ROSTAD RANCH MITIGATION SITE

Project Overview

MDT Project: STPX 002(749), UPN #5565

Watershed: Watershed #10 – Musselshell River Basin

Monitoring Year: 2021

Years Monitored: 9th year of monitoring

Corps Permit Number: NWO-2006-90851-MTB

Monitoring Conducted By: Confluence Consulting Inc.

Dates Monitoring Was Conducted: July 22, 2021

Purpose of the Approved Project:

The site was originally constructed to provide 39.70 acres of compensatory wetland mitigation credits for wetland impacts associated with future transportation projects in Watershed #10 – Musselshell River Basin. The initial project consisted of filling drainage ditches, excavating and grading the site to distribute water across the site, and creating open-water areas. Adaptive Management actions were undertaken in 2017 to install several spreader berms to improve distribution of supplemental irrigation water across the site. After discussions with the Corps and the Design Consultant, the overall wetland development goal was reduced to 27.4 wetland credit acres.

Site Location:

Latitude: 46.462457 **Longitude:** –110.294063 **County:**

Meagher **Nearest Town:** Martinsdale, MT

Map Included: Figure 1 – Site Location Map on page #9.

Mitigation Site Construction Started: 2012 **Construction Ended:** 2012

Adaptive Management: In 2017, several berms were installed to improve overall water management and distribution for increased wetland expansion across the site.

Dates of Any Recent Corrective or Maintenance Activities (since previous report):

Activity: Weed Spraying **Date:** October 2021

Specific recommendations for any additional corrective actions: Weed treatment should continue in 2022.

Anticipated Wetland Credit Acres: 27.4

Wetland Credit Acres Generated to Date: 30.61

Previous Monitoring Reports:

https://www.mdt.mt.gov/publications/brochures/wetland_mitigation.shtml

Requirements (from approved mitigation plan, banking instrument, or Department of Army (DA) permit conditions)

Monitoring Period: 5 years from construction completion or until concurrence by the US Army Corps of Engineers (USACE).

Performance Standards: A summary of performance standards established for the Rostad Ranch site and whether they are being achieved is provided in Table 1.

Table 1. Summary of Performance Standards

Performance Standards	Success Criteria	Criteria Achieved Y/N	Discussion
Wetland Characteristics	The three parameter criteria for hydrology, vegetation, and soils as outlined in the 1987 Wetland Manual and 2010 Great Plains Regional Supplement.	Y	Wetland habitat areas within the mitigation site meet the three parameters required to qualify as wetlands and thus the success criterion is being satisfied.
Wetland Hydrology	Soil saturation is present for at least 12.5 percent of the growing season.	Y	Irrigation water was diverted into the site on May 5th and turned off on May 28, 2021. All wetlands within the project area were saturated for the minimum 12.5 percent of growing season.
Hydric Soil	Hydric soil conditions are present or appear to be forming.	Y	The constructed wetland complex is beginning to develop hydric soils in areas that were identified as nonhydric prior to construction. Hydric soil characteristics are present in areas that were identified as wetland prior to construction.
	Soil is sufficiently stable to prevent erosion.	Y	Disturbed soil is stable and does not exhibit signs of erosion.
	Soil is able to support plant cover	Y	Plant cover has continued to develop across disturbed soils.
Hydrophytic Vegetation	Combined absolute cover of facultative or wetter species is greater than or equal to 70 percent.	Y	Wetland areas within the mitigation site contain greater than 70% absolute cover from hydrophytic vegetation (OBL, FACW, and FAC).
	Noxious weeds do not exceed 5 percent cover.	Y	Noxious weed cover has been steadily decreasing and is now estimated to be less than 5 percent within delineated wetlands.
Woody Plants	Plantings exceed 50 percent survival after 5 years.	Y	Woody plant survival was estimated at 50 percent in 2021 for all plantings, meeting the 50 percent survival rate.
Open-Water Areas	Open water that is established within the designated wetland cells will be considered successful and creditable if open water does not exceed 10 percent of the total wetland acreage.	Y	No open water was observed at the site during the 2021 monitoring event.
Upland Buffer	Success will be achieved when noxious weeds do not exceed 5 percent cover within the buffer areas on the site.	Y	Noxious weed cover was estimated at 2 percent across the site.

Upland Buffer	Any area that was disturbed within creditable buffer zone must have at least 50 percent aerial cover of desirable upland plant species by the end of the monitoring period.	Y	Upland buffers that surround wetland areas within the site exhibited greater than 50 percent aerial cover of non-weed species in 2021.
Performance Standards	**Success Criteria**	**Criteria Achieved Y/N**	**Discussion**
Weed Control	Weed-control measures are implemented to minimize and/or eliminate infestations of state-listed noxious weed species within the site.	Y	Noxious weed treatments have been effective at reducing noxious weed cover. State-listed noxious weed species across the site were estimated at 2 percent absolute cover in 2021.
Fencing	Wildlife-friendly fencing is installed along the easement boundaries.	Y	Wildlife-friendly fencing was installed with the construction of this site around the easement boundaries and remains in good condition.

Summary Data

Wetland Delineation – The total wetland acreage delineated in 2021 was 28.93 acres, which included preexisting wetlands (see maps in Appendix A). This is a 0.66-acre increase in wetland acreage from 2020. The adaptive management strategies implemented in 2017 increased the amount of inundation in some places on the site, and caused some areas previously delineated as upland to become wetland. Some of the newly inundated and saturated areas are beginning to transition to include more hydrophytic species and develop hydric soil indicators and are likely to continue development in future years.

Vegetation – A total of 89 plant species were identified on the site from 2013 through 2021, with 11 new species identified at the site in 2021. A comprehensive species list can be found in Appendix B (Table B-1). Vegetation communities were identified by plant composition and dominance. Community composition has remained relatively consistent across the site, with a notable increase in hydrophytic species in several communities, including balsam poplar (*Populus balsamifera*). In 2021, no open standing water or surface inundation was observed across the site, and wetland type 13 (*Beckmannia syzigachne*) was created to describe the community that has developed in the northeast corner of the mitigation area that was previously inundated. The following vegetation community types were identified in 2021:

- Upland Type 8 – *Bromus inermis*
- Upland Type 11 – *Elymus trachycaulus/Pascopyrum smithii*
- Wetland Type 2 – *Juncus balticus/Carex nebrascensis*
- Wetland Type 3 – *Salix exigua*
- Wetland Type 5 – *Glyceria grandis/Typha latifolia*
- Wetland Type 7 – *Phalaris arundinacea*
- Wetland Type 10 – *Alopecurus pratensis*
- Wetland Type 12 - *Phalaris arundinacea/Eleocharis palustris*
- Wetland Type 13 – *Beckmannia syzigachne*

The community composition for each community type is provided in full detail on the Wetland Mitigation Site Monitoring form (Appendix B), and the community boundaries are shown on Figure A-3 (Appendix A).

Absolute cover of state-listed noxious weed was estimated at two percent across the entire site. Canada thistle (*Cirsium arvense*) was observed in eight locations with patch sizes ranging from trace to high. Spotted knapweed (*Centaurea stoebe*) was observed at three locations in trace patch sizes, as well as one trace patch of houndstongue (*Cynoglossum officinale*). Weed locations are identified in Figure A-3, Appendix A.

Vegetation cover was measured along four transects in 2021 (Figure A-2, Appendix A). Summaries of the data collected at these transects are presented in Tables 2-5 below, while detailed data for each transect are provided in the monitoring forms in Appendix B. Photographs of the transect start and end points are provided in Appendix C.

Table 2 summarizes the data for T-1 which is 422 feet long and intersects upland community types 8 and 11, and wetland community types 2, 5, 7, and 12. Sixty-one percent of the transect crossed wetland habitat, which is consistent with findings in 2020. Total vegetative cover has remained constant at 95 percent from 2016 to 2021.

Table 2. Data Summary for T-1 From 2016 Through 2021 at the Rostad Ranch Mitigation Site

Monitoring Year	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**
Transect Length (feet)	**422**	**422**	**422**	**422**	**422**	**422**
Vegetation Community Transitions Along Transect	4	5	5	5	5	5
Vegetation Communities Along Transect	5	5	5	5	6	6
Hydrophytic Vegetation Communities Along Transect	4	4	4	4	4	4
Total Vegetative Species	26	23	26	23	22	23
Total Hydrophytic Species	10	10	11	10	8	10
Total Upland Species	16	13	15	13	14	13
Estimated % Total Vegetative Cover	95	95	95	95	95	95
Estimated % Unvegetated	5	5	5	5	5	5
% Transect Length Comprising Hydrophytic Vegetation Communities	59	56	62	62	61	61
% Transect Length Comprising Upland Vegetation Communities	41	44	38	38	39	39
% Transect Length Comprising Unvegetated Open Water	0	0	0	0	0	0
% Transect Length Comprising of Mud Flat	0	0	0	0	0	0

Table 3. Data Summary for T-2 From 2016 Through 2021 at the Rostad Ranch Mitigation Site

Monitoring Year	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**
Transect Length (feet)	**453**	**453**	**453**	**453**	**453**	**453**
Vegetation Community Transitions Along Transect	2	2	3	3	4	4
Vegetation Communities Along Transect	2	2	3	3	3	3
Hydrophytic Vegetation Communities Along Transect	1	1	2	2	2	2
Total Vegetative Species	25	17	16	16	16	19
Total Hydrophytic Species	7	6	7	9	6	8
Total Upland Species	18	11	9	7	10	11
Estimated % Total Vegetative Cover	95	95	95	95	95	95
Estimated % Unvegetated	5	5	5	5	5	5
% Transect Length Comprising Hydrophytic Vegetation Communities	70	76	76	78	82	93
% Transect Length Comprising Upland Vegetation Communities	30	24	24	22	18	7
% Transect Length Comprising Unvegetated Open Water	0	0	0	0	0	0
% Transect Length Comprising of Mud Flat	0	0	0	0	0	0

Data collected on T-2 are summarized in Table 3. T-2 is 453 feet long and intersects upland community type 8

and wetland community types 2 and 7. Ninety-three percent of the transect crossed wetland habitat in 2021, which is an 11 percent increase from 2020. Total vegetative cover has remained constant at 95 percent from 2016 to 2021.

Data collected on T-3 are summarized in Table 4. T-3 is 320 feet long and intersects wetland community types 2, 5, and 7. One-hundred percent of the transect crossed wetland habitat in 2021, which has been consistent since 2018. The total number of species observed in 2021 decreased by three from the previous year, and the number of hydrophytic species decreased by four. Total vegetative cover is consistent with 2020 findings at ninety percent.

Table 4. Data Summary for T-3 From 2016 Through 2021 at the Rostad Ranch Mitigation Site

Monitoring Year	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**
Transect Length (feet)	**320**	**320**	**320**	**320**	**320**	**320**
Vegetation Community Transitions Along Transect	4	3	3	3	3	3
Vegetation Communities Along Transect	4	3	3	3	3	3
Hydrophytic Vegetation Communities Along Transect	3	2	3	3	3	3
Total Vegetative Species	30	23	23	21	22	19
Total Hydrophytic Species	16	15	16	16	16	12
Total Upland Species	14	8	7	5	6	7
Estimated % Total Vegetative Cover	90	80	85	85	90	90
Estimated % Unvegetated	10	20	15	15	10	10
% Transect Length Comprising Hydrophytic Vegetation Communities	93	91	100	100	100	100
% Transect Length Comprising Upland Vegetation Communities	7	9	0	0	0	0
% Transect Length Comprising Unvegetated Open Water	0	0	0	0	0	0
% Transect Length Comprising of Mud Flat	0	0	0	0	0	0

Data collected on T-4 (Wetland Mitigation Site Monitoring form, Appendix B) are summarized in Table 5. T-4 was established in 2017 following adaptive management actions at the site and is 412 feet long. T-4 intersects upland community type 8, and wetland community type 7. Ten percent of the transect crossed wetland vegetation communities in 2021, which is an increase of 2 percent from 2020. The number of vegetation community transitions along the transect decreased in 2021 due to community type 8 expanding across the spreader berm at the north end of the transect, previously mapped as community type 11. Total vegetative cover increased since 2020 and was estimated at 85 percent.

Table 5. Data Summary for T-4 From 2017 Through 2021 at the Rostad Ranch Mitigation Site

Monitoring Year	**2017**	**2018**	**2019**	**2020**	**2021**
Transect Length (feet)	**412**	**412**	**412**	**412**	**412**
Vegetation Community Transitions Along Transect	4	3	3	4	2
Vegetation Communities Along Transect	3	2	2	3	2
Hydrophytic Vegetation Communities Along Transect	1	1	1	1	1
Total Vegetative Species	10	16	14	17	15
Total Hydrophytic Species	1	3	5	4	3
Total Upland Species	10	13	9	13	12
Estimated % Total Vegetative Cover	70	80	80	80	85
Estimated % Unvegetated	30	20	20	20	15
% Transect Length Comprising Hydrophytic Vegetation Communities	12	12	21	8	10
% Transect Length Comprising Upland Vegetation Communities	88	88	79	80	90
% Transect Length Comprising Unvegetated Open Water	0	0	0	0	0
% Transect Length Comprising of Mud Flat	0	0	0	0	0

Woody Plant Survival – Woody plant survival was estimated at 50 percent in 2021 for all plantings. Approximately 2,000 willow cuttings were planted throughout the excavated areas. An estimated 50 percent of the willow cuttings survived through 2021. The cuttings appeared healthy and vigorous with some signs of browse. A total of 100 black cottonwoods (*Populus balsamifera*) and 100 quaking aspens (*Populus tremuloides*) were installed around the perimeter of the proposed open-water areas in 2012. Survival of these containerized, 5-gallon plant materials was also estimated at 50 percent in 2021. Willow dominance continues to increase via natural recruitment in the southern portion of the site within Community Type 3 – *Salix exigua*.

Hydrology – The hydrology for the site is supplied from multiple sources, including a shallow seasonal groundwater table, groundwater that emerges from a natural spring located near the narrow-leaf willow (*Salix exigua*) stand in the southern portion of the site, direct precipitation, surface runoff, and surface- water diversion out of an adjacent irrigation canal. Irrigation water was diverted onto the site on May 5, 2021 and was turned off on May 28, 2021. The site was irrigated earlier and for a shorter duration than in previous years due to calls from downstream senior water right users within the Musselshell River basin. Adaptive management in the spring of 2017 installed a series of berms at strategic locations within the site to assist in storing and distributing water to other areas of the mitigation site to improve the development of wetland habitat (See Figure A-2 for berm locations). For the first time since the berms were installed, no inundation was present at the site during the monitoring event. This is likely a result of water availability given that 2021 was a drought year, and not a failure in adaptive management plans. One groundwater monitoring well remains at the site and is monitored monthly by the US Geological Survey (USGS).

Photographs – Photographs taken in 2021 at photo points 1–10 (PP1 to PP10), transect endpoints, and data points (Appendix C). Please refer to previous years' monitoring reports for photographs from all other years (https://www.mdt.mt.gov/publications/brochures/wetland_mitigation.shtml).

Soils – Soil test pits were excavated at four locations. One pair of sample points (DP01u, DP01w) are located in the Veryney-Notter cobbly loams soil unit, and the second pair or sample points (DP02u, DP02w) are located within the Delpoint variant-Marmarth-Cabbart loam soil unit (NRCS 2020)(Figure A-2, Appendix A). DP01w and DP02w both contained hydric soil indicators.

The soil profile of DP01w displayed 2 inches of dark brown (7.5YR 3/2) sandy clay loam over 5 inches of dark grayish brown (10YR 4/2) sandy clay with 2% yellowish brown (10YR 5/8) redoximorphic concentrations in the matrix. Below 7 inches was a cemented horizon that could not be excavated. This soil met the criteria for a depleted matrix (F3) and was classified as a hydric soil. DP01u, located on spreader berm #4, contained 10 inches of dark grayish-brown (10YR 4/2) sandy clay with 2% brownish yellow (10YR 6/8) concentrations in the matrix.

The soil at DP02w contained a 3-inch surface horizon of dark grey (10YR 4/1) sandy clay over 6-inches of dark grayish brown (10YR 4/2) sandy clay with 10% strong brown (7.5YR 5/6) redoximorphic concentrations in the matrix and along pore linings. Below 9 inches was a light olive-brown (2.5 Y 5/3) sandy clay loam. This soil met the criteria for the depleted matrix (F3) hydric soil indicator. DP02u, which is located upslope from DP02w, exhibited a dark grayish brown (10YR 4/2) sandy loam over a sandy clay loam and did not display any hydric soil indicators.

Wildlife – Seven bird species were observed at the site during monitoring in 2021, and 39 have been reported historically. Six of the seven bird boxes installed at the site are functional, though they appeared empty and not in use in 2021. In addition to bird observations, deer (*Odocoileus sp*.) tracks and beds were noted across the site, as well as observations of coyote (*Canis latrans*) and black bear (*Ursus americanus*) scat.

Functional Assessment – Overall, the site rates as a Category III wetland and generated 160.5 Functional Units in 2021. This is a decrease of 11.8 functional units since 2020, largely owning to the fact that the site was hayed in 2021, but still an increase of 8.6 functional units since 2019. The 2021 functional assessment results for the Rostad Ranch Mitigation Site are summarized in Table 6. Completed Montana Wetland Assessment

Method (MWAM) forms for the site are provided in Appendix B.

Table 6. Montana Wetland Assessment Method Summary for the Rostad Ranch Site

Function and Value Parameters from the Montana Wetland Assessment Method	2013[a]	2014[a]	2015[a]	2016[a]	2017[a]	2018[a]	2019[a]	2020[a]	2021[b]
Listed/Proposed T&E Species Habitat	Low (0.0)	Low (0)	Low (0)	Low (0)	Low (0)	Low (0)	Low (0)	Low (0)	Low (0)
MTNHP Species Habitat	High (0.9)	High (0.9)	High (0.9)	High (0.9)	High (0.9)	High (0.9)	High (0.9)	High (0.9)	High (0.9)
General Wildlife Habitat	Mod (0.5)	Low (0.3)	Mod (0.5)	Mod (0.5)	Mod (0.5)	Mod (0.5)	Mod (0.5)	Mod (0.5)	Low (0.3)
General Fish/Aquatic Habitat	NA	NA	NA	NA	NA	NA	NA	NA	NA
Flood Attenuation	NA	NA	NA	NA	NA	NA	NA	NA	NA
Short- and Long-Term Surface Water Storage	High (0.8)	Mod (0.6)	Mod (0.6)	Mod (0.6)	Mod (0.6)	Mod (0.6)	Mod (0.6)	High (0.9)	High (0.9)
Sediment/Nutrient/Toxicant Removal	Mod (0.7)	Mod (0.7)	High (1.0)	High (1.0)	High (1.0)	High (1.0)	High (1.0)	High (1.0)	High (1.0)
Sediment/Shoreline Stabilization	NA	Mod (0.6)	High (0.9)	High (0.9)	High (0.9)	High (0.9)	High (0.9)	High (0.9)	High (0.9)
Production Export/Food Chain Support	High (0.9)	Mod (0.6)	High (0.8)	High (0.8)	High (0.8)	High (0.8)	High (0.8)	High (0.8)	Mod (0.6)
Groundwater Discharge/Recharge	High (1.0)	Mod (0.7)	Mod (0.7)	Mod (0.7)	Mod (0.7)	Mod (0.7)	Mod (0.7)	Mod (0.7)	Mod (0.7)
Uniqueness	Mod (0.4)	Low (0.2)	Low (0.3)	Low (0.3)	Low (0.3)	Low (0.3)	Low (0.3)	Low (0.3)	Low (0.2)
Recreation/Education Potential (bonus points)	Low (0.05)	Low (0.05)	Low (0.05)	Low (0.05)	Low (0.05)	Low (0.05)	Low (0.05)	Low (0.05)	Low (0.05)
Actual Points/Possible Points	**5.25/8**	**4.65/9**	**5.75/9**	**5.75/9**	**5.75/9**	**5.75/9**	**5.75/9**	**6.05/9**	**5.55/9**
% of Possible Score Achieved	**65.6%**	**51.7%**	**63.9%**	**63.9%**	**63.9%**	**63.9%**	**63.9%**	**67.2%**	**61.7%**
Overall Category	**II**	**III**	**III**	**III**	**III**	**III**	**III**	**III**	**III**
Total Acreage of Assessed Wetlands within Site Boundaries	**13.74**	**14.40**	**14.90**	**14.90**	**26.42**	**26.42**	**26.42**	**28.48**	**28.93**

(a) 1999 MWAM form (Berglund, 1999)
(b) 2008 MWAM form (Berglund and McEldowney, 2008)

Credit Summary – Table 7 summarizes the estimated wetland credits based on the USACE-approved credit ratios and the wetland delineations completed in 2018-2021. Proposed mitigation credits from the Rostad Ranch Mitigation Plan (Montana Department of Transportation 2007) included reestablishing 27.11 wetland acres, rehabilitating 2.63 wetland acres, creating 9.84 wetland acres, preserving 0.25 wetland acres, and maintaining 6.76 acres of upland buffer, to produce a total of 39.7 mitigation credit acres. Adaptive management activities on the site in 2017 resulted in a shift of crediting such that the total number of anticipated wetland credit acres was reduced to 27.4. The mitigation credits estimated in 2021 totaled 30.61 credit acres, which is an increase of 2.27 credit acres from 2020.

Table 7. Wetland Mitigation Credits Estimated for the Rostad Ranch Site (2018–2021)

Compensatory Mitigation Type	Wetland Type (FGDC 2013)	Approved Mitigation Ratios[a]	Anticipated Mitigation Area (acres)	Anticipated Mitigation Credit (acres)	2019 Delineated Mitigation Areas (acres)	2019 Estimated Mitigation Credit (acres)	2020 Delineated Mitigation Areas (acres)	2020 Estimated Mitigation Credit (acres)	2021 Delineated Mitigation Areas (acres)	2021 Estimated Mitigation Credit (acres)
Restoration (Re-establishment)	Palustrine Emergent	1:1	27.11	27.11[d]	14.62	14.62	18.46	18.46	19.30	19.30
Establishment (Creation)	Palustrine Emergent	1:1	9.84	9.84[d]	13.18	13.18	7.5	7.5	7.32	7.32
Restoration (Rehabilitation)	Palustrine Emergent	1.5:1	2.63	1.75[d]	0.81	0.54	2.06	1.37	2.06	1.37
Preservation	Palustrine, Scrub/shrub	4:1	0.25	0.06	0.25	0.06	0.25	0.06	0.25	0.06
Upland Buffer	N/A	5:1	6.76[b]	1.35[b]	6.76[b]	1.35[b]	6.76[b]	1.35[b]	12.79[c]	2.56[c]
Permanent Wetland Impact	N/A	1:1	N/A	-0.41	N/A	-0.41	N/A	-0.41	N/A	-0.41
		Totals	**46.59**	**39.70**	**35.62**	**29.34**	**35.03**	**28.34**	**35.69**	**30.61**

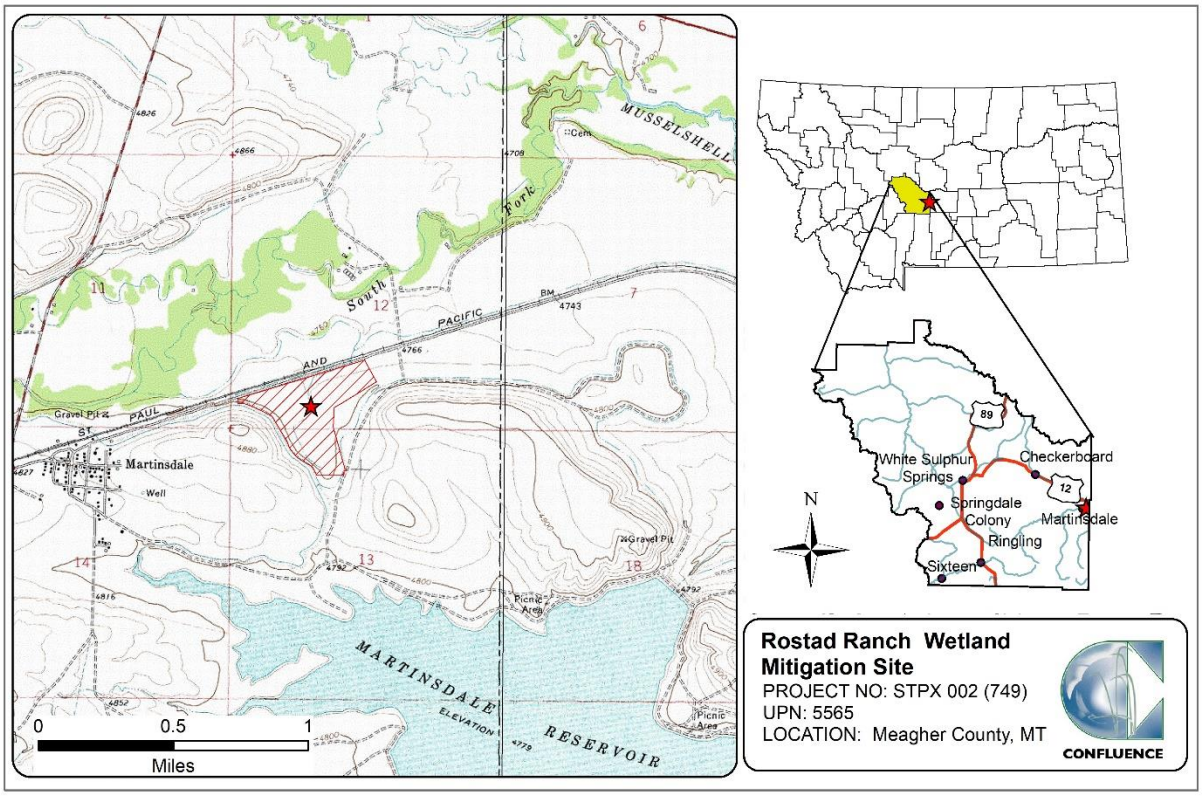
(a) Mitigation credit ratios utilized were from the Montana Corps Regulatory Programs 2005 Wetland Credit Ratios [USACE, 2005].
(b) Anticipated upland buffer credits were used for the first several years of the project.
(c) In 2021, upland buffer credit acres were calculated based on the area of a 50-foot buffer around the 2021 delineated wetland boundary.
(d) Adaptive management activities on the site in 2017 resulted in a shift of crediting such that the total number of anticipated wetland credit acres was reduced to 27.4

Table 8. Functional Unit Credits for the Rostad Ranch Site

Compensatory Mitigation Type	2021 Delineated Acres	Mitigation Ratio	2021 Mitigation Credit Acres	MWAM Actual Points	2021 Functional Units Generated
Restoration (Reestablishment)	19.30	1:1	19.30	5.5	106.15
Establishment (Creation)	7.32	1:1	7.32	5.5	40.26
Restoration (Rehabilitation)	2.06	1.5:1	1.37	5.5	7.55
Preservation	0.25	4:1	0.06	5.5	0.34
Upland Buffer	12.79	5:1	2.56	N/A	N/A
				(Mitigation Credit Acres × Actual Points)	**154.31**

Maps, Plans, Photos

Figure 1: Site Location Map



Project Area Maps/Figures: See Appendix A (A-2 – Monitoring Activity Locations, A-3 – Mapped Site Features and A-4 – Wetland Delineation).

Data Forms: See Appendix B (Site Monitoring form, plant list, USACE data forms, and MWAM forms).

Photos: See Appendix C.

Plans: See Appendix D of 2018 Monitoring Report
https://www.mdt.mt.gov/other/webdata/external/planning/wetlands/2018-REPORTS/2018-FINAL-Rostad-Ranch.PDF

Conclusions

In 2021, the Rostad Ranch Mitigation Site met all of the established performance standards and is continuing to develop into a diverse wetland ecosystem. Since adaptive management actions were implemented in 2017 to more effectively spread water across the site, the wetland areas on the site have gradually expanded. At the time of the 2021 monitoring event, a total of 29 wetland credit acres have been earned at the Rostad Ranch site, which exceeds the target number by 1.01 acres. Wetlands are likely to continue to expand and develop in some areas, and the site has potential to provide additional wetland credits going forward.

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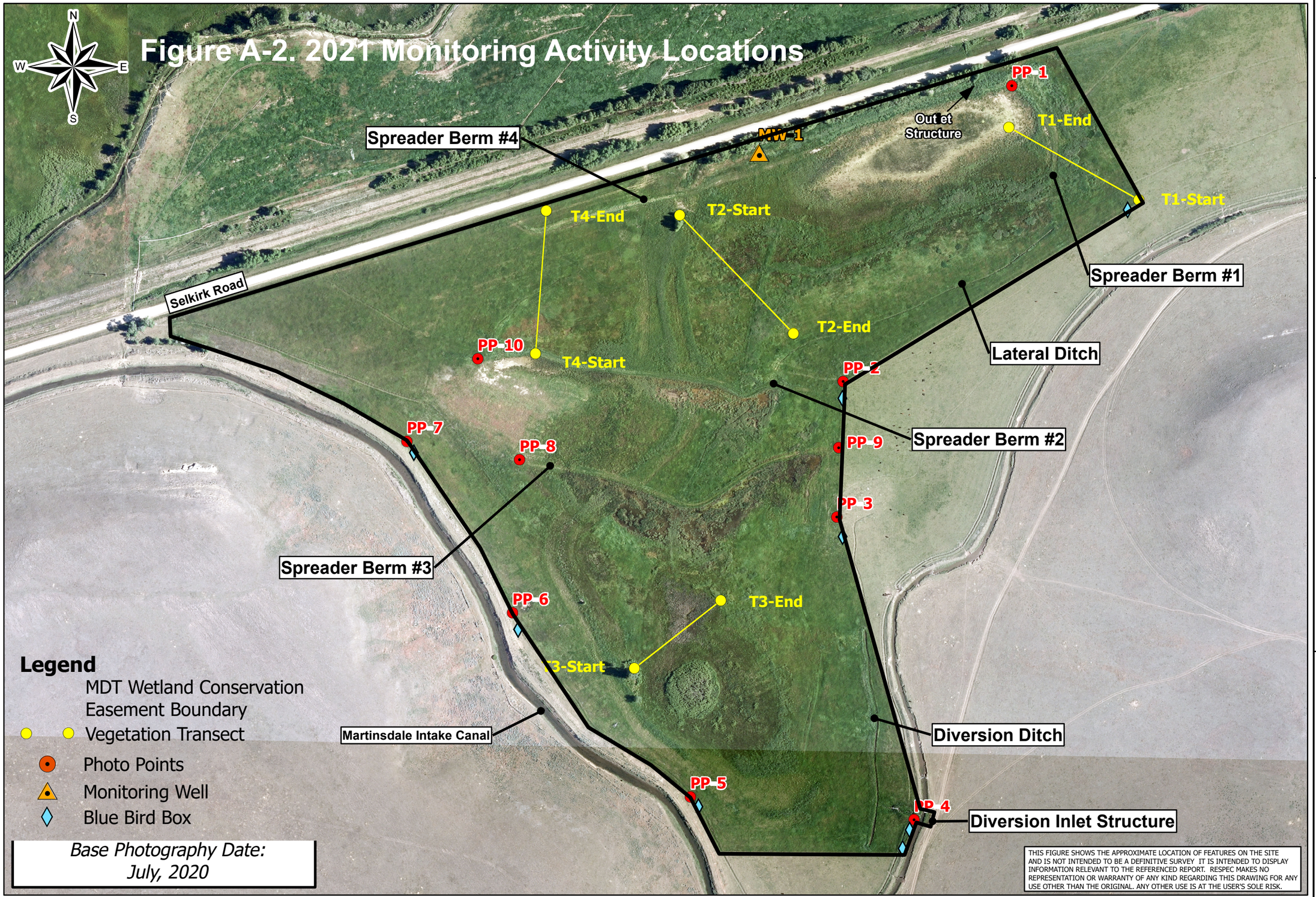
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APPENDIX A
PROJECT AREA MAPS

MDT Wetland Mitigation Monitoring
Rostad Ranch
Meagher County, Montana

Figure A-2. 2021 Monitoring Activity Locations



Legend

- MDT Wetland Conservation Easement Boundary
- Vegetation Transect
- Photo Points
- Monitoring Well
- Blue Bird Box

Base Photography Date: July, 2020

THIS FIGURE SHOWS THE APPROXIMATE LOCATION OF FEATURES ON THE SITE AND IS NOT INTENDED TO BE A DEFINITIVE SURVEY. IT IS INTENDED TO DISPLAY INFORMATION RELEVANT TO THE REFERENCED REPORT. RESPEC MAKES NO REPRESENTATION OR WARRANTY OF ANY KIND REGARDING THIS DRAWING FOR ANY USE OTHER THAN THE ORIGINAL. ANY OTHER USE IS AT THE USER'S SOLE RISK.

CONFLUENCE
consulting incorporated

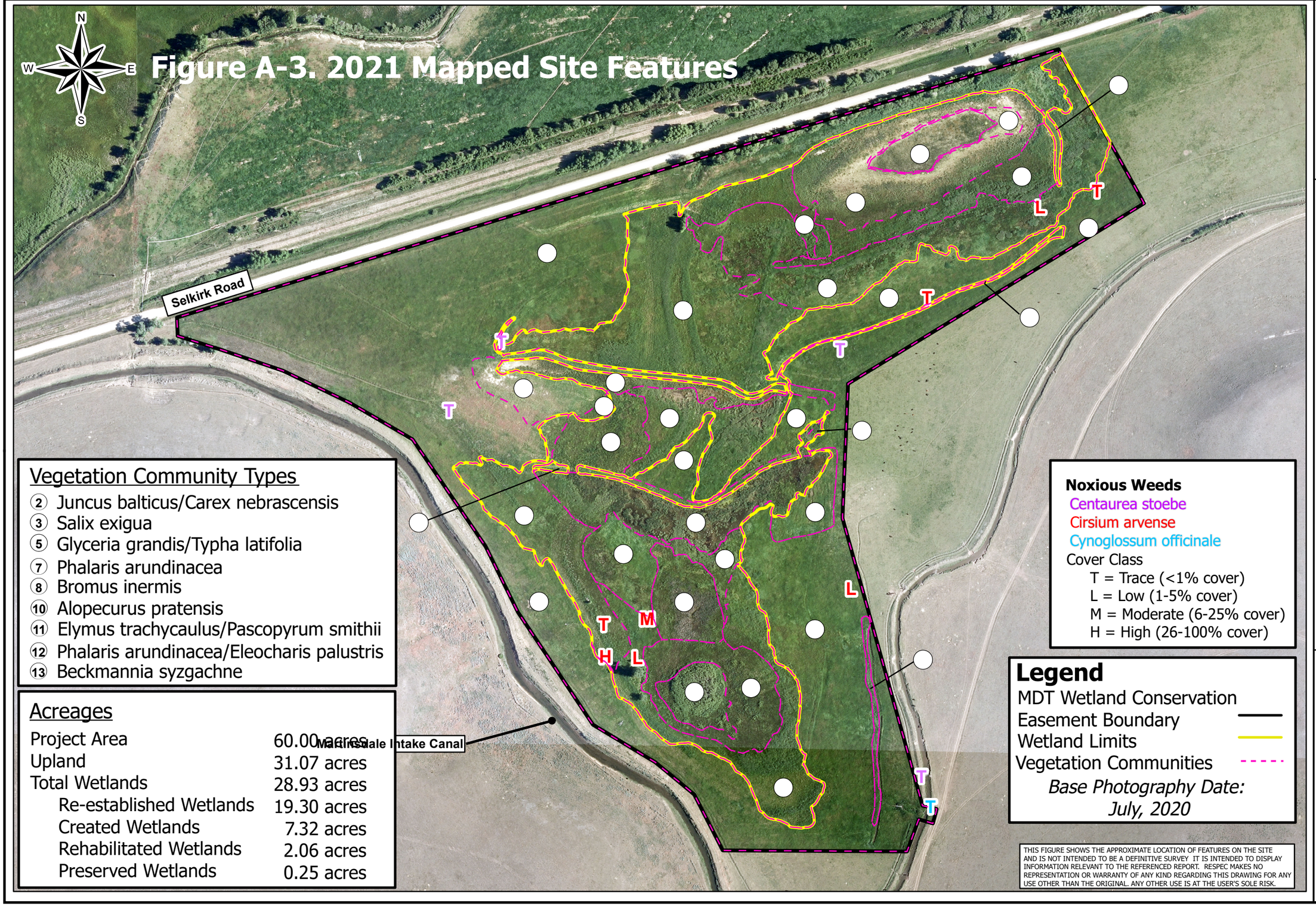
Rostad Ranch Wetland Mitigation Site
2021 Monitoring Activity Locations

0 100 200 400 600 800 1,000 Feet

Project:	STPX 002 (749)
Location:	Meagher Co., Montana
Date:	February 2022
Project Manager:	R. McEldowney
Drawn By:	RCJ

File: X:\Project\MDT Wetland Mitigation 2\Mains\Rostad\2021\Monitor2021_MDT.mxd

Figure A-3. 2021 Mapped Site Features



Vegetation Community Types

② Juncus balticus/Carex nebrascensis
③ Salix exigua
⑤ Glyceria grandis/Typha latifolia
⑦ Phalaris arundinacea
⑧ Bromus inermis
⑩ Alopecurus pratensis
⑪ Elymus trachycaulus/Pascopyrum smithii
⑫ Phalaris arundinacea/Eleocharis palustris
⑬ Beckmannia syzgachne

Acreages

Project Area	60.00 acres
Upland	31.07 acres
Total Wetlands	28.93 acres
Re-established Wetlands	19.30 acres
Created Wetlands	7.32 acres
Rehabilitated Wetlands	2.06 acres
Preserved Wetlands	0.25 acres

Noxious Weeds
Centaurea stoebe
Cirsium arvense
Cynoglossum officinale
Cover Class
T = Trace (<1% cover)
L = Low (1-5% cover)
M = Moderate (6-25% cover)
H = High (26-100% cover)

Legend

MDT Wetland Conservation Easement Boundary
Wetland Limits
Vegetation Communities

Base Photography Date: July, 2020

THIS FIGURE SHOWS THE APPROXIMATE LOCATION OF FEATURES ON THE SITE AND IS NOT INTENDED TO BE A DEFINITIVE SURVEY. IT IS INTENDED TO DISPLAY INFORMATION RELEVANT TO THE REFERENCED REPORT. RESPEC MAKES NO REPRESENTATION OR WARRANTY OF ANY KIND REGARDING THIS DRAWING FOR ANY USE OTHER THAN THE ORIGINAL. ANY OTHER USE IS AT THE USER'S SOLE RISK.

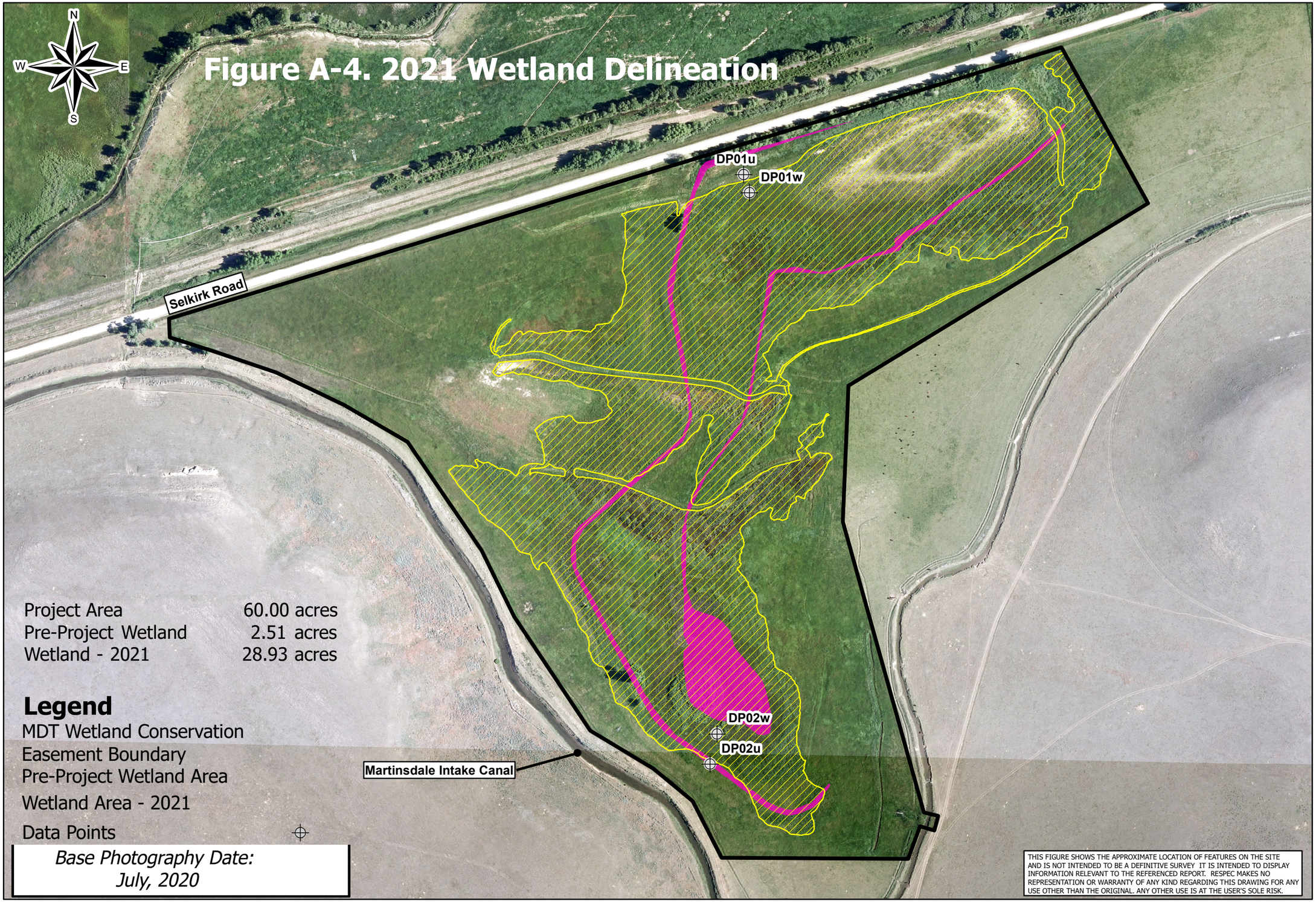
CONFLUENCE
consulting incorporated

Rostad Ranch Wetland Mitigation Site
2021 Mapped Site Features

0 100 200 400 600 800 1,000 Feet

Project: STPX 002 (749)
Location: Meagher Co., Montana
Date: February 2022
Project Manager: R. McEldowney
Drawn By: RCJ

Figure A-4. 2021 Wetland Delineation



Project Area	60.00 acres
Pre-Project Wetland	2.51 acres
Wetland - 2021	28.93 acres

Legend

MDT Wetland Conservation Easement Boundary

Pre-Project Wetland Area

Wetland Area - 2021

Data Points

Base Photography Date: July, 2020

THIS FIGURE SHOWS THE APPROXIMATE LOCATION OF FEATURES ON THE SITE AND IS NOT INTENDED TO BE A DEFINITIVE SURVEY IT IS INTENDED TO DISPLAY INFORMATION RELEVANT TO THE REFERENCED REPORT. RESPEC MAKES NO REPRESENTATION OR WARRANTY OF ANY KIND REGARDING THIS DRAWING FOR ANY USE OTHER THAN THE ORIGINAL. ANY OTHER USE IS AT THE USER'S SOLE RISK.

CONFLUENCE
consulting incorporated

Rostad Ranch Wetland Mitigation Site
2021 Wetland Delineation

0 100 200 400 600 800 1,000 Feet

Project: STPX 002 (749)

Location: Meagher Co., Montana

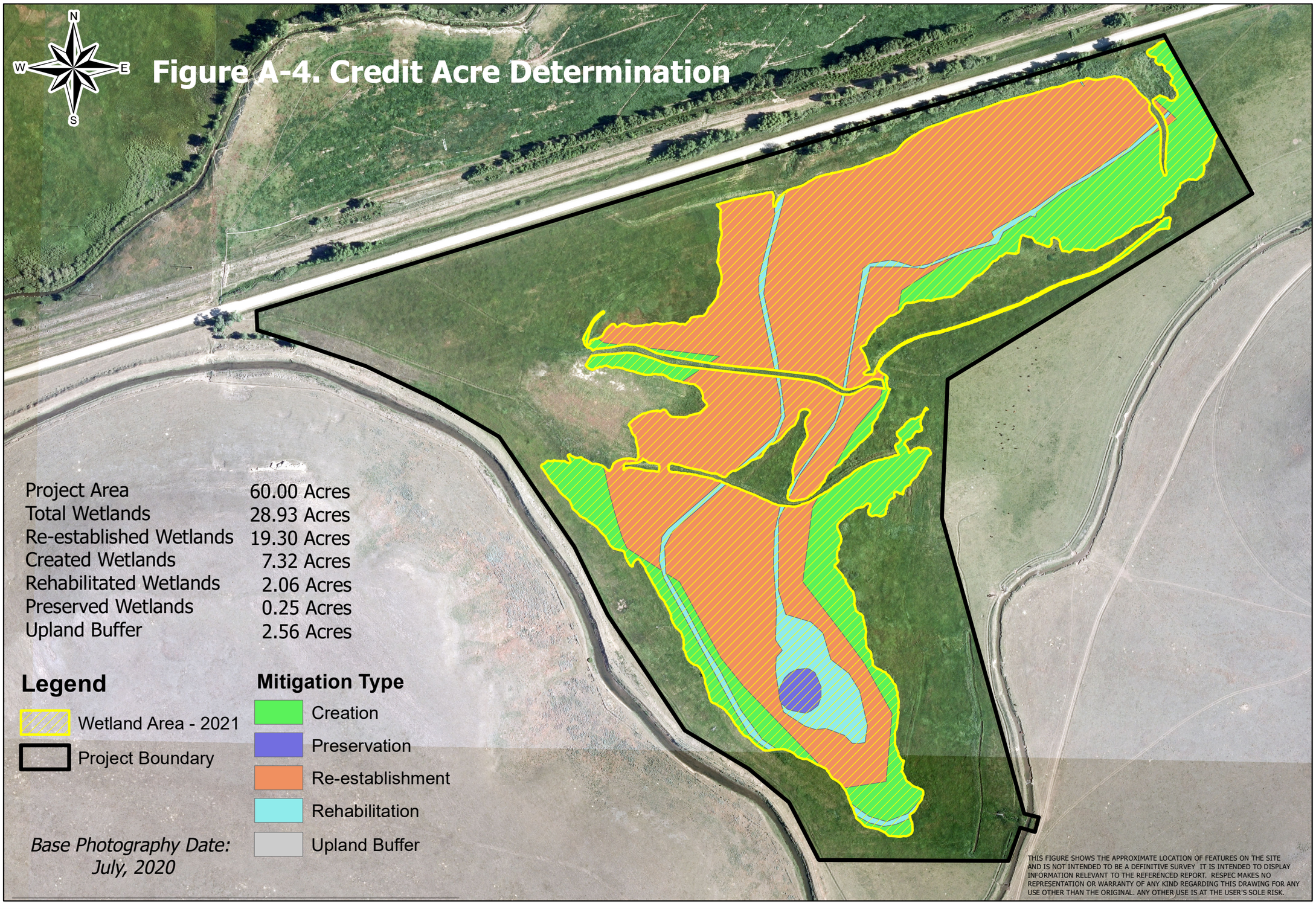
Date: February 2022

Project Manager: R. McEldowney

Drawn By: RCJ

File: X:\Project\MDT Wetland Mitigation 2\Mains\Rostad\2021\DelIn2021_MDT.mxd

Figure A-4. Credit Acre Determination



CONFLUENCE
consulting incorporated

Rostad Ranch Wetland Mitigation Site
2021 Mitigation Credit Areas

0 100 200 400 600 800 1,000 Feet

Project: STPX 002 (749)
Location: Meagher Co., Montana
Date: February 2022
Project Manager: R. McEldowney
Drawn By: SNW

File: X:\Project\MDT Wetland Mitigation 2\Mains\Rostad\2021\CreditAcreageDetermination.mxd

APPENDIX B

MONITORING FORMS

MDT Wetland Mitigation Monitoring

Rostad Ranch
Meagher County, Montana

MDT WETLAND MITIGATION SITE MONITORING FORM

Project Site: Rostad Ranch Assessment Date/Time 7/22/2021

Person(s) conducting the assessment: R Jones, S Weyant

Weather: Sunny, Smokey, 90 degrees Location: Martinsdale, MT

MDT District: Billings Milepost:

Legal Description: T 8N R 11E Section(s) 12 and 13

Initial Evaluation Date: 8/21/2013 Monitoring Year: 9 #Visits in Year: 1

Size of Evaluation Area: 60 (acres)

Land use surrounding wetland:

Agriculture

HYDROLOGY

Surface Water Source: Groundwater, supplemental hydrology from ditch/headgate, surface runoff

Inundation: ☐ Average Depth: 0 **(ft)** Range of Depths: 0 **(ft)**

Percent of assessment area under inundation: 0 %

Depth at emergent vegetation-open water boundary: 0 **(ft)**

If assessment area is not inundated then are the soils saturated within 12 inches of surface: Yes

Other evidence of hydrology on the site (ex. – drift lines, erosion, stained vegetation, etc:

Drainage patterns, soil saturation, water marks, water stained leaves, geomorphic position, FAC-neutral test, soil surface cracks.

Groundwater Monitoring Wells

Record depth of water surface below ground surface, in feet.

Well ID	Water Surface Depth (ft)
MW-1	6.09

Additional Activities Checklist:

☑ Map emergent vegetation-open water boundary on aerial photograph.

☑ Observe extent of surface water during each site visit and look for evidence of past surface water elevations (drift lines, erosion, vegetation staining, etc.)

☑ Use GPS to survey groundwater monitoring well locations, if present.

Hydrology Notes:

Groundwater well measured 5/10/2021 by USGS. Depths are Below Land Surface (BLS). No open water observed at site in 2021, likely due to extreme drought experienced in this region.

VEGETATION COMMUNITIES

Site Rostad Ranch

(Cover Class Codes **0** = < 1%, **1** = 1-5%, **2** = 6-10%, **3** = 11-20%, **4** = 21-50% , **5** = >50%)

Community # 2 **Community Type:** Juncus balticus / Carex nebrascensis **Acres:** 6.9

Species	Cover class	Species	Cover class
Agrostis gigantea	2	Alopecurus pratensis	1
Beckmannia syzigachne	2	Bromus inermis	0
Carex bebbii	0	Carex nebrascensis	4
Carex pellita	0	Carex praegracilis	0
Carex stipata	1	Carex utriculata	0
Cirsium arvense	0	Deschampsia caespitosa	1
Eleocharis palustris	2	Elymus repens	0
Elymus trachycaulus	0	Epilobium ciliatum	1
Hordeum jubatum	1	Juncus balticus	4
Juncus bufonius	1	Mentha arvensis	1
Open Water	0	Pascopyrum smithii	0
Phalaris arundinacea	3	Phleum pratense	1
Poa palustris	1	Poa pratensis	1
Populus balsamifera	0	Rumex crispus	1
Salix exigua	1	Schedonorus pratensis	0
Sonchus arvensis	1	Trifolium pratense	0
Triglochin maritima	0	Typha latifolia	1

Comments:

Wet meadow, revegetation successful since 2013. No open water observed in 2021 monitoring event.

Community # 3 **Community Type:** Salix exigua / **Acres:** 0.8

Species	Cover class	Species	Cover class
Agrostis gigantea	0	Alopecurus pratensis	2
Beckmannia syzigachne	0	Carex bebbii	0
Carex nebrascensis	1	Carex pellita	1
Carex praegracilis	1	Deschampsia caespitosa	2
Eleocharis palustris	1	Juncus balticus	0
Poa palustris	2	Salix exigua	5
Salix lutea	1	Schedonorus pratensis	2
Typha latifolia	0	Veronica peregrina	0

Comments:

Undisturbed Salix community near southern extent of monitoring boundary. A new Salix community is becoming established in the middle of the site as well.

Community # 5 Community Type: Glyceria grandis / Typha latifolia **Acres:** 4.6

Species	Cover class	Species	Cover class
Alopecurus pratensis	2	Bare Ground	2
Beckmannia syzigachne	3	Carex aquatilis	0
Carex nebrascensis	0	Carex pellita	1
Eleocharis palustris	2	Elymus trachycaulus	1
Glyceria grandis	3	Glyceria striata	1
Hippuris vulgaris	1	Phalaris arundinacea	1
Rumex crispus	1	Salix exigua	1
Schoenoplectus maritimus	0	Typha latifolia	3

Comments:

Wetland community type found in some of the lower areas of the site. Open water noted in previous years was not observed during the 2021 monitoring event.

Community # 7 Community Type: Phalaris arundinacea / **Acres:** 10.7

Species	Cover class	Species	Cover class
Agrostis gigantea	1	Alopecurus arundinaceus	1
Alopecurus pratensis	0	Amaranthus retroflexus	1
Bromus inermis	1	Carex nebrascensis	1
Carex praegracilis	1	Cirsium arvense	0
Deschampsia caespitosa	0	Eleocharis palustris	1
Elymus repens	1	Elymus trachycaulus	3
Juncus balticus	0	Medicago sativa	0
Phalaris arundinacea	5	Phleum pratense	1
Poa palustris	1	Poa pratensis	1
Populus balsamifera	1	Rumex crispus	0
Salix exigua	0	Thlaspi arvense	1
Trifolium pratense	1	Typha latifolia	1

Comments:

This community has expanded and contracted over the last several years, in conjunction with changes in hydrology.

Community # 8 **Community Type:** Bromus inermis / **Acres:** 28.8

Species	Cover class	Species	Cover class
Achillea millefolium	0	Agrostis gigantea	2
Bromus inermis	5	Carex praegracilis	1
Carum carvi	1	Centaurea stoebe	1
Cirsium arvense	0	Elymus repens	2
Elymus trachycaulus	2	Juncus balticus	1
Medicago sativa	0	Melilotus officinalis	0
Pascopyrum smithii	2	Phalaris arundinacea	1
Phleum pratense	3	Poa palustris	1
Poa pratensis	1	Populus angustifolia	1
Schedonorus pratensis	2	Sinapis arvensis	0
Symphyotrichum ascendens	1	Symphyotrichum ericoides	0
Taraxacum officinale	1	Trifolium pratense	0
Trifolium repens	0		

Comments:

Previously recorded as CT1 with a prevalence of Phleum pratense. Upland community observed across the site and strongly dominated by Bromus inermis. Few forbs observed in this community during 2021 monitoring event.

Community # 10 **Community Type:** Alopecurus pratensis / **Acres:** 2.1

Species	Cover class	Species	Cover class
Agrostis gigantea	2	Alopecurus pratensis	4
Carex nebrascensis	1	Hordeum jubatum	1
Juncus balticus	2	Juncus balticus	1
Phalaris arundinacea	3	Typha angustifolia	1

Comments:

The lower (eastern) edge of this community type may transition into CT2 or CT12 in future years due to increased inundation.

Community # 11 **Community Type:** Elymus trachycaulus / Pascopyrum smithii **Acres:** 2.0

Species	Cover class	Species	Cover class
Agrostis gigantea	1	Bare Ground	2
Bromus inermis	1	Chenopodium album	2
Cirsium arvense	0	Elymus repens	1
Elymus trachycaulus	3	Melilotus officinalis	3
Pascopyrum smithii	3	Phalaris arundinacea	1
Sinapis arvensis	3	Symphyotrichum ascendens	1
Symphyotrichum ericoides	1	Trifolium hybridum	3

Comments:

This community type was found in some areas that were revegetated following the 2017 constuction. In 2021, constructed berms had ~85% vegetative cover and were dominated by seeded species, volunteer grasses, and forbs.

Community # 12 **Community Type:** Phalaris arundinacea / Eleocharis palustris **Acres:** 3.1

Species	Cover class	Species	Cover class
Bare Ground	3	Beckmannia syzigachne	1
Carex nebrascensis	1	Eleocharis palustris	3
Glyceria grandis	2	Open Water	0
Phalaris arundinacea	3	Rumex crispus	1
Schoenoplectus maritimus	1	Typha angustifolia	1
Typha latifolia	3		

Comments:

New community type created in 2020 to document wetland fringe around open water.

Community # 13 **Community Type:** Beckmannia syzigachne / **Acres:** 0.7

Species	Cover class	Species	Cover class
Bare Ground	4	Beckmannia syzigachne	4

Comments:

In 2021, this community had developed in an area that was mapped as open water in 2020.

Total Vegetation Community Acreage ***60.0***

VEGETATION TRANSECTS

Site: Rostad Ranch Date: 7/22/2021

Transect Number: 1 **Compass Direction from Start:** 290

Interval Data:

Ending Station 146 **Community Type:** Bromus inermis /

Species	Cover class	Species	Cover class
Bromus inermis	4	Carex praegracilis	1
Carum carvi	1	Cirsium arvense	1
Elymus repens	1	Elymus trachycaulus	1
Juncus balticus	1	Phleum pratense	2
Poa palustris	1	Poa pratensis	2
Symphyotrichum ascenden	1	Taraxacum officinale	0

Ending Station 267 **Community Type:** Juncus balticus / Carex nebrascensis

Species	Cover class	Species	Cover class
Agrostis gigantea	1	Alopecurus pratensis	2
Bromus inermis	1	Carex nebrascensis	2
Elymus repens	1	Juncus balticus	3
Phalaris arundinacea	4	Phleum pratense	0
Poa palustris	3		

Ending Station 286 **Community Type:** Elymus trachycaulus / Pascopyrum smithii

Species	Cover class	Species	Cover class
Agrostis gigantea	1	Bare Ground	2
Elymus trachycaulus	4	Pascopyrum smithii	2
Phalaris arundinacea	4		

Ending Station 358 **Community Type:** Phalaris arundinacea /

Species	Cover class	Species	Cover class
Agrostis gigantea	1	Carex nebrascensis	2
Cirsium arvense	0	Elymus trachycaulus	1
Phalaris arundinacea	5	Phleum pratense	0
Rumex crispus	1		

Ending Station 386 **Community Type:** Glyceria grandis / Typha latifolia

Species	Cover class	Species	Cover class
Alopecurus pratensis	1	Bare Ground	2
Eleocharis palustris	1	Elymus trachycaulus	1
Glyceria grandis	1	Phalaris arundinacea	3
Rumex crispus	1	Typha latifolia	1

Ending Station 422 **Community Type:** Phalaris arundinacea / Eleocharis palustris

Species	Cover class	Species	Cover class
Bare Ground	3	Beckmannia syzigachne	2
Eleocharis palustris	3	Glyceria grandis	2
Phalaris arundinacea	1	Rumex Crispus	0
Schoenoplectus maritimus	0	Typha latifolia	1

Transect Notes:

Wetland community types 2 and 7 at end stations 267 and 358 have increased by 1 and 6 feet, respecitvely.

Transect Number: 2 **Compass Direction from Start:** 120

Interval Data:

Ending Station 119 **Community Type:** Juncus balticus / Carex nebrascensis

Species	Cover class	Species	Cover class
Agrostis gigantea	2	Alopecurus pratensis	1
Bromus inermis	1	Carex utriculata	1
Elymus repens	1	Elymus trachycaulus	1
Juncus balticus	2	Phalaris arundinacea	5
Poa palustris	1	Populus balsamifera	2
Rumex crispus	1	Trifolium pratense	1

Ending Station 156 **Community Type:** Phalaris arundinacea /

Species	Cover class	Species	Cover class
Agrostis gigantea	1	Phalaris arundinacea	5
Phleum pratense	2	Rumex crispus	0

Ending Station 236 **Community Type:** Juncus balticus / Carex nebrascensis

Species	Cover class	Species	Cover class
Agrostis gigantea	2	Alopecurus pratensis	3
Carex nebrascensis	4	Carex stipata	1
Phalaris arundinacea	4	Phleum pratense	1
Poa palustris	1	Poa pratensis	2
Trifolium pratense	1	Typha latifolia	1

Ending Station 259 **Community Type:** Phalaris arundinacea /

Species	Cover class	Species	Cover class
Agrostis gigantea	1	Phalaris arundinacea	5
Phleum pratense	1		

Ending Station 295 **Community Type:** Juncus balticus / Carex nebrascensis

Species	Cover class	Species	Cover class
Carex bebbii	1	Carex nebrascensis	1
Carex praegracilis	1	Juncus balticus	4
Phalaris arundinacea	2	Phleum pratense	2

Ending Station 421 **Community Type:** Phalaris arundinacea /

Species	Cover class	Species	Cover class
Agrostis gigantea	1	Alopecurus pratensis	2
Phalaris arundinacea	4	Phleum pratense	2
Poa palustris	1	Poa pratensis	2
Salix exigua	0		

Ending Station 453 **Community Type:** Bromus inermis /

Species	Cover class	Species	Cover class
Bromus inermis	3	Elymus repens	1
Elymus trachycaulus	1	Pascopyrum smithii	1
Phleum pratense	2	Poa pratensis	3
Schedonorus pratensis	1		

Transect Notes:

Significant changes were observed along this transect in 2021. All vegetation communities are becoming more hydrophytic.

Transect Number: 3 **Compass Direction from Start:** 30

Interval Data:

Ending Station 18 **Community Type:** Phalaris arundinacea /

Species	Cover class	Species	Cover class
Agrostis gigantea	1	Alopecurus arundinaceus	0
Juncus balticus	3	Phalaris arundinacea	4
Poa pratensis	1	Populus balsamifera	4

Ending Station 123 **Community Type:** Juncus balticus / Carex nebrascensis

Species	Cover class	Species	Cover class
Agrostis gigantea	4	Alopecurus pratensis	3
Carex nebrascensis	1	Carex pellita	2
Cirsium arvense	0	Eleocharis palustris	3
Juncus balticus	4	Phalaris arundinacea	2
Salix exigua	2	Schedonorus pratensis	1
Sonchus arvensis	2	Triglochin maritima	1

Ending Station 288 **Community Type:** Glyceria grandis / Typha latifolia

Species	Cover class	Species	Cover class
Alopecurus pratensis	2	Bare Ground	2
Beckmannia syzigachne	0	Carex aquatilis	2
Carex nebrascensis	2	Carex pellita	0
Eleocharis palustris	4	Glyceria grandis	3
Phalaris arundinacea	1	Salix exigua	2
Typha latifolia	5		

Ending Station 306 **Community Type:** Juncus balticus / Carex nebrascensis

Species	Cover class	Species	Cover class
Agrostis gigantea	1	Alopecurus pratensis	2
Beckmannia syzigachne	0	Carex nebrascensis	2
Eleocharis palustris	2	Juncus balticus	4
Phalaris arundinacea	4	Salix exigua	3

Transect Notes:

Transect composed entirely of wetland community types.

Transect Number: 4 **Compass Direction from Start:** 0

Interval Data:

Ending Station 17 **Community Type:** Bromus inermis /

Species	Cover class	Species	Cover class
Bromus inermis	0	Elymus repens	4
Phalaris arundinacea	5		

Ending Station 56 **Community Type:** Phalaris arundinacea /

Species	Cover class	Species	Cover class
Alopecurus arundinaceus	2	Carex praegracilis	2
Deschampsia caespitosa	0	Elymus repens	0
Phalaris arundinacea	1	Poa palustris	5

Ending Station 412 **Community Type:** Bromus inermis /

Species	Cover class	Species	Cover class
Bromus inermis	5	Cirsium arvense	0
Elymus repens	2	Elymus trachycaulus	1
Pascopyrum smithii	4	Phleum pratense	1
Poa pratensis	4	Sinapis arvensis	0
Symphyotrichum ascenden	0	Symphyotrichum ericoides	0

Transect Notes:

Wetland community type 7 (Phalaris arundinacea) now extends 40' along transect.

PLANTED WOODY VEGETATION SURVIVAL

Rostad Ranch

Planting Type	#Planted	#Alive	Notes
Populus balsamifera	100		Estimated 50% survival
Populus tremuloides	100		Estimated 50% survival
Salix sp.	2000		Estimated 50% survival

Comments

Willow stakes were planted in spring 2013. Due to tall herbaceous vegetation, locating all plantings was difficult during the site visit, especially locating stems that had died. Some dead stems were present in the open water portion of the NE wetland cell. Live plants observed looked healthy; signs of browsing were evident. Survival in 2021 was estimated at 50% based on the number of live stems observed. Willows are naturally expanding around vegetation community 3 in the southern area of the site. Volunteer Salix exigua and Populus balsamifera are appearing around the edges of CT 3 and CT 2 in the south eastern area of the site, and a new Salix community (CT 3) is establishing in the middle of the site.

Rostad Ranch

WILDLIFE

Birds

Were man-made nesting structures installed? Yes

If yes, type of structure: _____

How many? 7

Are the nesting structures being used? No

Do the nesting structures need repairs? Yes

Nesting Structure Comments:

One bird box originally located near the start of Transect T-1 in the NE corner of the site is absent. All other boxes are in good condition, but appear empty and not in use.

Species	#Observed	Behavior	Habitat
American Robin	4	FO, L	
Brewer's Blackbird	6	FO, L	
Canada Goose	6	FO	
Common Raven	1	FO	
Red-winged Blackbird	4	FO, L	
Sandhill Crane	2	FO, L	
Western Meadowlark	1	L	

Bird Comments

Seven bird species observed in 2021.

BEHAVIOR CODES

BP = One of a breeding pair **BD** = Breeding display **F** = Foraging **FO** = Flyover **L** = Loafing **N** = Nesting

HABITAT CODES

AB = Aquatic bed **SS** = Scrub/Shrub **FO** = Forested **UP** = Upland buffer **I** = Island

WM = Wet meadow **MA** = Marsh **US** = Unconsolidated shore **MF** = Mud Flat **OW** = Open Water

Mammals and Herptiles

Species	# Observed	Tracks	Scat	Burrows	Comments
Black Bear		No	Yes	No	
Coyote		No	Yes	No	
White-tailed Deer		Yes	No	Yes	

Wildlife Comments:

Evidence of wildlife on site include observations, tracks, scat, and burrows.

Rostad Ranch

PHOTOGRAPHS

Take photographs of the following permanent reference points listed in the check list below. Record the direction of the photograph using a compass. When at the site for the first time, establish a permanent reference point by setting a ½ inch rebar or fencepost extending 2-3 feet above ground. Survey the location with a resource grade GPS and mark the location on the aerial photograph.

Photograph Checklist:

☐ One photograph for each of the four cardinal directions surrounding the wetland.

☐ At least one photograph showing upland use surrounding the wetland. If more than one upland exists then take additional photographs.

☑ At least one photograph showing the buffer surrounding the wetland.

☑ One photograph from each end of the vegetation transect, showing the transect.

Photo #	Latitude	Longitude	Bearing	Description
DP01u	46.463193	-110.295694		
DP01w	46.463056	-110.295628		
DP02u	46.458696	-110.295998		
DP02w	46.458926	-110.295925		
Photo point 1	46.463894	-110.292697		
Photo point 10	46.461759	-110.298593		
Photo point 2	46.461612	-110.294535		
Photo point 3	46.460573	-110.294591		
Photo point 4	46.458259	-110.293701		
Photo point 5	46.458417	-110.296185		
Photo point 6	46.459813	-110.298179		
Photo point 7	46.461119	-110.299371		
Photo point 8	46.460987	-110.298118		
Photo point 9	46.461106	-110.294579		
Transect 1 End	46.463576102426	-110.2927263717		
Transect 1 Start	46.463029103021	-110.291276		
Transect 2 End	46.461978946056	-110.295094		
Transect 2 Start	46.462875830304	-110.29637		
Transect 3 End	46.459923761462	-110.2958697392		
Transect 3 Start	46.459397471592	-110.296821		
Transect 4 End	46.4629	-110.297851		
Transect 4 Start	46.461803077753	-110.297953		

Comments:

Rostad Ranch

ADDITIONAL ITEMS CHECKLIST

Hydrology

☑ Map emergent vegetation/open water boundary on aerial photos.
☑ Observe extent of surface water. Look for evidence of past surface water elevations (e.g. drift lines, vegetation staining, erosion, etc).

Photos

☑ One photo from the wetland toward each of the four cardinal directions
☑ One photo showing upland use surrounding the wetland.
☑ One photo showing the buffer around the wetland
☑ One photo from each end of each vegetation transect, toward the transect

Vegetation

☑ Map vegetation community boundaries

☑ Complete Vegetation Transects

Soils

☑ Assess soils

Wetland Delineations

☐ Delineate wetlands according to applicable USACE protocol (1987 form or Supplement)
☐ Delineate wetland – upland boundary onto aerial photograph.

Wetland Delineation Comments

28.93 acres of wetland delineated in 2021.

Functional Assessments

☐ Complete and attach full MDT Montana Wetland Assessment Method field forms.

Functional Assessment Comments:

Category 2 wetland.

Maintenance

Were man-made nesting structure installed at this site? Yes

If yes, do they need to be repaired? Yes

If yes, describe the problems below and indicate if any actions were taken to remedy the problems

Were man-made structures built or installed to impound water or control water flow

into or out of the wetland? Yes

If yes, are the structures in need of repair? No

If yes, describe the problems below.

Birdbox in NE corner of site is absent and needs replacement.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Rostad Ranch City/County: Meagher Sampling Date: 7/22/2021

Applicant/Owner: MDT State: Montana Sampling Point: DP01u

Investigator(s): R Jones, S Weyant Section, Township, Range: 12 8N 11E

Landform (hillslope, terrace, etc.): Mound Local relief (concave, convex, none): flat Slope (%): 0

Subregion (LRR): LRR F Lat: 46.463193 Long: -110.295694 Datum: NAD 83

Soil Map Unit Name: 854B: Varney-Notter cobbly loams, 2-4% slopes NWI classification: Not Mapped.

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☑ No ☐ (If no, explain in Remarks.)

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☑ No ☐

Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☐ No ☑	**Is the Sampled Area within a Wetland?** Yes ☐ No ☑
Hydric Soil Present?	Yes ☐ No ☑	
Wetland Hydrology Present?	Yes ☐ No ☑	

Remarks: Upland sample point located on spreader berm near DP01w.

VEGETATION - Use scientific names of plants

Tree Stratum Plot size (30 Foot Radius)

	Absolute % Cover:	Domiant Species?	Indicator Status

Sapling/Shrub Stratum Plot size (15 Foot Radius)

Herbaceous Stratum Plot size (5 Foot Radius)

Elymus repens	70	☑	FACU
Elymus trachycaulus	12	☐	FACU
Phalaris arundinacea	3	☐	FACW

Woody Vine Stratum Plot size (30 Foot Radius)

Percent Bare Ground 15

Dominance Test worksheet

Number of Dominant Species that are OBL, FACW or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.0 % (A/B)

Prevalence Index worksheet

Total % Cover of:		Multiply by:
OBL species	0 X 1	0
FACW species	3 X 2	6
FAC species	0 X 3	0
FACU species	82 X 4	328
UPL species	0 X 5	0
Column Totals	85 (A)	334 (B)

Prevalence Index = B/A = 3.93

Hydrophytic Vegetation Indicators

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☐ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is <= 3.0
- ☐ 4 - Morphological Adaptations (Provide supporting data in remarks or on separate sheet.
- ☐ 5 - Wetland Non-Vascular Plants
- ☐ Problematic Hydrophytic Vegetation (Explain)

Indicators of hydric sil and wetland hydrology must be present, unless disturbed or problematic for #3, 4, 5.

Hydrophytic Vegetation Present? Yes ☐ NO ☑

Remarks:

BG/litter=15%. Data point is dominated by upland vegetation.

SOIL

Sampling Point: DP01u

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR 4/2	98	10YR 6/8	2	C	M	Sandy Clay	
~~10+~~							~~Hardpan~~	~~**Hardpan/cemented**~~

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR F**)
- ☐ 1 cm Muck (A9) (**LRR F, G, H**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ☐ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) (**LRR I, J**)
- ☐ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ☐ Dark Surface (S7) (**LRR G**)
- ☐ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☐ No ☑

Remarks: Although a depleted matrix was observed, the data point was dominated by an upland plant community and is not supported by wetland hydrology (1987 COE Wetland Delineation Manual).

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Dry-Season Water Table (C2)
- ☐ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ☐ Presence of Reduced Iron (C4)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ FAC-Neutral Test (D5)
- ☐ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes ☐ No ☑ Depth (inches): _____

Water Table Present? Yes ☐ No ☑ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ☐ No ☑ Depth (inches): _____

Wetland Hydrology Present? Yes ☐ No ☑

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: No evidence of wetland hydrology observed.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Rostad Ranch City/County: Meagher Sampling Date: 7/22/2021

Applicant/Owner: MDT State: Montana Sampling Point: DP01w

Investigator(s): R Jones, S Weyant Section, Township, Range: 12 8N 11E

Landform (hillslope, terrace, etc.): Valley bottom Local relief (concave, convex, none): hummocky Slope (%): 0

Subregion (LRR): LRR F Lat: 46.463056 Long: -110.295628 Datum: NAD 83

Soil Map Unit Name: 854B: Varney-Notter cobbly loams, 2-4% slopes NWI classification: Not Mapped.

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☑ No ☐ (If no, explain in Remarks.)

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☑ No ☐

Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☑ No ☐	**Is the Sampled Area within a Wetland?** Yes ☑ No ☐
Hydric Soil Present?	Yes ☑ No ☐	
Wetland Hydrology Present?	Yes ☑ No ☐	

Remarks: PEM, DEPRESSIONAL wetland.

VEGETATION - Use scientific names of plants

Tree Stratum Plot size (30 Foot Radius)

	Absolute % Cover:	Domiant Species?	Indicator Status

Sapling/Shrub Stratum Plot size (15 Foot Radius)

Herbaceous Stratum Plot size (5 Foot Radius)

Agrostis stolonifera	40	☑	FACW
Carex stipata	10	☐	OBL
Elymus trachycaulus	1	☐	FACU
Juncus balticus	20	☑	FACW
Phalaris arundinacea	15	☐	FACW
Phleum pratense	2	☐	FACU
Rumex crispus	1	☐	FAC
Salix exigua	1	☐	FACW

Woody Vine Stratum Plot size (30 Foot Radius)

Percent Bare Ground 10

Dominance Test worksheet

Number of Dominant Species that are OBL, FACW or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0 % (A/B)

Prevalence Index worksheet

Total % Cover of:		Multiply by:	
OBL species	10	X 1	10
FACW species	76	X 2	152
FAC species	1	X 3	3
FACU species	3	X 4	12
UPL species	0	X 5	0
Column Totals	90 (A)		177 (B)

Prevalence Index = B/A = 1.97

Hydrophytic Vegetation Indicators

- ☑ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☑ 3 - Prevalence Index is <= 3.0
- ☐ 4 - Morphological Adaptations (Provide supporting data in remarks or on separate sheet.
- ☐ 5 - Wetland Non-Vascular Plants
- ☐ Problematic Hydrophytic Vegetation (Explain)

Indicators of hydric sil and wetland hydrology must be present, unless disturbed or problematic for #3, 4, 5.

Hydrophytic Vegetation Present? Yes ☑ NO ☐

Remarks:

BG/litter=10%. Salix exigua was included in the herb stratum as it contributed less than 1% cover. Evidence of hydrophytic vegetation includes a positive rapid test, a positive dominance test, and a prevalence index less than or equal to 3.0.

SOIL

Sampling Point: DP01w

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-02	7.5YR 3/2	100					Sandy Clay Loam	
02-07	10YR 4/2	98	10YR 5/8	2	C	M	Sandy Clay	**Hardpan/cemented**
7+							Hardpan	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR F**)
- ☐ 1 cm Muck (A9) (**LRR F, G, H**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ☐ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) (**LRR I, J**)
- ☐ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ☐ Dark Surface (S7) (**LRR G**)
- ☐ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☑ No ☐

Remarks: Prominent concentrations common within the depleted matrix. Due to extreme difficulty excavating through a hardpan/cemented layer, the identification of a hydric soil indication, evidence of wetland hydrology, and a hydrophytic vegetation community, the sample pit was not excavated beyond 7".

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☑ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Dry-Season Water Table (C2)
- ☐ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ☐ Presence of Reduced Iron (C4)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☑ Geomorphic Position (D2)
- ☑ FAC-Neutral Test (D5)
- ☐ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes ☐ No ☑ Depth (inches): _____

Water Table Present? Yes ☐ No ☑ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ☐ No ☑ Depth (inches): _____

Wetland Hydrology Present? Yes ☑ No ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Evidence of wetland hydrology includes geomorphic position, a positive FAC-Neutral test, and water stained leaves.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Rostad Ranch City/County: Meagher Sampling Date: 7/22/2021

Applicant/Owner: MDT State: Montana Sampling Point: DP02u

Investigator(s): R Jones, S Weyant Section, Township, Range: 13 8N 11E

Landform (hillslope, terrace, etc.): Hillside Local relief (concave, convex, none): flat Slope (%): 5

Subregion (LRR): LRR F Lat: 46.458696 Long: -110.295998 Datum: NAD 83

Soil Map Unit Name: 86C: Delpoint variant-Marmarth-Cabbart loams, 2-8% slopes NWI classification: Not Mapped.

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☑ No ☐ (If no, explain in Remarks.)

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☑ No ☐

Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☐ No ☑	**Is the Sampled Area within a Wetland?** Yes ☐ No ☑
Hydric Soil Present?	Yes ☐ No ☑	
Wetland Hydrology Present?	Yes ☐ No ☑	

Remarks: Upland sample point located on hillside, upslope from DP02w.

VEGETATION - Use scientific names of plants

Tree Stratum Plot size (30 Foot Radius)

	Absolute % Cover:	Domiant Species?	Indicator Status

Sapling/Shrub Stratum Plot size (15 Foot Radius)

Herbaceous Stratum Plot size (5 Foot Radius)

Bromus inermis	30	☑	UPL
Centaurea stoebe	5	☐	NL
Pascopyrum smithii	10	☐	FACU
Poa pratensis	25	☑	FACU

Woody Vine Stratum Plot size (30 Foot Radius)

Percent Bare Ground 30

Dominance Test worksheet

Number of Dominant Species that are OBL, FACW or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.0 % (A/B)

Prevalence Index worksheet

Total % Cover of:		Multiply by:
OBL species	0 X 1	0
FACW species	0 X 2	0
FAC species	0 X 3	0
FACU species	35 X 4	140
UPL species	35 X 5	175
Column Totals	70 (A)	315 (B)

Prevalence Index = B/A = 4.50

Hydrophytic Vegetation Indicators

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☐ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is <= 3.0
- ☐ 4 - Morphological Adaptations (Provide supporting data in remarks or on separate sheet.
- ☐ 5 - Wetland Non-Vascular Plants
- ☐ Problematic Hydrophytic Vegetation (Explain)

Indicators of hydric sil and wetland hydrology must be present, unless disturbed or problematic for #3, 4, 5.

Hydrophytic Vegetation Present? Yes ☐ NO ☑

Remarks:

BG/litter=30%. Data point is dominated by upland vegetation.

SOIL

Sampling Point: DP02u

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-01	10YR 4/2	100					Sandy Loam	
~~01-12~~	~~10YR 4/2~~	~~100~~					~~Sandy Clay Loam~~	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR F**)
- ☐ 1 cm Muck (A9) (**LRR F, G, H**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ☐ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) (**LRR I, J**)
- ☐ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ☐ Dark Surface (S7) (**LRR G**)
- ☐ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☐ No ☑

Remarks: No evidence of hydric soil indicators observed.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Dry-Season Water Table (C2)
- ☐ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ☐ Presence of Reduced Iron (C4)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ FAC-Neutral Test (D5)
- ☐ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes ☐ No ☑ Depth (inches): _____

Water Table Present? Yes ☐ No ☑ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ☐ No ☑ Depth (inches): _____

Wetland Hydrology Present? Yes ☐ No ☑

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: No evidence of wetland hydrology observed.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Rostad Ranch City/County: Meagher Sampling Date: 7/22/2021

Applicant/Owner: MDT State: Montana Sampling Point: DP02w

Investigator(s): R Jones, S Weyant Section, Township, Range: 13 8N 11E

Landform (hillslope, terrace, etc.): Valley bottom Local relief (concave, convex, none): flat Slope (%): 0

Subregion (LRR): LRR F Lat: 46.458926 Long: -110.295925 Datum: NAD 83

Soil Map Unit Name: 86C: Delpoint variant-Marmarth-Cabbart loams, 2-8% slopes NWI classification: Not Mapped.

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☑ No ☐ (If no, explain in Remarks.)

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☑ No ☐

Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☑	No ☐	**Is the Sampled Area within a Wetland?** Yes ☑ No ☐
Hydric Soil Present?	Yes ☑	No ☐	
Wetland Hydrology Present?	Yes ☑	No ☐	

Remarks: PEM, DEPRESSIONAL wetland with PSS component.

VEGETATION - Use scientific names of plants

Tree Stratum (Plot size (30 Foot Radius))	Absolute % Cover:	Domiant Species?	Indicator Status

Sapling/Shrub Stratum (Plot size (15 Foot Radius))			
Salix exigua	15	☑	FACW

Herbaceous Stratum (Plot size (5 Foot Radius))			
Agrostis stolonifera	20	☑	FACW
Carex nebrascensis	5	☐	OBL
Cirsium arvense	1	☐	FACU
Eleocharis palustris	5	☐	OBL
Juncus balticus	35	☑	FACW
Mentha arvensis	1	☐	FACW
Phalaris arundinacea	5	☐	FACW
Phleum pratense	6	☐	FACU

Woody Vine Stratum (Plot size (30 Foot Radius))

Percent Bare Ground 7

Dominance Test worksheet

Number of Dominant Species that are OBL, FACW or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0 % (A/B)

Prevalence Index worksheet

Total % Cover of:		Multiply by:	
OBL species	10	X 1	10
FACW species	76	X 2	152
FAC species	0	X 3	0
FACU species	7	X 4	28
UPL species	0	X 5	0
Column Totals	93 (A)		190 (B)

Prevalence Index = B/A = 2.04

Hydrophytic Vegetation Indicators

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☑ 3 - Prevalence Index is <= 3.0
- ☐ 4 - Morphological Adaptations (Provide supporting data in remarks or on separate sheet.
- ☐ 5 - Wetland Non-Vascular Plants
- ☐ Problematic Hydrophytic Vegetation (Explain)

Indicators of hydric sil and wetland hydrology must be present, unless disturbed or problematic for #3, 4, 5.

Hydrophytic Vegetation Present? Yes ☑ NO ☐

Remarks:

BG/litter=7%. Salix exigua contributed 15% cover within the herb stratum. Evidence of hydrophytic vegetation includes a positive dominance test and a prevalence index less than or equal to 3.0.

SOIL

Sampling Point: DP02w

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-03	10YR	4/1	100						Sandy Clay	
03-09	10YR	4/2	90	7.5YR	5/6	10	C	M, PL	Sandy Clay	
09-13	2.5Y	5/3	100						Sandy Clay Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR F**)
- ☐ 1 cm Muck (A9) (**LRR F, G, H**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ☐ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) (**LRR I, J**)
- ☐ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ☐ Dark Surface (S7) (**LRR G**)
- ☐ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☑ No ☐

Remarks: Distinct concentrations common within the depleted matrix.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Dry-Season Water Table (C2)
- ☑ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ☐ Presence of Reduced Iron (C4)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☑ Geomorphic Position (D2)
- ☑ FAC-Neutral Test (D5)
- ☐ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes ☐ No ☑ Depth (inches): _____

Water Table Present? Yes ☐ No ☑ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ☐ No ☑ Depth (inches): _____

Wetland Hydrology Present? Yes ☑ No ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Evidence of wetland hydrology includes oxidized rhizospheres on living roots, geomorphic position, and a positive FAC-Neutral test.

MDT Montana Wetland Assessment Form (revised March 2008)

1. Project name Rostad Ranch **2. MDT project#** STPP STWD (813) **Control#** 9680000

3. Evaluation Date 7/22/2021 **4. Evaluators** R. Jones, S. Weyant **5. Wetland/Site# (s)** Rostad Mitigation Site

6. Wetland Location(s): **T** 8 N **R** 11 E **Sec1** 12 **T** 8 N **R** 11 E **Sec2** 13

Approx Stationing or Mileposts

Watershed 10 - Musselshell **Watershed/County** Meagher

7. Evaluating Agency CCI for MDT

8. Wetland size acres 28.93

How assessed: Measured e.g. by GPS

9. Assesssment area (AA) size (acres) 28.93

How assessed: Measured e.g. by GPS

Purpose of Evaluation

- ☐ **Wetlands potentially affected by MDT project**
- ☐ **Mitigation Wetlands: pre-construction**
- ☑ **Mitigation Wetlands: post construction**
- ☐ **Other**

10. Classification of Wetland and Aquatic Habitats in AA

HGM Class (Brinson)	Class (Cowardin)	Modifier (Cowardin)	Water Regime	% of AA
Slope	Emergent Wetland	Excavated	Seasonal/Intermittent	77
Slope	Scrub-Shrub Wetland		Seasonal/Intermittent	3
Depressional	Emergent Wetland	Excavated	Seasonal/Intermittent	6
Depressional	Emergent Wetland	Excavated	Seasonal/Intermittent	14

11. Estimated Relative Abundance Common

12. General Condition of AA

i. Disturbance: (use matrix below to determine [circle] appropriate response – see instructions for Montana-listed noxious weed and aquatic nuisance vegetation species (**ANVS**) lists)

Conditions within AA	*Predominant conditions adjacent to (within 500 feet of) AA*		
	Managed in predominantly natural state; is not grazed, hayed, logged, or otherwise converted; does not contain roads or buildings; and noxious weed or ANVS cover is <=15%.	Land not cultivated, but may be moderately grazed or hayed or selectively logged; or has been subject to minor clearing; contains few roads or buildings; noxious weed or ANVS cover is <=30%.	Land cultivated or heavily grazed or logged; subject to substantial fill placement, grading, clearing, or hydrological alteration; high road or building density; or noxious weed or ANVS cover is >=30%.
AA occurs and is managed in predominantly natural state; is not grazed, hayed, logged, or otherwise converted; does not contain roads or occupied buildings; and noxious weed or ANVS cover is <=15%.	low disturbance	low disturbance	moderate disturbance
AA not cultivated, but may be moderately grazed or hayed or selectively logged; or has been subject to relatively minor clearing, fill placement, or hydrological alteration; contains few roads or buildings; noxious weed or ANVS cover is <=30%.	moderate disturbance	moderate disturbance	high disturbance
AA cultivated or heavily grazed or logged; subject to relatively substantial fill placement, grading, clearing, or hydrological alteration; high road or building density; or noxious weed or ANVS cover is >=30%.	high disturbance	high disturbance	high disturbance

Comments: (types of disturbance, intensity, season, etc)

Rangeland surrounds the site to the West, South, and East, and is bordered by a lightly used county road to the North. The majority of the site was hayed prior to the 2021 site visit.

ii. Prominent noxious, aquatic nuisance, other exotic species:

Spotted knapweed, Canada thistle

iii. Provide brief descriptive summary of AA and surrounding land use/habitat

The AA was historically drained and heavily grazed by cattle. A drainage ditch bisected the property prior to construction of the mitigation wetland. Historic and existing wetlands were expanded through construction activities with the goal of establishing or re-establishing emergent and scrub-shrub wetland. Surrounding land use includes transportation corridors (county road, historic railroad berm), agriculture (hay production and cattle grazing). The South Fork of the Musselshell River is located to the north of the mitigation site.

13. Structural Diversity: (based on number of "Cowardin" ***vegetated*** classes present [do not include unvegetated classes], see #10 above)

Existing # of "Cowardin" Vegetated Classes in AA	Initial Rating	Is current management preventing (passive) existence of additional vegetated classes?		Modified Rating
>=3 (or 2 if 1 is forested) classes	H	NA	NA	NA
2 (or 1 if forested) classes	M	NA	NA	NA
1 class, but not a monoculture	M	<NO	YES>	L
1 class, monoculture (1 species comprises>=90% of total cover)	L	NA	NA	NA

Comments: Emergent and scrub-shrub vegetation classes present

SECTION PERTAINING to FUNCTIONS VALUES ASSESSMENT

14A. Habitat for Federally Listed or Proposed Threatened or Endangered Plants or Animals:

i. AA is Documented (D) or Suspected (S) to contain (check one based on definitions contained in instructions):

Primary or critical habitat (list species)	○ D ○ S	
Secondary habitat (list Species)	○ D ○ S	
Incidental habitat (list species)	○ D ○ S	
No usable habitat	☑ S	

ii. Rating (use the conclusions from i above and the matrix below to arrive at [check] the functional points and rating)

Highest Habitat Level	doc/primary	sus/primary	doc/secondary	sus/secondary	doc/incidental	sus/incidental	None
Functional Points and Rating	1H	.9H	.8H	.7M	.3L	.1L	0L

Sources for documented use USFWS list for Meagher County; no habitat usable and no suspected or documented occurences.

14B. Habitat for plant or animals rated S1, S2, or S3 by the Montana Natural Heritage Program: (not including species listed in14A above)

i. AA is Documented (D) or Suspected (S) to contain (check one based on definitions contained in instructions):

Primary or critical habitat (list species)	◉ D ○ S	Downingia laeta (S2S3)
Secondary habitat (list Species)	◉ D ○ S	Long-billed curlew (S3B); Mountain plover (S2B)
Incidental habitat (list species)	○ D ○ S	
No usable habitat	☐ S	

ii. Rating (use the conclusions from i above and the matrix below to arrive at [check] the functional points and rating)

Highest Habitat Level	doc/primary	sus/primary	doc/secondary	sus/secondary	doc/incidental	sus/incidental	None
S1 Species: *Functional Points and Rating*	1H	.8H	.7M	.6M	.2L	.1L	0L
S2 and S3 Species: *Functional Points and Rating*	.9H	.7M	.6M	.5M	.2L	.1L	0L

Sources for documented use Observations of Downingia laeta in wetland during 2013-2015 site visits; long-billed curlews, upland sandpipers, and bobolinks continue to use the site since construction and were recently observed by MDT staff in 2019 and 2020.

14C. General Wildlife Habitat Rating:

i. Evidence of overall wildlife use in the AA (check substantial, moderate, or low based on supporting evidence): Moderate

Substantial (based on any of the following [check]):

- ☐ observations of abundant wildlife #s or high species diversity (during any period)
- ☐ abundant wildlife sign such as scat, tracks, nest structures, game trails, etc.
- ☐ presence of extremely limiting habitat features not available in the surrounding area
- ☐ interviews with local biologists with knowledge of the AA

Minimal (based on any of the following [check]):

- ☐ few or no wildlife observations during peak use periods
- ☐ little to no wildlife sign
- ☐ sparse adjacent upland food sources
- ☐ interviews with local biologists with knowledge of the AA

Moderate (based on any of the following [check]):

- ☑ observations of scattered wildlife groups or individuals or relatively few species during peak periods
- ☑ common occurrence of wildlife sign such as scat, tracks, nest structures, game trails, etc.
- ☐ adequate adjacent upland food sources
- ☐ interviews with local biologists with knowledge of the AA

ii. Wildlife habitat features (Working from top to bottom, check appropriate AA attributes in matrix to arrive at rating. Structural diversity is from #13. For class cover to be considered evenly distributed, the most and least prevalent **vegetated** classes must be within 20% of each other in terms of their percent composition of the AA (see #10). Abbreviations for surface water durations are as follows: P/P = permanent/perennial; S/I = seasonal/intermittent; T/E = temporary/ephemeral; and A = absent [see instructions for further definitions of these terms])

Structural diversity (see #13)	High								Moderate								Low			
Class cover distribution (all vegetated classes)	Even				Uneven				Even				Uneven				Even			
Duration of surface water in ≥ 10% of AA	P/P	S/I	T/E	A	P/P	S/I	T/E	A	P/P	S/I	T/E	A	P/P	S/I	T/E	A	P/P	S/I	T/E	A
Low disturbance at AA (see #12i)	E	E	E	H	E	E	H	H	E	H	H	M	E	H	M	M	E	H	M	M
Moderate disturbance at AA (see #12i)	H	H	H	H	H	H	H	M	H	H	M	M	H	M	M	L	H	M	L	L
High disturbance at AA (see #12i)	M	M	M	L	M	M	L	L	M	M	L	L	M	L	L	L	L	L	L	L

iii. Rating (use the conclusions from i and ii above and the matrix below to arrive at [check] the functional points and rating)

Evidence of wildlife use (i)	*Wildlife habitat features rating (ii)*			
	Exceptional	High	Moderate	Low
Substantial	1E	.9H	.8H	.7M
Moderate	.9H	.7M	.5M	.3L
Minimal	.6M	.4M	.2L	.1L

Comments Site is being used by deer and various bird species. Active Sandhill Crane nesting observed in wetlands in 2016, 2018, and 2019 (observed by MDT).

14D. General Fish Habitat Rating: (Assess this function if the AA is used by fish or the existing situation is "correctable" such that the AA could be used by fish [i.e., fish use is precluded by perched culvert or other barrier, etc.]. If the AA is not used by fish, fish use is not restorable due to habitat constraints, or is not desired from a management perspective [such as fish entrapped in a canal], then check ☑ **NA** here and proceed to 14E.)

i. Habitat Quality and Known / Suspected Fish Species in AA (use matrix to arrive at [check the functional points and rating)

Duration of surface water in AA	Permanent / Perennial						Seasonal / Intermittent						Temporary / Ephemeral					
Aquatic hiding / resting / escape cover	Optimal		Adequate		Poor		Optimal		Adequate		Poor		Optimal		Adequate		Poor	
Thermal cover optimal / suboptimal	O	S	O	S	O	S	O	S	O	S	O	S	O	S	O	S	O	S
FWP Tier I fish species	1E	.9H	.8H	.7M	.6M	.5M	.9H	.8H	.7M	.6M	.5M	.4M	.7M	.6M	.5M	.4M	.3L	.3L
FWP Tier II or Native Game fish species	.9H	.8H	.7M	.6M	.5M	.5M	.8H	.7M	.6M	.5M	.4M	.4M	.6M	.5M	.4M	.3L	.2L	.2L
FWP Tier III or Introduced Game fish	.8H	.7M	.6M	.5M	.5M	.4M	.7M	.6M	.5M	.4M	.4M	.3L	.5M	.4M	.3L	.2L	.2L	.1L
FWP Non-Game Tier IV or No fish species	.5M	.5M	.5M	.4M	.4M	.3L	.4M	.4M	.4M	.3L	.3L	.2L	.2L	.2L	.2L	.1L	.1L	.1L

Sources used for identifying fish sp. potentially found in AA:

ii. Modified Rating (**NOTE:** Modified score cannot exceed 1 or be less than 0.1)
a) Is fish use of the AA significantly reduced by a culvert, dike, or other man-made structure or activity ***or*** *is the waterbody included on the current final MDEQ list of waterbodies in need of TMDL development with listed "Probable Impaired Uses" including cold or warm water fishery or aquatic life support,* ***or*** *do aquatic nuisance plant or animal species (see* ***Appendix E****) occur in fish habitat?* **Y** ◯ **N** ◉ *If yes, reduce score in* ***i*** *above by 0.1:* **Modified Rating**

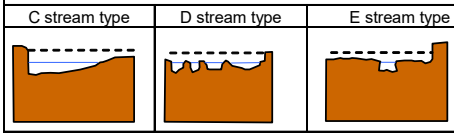
b) Does the AA contain a documented spawning area or other critical habitat feature (i.e., sanctuary pool, upwelling area, etc.- specify in comments) for native fish or introduced game fish? ◯ **Y** ◉ **N** *If yes, add 0.1 to the adjusted score in* ***i*** *or* ***iia*** *above:*
Modifed Rating

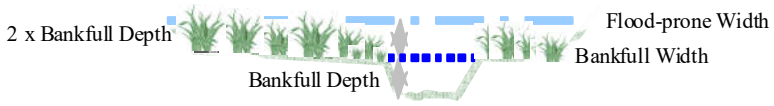
iii. Final Score and Rating: 0 NA **Comments:** No water within AA for fish habitat.

14E. Flood Attenuation: (Applies only to wetlands subject to flooding via in-channel or overbank flow. If wetlands in AA are not flooded from in-channel or overbank flow, click ☑ **NA** here and proceed to 14F.)

i. Rating (working from top to bottom, use the matrix below to arrive at [check] the functional points and rating)

Estimated or Calculated Entrenchment (Rosgen 1994, 1996)	Slightly entrenched - C, D, E stream types			Moderately entrenched – B stream type			Entrenched-A, F, G stream types		
% of flooded wetland classified as forested and/or scrub/shrub	75%	25-75%	<25%	75%	25-75%	<25%	75%	25-75%	<25%
AA contains **no outlet or restricted outlet**	1H	.9H	.6M	.8H	.7M	.5M	.4M	.3L	.2L
AA contains **unrestricted outlet**	.9H	.8H	.5M	.7M	.6M	.4M	.3L	.2L	.1L

Slightly Entrenched ER = >2.2			**Moderately Entrenched ER = 1.41 – 2.2**	**Entrenched ER = 1.0 – 1.4**		
C stream type	D stream type	E stream type	B stream type	A stream type	F stream type	G stream type
						



Floodprone width / **Bankfull width** = **Entrenchment ratio**

ii. Are ≥10 acres of wetland in the AA subject to flooding **AND** are man-made features which may be significantly damaged by floods located within 0.5 mile downstream of the AA (check)? **Y** ◯ **N** ◉

Comments: No flooding occurs via in-channel or overbank flow.

14F. Short and Long Term Surface Water Storage: (Applies to wetlands that flood or pond from overbank or in-channel flow, precipitation, upland surface flow, or groundwater flow. If no wetlands in the AA are subject to flooding or ponding, click ☐ **NA** here and proceed to 14G.)

i. Rating (Working from top to bottom, use the matrix below to arrive at [check] the functional points and rating. Abbreviations for surface water durations are as follows: P/P = permanent/perennial; S/I = seasonal/intermittent; and T/E = temporary/ephemeral [see instructions for further definitions of these terms].)

Estimated maximum acre feet of water contained in wetlands within the AA that are subject to periodic flooding or ponding	>5 acre feet			1.1 to 5 acre feet			≤1 acre foot		
Duration of surface water at wetlands within the AA	P/P	S/I	T/E	P/P	S/I	T/E	P/P	S/I	T/E
Wetlands in AA flood or pond **≥ 5 out of 10 years**	1H	.9H	.8H	.8H	.6M	.5M	.4M	.3L	.2L
Wetlands in AA flood or pond **< 5 out of 10 years**	.9H	.8H	.7M	.7M	.5M	.4M	.3L	.2L	.1L

Comments: Depressional area and portions of slope wetlands maintain water seasonally/intermittently. Adaptive management in 2017 resulted in an increased score for this function.

14G. Sediment/Nutrient/Toxicant Retention and Removal: (Applies to wetlands with potential to receive sediments, nutrients, or toxicants through influx of surface or ground water or direct input. If no wetlands in the AA are subject to such input, click ☐ **NA** here and proceed to 14H.)

i. Rating (working from top to bottom, use the matrix below to arrive at [check] the functional points and rating [H = high, M = moderate, or L = low])

Sediment, nutrient, and toxicant input levels within AA	AA receives or surrounding land use with potential to deliver levels of sediments, nutrients, or compounds at levels such that other functions are not substantially impaired. Minor sedimentation, sources of nutrients or toxicants, or signs of eutrophication present.				Waterbody on MDEQ list of waterbodies in need of TMDL development for "probable causes" related to sediment, nutrients, or toxicants **or** AA receives or surrounding land use with potential to deliver high levels of sediments, nutrients, or compounds such that other functions are substantially impaired. Major sedimentation, sources of nutrients or toxicants, or signs of eutrophication present.			
% cover of wetland vegetation in AA	≥ 70%		< 70%		≥ 70%		< 70%	
Evidence of flooding / ponding in AA	Yes	No	Yes	No	Yes	No	Yes	No
AA contains **no or restricted outlet**	1H	.8H	.7M	.5M	.5M	.4M	.3L	.2L
AA contains **unrestricted outlet**	.9H	.7M	.6M	.4M	.4M	.3L	.2L	.1L

Comments: More than 80 percent of the wetlands are vegetated. A restricted outlet is located in the depressional area as a constructed overflow channel.

14H Sediment/Shoreline Stabilization: (Applies only if AA occurs on or within the banks or a river, stream, or other natural or man-made drainage, or on the shoreline of a standing water body which is subject to wave action. If 14H does not apply, click ☐ **NA** here and proceed to 14I.)

i. Rating (working from top to bottom, use the matrix below to arrive at [check] the functional points and rating)

*% Cover of **wetland** streambank or shoreline by species with stability ratings of ≥6 (see **Appendix F**).*	*Duration of surface water adjacent to rooted vegetation*		
	Permanent / Perennial	Seasonal / Intermittent	Temporary / Ephemeral
≥ 65%	1H	.9H	.7M
35-64%	.7M	.6M	.5M
< 35%	.3L	.2L	.1L

Comments: Open water areas were not present during 2021 monitoring event, however the site does contain manmade drainages, the majority of which are heavily vegetated by species with stability rating less than or equal to 6.

14I. Production Export/Food Chain Support:

i. Level of Biological Activity (synthesis of wildlife and fish habitat ratings [check])

General Fish Habitat Rating (14D.iii.)	**General Wildlife Habitat Rating (14C.iii.)**		
	E/H	M	L
E/H	H	H	M
M	H	M	M
L	M	M	L
N/A	H	M	L

ii. Rating (Working from top to bottom, use the matrix below to arrive at [check] the functional points and rating. Factor A = acreage of vegetated wetland component in the AA; Factor B = level of biological activity rating from above (14I.i.); Factor C = whether or not the AA contains a surface or subsurface outlet; the final three rows pertain to duration of surface water in the AA, where P/P, S/I, and T/E are as previously defined, and A = "absent" [see instructions for further definitions of these terms].)

A	Vegetated component >5 acres						Vegetated component 1-5 acres						Vegetated component <1 acre					
B	High		Moderate		Low		High		Moderate		Low		High		Moderate		Low	
C	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
P/P	1E	.7H	.8H	.5M	.6M	.4M	.9H	.6M	.7H	.4M	.5M	.3L	.8H	.6M	.6M	.4M	.3L	.2L
S/I	.9H	.6M	.7H	.4M	.5M	.3L	.8H	.5M	.6M	.3L	.4M	.2L	.7H	.5M	.5M	.3L	.3L	.2L
T/E/A	.8H	.5M	.6M	.3L	.4M	.2L	.7H	.4M	.5M	.2L	.3L	.1L	.6M	.4M	.4M	.2L	.2L	.1L

iii. Modified Rating (**NOTE:** Modified score cannot exceed 1 or be less than 0.1.) **Vegetated Upland Buffer (VUB)**: Area with ≥ 30% plant cover, ≤ 15% noxious weed or ANVS cover, and that is not subjected to periodic mechanical mowing or clearing (unless for weed control).

a) Is there an average ≥ 50 foot-wide vegetated upland buffer around ≥ 75% of the AA circumference? **Y** ◉ **N** ○ *If yes, add 0.1 to the score in **ii** above and adjust rating accordingly:* **Modified Rating** .6M

Comments: Moderate biologial activity; qualifying upland buffer exisits.

14J. Groundwater Discharge/Recharge: (check the appropriate indicators in i & ii below)

i. Discharge Indicators

- [x] The AA is a slope wetland
- [x] Springs or seeps are known or observed
- [x] Vegetation growing during dormant season/drought
- [ ] Wetland occurs at the toe of a natural slope
- [ ] Seeps are present at the wetland edge
- [ ] AA permanently flooded during drought periods
- [ ] Wetland contains an outlet, but no inlet
- [ ] Shallow water table and the site is saturated to the surface
- [ ] Other:

ii. Recharge Indicators

- [x] Permeable substrate present without underlying impeding layer
- [x] Wetland contains inlet but no outlet
- [ ] Stream is a known 'losing' stream; discharge volume decreases
- [ ] Other:

iii. Rating (use the information from i and ii above and the table below to arrive at [check] the functional points and rating)

	Duration of saturation at AA Wetlands *FROM GROUNDWATER DISCHARGE OR WITH WATER THAT IS RECHARGING THE GROUNDWATER SYSTEM*			
Criteria	P/P	S/I	T	None
Groundwater Discharge or Recharge	1H	.7M	.4M	.1L
Insufficient Data/Information		NA		

Comments: Seasonal water regime within AA.

14K. Uniqueness:

i. Rating (working from top to bottom, use the matrix below to arrive at [check] the functional points and rating)

Replacement potential	AA contains fen, bog, warm springs or mature (>80 yr-old) forested wetland **or** plant association listed as "S1" by the MTNHP			AA does not contain previously cited rare types **and** structural diversity (#13) is high **or** contains plant association listed as "S2" by the MTNHP			AA does not contain previously cited rare types or associations **and** structural diversity (#13) is low-moderate		
Estimated relative abundance (#11)	rare	common	abundant	rare	common	abundant	rare	common	abundant
Low disturbance at AA (#12i)	1H	.9H	.8H	.8H	.6M	.5M	.5M	.4M	.3L
Moderate disturbance at AA (#12i)	.9H	.8H	.7M	.7M	.5M	.4M	.4M	.3L	.2L
High disturbance at AA (#12i)	.8H	.7H	.6M	.6M	.4M	.3L	.3L	.2L	.1L

Comments: PEM & PSS wetlands are common in the area. Structural diversity is moderate and disturbance is high.

14L. Recreation/Education Potential: (affords "bonus" points if AA provides recreation or education opportunity)

i. Is the AA a known or potential rec./ed. site: (check) **Y** (●) **N** (○) (if 'Yes' continue with the evaluation; if 'No' then click ☐ **NA** here and proceed to the overall summary and rating page)

ii. Check categories that apply to the AA: ☐ Educational/scientific study; ☐ Consumptive rec.; ☑ Non-consumptive rec.; ☐ Other

iii. Rating (use the matrix below to arrive at [check] the functional points and rating)

Known or Potential Recreation or Education Area	Known	Potential
Public ownership or public easement with general public access (no permission required)	.2H	.15H
Private ownership with general public access (no permission required)	.15H	.1M
Private or public ownership without general public access, or requiring permission for public access	.1M	.05L

Comments:

Currently no recreation/education occurs at the site.

General Site Notes

FUNCTION & VALUE SUMMARY & OVERALL RATING FOR WETLAND/SITE #(S): Rostad Mitigation Site

Function & Value Variables	Rating	Actual Functional Points	Possible Functional Points	Functional Units: (Actual Points x Estimated AA Acreage)	Indicate the four most prominent functions with an asterisk (*)
A. Listed/Proposed T&E Species Habitat	L	0	1	0.00	☐
B. MT Natural Heritage Program Species Habitat	H	.9	1	26.04	☑
C. General Wildlife Habitat	L	.3	1	8.68	☑
D. General Fish Habitat	NA	0	0	0.00	☐
E. Flood Attenuation	NA	0	0	0.00	☐
F. Short and Long Term Surface Water Storage	H	.9	1	26.04	☑
G. Sediment/Nutrient/Toxicant Removal	H	1	1	28.93	☐
H. Sediment/Shoreline Stabilization	H	.9	1	26.04	☐
I. Production Export/Food Chain Support	M	.6	1	17.36	☐
J. Groundwater Discharge/Recharge	M	.7	1	20.25	☑
K. Uniqueness	L	.2	1	5.79	☐
L. Recreation/Education Potential (bonus points)	L	.05	NA	1.45	☐
Totals:		5.55	9	160.56	
Percent of Possible Score			**61.67** %		

Category I Wetland: (must satisfy **one** of the following criteria; otherwise go to Category II)
- ☐ Score of 1 functional point for Listed/Proposed Threatened or Endangered Species; **or**
- ☐ Score of 1 functional point for Uniqueness; **or**
- ☐ Score of 1 functional point for Flood Attenuation **and** answer to Question 14E.ii is "yes"; **or**
- ☐ Percent of possible score > 80% (round to nearest whole #).

Category II Wetland: (Criteria for Category I not satisfied **and** meets any **one** of the following criteria; otherwise go to Category IV)
- ☐ Score of 1 functional point for MT Natural Heritage Program Species Habitat; **or**
- ☐ Score of .9 or 1 functional point for General Wildlife Habitat; **or**
- ☐ Score of .9 or 1 functional point for General Fish Habitat; **or**
- ☐ "High" to "Exceptional" ratings for **both** General Wildlife Habitat **and** General Fish/Aquatic Habitat; **or**
- ☐ Score of .9 functional point for Uniqueness; **or**
- ☐ Percent of possible score > 65% (round to nearest whole #).

Category III Wetland: (Criteria for Categories I, II, or IV not satisfied)

☑

Category IV Wetland: (Criteria for Categories I or II are not satisfied and all of the following criteria are met; otherwise go to Category III)
- ☐ "Low" rating for Uniqueness; **and**
- ☐ Vegetated wetland component < 1 acre (do not include upland vegetated buffer); **and**
- ☐ Percent of possible score < 35% (round to nearest whole #).

OVERALL ANALYSIS AREA RATING:
(check appropriate category based on the criteria outlined above)

I | II | **III** | IV

Scientific Names	Common Names	GP Indicator Status[(1)]
Achillea millefolium	Common Yarrow	FACU
Agropyron cristatum	Crested Wheatgrass	UPL
Agrostis gigantea	Black Bent	FACW
Algae, green	Algae, green	NL
Alopecurus arundinaceus	Creeping-Meadow Foxtail	FACW
Alopecurus pratensis	Field Meadow-Foxtail	FACW
Amaranthus retroflexus	Red-Root	FACU
Ambrosia acanthicarpa	Flat-spine Ragweed	UPL
Artemisia ludoviciana	**White Sagebrush**	**UPL**
Aster sp.	Aster	UPL
Bassia scoparia	Mexican-Fireweed	FACU
Beckmannia syzigachne	American Slough Grass	OBL
Berteroa incana	Hoary False-alyssum	UPL
Bromus arvensis	Field Brome	FACU
Bromus carinatus	California Brome	UPL
Bromus inermis	Smooth Brome	UPL
Cardaria draba	Whitetop	UPL
Carex bebbii	**Bebb's Sedge**	**OBL**
Carex nebrascensis	Nebraska Sedge	OBL
Carex pellita	Woolly Sedge	OBL
Carex praegracilis	Clustered Field Sedge	FACW
Carex stipata	Stalk-Grain Sedge	OBL
Carex utriculata	Northwest Territory Sedge	OBL
Carum carvi	Caraway	UPL
Centaurea stoebe	Spotted Knapweed	UPL
Chenopodium album	Lamb's-Quarters	FACU
Chenopodium sp.	Goosefoot	UPL
Cirsium arvense	Canadian Thistle	FACU
Convolvulus arvensis	Field Bindweed	UPL
Cynoglossum officinale	Gypsy-Flower	FACU
Cyrtorhyncha cymbalaria	Alkali Buttercup	OBL
Deschampsia caespitosa	Tufted Hair Grass	FACW
Descurainia sophia	Herb Sophia	UPL
Downingia laeta	Great Basin Calico-Flower	OBL
Eleocharis acicularis	**Needle Spike-Rush**	**OBL**
Eleocharis palustris	Common Spike-Rush	OBL
Elymus hispidus	**Intermediate Wheatgrass**	**UPL**
Elymus repens	Creeping Wild Rye	FACU

Scientific Names	Common Names	GP Indicator Status[1]
Elymus trachycaulus	Slender Wild Rye	FACU
Epilobium ciliatum	Fringed Willowherb	FACW
Equisetum laevigatum	**Smooth Scouring-Rush**	**FAC**
Glyceria grandis	American Manna Grass	OBL
Glyceria striata	**Fowl Manna Grass**	**OBL**
Glycyrrhiza lepidota	American Licorice	FACU
Helianthus annuus	Common Sunflower	FACU
Hippuris vulgaris	Common Mare's-Tail	OBL
Hordeum jubatum	Fox-Tail Barley	FACW
Juncus articulatus	Joint-Leaf Rush	OBL
Juncus balticus	Baltic Rush	FACW
Juncus bufonius	Toad Rush	OBL
Juncus longistylis	**Long-Style Rush**	**FACW**
Lactuca serriola	Prickly Lettuce	FAC
Lepidium densiflorum	Miner's Pepperwort	FAC
Medicago sativa	Alfalfa	UPL
Melilotus albus	White Sweetclover	UPL
Melilotus officinalis	Yellow Sweet-Clover	FACU
Mentha arvensis	American Wild Mint	FACW
Pascopyrum smithii	Western-Wheat Grass	FACU
Phalaris arundinacea	Reed Canary Grass	FACW
Phleum pratense	Common Timothy	FACU
Plantago major	**Great Plantain**	**FAC**
Poa palustris	Fowl Blue Grass	FACW
Poa pratensis	Kentucky Blue Grass	FACU
Polypogon monspeliensis	Annual Rabbit's-Foot Grass	FACW
Populus angustifolia	Narrow-Leaf Cottonwood	FACW
Populus balsamifera	Balsam Poplar	FACW
Populus tremuloides	Quaking Aspen	FAC
Potentilla gracilis	Graceful Cinquefoil	FAC
Rumex crispus	Curly Dock	FAC
Rumex occidentalis	Western Dock	OBL
Salix exigua	Narrow-Leaf Willow	FACW
Schedonorus pratensis	Meadow False Rye Grass	FACU
Schoenoplectus maritimus	**Saltmarsh Club-Rush**	**OBL**
Sinapis arvensis	Wild Mustard	UPL
Sonchus arvensis	Field Sow-Thistle	FAC
Symphyotrichum ascendens	Western American-Aster	FACU

Scientific Names	Common Names	GP Indicator Status[(1)]
Symphyotrichum ericoides	White Heath American-Aster	FACU
Tanacetum vulgare	Common Tansy	FACU
Taraxacum officinale	Common Dandelion	FACU
Thlaspi arvense	Field Pennycress	FACU
Tragopogon dubius	Meadow Goat's-beard	UPL
Trifolium arvense	Rabbit-foot Clover	UPL
Trifolium hybridum	Aslsike Clover	FACU
Trifolium pratense	Red Clover	FACU
Trifolium repens	White Clover	FACU
Triglochin maritima	**Seaside Arrow-Grass**	**OBL**
Typha angustifolia	**Narrow-Leaf Cat-tail**	**OBL**
Typha latifolia	Broad-Leaf Cat-Tail	OBL
Veronica peregrina	Neckweed	FACW

[1] 2018 NWPL (USACE 2018)

New species identified in 2021 are **bolded**.

APPENDIX C

PROJECT AREA PHOTOGRAPHS

MDT Wetland Mitigation Monitoring

Rostad Ranch
Meagher County, Montana

Rostad Ranch: Photo Point Photographs



Photo Point 1 – Panorama; Location: Northeast Corner; Bearing 200 degrees; Year 2013



Photo Point 1 – Panorama; Location: Northeast Corner; Bearing 200 degrees; Year 2021



Photo Point 2 – Panorama; Location: East Fence Corner; Bearing 125 degrees; Year 2013



Photo Point 2 – Panorama; Location: East Fence Corner; Bearing 125 degrees; Year 2021

Rostad Ranch: Photo Point Photographs



Photo Point 3 – Panorama; Location: East Fence Line; Bearing 280 degrees; Year 2013



Photo Point 3 – Panorama; Location: East Fence Line; Bearing 280 degrees; Year 2021



Photo Point 4 – Panorama; Location: SE Fence Corner; Bearing 240 degrees; Year 2013



Photo Point 4 – Panorama; Location: SE Fence Corner; Bearing 240 degrees; Year 2021

Rostad Ranch: Photo Point Photographs



Photo Point 5 – Panorama; Location: SW Fence Corner; Bearing 200 degrees; Year 2013



Photo Point 5 – Panorama; Location: SW Fence Corner; Bearing 200 degrees; Year 2021



Photo Point 7 – Panorama; Location: West Fence Corner; Bearing 90 degrees; Year 2013



Photo Point 7 – Panorama; Location: West Fence Corner; Bearing 90 degrees; Year 2021

Rostad Ranch: Photo Point Photographs



Photo Point 6 **Location**: West Fence Line
Bearing: 30 degrees **Year**: 2013



Photo Point 6 **Location**: West Fence Line
Bearing: 30 degrees **Year:** 2021



Photo Point 6 **Location:** West Fence Line
Bearing: 100 degrees **Year**: 2013



Photo Point 6 **Location**: West Fence Line
Bearing: 100 degrees **Year**: 2021



Photo Point 8 **Location:** West Central
Bearing: 90 degrees **Year**: 2017



Photo Point 8 **Location:** West Central
Bearing: 90 degrees **Year**: 2021

Rostad Ranch: Photo Point Photographs



Photo Point 9 **Location:** East Fence Line
Bearing: 240 degrees **Year**: 2017



Photo Point 9 **Location:** East Fence Line
Bearing: 240 degrees **Year**: 2021



Photo Point 10 **Location**: West Central
Bearing: 80 degrees **Year**: 2017



Photo Point 10 **Location**: West Central
Bearing: 80 degrees **Year**: 2021

Rostad Ranch: Transect Photographs



Transect 1: Start **Location:** NE Branch of site
Bearing: 290 degrees **Year**: 2013



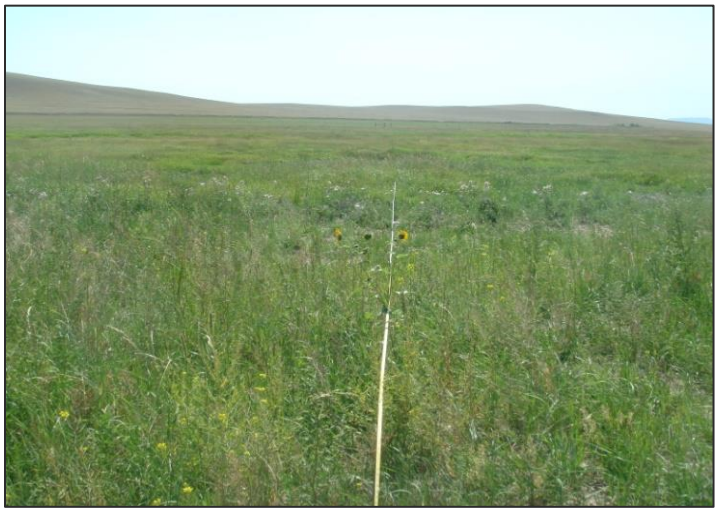
Transect 1: Start **Location:** NE Branch of site
Bearing: 290 degrees **Year:** 2021



Transect 1: End **Location:** NE Branch of site
Bearing: 110 degrees **Year:** 2013



Transect 1: End **Location:** NE Branch of site
Bearing: 110 degrees **Year:** 2021



Transect 2: Start **Location:** North Central
Bearing: 130 degrees **Year**: 2013



Transect 2: Start **Location:** North Central
Bearing: 130 degrees **Year:** 2021

Rostad Ranch: Transect Photographs



Transect 2: End **Location:** North Central
Bearing: 310 degrees **Year**: 2013



Transect 2: End **Location:** North Central
Bearing: 310 degrees **Year:** 2021



Transect 3: Start **Location:** South Portion of site
Bearing: 30 degrees **Year:** 2013



Transect 3: Start **Location:** South Portion of site
Bearing: 30 degrees **Year:** 2021



Transect 3: End **Location:** South Portion of site
Bearing 30: degrees **Year:** 2013



Transect 3: End **Location:** South Portion of site
Bearing: 30: degrees **Year:** 2021

Rostad Ranch: Transect Photographs



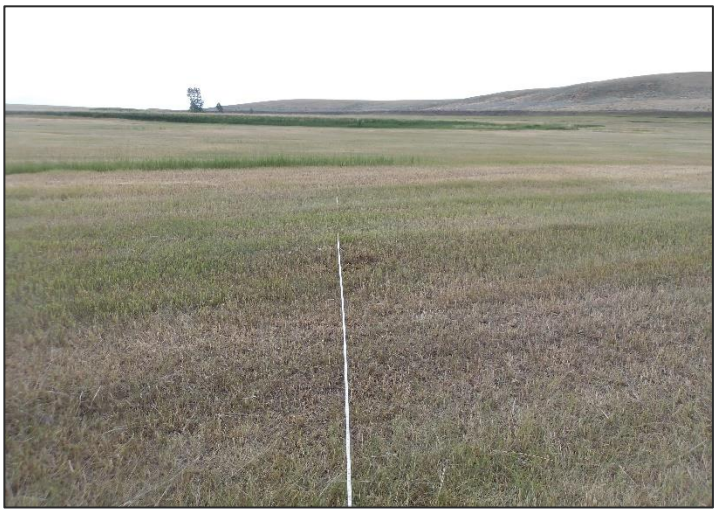
Transect 4: Start **Location:** Northwest Portion
Bearing: 0 degrees **Year:** 2017



Transect 4: Start **Location:** Northwest Portion
Bearing: 0 degrees **Year:** 2021



Transect 4: End **Location:** Northwest Portion
Bearing: 180 degrees **Year:** 2017



Transect 4: End **Location:** Northwest Portion
Bearing: 180 degrees **Year:** 2021

Rostad Ranch: Data Point Photographs



Data Point: DP01w
Location: N boundary of project
Year: 2021
area within CT7.



Data Point: DP01u
Location: N boundary of project
Year: 2021
area within CT8.



Data Point: DP02w
Location: PEM/PSS in S
Year: 2021
project area.



Data Point: DP02u
Location: Hillside in SE corner
Year: 2021
of project area.