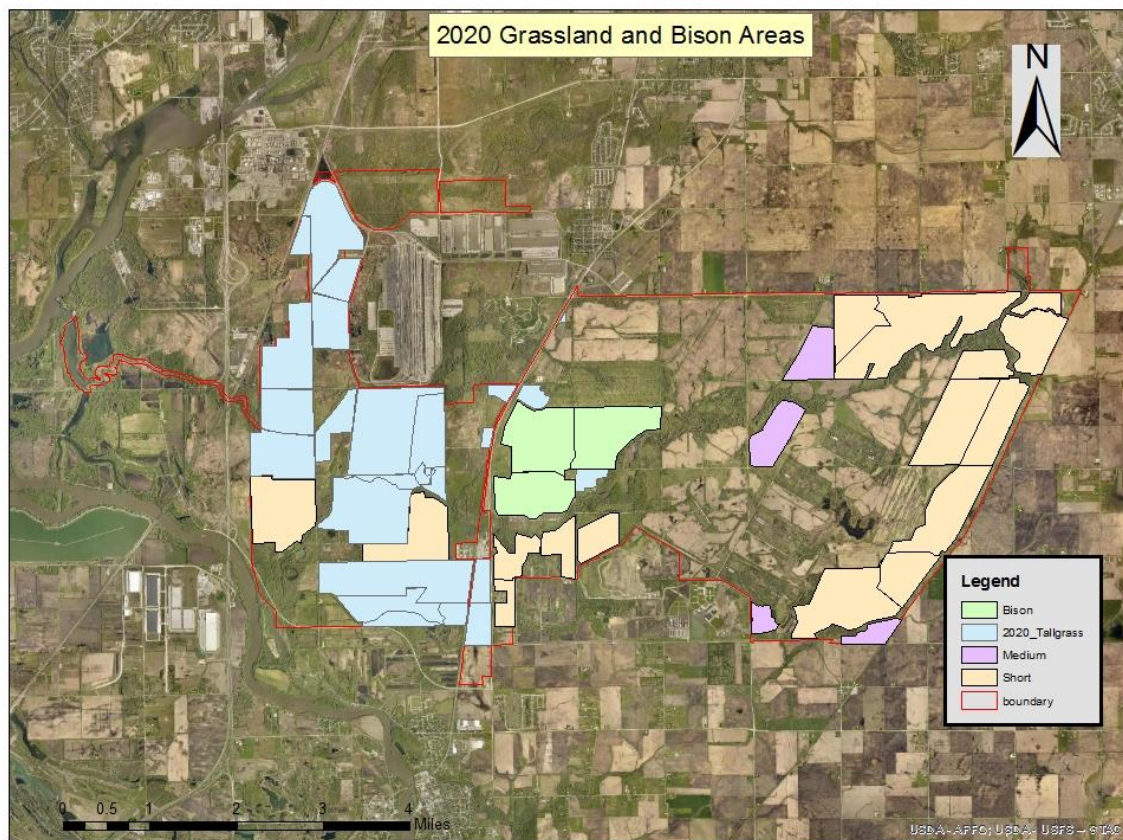


Figure 9. Map showing areas of short stature, medium stature, and tall stature grasslands and bison grazed grassland for 2020. For definitions of these areas, see Table 8.

#### 6.4.2 What is the ecosystem status for wetland species?

**Indicators:** Acres of newly restored wetlands; Acres of newly enhanced wetlands; Acres of wetlands managed

No data available at the time of this report.

#### 6.4.3 What is the ecosystem status for insects?

**Indicator:** Total acres of tallgrass prairie/wetlands within MNTTP



Table 19. Indicator for tallgrass prairie/wetlands by year.

Fiscal Year	Total acres of tallgrass prairie/wetlands@
2016	3,192
2017	3,192
2018	3,192
2019	3,584
2020	3,441

@ Includes acres of tallgrass prairie and dolomite prairie

#### 6.4.4 What is the ecosystem status for woodland/forest/savanna species?

**Indicator:** Acres of woodland/forest/savanna being managed

Table 20. Indicator for woodland/forest/savanna by year.

Fiscal Year	Acres of woodland/forest/savanna being managed
2016	248
2017	185
2018	353
2019	502
2020	248

#### 6.4.5 What is the ecosystem status for dolomite prairie species?

**Indicator:** Acres of dolomite prairie being managed; Acres of dolomite prairie managed with prescribed fire

Table 21. Indicators for dolomite prairie managed and dolomite prairie managed with prescribed fire by year.

Fiscal Year	Acres of dolomite prairie being managed	Acres of dolomite prairie managed with prescribed fire
2016	889	262
2017	889	842
2018	889	558
2019	889	841
2020	889	331

#### 6.4.6 What is the ecosystem status for aquatic species?

**Indicator:** Macroinvertebrates (Riverwatch) - MBI, Taxa Richness, EPT Taxa Richness

See question 6.1.2 above for data and analysis of MBI, taxa richness and EPT taxa richness.

## 6.5 VISITOR USE, VISITOR SATISFACTION AND RECREATION OBJECTIVES

In 2000 the USDA Forest Service began implementing National Visitor Use Monitoring (NVUM) with two concurrent goals. First, to produce estimates of the volume of recreation visitation to National Forests and Grasslands. Second, to produce descriptive information about that visitation, including activity participation, demographics, visit duration, measures of satisfaction, and trip spending connected to the visit.

All national forests and grasslands are surveyed on a five-year cycle. National Visitor Use Monitoring first took place at Midewin National Tallgrass Prairie in 2003 and subsequently in 2008, 2013, and most recently in 2018. Following is a summary of key results that help the Prairie make critical decisions regarding visitors in planning and implementation of all types of projects. The complete 2018 National Visitor Use Monitoring report for Midewin National Tallgrass Prairie that includes a description of survey methods can be found at [https://apps.fs.usda.gov/nvum/results/ReportCache/2018\\_A09015\\_Master\\_Report.pdf](https://apps.fs.usda.gov/nvum/results/ReportCache/2018_A09015_Master_Report.pdf).

### 6.5.1 5a. How many MNTP visits have occurred?

**Indicators:** Annual Visitation Estimate (Number of visitors); Annual Visitation Frequency (Returning visitors)

This data shows how many visits MNTP had and how often people visit (i.e. return visitors). Over time this data may show the trends for total visits and returning visits for people coming to Midewin.

Table 22. Annual visitation estimate by year of National Visitor Use Monitoring.

Visit Type	2018 Visits (1,000s)	90% Confidence Level (%)#	2013 Visits (1,000s)	2008 Visits (1,000s)	2003 Visits (1,000s)
Total Estimated Site Visits*	71	±23.0	79	17	29.5
Day Use Developed Site Visits	6	±16.2	4	0	NA
General Forest Area Visits	65	±25.1	74	16	NA

Visit Type	2018 Visits (1,000s)	90% Confidence Level (%)#	2013 Visits (1,000s)	2008 Visits (1,000s)	2003 Visits (1,000s)
Total Estimated National Forest Visits§	54	±24.0	74	16	NA
Special Events and Organized Camp Use‡	0	±0.0	0	0	NA

\* A Site Visit is the entry of one person onto a National Forest site or area to participate in recreation activities for an unspecified period of time.

‡ Special events and organizational camp use are not included in the Site Visit estimate, only in the National Forest Visits estimate. Forests reported the total number of participants and observers so this number is not estimated; it is treated as 100% accurate.

§ A National Forest Visit is defined as the entry of one person upon a national forest to participate in recreation activities for an unspecified period of time. A National Forest Visit can be composed of multiple Site Visits.

# This value defines the upper and lower bounds of the visitation estimate at the 90% confidence level, for example if the visitation estimate is 100 +/-5%, one would say “at the 90% confidence level visitation is between 95 and 105 visits.”

### Percent of National Forest Visits\* by Annual Visit Frequency

Table 23. Percent of National Forest visits by annual visit frequency by year of National Visitor Use Monitoring.

Number of Annual Visits	2018 Visits (%)†	2013 Visits (%)†	2008 Visits (%)†	2003 Visits (%)†
1 - 5	50.7	41.8	48.7	NA
6 - 10	13.3	15.6	15.5	NA
11 - 15	11.3	8.4	8.1	NA
16 - 20	12.8	10.0	8.0	NA
21 - 25	1.5	5.1	1.0	NA
26 - 30	5.8	0.3	3.0	NA
31 - 35	0.2	0.0	1.0	NA
36 - 40	0.3	4.1	1.9	NA
41 - 50	0.4	6.0	4.9	NA
51 - 100	3.0	3.4	1.9	NA
101 - 200	0.3	1.9	4.0	NA
201 - 300	0.4	3.2	0.0	NA
Over 300	0.0	0.2	1.9	NA

\* A National Forest Visit is defined as the entry of one person upon a national forest to participate in recreation activities for an unspecified period of time. A National Forest Visit can be composed of multiple Site Visits.

† The first row indicates the percent of National Forest Visits made by persons who visit 1 to 5 times per year. The last row indicates the percent of National Forest Visits made by persons who visit more than 300 times per year.

### 6.5.2 What are the demographics of MNTP visitors?

**Indicators:** Gender of visitors, Age distribution of visitors; Race/Ethnicity distribution of visitors; Household Income distribution of visitors

This data show demographics of visitors and over time could show changes. This can help to show underserved audiences and focus outreach to these audiences to become aware of the recreational opportunities at MNTP.

*Table 24. Percent of National Forest Visits\* by Gender by year of National Visitor Use Monitoring.*

Gender	2018 National Forest Visits (%)‡	2013 National Forest Visits (%)‡	2008 National Forest Visits (%)‡	2003 National Forest Visits (%)‡
Female	27.7	14.3	22.6	11.5
Male	72.3	85.7	77.4	88.5

\* A National Forest Visit is defined as the entry of one person upon a national forest to participate in recreation activities for an unspecified period of time. A National Forest Visit can be composed of multiple Site Visits.

† Non-respondents to gender questions were excluded from analysis.

‡ Calculations are computed using weights that expand the sample of individuals to the population of National Forest Visits.

*Table 25. Percent of National Forest Visits\* by Age by year of National Visitor Use Monitoring.*

Age Class	2018 National Forest Visits (%)‡	2013 National Forest Visits (%)‡	2008 National Forest Visits (%)‡	2003 National Forest Visits (%)‡
Under 16	23.7	3.4	6.3	5.7
16-19	3.2	3.5	0.3	4.49
20-29	12.4	6.8	11.3	4.46
30-39	11.5	24.0	19.6	16.70
40-49	11.8	20.1	25.6	35.20
50-59	21.5	21.5	21.5	22.20
60-69	9.4	10.0	11.3	11.26
70+	6.5	7.3	4.2	0.52

\* A National Forest Visit is defined as the entry of one person upon a national forest to participate in recreation activities for an unspecified period of time. A National Forest Visit can be composed of multiple Site Visits

† Non-respondents to age questions were excluded from analysis.

‡ Calculations are computed using weights that expand the sample of individuals to the population of National Forest Visits.



Table 26. Percent of National Forest Visits\* by Race/Ethnicity by year of National Visitor Use Monitoring.

Race †	2018 National Forest Visits (%)§#	2013 National Forest Visits (%)§#	2008 National Forest Visits (%)§#	2003 National Forest Visits (%)§#
American Indian / Alaska Native	1.1	6.6	7.6	0.0
Asian	0.5	0.5	1.0	1.7
Black / African American	2.2	0.1	0.0	0.0
Hawaiian / Pacific Islander	0.2	0.0	2.1	0.0
White	96.1	96.1	89.5	98.1
Hispanic / Latino	9.3	3.9	5.3	0.1

\* A National Forest Visit is defined as the entry of one person upon a national forest to participate in recreation activities for an unspecified period of time. A National Forest Visit can be composed of multiple Site Visits.

# Respondents could choose more than one racial group, so the total may be more than 100%.

† Race and Ethnicity were asked as two separate questions.

‡ Non-respondents to race/ethnicity questions were excluded from analysis.

§ Calculations are computed using weights that expand the sample of individuals to the population of National Forest Visits.

Note: In the 2003 NVUM survey, race category names varied slightly from later reports. To allow for comparison, those 2003 categories have been converted as closely as possible to align with later reports.

Table 27. Percent of National Forest Visits\* by Annual Household Income by year of National Visitor Use Monitoring.

Annual Household Income Category	2018 National Forest Visits (%)	2013 National Forest Visits (%)	2008 National Forest Visits (%)	2003 National Forest Visits (%)
Under \$25,000	0.5	12.7	0.0	NA
\$25,000 to \$49,999	23.6	14.8	22.4	NA
\$50,000 to \$74,999	8.2	12.3	18.7	NA
\$75,000 to \$99,999	28.4	14.3	23.1	NA
\$100,000 to \$149,999	15.1	21.2	31.4	NA
\$150,000 and up	24.2	24.7	4.3	NA

\* National Forest Visits are defined as the entry of one person upon a national forest to participate in recreation activities for an unspecified period of time. A National Forest Visit can be composed of multiple Site Visits.

### 6.5.3 How satisfied are MNTP visitors?

**Indicator:** Percent of NF visits by overall satisfaction rating

This data shows the satisfaction of visitors to MNTP, while other data show satisfaction with developed facilities, access, services, and feeling of safety. Tracking this data can show areas that are deficient from a user perspective and indicate areas MNTP may need to improve.

*Table 28. Percent of National Forest Visits by Overall Satisfaction Rating by year of National Visitor Use Monitoring.*

Overall Satisfaction Rating	2018 National Forest Visits (%)	2013 National Forest Visits (%)	2008 National Forest Visits (%)	2003 National Forest Visits (%)
Very Satisfied	70.2%	64.7	68.4	NA
Somewhat Satisfied	22.9%	27.2	26.6	NA
Neither Satisfied nor Dissatisfied	6.2%	4.0	3.9	NA
Somewhat Dissatisfied	0.0%	1.8	1.0	NA
Very Dissatisfied	0.8%	2.3	0.1	NA

\* National Forest Visits are defined as the entry of one person upon a national forest to participate in recreation activities for an unspecified period of time. A National Forest Visit can be composed of multiple Site Visits.

## 6.6 OTHER STRESSORS

### 6.6.1 What impact are invasive species having on restoration areas?

**Indicator:** Frequency analysis showing native richness and invasive richness (Random Vegetation Sampling)

See question 6.3.2 above for an analysis of native richness and invasive richness.

## 6.7 PROGRESS TOWARD MEETING THE DESIRED CONDITIONS AND OBJECTIVES IN THE PLAN

### 6.7.1 How is MNTP meeting the goal to manage the land and water resources of Midewin in a manner that will conserve and enhance the native populations and habitats of fish, wildlife, and plants?

**Indicators:** Macroinvertebrates (Riverwatch) - MBI, Taxa Richness, EPT Taxa Richness; Population estimates from bird surveys; Frequency analysis showing native richness and invasive richness (Random Vegetation Sampling)

See question 6.1.2 above for data and analysis of MBI, taxa richness and EPT taxa richness. See question 6.4.1 for data and analysis from bird surveys. See question 6.3.2 above for an analysis of native richness and invasive richness.

### 6.7.2 How is MNTP meeting the goal to provide opportunities for scientific, environmental, and land use education and research?

**Indicators:** Number of people attending tours and interpretative programs, Number of people attending education programs, List of scientific studies conducted at MNTP

*Table 29. Indicators for numbers of people attending tours and interpretive programs and educational programs by year.*

Fiscal Year	Tours and Interpretive	Educational Programs
2016	4,894	2,616
2017	4,523	5,813
2018	4,468	2,536
2019	3,960	3,665
2020	5,189	927

**Tours & Interp:** Public Programs and Tours advertised in the annual program schedule, large events @ Midewin (or hosted virtually by Midewin), and large off-site events (parades, expos, etc).

**Educational:** Mighty Acorns, Midewin for Kids, Winter Lecture Series, Special Request tours/programs.

Most of FY20 presented unique challenges for everyone, especially Interp/Education due to Covid-19. We were able to offer several virtual programs in FY20 to continue outreach and education with the public. The increase from FY19 to FY20 in the Tours & Interp category is mostly due to a Midewin NTP seed display at the Madlener House in Chicago that was viewed by over 2,500 people. The decrease in Educational numbers is directly due to having to cancel some programming due to Covid-19 health and safety concerns (four (4) lectures, spring Mighty Acorns). Also not being able to host in-person activities drove down our number for special request programming (Special requests FY19 859 ppl vs. FY20 215 ppl).

A list and short description of research show what outside research is being conducted at MNTP and the topics of scientific study. Over time this information may show trends in areas of scientific research being conducted at Midewin.

*Table 30. List of Permittees and permit descriptions issued at Midewin by year.*

Year	Permittee	Description
2016	University of Notre Dame	Archeology Permit West Side
2016	Chicago Field Museum	Butterfly Research at Iron Bridge Trailhead
2017	Governor's State University	White Footed Mouse Research
2017	University of Notre Dame	Archeology Permit West Side
2017	Olivet Nazarene University	Rusty Patch Bumble Bee

Year	Permitee	Description
2017	Incorporated Research Institution for Seismology	Earthquake monitoring system
2018	University of Illinois – Chicago	Carbon Sequestration Study
2018	Incorporated Research Institution for Seismology	Earthquake monitoring system
2018	BP	Franklin Ground Squirrel Study
2019	Lewis University	Soil Study
2019	University of Notre Dame	Archeology Permit West Side
2019	Incorporated Research Institution for Seismology	Earthquake monitoring system
2019	University of Illinois – Chicago	Carbon Sequestration Study
2019	University of Illinois – Champaign	Snake Study
2019	Chicago Botanic Garden	Native Violet Research in Prairies
2020	University of Illinois – Chicago	Carbon Sequestration Study
2020	Incorporated Research Institution for Seismology	Earthquake monitoring system
2020	BP	Franklin Ground Squirrel Study
2020	University of Illinois – Champaign	Snake Study
2020	Olivet Nazarene University	Non Native Oriental Weather Loach Fish Study

### 6.7.3 How is MNTP meeting the goal to allow the continuation of agricultural uses of lands within Midewin?

**Indicators:** List of row crop and grazing permits by acres

When reviewing agriculture special use permits and grazing permits, we obtain the number of acres per permit. These numbers are reported annually. Agricultural use permits are used for resource management purposes; to manage grassland ecosystems, control invasive plant species and to develop native grassland vegetation and habitat. Agricultural crop permits are also used to prepare sites for planting prairie and wetland vegetation, as well as grassland and prairie habitat. The agricultural production controls invasive species prior to planting and provides an excellent seedbed to plant native prairie seed. Grazing is used as a management tool to control grass height and provide habitat for grassland wildlife. In alignment with the Prairie Plan there could be an increase in the number of acres grazed as agricultural crop lands are removed from crop production and converted to grassland and prairie habitat. This could improve management of grassland habitat within the allotments.

*Table 31. Indicator for agricultural crop permits by year.*

Fiscal Year	Number of Ag Permits	Total Acres of Ag Permits
2016	4	3,377
2017	6	3,375

Fiscal Year	Number of Ag Permits	Total Acres of Ag Permits
2018	6	3,325
2019	3	3,576
2020	4	3,616

Table 32. Indicator for grazing permits by year.

Year	Number of Grazing Permits	Total Acres of Grazing Permits
2016		
2017	11	3,832
2018	11	3,832
2019	11	3,832
2020	11	3,832

#### 6.7.4 How is MNTP meeting the goal to provide a variety of recreation opportunities?

**Indicator:** Activity Participation by percentage

Table 33. Activity participation by year of National Visitor Use Monitoring.

Activity	2018 % Participation*	2018 % Main Activity ‡	2018 Avg Hours Doing Main Activity
Hiking / Walking	58.8	29.7	68.4
Hunting	43.3	43.3	26.6
Viewing Wildlife	42.6	14.7	3.9
Viewing Natural Features	32.0	3.2	1.0
Bicycling	22.1	4.5	0.1
Nature Center Activities	17.9	0.5	1.0
Visiting Historic Sites	15.2	0.0	3.0
Relaxing	5.1	0.0	1.0
Nature Study	4.8	1.1	3.6
Some Other Activity	1.5	1.5	6.0
Horseback Riding	1.5	1.5	6.0
Picnicking	0.4	0.4	2.0

\* Survey respondents could select multiple activities so this column may total more than 100%.

‡ Survey respondents were asked to select just one of their activities as their main reason for the forest visit. Some respondents selected more than one, so this column may total more than 100%.

## 6.8 8. LAND PRODUCTIVITY

### 6.8.1 What activities at MNTP are affecting the soil productivity of the land?

**Indicators:** Acres of roads removed/added; Acres of trails removed/added; Square feet of buildings removed/added; Acres of row crops converted to prairie/pasture

*Table 34. Indicator for roads/railbeds removed, trails added, buildings removed, and row crops converted to prairie/pasture by year.*

Fiscal Year	Acres of roads/railbeds removed	Acres of trails Added	Square feet of buildings Removed	Acres of row crops converted to prairie/grassland*
2015	3.04	0	6,391	859
2016	1.38	2.52	28,951	0
2017	13.30	0	39,546	0
2018	33.73	0	91,752	164
2019	23.4	0	131,084	242
2020	5.8	0	14,167	242

\*Entries are the year areas were first seeded/planted to the new land use. Includes areas converted to savanna.

## 6.9 MANAGEMENT AREA 3 – SPECIAL AREAS

### 6.9.1 Has there been any noncompliance of restrictions for Management Area 3 lands? If so, describe actions taken to remedy the noncompliance and explain the reasons for the non-compliance.

In 2008, the Prairie Plan was amended to create additional Management Areas within Midewin National Tallgrass Prairie. Management Area 3 includes those areas on the landscape that were designated as Soil Restriction Areas and Groundwater Management Zones by the US Army. Plan Standards were created related to activity within these areas.

During 2019-2020, resource activities on lands designated as Management Area 3 have all complied with the standards set for these special areas. Therefore, no actions were needed to remedy for non-compliance activities.