# MONTANA DEPARTMENT OF TRANSPORTATION
# WETLAND MITIGATION MONITORING REPORT: YEAR 2011

*Nashua East*
*Valley County, Montana*



Prepared for:

MONTANA DEPARTMENT OF TRANSPORTATION
2701 Prospect Ave
Helena, MT 59620-1001

Prepared by:

CONFLUENCE
PO Box 1133
Bozeman, MT 59771-1133

December 2011

# MONTANA DEPARTMENT OF TRANSPORTATION

## WETLAND MITIGATION MONITORING REPORT:

## YEAR 2011

*Nashua East*
*Valley County, Montana*

MDT Project Number: NH 1-9(39)555
Control Number: 2144

USACE: NWO-2004-90-575-MTB

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**MONTANA DEPARTMENT OF TRANSPORTATION**
2701 Prospect Ave
Helena, MT 59620-1001

Prepared by:

**Confluence Consulting, Inc.**
P.O. Box 1133
Bozeman, MT 59771

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CCI Project No: MDT.004

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# 1. INTRODUCTION

The Nashua East 2011 Wetland Mitigation Monitoring Report presents the results of the final year of post-construction monitoring at the Nashua mitigation site. The Montana Department of Transportation (MDT) wetland mitigation project was constructed in 2007 and is located in Section 3, Township 27 North, Range 42 East, Valley County, Montana. The property is located approximately four miles east of Nashua on US Highway 2 (Figure 1). The wetland conservation easement encompasses a total area of 9.4 acres including 7.1 acres of wetland and 2.3 acres of upland buffer. Figures 2 and 3 (Appendix A) show the 2011 Monitoring Activity Locations and 2011 Mapped Site Features, respectively. The MDT Mitigation Site Monitoring Form, US Army Corps of Engineers (USACE) Wetland Determination Data Forms – Great Plains Region (USACE 2010), and the 2008 MDT Montana Wetland Assessment Form are included in Appendix B. Project site photographs are included in Appendix C.

The wetland restoration site is located within Watershed 11, the Milk River Basin. Wetlands developed at this location were to provide compensatory mitigation in the Glendive District for wetland impacts associated with the reconstruction of 10.19 miles of Highway 2 beginning west of Nashua and proceeding east (USACE 2004). A minimum of 4.395 acres of wetlands were to be created to account for 2.93 acres of impacts to emergent wetlands, at a 1.5:1 debit ratio required as a result of completing wetland mitigation concurrently with impacts associated with road construction. Approximately 7.1 acres of wetland were constructed with an undulating bottom below the plan elevation. At least 75 percent of the final elevations in the wetland area were to be at or below the plan elevation after placement of the salvage wetland material and topsoil.

The performance standards in the permit approval letter (USACE 2004) specified that the wetlands were to have at least 60 percent cover of native wetland species in the herbaceous layer after three years and 75 percent cover after five years. Invasive and noxious species were to contribute to “no more than 10 percent of the relative cover and shall not dominate the vegetation in any extensive area of the mitigation wetland.” The wetland was to be inundated or saturated to the surface continuously for at least 5 percent of the growing season in most years.

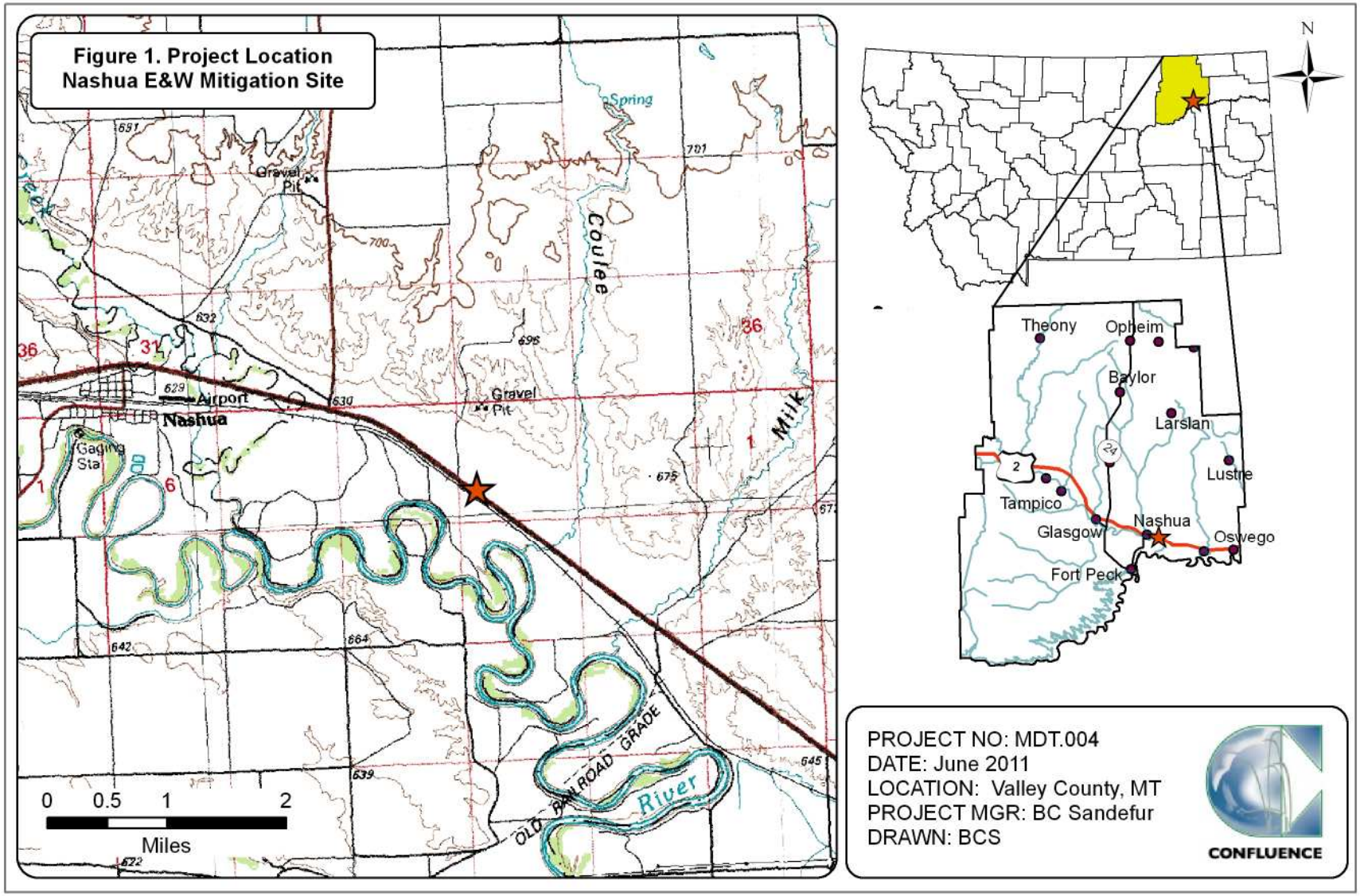



**Figure 1. Project location of Nashua East Mitigation Site.**

# 2. METHODS

Monitoring was completed on August 11, 2011. Information for the Mitigation Monitoring Form and Wetland Data Form was entered electronically in the field on a personal digital assistant (PDA) palmtop computer during the field investigation (Appendix B). Monitoring activity sites were located with a global positioning system (GPS) as shown on Figure 2 (Appendix A). Information included completion of a wetland delineation, vegetation community mapping, vegetation transect monitoring, soil and hydrology data collection, bird and wildlife use documentation, photographs, and a non-engineering examination of the infrastructure established within the mitigation project area.

## 2.1. Hydrology

The presence of hydrological indicators as outlined on the Wetland Data Form was assessed at three data points established within the project area. The hydrologic indicators were evaluated according to features observed during the site visit. The data were recorded on the electronic Wetland Data Form (Appendix B). Hydrologic assessments allow evaluation of mitigation goals addressing inundation/saturation requirements.

Technical criteria for wetland hydrology guidelines have been established as "permanent or periodic inundation, or soil saturation within 12 inches of the ground surface for a significant period (12.5 percent of the growing season) during the growing season" (USACE 2010). Systems with continuous inundation or saturation for greater than 12.5 percent of the growing season are classified as exhibiting wetland hydrology. The growing season is defined for purposes of this report as the number of days where there is a 50 percent probability that the minimum daily temperature is greater than or equal to 28 degrees Fahrenheit (USACE 2010). The growing season recorded for the predominant soil map units, Vaeda silty clay, averages 120 days (USDA 2010). Areas defined as wetlands would require 15 days of inundation or saturation within 12 inches of the ground surface to meet the hydrology criteria.

Soil pits excavated during the wetland delineation were used to evaluate groundwater levels within 18 inches of the ground surface. The data was recorded on the Wetland Data Form (Appendix B).

## 2.2. Vegetation

The boundaries of dominant species-based vegetation communities were determined in the field during the active growing season and subsequently delineated on the 2011 aerial photograph (Figure 3, Appendix A). The percent cover of dominant species within a community type was estimated and recorded using the following values: 0 (less than 1 percent), 1 (1 to 5 percent), 2 (6 to10 percent), 3 (11 to 20 percent), 4 (21 to 50 percent), and 5 (greater than 50 percent) (Monitoring Form, Appendix B). Community types were named based on the predominant vegetation species that characterized each mapped polygon (Figure 3, Appendix A).

A single, static belt transect was established in August 2011 (Figure 2, Appendix A). Vegetation composition was assessed and recorded along the transect (T-1) that was approximately 10 feet wide and 863 feet long (Figure 2, Appendix A). The percent cover of each vegetation species within the "belt" was estimated using the same values and cover ranges listed for the community polygon data (Figure 3, Appendix A). The transect location was recorded with a resource-grade GPS unit. Photographs were taken at the transect endpoints during the monitoring event (Appendix C). The planting of woody species and the health of existing woody volunteers will be evaluated within the site.

The location of noxious weeds was noted in the field and mapped on the 2011 aerial photo (Figure 3, Appendix A). The noxious weed species identified are color-coded. The locations are denoted with the symbol "**X**", "▲", or "■" representing 0 to 0.1 acre, .1 to 1 acre, or greater than 1 acre in extent, respectively. Cover classes are represented by T, L, M, or H, for less than 1 percent, 1 to 5 percent, 2 to 25 percent, and 25 to 100 percent, respectively.

### 2.3. Soil

Soil information was obtained from the *Soil Survey for Valley County Area* (USDA 2010) and *in situ* soil descriptions. Soil cores were excavated using a hand auger and evaluated according to procedures outlined in the 1987 wetland Delineation Manual (Environmental Laboratory 1987) and the 2010 Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Great Plains Region (USACE 2010). A description of the soil profile, including hydric soil indicators when present, was recorded on the Wetland Data Form for each profile (Appendix B).

### 2.4. Wetland Delineation

Waters of the US including special aquatic sites and jurisdictional wetlands were delineated throughout the project area in accordance with criteria established in the 2010 Regional Supplement. The technical criteria for hydrophytic vegetation, hydric soil, and wetland hydrology must be satisfied to delineate a representative area as jurisdictional. The indicator status of vegetation was derived from the National List of Plant Species that Occur in Wetlands: Northern Plains Region 4 (Reed 1988). A Routine Level-2 On-site Determination Method (Environmental Laboratory 1987) was used to delineate jurisdictional areas within the project boundaries. The information was recorded electronically on the Wetland Data Form (Appendix B).

The wetland boundary was determined in the field based on changes in plant communities and/or hydrology, and changes in soil characteristics. Topographic relief boundaries within the project area were also examined and cross referenced with soil and vegetation communities as supportive information for this delineation. Vegetation composition, soil characteristics, and hydrology were assessed at likely wetland and adjacent upland locations. If all three parameters met the criteria, the area was designated as wetland and mapped by vegetation community type. If any one of the parameters did not exhibit positive wetland

indicators, the area was determined to be upland unless the site was classified as an atypical situation, potential problem area for vegetation, soil or hydrology, or special aquatic site, i.e., mudflat. The wetland boundary was delineated on the 2011 aerial imagery and digitized into Geographic Information System (GIS) format. Wetland areas reported were estimated using GIS methodology.

### 2.5. Wildlife

Observations and other positive indicators of use of mammal, reptile, amphibian, and bird species were recorded on the Mitigation Monitoring Form during the site visit. Indirect use indicators, including tracks, scat, burrow, eggshells, skins, and bones, were also recorded. These signs were recorded while traversing the site for other required activities. Direct sampling methods, such as snap traps, live traps, and pitfall traps, were not used. A comprehensive wildlife list of species observed in 2011 was compiled for this report.

### 2.6. Functional Assessment

The 2008 MDT Montana Wetland Assessment Method (MWAM) (Berglund and McEldowney 2008) was used to evaluate functions and values on the site in 2011. This method provides an objective means of assigning wetlands an overall rating and provides regulators a means of assessing mitigation success based on wetland functions. Functions are the self-sustaining properties of a wetland ecosystem that exist in the absence of society and relate to ecological significance without regard to subjective human values (Berglund and McEldowney 2008). Field data for this assessment were collected during the site visit. One Wetland Assessment Form was completed for the 7.1 acre mitigation wetland (Appendix B).

### 2.7. Photo Documentation

Monitoring at photo points provided supplemental information documenting wetland and upland conditions, site trends, current land uses on the adjacent properties, and the vegetation transect endpoints. Photographs were taken at established photo points throughout the mitigation site during the site visit (Appendix C). Photo point locations were recorded with a resource grade GPS unit (Figure 2, Appendix A).

### 2.8. GPS Data

Site features and survey points were collected with a resource grade Thales Pro Mark III GPS unit during the 2011 monitoring season. Points were collected using WAAS-enabled differential correction satellites, typically improving resolution to sub-meter accuracy. The GPS data were subsequently exported into GIS and drawn in Montana State Plane Single Zone NAD 83 meters. In addition to GPS, some site features within the site were hand-mapped onto an aerial photograph, then digitized. Site features and survey points that were mapped included fence boundaries, photograph points, transect beginnings and endings, wetland boundaries, vegetation community boundaries, and wetland data points.

### 2.9. Maintenance Needs

Channels, engineered structures, fencing, and other features were examined during the site visit for obvious signs of breaching, damage, or other problems. This was a cursory examination and did not constitute an engineering-level structural inspection.

## 3. RESULTS

### 3.1. Hydrology

Climate data from the meteorological station at Glasgow WSO Airport, Montana (243558), recorded an average annual precipitation rate of 11.38 inches from November 1955 to December 2010 (WRCC 2011). The average precipitation recorded in 2010 was 18.06 inches, which was 6.68 inches higher than the 55 year average. Total precipitation from January to April 2011 was 3.59 inches (NCDC 2011). There was no data available for May or June 2011.

The primary water sources for the Nashua site are surface water runoff and precipitation. Seventy percent of the mitigation site was inundated in 2011 with an average of 1.0 foot of surface water. The range of surface water depths was 0.5 feet to 2.5 feet and the depth at the emergent vegetation-open water boundary was 0.8 feet. Areas determined to be wetland that were not inundated were saturated within 12 inches of the ground surface.

Wetland data was collected at three sample points, N-1, N-2, and N-3. Data points N-1 and N-3 were located in areas that met the wetland criteria. Sample point N-1 was located at the edge of the open water in wetland Community 2. The data point exhibited surface water 2 inches deep, and a high water table and saturation at the ground surface. A hydrogen sulfide odor provided another primary indicator of wetland hydrology. Sample point N-2 was located in upland Community 1. There were no primary or secondary indicators of wetland hydrology. Data point N-3 located in wetland Community 3 exhibited saturation to the ground surface. The soil was dense clay. The water table was not apparent within the test pit, likely the result of the wetland hydrology being driven by overland surface water flow rather than groundwater flow and very low permeability within the clay loam soils.

### 3.2. Vegetation

Monitoring year 2011 marked the first year of monitoring on the Nashua East wetland mitigation site. The purpose of the first year of monitoring was to establish a baseline for subsequent monitoring and to describe the vegetation types and cover classes within the wetland mitigation area. Thirty plant species were observed site wide in 2011 (Table 1). Vegetation plant communities names and species composition are shown on the Mitigation Monitoring Form (Appendix B). The vegetation community boundaries are shown on Figure 3 (Appendix A).

The excavated wetland cell was revegetated with a wetland seed mix consisting of slender wheatgrass (*Agropyron trachycaulum*), alkali bulrush (*Scirpus*

*maritimus*), Western wheatgrass (*Agropyron smithii*), Great Basin wildrye (*Elymus cinereus*), and Nuttall alkaligrass (*Puccinellia nuttaliana*). In addition, salvaged wetland soil and sod were used to provide a native seed bank.

Four vegetation communities were identified during the 2011 monitoring event, Type 1 – *Agropyron smithii/Rumex crispus* Upland, Type 2 – *Typha latifolia* Wetland, Type 3 – *Alopecurus pratensis* Wetland, and Type 4 – *Salix planifolia* Wetland. Upland community Type 1 – *Agropyron smithii/Rumex crispus* characterized the upland that surrounded the constructed wetland depression. The community exhibited approximately 75 percent vegetation cover except near the north and northeast property boundaries where 50 percent of the total cover was bare ground. The dominant species were Western wheatgrass (*Agropyron smithii*), curly dock (*Rumex crispus*), and common sunflower (*Helianthus annuus*).

Wetland community Type 2 – *Typha latifolia* encompassed the constructed, shallow open water depression that contained surface water depths of 1 to 2 feet. Broad-leaf cattail (*Typha latifolia*), common water plantain (*Alisma plantago-aquatica*), creeping spikerush (*Eleocharis palustris*), hard stem bulrush (*Scirpus acutus*), alkali bulrush (*Scirpus maritimus*), and American sloughgrass (*Beckmannia syzigachne*) dominated the herbaceous species. Water milfoil species (*Myriophyllum* sp.) and green algae inhabited the open water areas of the community.

Wetland community Type 3 – *Alopecurus pratensis* defined the predominantly wetland vegetation cover located in the narrow band between Communities 1 and 2. The vegetation was dominated by meadow foxtail (*Alopecurus pratensis*), curly dock, slender wheatgrass (*Agropyron trachycaulum*), foxtail barley (*Hordeum jubatum*), and American sloughgrass. Bare ground contributed 6 to 10 percent to total cover within the excavated areas.

Wetland community Type 4 – *Salix planifolia* (diamond-leaf willow) dominated the small scrub-shrub community that has formed from volunteers at the edge of the open water depression within the south half of the site. The woody cover included sandbar willow (*Salix exigua*), black cottonwood (*Populus trichocarpa*) with a low percent cover of common water plantain and American sloughgrass.

A small infestation of Canada thistle (*Cirsium arvense*) was observed on the edge of the open water near the northwest boundary. The infestation size was less than 0.1 acres and the cover was less than 1 percent. A single tamarisk (*Tamarix ramosissima*) was noted near the west edge of the site. Both plants are considered Priority 2 B weeds.

Vegetation community transitions were measured on a single transect established from the south to north property corners. The transect intersected Upland Community 1 – *Agropyron smithii/Rumex crispus*, Wetland Community 2

– *Typha latifolia*, and Wetland Community 3 – *Alopecurus pratensis*. Hydrophytic species dominated 88.4 percent of the transect intervals. Approximately 11 to 20 percent of Community 2 consisted of open water.

**Table 1. Vegetation species observed in 2011 at the Nashua East Wetland Mitigation Site.**

| SCIENTIFIC NAME | COMMON NAME | REGION 4 INDICATOR STATUS[1] |
|---|---|---|
| *Agropyron smithii* | wheatgrass,western | FACU |
| *Agropyron trachycaulum* | wheatgrass,slender | FACU |
| *Algae, green* | algae, green | NL |
| *Alisma plantago-aquatica* | water-plantain,broad-leaf | OBL |
| *Alopecurus pratensis* | foxtail,meadow | FACW |
| *Artemisia cana* | sagebrush,silver | FACU |
| *Artemisia frigida* | prairie sagewort | NL |
| *Beckmannia syzigachne* | sloughgrass,American | OBL |
| *Bromus inermis* | smooth brome | NL |
| *Cirsium arvense* | thistle,Canada | FACU |
| *Eleocharis palustris* | spikerush,creeping | OBL |
| *Grindelia squarrosa* | gumweed,curly-cup | UPL |
| *Helianthus annuus* | sunflower,common | FACU |
| *Hordeum jubatum* | barley,fox-tail | FACW |
| *Iva axillaris* | sumpweed,small-flower | FACU |
| *Kochia scoparia* | summer-cypress,Mexican | FAC |
| *Lactuca serriola* | lettuce,prickly | FACU |
| *Medicago sativa* | alfalfa | NL |
| *Melilotus officinalis* | sweetclover,yellow | FACU- |
| *Myriophyllum sp.* | | NL |
| *Poa arida* | bluegrass,plains | FAC |
| *Populus trichocarpa** | black cottonwood | FACW |
| *Rumex crispus* | dock,curly | FACW |
| *Salix exigua* | willow,sandbar | FACW+ |
| *Salix planifolia* | willow,diamond-leaf | OBL |
| *Scirpus acutus* | bulrush,hard-stem | OBL |
| *Scirpus maritimus* | bulrush,saltmarsh | NI |
| *Tamarix ramosissima* | saltcedar | NI |
| *Thlaspi arvense* | penny-cress,field | NI |
| *Typha latifolia* | cattail,broad-leaf | OBL |

[1]Region 4 Northern Plains (Reed 1988).

*Commonly accepted name not included on the 1988 list.

**Table 2. Data summary for Transect 1 in 2011 at the Nashua East Wetland Mitigation Site.**

| Monitoring Year | 2011 |
|---|---|
| **Transect Length (feet)** | 863 |
| Vegetation Community Transitions along Transect | 3 |
| Vegetation Communities along Transect | 3 |
| Hydrophytic Vegetation Communities along Transect | 2 |
| Total Vegetative Species | 19 |
| Total Hydrophytic Species | 13 |
| Total Upland Species | 6 |
| Estimated % Total Vegetative Cover | 100 |
| % Transect Length Comprising Hydrophytic Vegetation | 88.4 |
| % Transect Length Comprising Upland Vegetation Communities | 11.6 |
| % Transect Length Comprising Unvegetated Open Water | 0.0 |
| % Transect Length Comprising Bare Substrate | 0.0 |

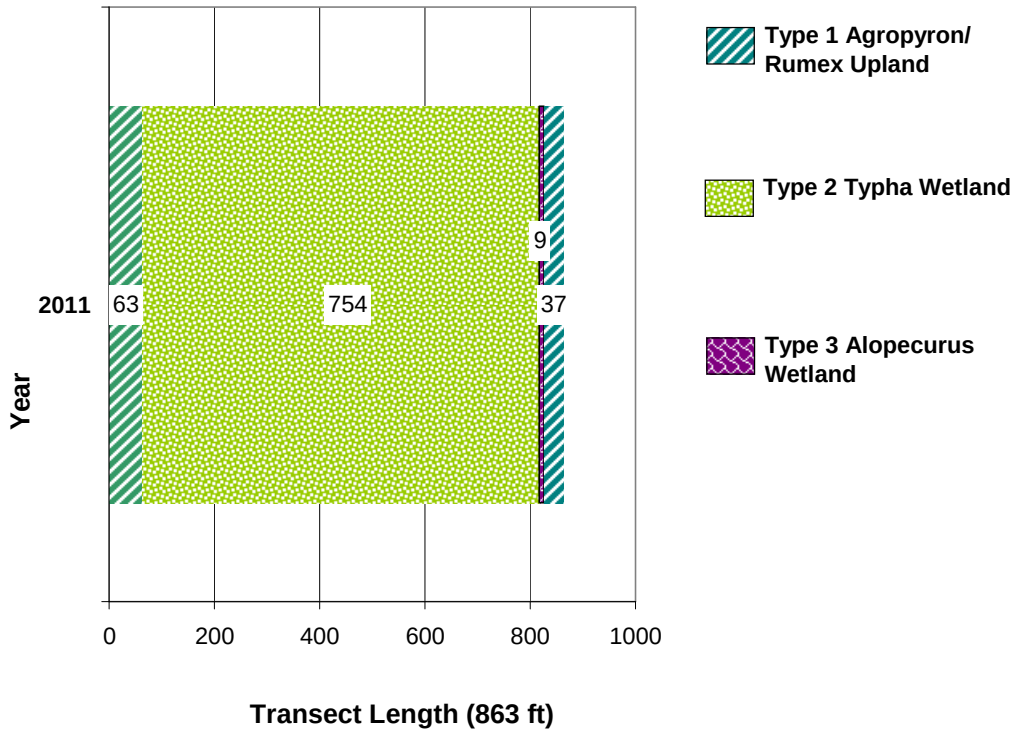



**Chart 1. Transect map showing community types on Transect 1 in 2011 from beginning (0 feet) to end (863 feet) at Nashua East Wetland Mitigation Site.**

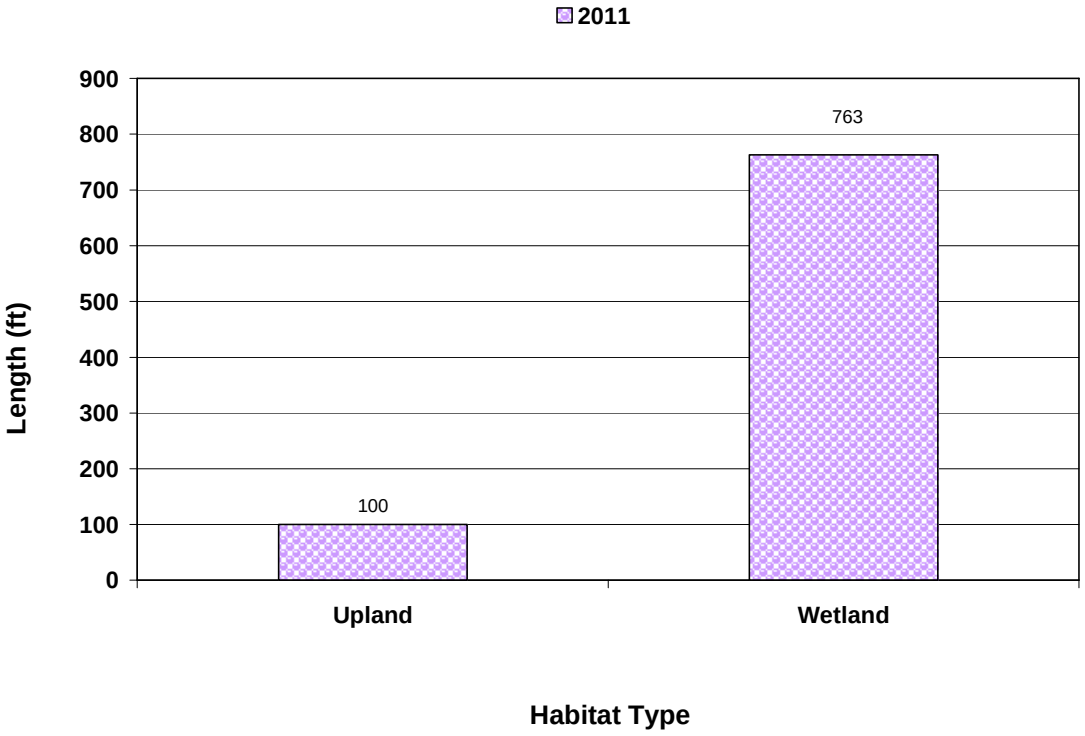



**Chart 2. Length of habitat types within Transect 1 in 2011 at Nashua East Wetland Mitigation Site.**

### 3.3. Soil

The project site was mapped in the Valley County Soil Survey (USDA 2011) as Vaeda silty clay. The Vaeda silty clay is a non-hydric soil found on floodplains and terraces, taxonomically classified as frigid Ustic Torriorthents. The soil in the test pits did not generally confirm the mapped unit, likely the result of soil disturbance during construction.

The soil in test pit N-1 exhibited a gleyed (4/N) clay loam soil. Redox concentrations (7.5 YR 4/4) were observed in 40 percent of the of the soil matrix. The loamy gleyed matrix and hydrogen sulfide odor were positive indicators of a hydric soil. Test pit N-2 revealed a light grayish brown, clay loam soil (10 YR 4.1) without redox features. There were no hydric soil indicators. The soil at N-3 was a clay loam (10 YR 4/1) with redox concentrations (7.5 YR 4/4) in 5 percent of the matrix. The depleted matrix provided a positive indication of a hydric soil.

### 3.4. Wetland Delineation

Three data points were used to define the vegetation, soil, and hydrology of site wetlands (N-1 to N-3, Figure 2, Appendix A, and Wetland Data Forms, Appendix B). Data points N-1 and N-3 were located in areas that met the wetland criteria. The total acreage of emergent wetland delineated in 2011 was 7.1 acres (Table

3). The upland buffer encompassed 2.3 acres. The wetland area was 2.71 acres above the mitigation target of 4.395 acres.

**Table 3. Total wetland acres delineated in August 2011 at Nashua East Wetland Mitigation Site.**

| ACREAGE OF WETLAND AND UPLAND HABITATS | 2011 |
|---|---|
| Emergent Wetland | 7.1 |
| Upland Buffer | 2.3 |
| **Total Project Area (acres)** | 9.4 |

### 3.5. Wildlife

A comprehensive list of bird and other wildlife species observed directly or indirectly during the 2011 monitoring visit is presented in Table 7 (Mitigation Monitoring Form, Appendix B). The site investigation was conducted during mid-day when the temperatures were over 90 degrees Fahrenheit. This factor may have limited bird and wildlife use during the investigation. Four red-winged blackbirds and one Western meadowlark were observed in 2011. At least 30 Northern leopard frogs and tracks of a raccoon and deer were observed during the site review. The Northern leopard frog is an S4 species based on the Montana Natural Heritage Program list. The MDT reported seeing several species of waterfowl during early morning and late evening site reviews completed earlier in the season.

**Table 4. Wildlife species observed within the Nashua East Wetland Mitigation Site in 2011.**

| COMMON NAME | SCIENTIFIC NAME |
|---|---|
| **AMPHIBIAN** | |
| Northern leopard frog | *Rana pipiens* |
| **BIRD** | |
| Red-winged Blackbird | *Agelaius phoeniceus* |
| Western Meadowlark | *Sturnella neglecta* |
| **MAMMAL** | |
| Raccoon | *Procyon lotor* |
| Deer sp. | *Odocoileus* |

### 3.6. Functional Assessment

The 7.1 acre constructed wetland cell and adjacent wetland fringe was assessed in 2011 as one assessment area (AA) using the 2008 MDT Montana Wetland Assessment Method (MWAM) (Berglund and McEldowney 2008) (Appendix B). The AA was rated as a Category II wetland with 70.0 percent of the total possible points and 44.73 functional units. The ratings were high for general wildlife habitat, short and long term surface water storage, sediment/nutrient/toxicant removal, sediment/shoreline stabilization, and groundwater discharge/recharge and moderate for MTNHP species habitat.

**Table 5. Functions and Values of Nashua East Wetlands.**

| Function and Value Parameters from the Montana Wetland Assessment Method | 2011 |
|---|---|
| Listed/Proposed T&E Species Habitat | Low (0) |
| MTNHP Species Habitat | Mod (0.5) |
| General Wildlife Habitat | High (0.9) |
| General Fish/Aquatic Habitat | NA |
| Flood Attenuation | NA |
| Short and Long Term Surface Water Storage | High (1.0) |
| Sediment/Nutrient/Toxicant Removal | High (1.0) |
| Sediment/Shoreline Stabilization | High (1.0) |
| Production Export/Food Chain Support | Mod (0.6) |
| Groundwater Discharge/Recharge | High (1.0) |
| Uniqueness | Low (0.3) |
| Recreation/Education Potential (bonus points[3]) | NA |
| **Actual Points/Possible Points** | **6.3 / 9** |
| **% of Possible Score Achieved** | **70.0%** |
| **Overall Category** | **II** |
| **Total Acreage of Assessed Wetlands within Site Boundaries** | **7.10** |
| **Functional Units** (acreage x actual points) | **44.73** |

### 3.7. Photo Documentation

Photographs taken at photo points PP1 and PP2 (Figure 2, Appendix A) are shown on page C-1 of Appendix C. Photographs of the transect endpoints are included on page C-2 and data points N-1 to N-3 are included on C-3 (Appendix C).

### 3.8. Maintenance Needs

An infestation of Canada thistle (*Cirsium arvense*) and a single tamarisk (*Tamarix ramosissima*), Priority 2 B weeds, was observed at the edge of the open water near the northwest boundary. The infestation size was less than 0.1 acres and the cover was less than 1 percent for the weeds. The MDT has an ongoing weed control program.

### 3.9. Current Credit Summary

A minimum of 4.395 acres of wetlands was to be created to mitigate for 2.93 acres of impacts to Category III and IV emergent wetlands at a 1.5:1 debit ratio required for construction of Highway 2. Approximately 7.1 acres of Category II emergent wetland have developed since construction of the Nashua East Mitigation Site in 2007.

The performance standards addressed in the permit approval letter (USACE 2004) specified that the wetlands were to have at least 60 percent cover of native wetland species in the herbaceous layer after three years and 75 percent cover after five years. Invasive and noxious species were to contribute to "no more than 10 percent of the relative cover and shall not dominate the vegetation in any extensive area of the mitigation wetland." The wetland was to be inundated or saturated to the surface continuously for at least 5 percent of the growing season in most years. The percent cover of native emergent and aquatic bed vegetation currently exceeds 60 percent by 10 to 20 percent. Invasive and noxious species do not contribute more than 10 percent to the total cover. Seventy percent of the wetland area was still inundated on August 11, 2011.

Table 9 summarizes the current wetland credits based on the approved credit ratios and the wetland delineation completed in August 2011. The areal extent of the created wetland in 2011 totaled 7.1 acres yielding 7.1 acres of credit at a 1:1 mitigation ratio. The upland buffer totals 2.3 acres yielding 0.46 acres of credit at a 5:1 ratio. The site has earned 7.56 total mitigation credit acres.

**Table 6. Summary of wetland credits as of 2011.**

| ACREAGE OF WETLAND AND UPLAND HABITATS | 2011 DELINEATED WETLANDS (acres) | 2011 CREDIT ACRES (acres) |
|---|---|---|
| Emergent Wetland | 7.10 | 7.10 |
| Upland Buffer | 2.30 | 0.46 |
| **Total Credits** | 9.40 | 7.56 |

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# Appendix A

Figures 2 and 3

**2011 MDT Wetland Mitigation Monitoring**
**Nashua East**
**Valley County, Montana**




GRAPHICAL REPRESENTATION MAY OR MAY NOT DEPICT THE LEGAL DESCRIPTION OF ANY PARCEL HEREIN. THIS FIGURE IS A VISUAL AID ONLY; BOUNDARY RESTORATION MUST BE MADE BY A LICENSED LAND SURVEYOR. THIS FIGURE IS INTENDED TO DISPLAY INFORMATION RELEVANT TO THE REFERENCED REPORT. CONFLUENCE 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.

LOCATION: Valley Co., MT

PROJECT NO: MDT.004

FILE: Nashua/Monitor2011.mxd

*Project Name*
Nashua East Mitigation Site

*Drawing Title*
2011 Monitoring Activity Locations

| DRAWN | CHECKED: | APPPROVED: |
|---|---|---|
| BV | BS | JJ |

SCALE: Noted

Drawn: September 19, 2011

PROJ MGR: B Sandefur

CONFLUENCE
consulting incorporated

Figure
2

REV -

# Figure 3: 2011 Mapped Site Features

## Vegetation Community Types

1 Agropyron smithii/Rumex crispus
2 Typha latifolia
3 Alopecurus pratensis
4 Salix planifolia

## Acreages

| | |
|---|---|
| Project Area | 9.4 acres |
| Created Wetlands | 7.1 acres |
| Upland Buffer | 2.3 acres |




## Legend

Monitoring Limits
Wetland Limits
Vegetation Communities

*Base Photography Date: August 17, 2011*

Noxious Weeds
**Cirsium arvense**
**Tamarix ramosissima**
Infestation SIze
X = <0.1 acre
▲ = 0.1 to 1 acre
■ = 1 to 5 acre
Cover Class
T = Trace (<1% cover)
L = Low (1-5% cover)
M = Moderate (5-25% cover)
H = High (25-100% cover)

N

0 50 100 200
Feet

GRAPHICAL REPRESENTATION MAY OR MAY NOT DEPICT THE LEGAL DESCRIPTION OF ANY PARCEL HEREIN. THIS FIGURE IS A VISUAL AID ONLY; BOUNDARY RESTORATION MUST BE MADE BY A LICENSED LAND SURVEYOR. THIS FIGURE IS INTENDED TO DISPLAY INFORMATION RELEVANT TO THE REFERENCED REPORT. CONFLUENCE 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.

LOCATION: Valley Co., MT
PROJECT NO: MDT.004
FILE: Nashua/Veg2011.mxd

*Project Name*
Nashua East Mitigation Site

*Drawing Title*
2011 Mapped Site Features

| | | | |
|---|---|---|---|
| DRAWN BV | CHECKED BCS | APPPROVED JJ | |
| SCALE: Noted | | | |
| Drawn: September 19, 2011 | | | |
| PROJ MGR: B Sandefur | | | |

CONFLUENCE
consulting incorporated

Figure 3

REV -

# Appendix B

2011 MDT Wetland Mitigation Site Monitoring Form
2011 USACE Wetland Determination Data Forms – Great Plains
2011 MDT Montana Wetland Assessment Form

**2011 MDT Wetland Mitigation Monitoring**
**Nashua East**
**Valley County, Montana**

## MDT WETLAND MITIGATION SITE MONITORING FORM

Project Site: Nashua East Assessment Date/Time 8/11/2011 9:09:54 AM

Person(s) conducting the assessment: B. Vaughn/B. Schultz

Weather: partly cloudy Location: 4 miles east of Nashua

MDT District: Glendive Milepost: NA

Legal Description: T 27N R 42E Section(s) 3

Initial Evaluation Date: 8/11/2011 Monitoring Year: 1 #Visits in Year: 1

Size of Evaluation Area: 9.4 (acres)

Land use surrounding wetland:

agricultural (grazing), Hwy 2 on south boundary

### HYDROLOGY

Surface Water Source: groundwater, precipitation

Inundation: ☑ Average Depth: 1 **(ft)** Range of Depths: 0.5 to 2.5 **(ft)**

Percent of assessment area under inundation: 70 %

Depth at emergent vegetation-open water boundary: 0.8 **(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**:**

Saturation w/in 12" of ground surface, high water table, hydrogen sulfide odor, and geomorphic position.

#### Groundwater Monitoring Wells

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

| Well ID | Water Surface Depth (ft) |
|---|---|
| No wells | |

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:**

Wetland depression inundated in August 2011.

## VEGETATION COMMUNITIES

**Site** Nashua East

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

* Indicates accepted spp name not on '88 list.

**Community #** 1 **Community Type:** Agropyron smithii / Rumex crispus **Acres:** 2.29

| Species | Cover class | Species | Cover class |
|---|---|---|---|
| Agropyron smithii | 5 | Agropyron trachycaulum | 1 |
| Artemisia cana | 1 | Artemisia frigida | 1 |
| Bare ground | 2 | Bromus inermis | 1 |
| Cirsium arvense | 0 | Grindelia squarrosa | 1 |
| Helianthus annuus | 2 | Hordeum jubatum | 1 |
| Iva axillaris | 1 | Kochia scoparia | 1 |
| Lactuca serriola | 0 | Medicago sativa | 0 |
| Poa arida | 1 | Rumex crispus | 3 |
| Tamarix ramosissima | 0 | Thlaspi arvense | 1 |

**Comments:**

Upland community surrounding wetland cell. Approx. 75 % cover except in northwest corner where bare ground encompasses 50% of total cover.

**Community #** 2 **Community Type:** Typha latifolia / **Acres:** 6.44

| Species | Cover class | Species | Cover class |
|---|---|---|---|
| Agropyron trachycaulum | 1 | Algae, green | 2 |
| Alisma plantago-aquatica | 3 | Alopecurus pratensis | 2 |
| Beckmannia syzigachne | 2 | Eleocharis palustris | 3 |
| Iva axillaris | 0 | Myriophyllum spp. | 1 |
| Open water | 3 | Populus trichocarpa* | 1 |
| Salix exigua | 1 | Salix planifolia | 2 |
| Scirpus acutus | 2 | Scirpus maritimus | 2 |
| Typha latifolia | 5 | | |

**Comments:**

Comm. 2 encompasses the constructed, shallow open water depression (less than 2.0 feet deep) with a predominance of cattail.

**Community #** 3 **Community Type:** Alopecurus pratensis / **Acres:** 0.59

| Species | Cover class | Species | Cover class |
|---|---|---|---|
| Agropyron trachycaulum | 1 | Alopecurus pratensis | 5 |
| Bare ground | 2 | Beckmannia syzigachne | 1 |
| Hordeum jubatum | 1 | Melilotus officinalis | 0 |
| Rumex crispus | 3 | | |

**Comments:**

Comm. 3 encompasses narrow community between 1 and 2 located primarily on west and northwest edges of wetland cell.

**Community #** 4 **Community Type:** Salix planifolia / **Acres:** 0.07

| Species | Cover class | Species | Cover class |
|---|---|---|---|
| Alisma plantago-aquatica | 1 | Beckmannia syzigachne | 1 |
| Populus trichocarpa* | 1 | Salix exigua | 3 |
| Salix planifolia | 5 | | |

**Comments:**

Small willow community formed from volunteers located on the west, southwest, east, southeast, and south sides of the open water depression.

***Total Vegetation Community Acreage*** **9.39**

***(Note: some area within the project bounds may be open water or other non-vegetative ground cover.)***

## VEGETATION TRANSECTS

**Site:** Nashua East Date: 8/11/2011 9:09:54 AM

**Transect Number:** 1 **Compass Direction from Start:** 0

**Interval Data:**

**Ending Station** 63 **Community Type:** Agropyron smithii / Rumex crispus

| Species | Cover class | Species | Cover class |
|---|---|---|---|
| Agropyron smithii | 5 | Bromus inermis | 1 |
| Grindelia squarrosa | 0 | Hordeum jubatum | 1 |
| Rumex crispus | 3 | | |

**Ending Station** 817 **Community Type:** Typha latifolia /

| Species | Cover class | Species | Cover class |
|---|---|---|---|
| Alisma plantago-aquatica | 1 | Beckmannia syzigachne | 1 |
| Eleocharis palustris | 2 | Open water | 3 |
| Populus trichocarpa* | 1 | Salix exigua | 2 |
| Salix planifolia | 2 | Scirpus acutus | 1 |
| Typha latifolia | 5 | | |

**Ending Station** 826 **Community Type:** Alopecurus pratensis /

| Species | Cover class | Species | Cover class |
|---|---|---|---|
| Alopecurus pratensis | 5 | Rumex crispus | 1 |

**Ending Station** 863 **Community Type:** Agropyron smithii / Rumex crispus

| Species | Cover class | Species | Cover class |
|---|---|---|---|
| Agropyron smithii | 2 | Bare ground | 4 |
| Helianthus annuus | 0 | Hordeum jubatum | 1 |
| Kochia scoparia | 2 | Lactuca serriola | 3 |
| Poa arida | 0 | Rumex crispus | 1 |
| Thlaspi arvense | 0 | | |

Transect Notes:

## PLANTED WOODY VEGETATION SURVIVAL

Nashua East

| Planting Type | #Planted | #Alive | Notes |
|---|---|---|---|

## Comments

The site was seeded. A small Salix planifolia and exigua community (Type 4) has voluntarily established on the south and west edges of the depression wetland.

Nashua East

## WILDLIFE

### Birds

Were man-made nesting structures installed? No

If yes, type of structure: _____

How many? _____

Are the nesting structures being used? No

Do the nesting structures need repairs? No

Nesting Structure Comments:

| Species | #Observed | Behavior | Habitat |
|---|---|---|---|
| Red-winged Blackbird | 4 | FO, L | MA, OW |
| Western Meadowlark | 1 | L | MA, OW |

**Bird Comments**

**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 |
|---|---|---|---|---|---|
| Deer Sp. | | Yes | No | No | |
| Northern Leopard Frog | 30 | No | No | No | |
| Raccoon | | Yes | No | No | |

**Wildlife Comments:**

Site border Highway 2, potentially limiting wildlife use from south. Open wildlife corridor to north of site.

Nashua East

## 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 |
|---|---|---|---|---|
| 1220 | 48.120235 | -106.292297 | 0 | t1 start looking across transect |
| 1223 | 48.121532 | -106.294197 | 21 | pp1 looking ne across typha |
| 1224 | 48.121532 | -106.294197 | 70 | pp1 looking ne-e |
| 1225 | 48.121532 | -106.294197 | 165 | pp1 looking se |
| 1226 | 48.123131 | -106.292366 | 180 | t1 end |
| 1227 | 48.121613 | -106.291008 | 180 | pp2 s |
| 1228 | 48.121613 | -106.291008 | 210 | pp2 sw |
| 1229 | 48.121613 | -106.291008 | 240 | pp2 sw-w |
| 1230 | 48.12014 | -106.292511 | 0 | N-1 |
| 1231 | 48.119938 | -106.292511 | 20 | N-2 |
| 1232 | | | | cover shot |
| 1233 | 48.120419 | -106.292099 | 315 | N-3 |

**Comments:**

Nashua East

## 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

### Functional Assessments

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

Functional Assessment Comments:

## Maintenance

Were man-made nesting structure installed at this site? No

If yes, do they need to be repaired?

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? No

If yes, are the structures in need of repair?

If yes, describe the problems below.

## WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Nashua East City/County: Valley Sampling Date: 8/11/2011

Applicant/Owner: MDT State: Montana Sampling Point: N-1

Investigator(s): B. Vaughn, B. Schultz Section, Township, Range: 3 27 N 42 E

Landform (hillslope, terrace, etc.): Flat Local relief (concave, convex, none): concave Slope (%): _____

Subregion (LRR): LRR F Lat: 48.120365 Long: -106.292456666667 Datum: WGS 84

Soil Map Unit Name: Vaeda silty clay NWI classification: _____

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: Data point located within Comm. 2 in inundated edge of open water.

### VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: ____) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. | 0 | ☐ | |
| 2. | 0 | ☐ | |
| 3. | 0 | ☐ | |
| 4. | 0 | ☐ | |
| | 0 = Total Cover | | |
| **Sapling/Shrub Stratum (Plot size: 15ft)** | | | |
| 1. Salix exigua | 5 | ☑ | FACW+ |
| 2. Salix planifolia | 20 | ☑ | OBL |
| 3. | 0 | ☐ | |
| 4. | 0 | ☐ | |
| 5. | 0 | ☐ | |
| | 25 = Total Cover | | |
| **Herb Stratum (Plot size: 5 ft)** | | | |
| 1. Eleocharis palustris | 30 | ☑ | OBL |
| 2. Typha latifolia | 20 | ☑ | OBL |
| 3. Rumex crispus | 1 | ☐ | FACW |
| 4. Beckmannia syzigachne | 7 | ☐ | OBL |
| 5. Alopecurus pratensis | 5 | ☐ | FACW |
| 6. Alisma plantago-aquatica | 3 | ☐ | OBL |
| 7. Agropyron smithii | 10 | ☐ | FACU |
| 8. | 0 | ☐ | |
| 9. | 0 | ☐ | |
| 10. | 0 | ☐ | |
| | 76 = Total Cover | | |
| **Woody Vine Stratum (Plot size: ____)** | | | |
| 1. | 0 | ☐ | |
| 2. | 0 | ☐ | |
| | 0 = Total Cover | | |

% Bare Ground in Herb Stratum 10

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | | Multiply by: | |
|---|---|---|---|
| OBL species | 80 | x 1 = | 80 |
| FACW species | 11 | x 2 = | 22 |
| FAC species | 0 | x 3 = | 0 |
| FACU species | 10 | x 4 = | 40 |
| UPL species | 0 | x 5 = | 0 |
| Column Totals: | 101 (A) | | 142 (B) |

Prevalence Index = B/A = 1.41

**Hydrophytic Vegetation Indicators:**

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☑ 3 - Prevalence Index is ≤3.0[1]
- ☐ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Hydrophytic Vegetation Present?** Yes ☑ No ☐

Remarks:

## SOIL

Sampling Point: N-1

**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 |
|---|---|---|---|---|---|---|---|---|
| 0-12 | N 4/N | 60 | C M | 7.5YR | 4/4 | 40 | 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:

## 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): 2

Water Table Present? Yes ☑ No ☐ Depth (inches): 0

Saturation Present? (includes capillary fringe) Yes ☑ No ☐ Depth (inches): 0

**Wetland Hydrology Present?** Yes ☑ No ☐

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

Remarks:

## WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Nashua East City/County: Valley Sampling Date: 8/11/2011

Applicant/Owner: MDT State: Montana Sampling Point: N-2

Investigator(s): B.Vaughn, B. Schultz Section, Township, Range: 3 27N 42E

Landform (hillslope, terrace, etc.): Flat Local relief (concave, convex, none): concave Slope (%): _____

Subregion (LRR): LRR F Lat: 48.1203866666667 Long: -106.29238 Datum: WGS 84

Soil Map Unit Name: Vaeda silty clay NWI classification: _____

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 ☑

Hydric Soil Present? Yes ☐ No ☑

Wetland Hydrology Present? Yes ☐ No ☑

**Is the Sampled Area within a Wetland?** Yes ☐ No ☑

Remarks: Located in Comm 1, upland, upslope from water's edge and Comm. 2

### VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: ) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. | 0 | ☐ | |
| 2. | 0 | ☐ | |
| 3. | 0 | ☐ | |
| 4. | 0 | ☐ | |
| | 0 = Total Cover | | |
| **Sapling/Shrub Stratum** (Plot size: ) | | | |
| 1. | 0 | ☐ | |
| 2. | 0 | ☐ | |
| 3. | 0 | ☐ | |
| 4. | 0 | ☐ | |
| 5. | 0 | ☐ | |
| | 0 = Total Cover | | |
| **Herb Stratum** (Plot size: 5 ft.) | | | |
| 1. Rumex crispus | 30 | ☑ | FACW |
| 2. Agropyron smithii | 60 | ☑ | FACU |
| 3. | 0 | ☐ | |
| 4. | 0 | ☐ | |
| 5. | 0 | ☐ | |
| 6. | 0 | ☐ | |
| 7. | 0 | ☐ | |
| 8. | 0 | ☐ | |
| 9. | 0 | ☐ | |
| 10. | 0 | ☐ | |
| | 90 = Total Cover | | |
| **Woody Vine Stratum** (Plot size: ) | | | |
| 1. | 0 | ☐ | |
| 2. | 0 | ☐ | |
| | 0 = Total Cover | | |

% Bare Ground in Herb Stratum 10

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 1 (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | | Multiply by: | |
|---|---|---|---|
| OBL species | 0 | x 1 = | 0 |
| FACW species | 30 | x 2 = | 60 |
| FAC species | 0 | x 3 = | 0 |
| FACU species | 60 | x 4 = | 240 |
| UPL species | 0 | x 5 = | 0 |
| Column Totals: | 90 (A) | | 300 (B) |

Prevalence Index = B/A = 3.33333

**Hydrophytic Vegetation Indicators:**

☐ 1 - Rapid Test for Hydrophytic Vegetation

☐ 2 - Dominance Test is >50%

☐ 3 - Prevalence Index is ≤3.0[1]

☐ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Hydrophytic Vegetation Present?** Yes ☐ No ☑

Remarks:

## SOIL

Sampling Point: N-2

**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 |
|---|---|---|---|---|---|---|---|---|
| 0-7 | 10YR 3/2 | 100 | | | | | Clay Loam | |
| 7-15 | 10YR 4/1 | 100 | | | | | 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 hydric soil indicators. Low chroma but no redox features.

## 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 indicators of wetland hydrology.

## WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Nashua East | City/County: Valley | Sampling Date: 8/11/2011

Applicant/Owner: MDT | State: Montana | Sampling Point: N-3

Investigator(s): B.Vaughn, B. Schultz | Section, Township, Range: 3

Landform (hillslope, terrace, etc.): Flat | Local relief (concave, convex, none): concave | Slope (%): _____

Subregion (LRR): MLRA 62 | Lat: 48.1203983333333 | Long: -106.292205 | Datum: WGS 84

Soil Map Unit Name: Vaeda silty clay | NWI classification: _____

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: Data point in Comm. 3., transitional community within two horizontal feet and 0.5 vertical feet near edge of open water.

### VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: _____) | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. | 0 | ☐ | |
| 2. | 0 | ☐ | |
| 3. | 0 | ☐ | |
| 4. | 0 | ☐ | |
| | 0 = Total Cover | | |
| **Sapling/Shrub Stratum** (Plot size: _____) | | | |
| 1. | 0 | ☐ | |
| 2. | 0 | ☐ | |
| 3. | 0 | ☐ | |
| 4. | 0 | ☐ | |
| 5. | 0 | ☐ | |
| | 0 = Total Cover | | |
| **Herb Stratum** (Plot size: 5 ft) | | | |
| 1. Beckmannia syzigachne | 25 | ☑ | OBL |
| 2. Alopecurus pratensis | 40 | ☑ | FACW |
| 3. Rumex crispus | 15 | ☐ | FACW |
| 4. Agropyron smithii | 15 | ☐ | FACU |
| 5. Typha latifolia | 10 | ☐ | OBL |
| 6. Eleocharis palustris | 3 | ☐ | OBL |
| 7. Salix exigua | 3 | ☐ | FACW+ |
| 8. | 0 | ☐ | |
| 9. | 0 | ☐ | |
| 10. | 0 | ☐ | |
| | 111 = Total Cover | | |
| **Woody Vine Stratum** (Plot size: _____) | | | |
| 1. | 0 | ☐ | |
| 2. | 0 | ☐ | |
| | 0 = Total Cover | | |

% Bare Ground in Herb Stratum 0

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 2 (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | | Multiply by: | |
|---|---|---|---|
| OBL species | 38 | x 1 = | 38 |
| FACW species | 58 | x 2 = | 116 |
| FAC species | 0 | x 3 = | 0 |
| FACU species | 15 | x 4 = | 60 |
| UPL species | 0 | x 5 = | 0 |
| Column Totals: | 111 (A) | | 214 (B) |

Prevalence Index = B/A = 1.92793

**Hydrophytic Vegetation Indicators:**

☐ 1 - Rapid Test for Hydrophytic Vegetation

☑ 2 - Dominance Test is >50%

☑ 3 - Prevalence Index is ≤3.0[1]

☐ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Hydrophytic Vegetation Present?** Yes ☑ No ☐

Remarks:

## SOIL

Sampling Point: N-3

**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 |
|---|---|---|---|---|---|---|---|---|
| 0-7 | 10YR 4/1 | 97 | C M | 10YR | 5/4 | 3 | Clay Loam | |
| 7-12 | 10YR 4/1 | 95 | C M | 7.5YR | 4/4 | 5 | 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:

## 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): 0

**Wetland Hydrology Present?** Yes ☑ No ☐

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

Remarks: Saturation to ground surface. Tight clay soil. Site hydrology driven by surface water rather than groundwater. No apparent water table within test pit.

# MDT Montana Wetland Assessment Form (revised March 2008)

**1. Project name** Nashua East **2. MDT project#** NH 1-9(39)555 **Control#** 2144

**3. Evaluation Date** 8/11/2011 **4. Evaluators** B.Vaughn, B.Schultz **5. Wetland/Site# (s)** Wetland Cell Creation

**6. Wetland Location(s):** **T** 27N **R** 42E **Sec1** 3 **T** **R** **Sec2**

**Approx Stationing or Mileposts**

**Watershed** 10050012 **Watershed/County** Lower Missouri River Watershed/Valley County

**7. Evaluating Agency** Confluence for MDT

**8. Wetland size acres** 7.1

**Purpose of Evaluation**

**How assessed:** Measured e.g. by GPS

☐ **Wetlands potentially affected by MDT project**

**9. Assesssment area (AA) size (acres)** 7.1

☐ **Mitigation Wetlands: pre-construction**

**How assessed:** Measured e.g. by GPS

☑ **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 |
|---|---|---|---|---|
| Depressional | Emergent Wetland | Excavated | Permanent/Perennial | 61 |
| Depressional | Emergent Wetland | Excavated | Seasonal/Intermittant | 8 |
| Depressional | Aquatic Bed | Excavated | Permanent/Perennial | 30 |
| Depressional | Scrub-Shrub Wetland | Excavated | Seasonal/Intermittant | 1 |
| | | | | |
| | | | | |

**11. Estimated Relative Abundance** Abundant

**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 | 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)**

Surrounding property grazed. The south and west boundaries of the site are located less than 200 feet from Highway 2. Mitigation site currently managed in predominantly natural state.

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

Cirsium arvense and single Tamarisk (Priority 2B); Lactuca serriola and Kochia scoparia (Exotic).

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

AA encompasses entire constructed wetland cell surrounded with upland buffer. Majority of cell inundated during August 2011 site visit. Shoreline well-vegetated. High percent cover of bare ground in upland buffter on north edge of property.

**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 vegetation class.Aquatic bed class w/ 30% cover. One % cover scrub-shrub class (Salix planifolia).

## 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** Not listed by USFWS for county.

**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

**Secondary habitat (list Species)** ○ D ◉ S Great blue heron (S3)

**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** MTNHP identified heron for AA township and range.Usage common by heron in similar wetlands. Note N. leopard frog (S4) onsite.

**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** Few wildlife observations during August field visit (hot temps.). Blackbird and Western meadow lark and raccoon & deer tracks observed. MDT biologist noted high waterfowl use at dawn and dusk throughout the growing season.

---

**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**

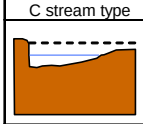
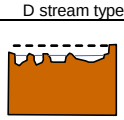
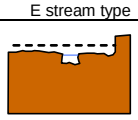
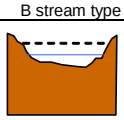
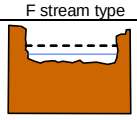
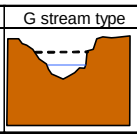
**iii. Final Score and Rating:** 0 NA **Comments:** Site is primarily a wetland depression w/o SW inlet or outlet

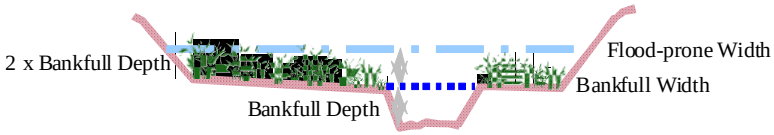
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**14E. Flood Attenuation:** (Applies only to wetlands subject to flooding via in-channel or overbank flow. If wetlands in AA are not flooded from in-channel or overbank flow, click ☑ **NA** here and proceed to 14F.)

**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 |
|  |  |  |  |  |  |  |




**Floodrpone 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:**

---

**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:** Wetland cell inundated in August 2011. Rating assumed 7 acres flooded to a depth of at least 1 foot.

**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:** Site is a depression wetland with no outlet except overland flow. The wetland vegetation cover was greater than 70%.

**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:** Cell shoreline subject to wave action and primarily vegetated with Typha, Scirpus, Eleocharis, and Salix species.

**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** | .9 | .6M | .7H | .4 | .5M | .3L | .8H | .5M | .6M | .3L | .4M | .2L | .7H | .5M | .5M | .3L | .3L | .2L |
| **T/E/A** | .8 | .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:** Veg comp=7, 14I, (i)=M, P/P regime, no surface outlet.

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

**i. Discharge Indicators**

- ☐ The AA is a slope wetland
- ☐ Springs or seeps are known or observed
- ☐ 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**

- ☐ Permeable substrate present without underlying impeding layer
- ☐ 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:** Majority of depression was inundated. Shoreline was saturated to surface.

**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:**

**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:**

Small size, limited access, and lack of diversity limit use as recreation/education area.

**General Site Notes**

Extent of scrub-shrub community expected to increase over time.

**FUNCTION & VALUE SUMMARY & OVERALL RATING FOR WETLAND/SITE #(S):** Wetland Cell Creation

| 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 | ☐ |
| B. MT Natural Heritage Program Species Habitat | M | .5 | 1 | 3.55 | ☐ |
| C. General Wildlife Habitat | H | .9 | 1 | 6.39 | ☐ |
| D. General Fish Habitat | NA | 0 | 0 | 0 | ☐ |
| E. Flood Attenuation | NA | 0 | 0 | 0 | ☐ |
| F. Short and Long Term Surface Water Storage | H | 1 | 1 | 7.1 | ☑ |
| G. Sediment/Nutrient/Toxicant Removal | H | 1 | 1 | 7.1 | ☑ |
| H. Sediment/Shoreline Stabilization | H | 1 | 1 | 7.1 | ☑ |
| I. Production Export/Food Chain Support | M | .6 | 1 | 4.26 | ☐ |
| J. Groundwater Discharge/Recharge | H | 1 | 1 | 7.1 | ☑ |
| K. Uniqueness | L | .3 | 1 | 2.13 | ☐ |
| L. Recreation/Education Potential (bonus points) | NA | 0 | NA | 0 | ☐ |
| Totals: | | 6.3 | 9 | 44.73 | |
| Percent of Possible Score | | | **70** % | | |

**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

| I | II | III | IV |
|---|---|---|---|

# Appendix C

Project Site Photographs

**2011 MDT Wetland Mitigation Monitoring**
**Nashua East**
**Valley County, Montana**




**Photo Point 1**– *Photo 1*
**Bearing:** 21 Degrees
**Location:** W property corner
**Taken in 2011**




**Photo Point 1**– *Photo 2*
**Bearing:** 70 Degrees
**Location:** W property corner
**Taken in 2011**




**Photo Point 1**– *Photo 3*
**Bearing:** 165 Degrees
**Location:** W property corner
**Taken in 2011**




**Photo Point 2**– *Photo 1*
**Bearing:** 180 Degrees
**Location:** E property corner
**Taken in 2011**




**Photo Point 2**– *Photo 2*
**Bearing:** 210 Degrees
**Location:** E property corner
**Taken in 2011**




**Photo Point 2**– *Photo 3*
**Bearing:** 240 Degrees
**Location:** E property corner
**Taken in 2011**




**Transect 1**– *Start* **Location:**
**Bearing:** 0 Degrees **Taken in 2011**




**Transect 1**– *End* **Location:**
**Bearing:** 180 Degrees **Taken in 2011**




**Data Point**– *N-1* **Location:** Community 2
**Bearing:** 0 **Taken in 2011**




**Data Point**– *N-2* **Location:** Community 1
**Bearing:** 20 **Taken in 2011**




**Data Point**– *N-3*
**Bearing:** 315

**Location:** Community 3
**Taken in 2011**