STATE OF COLORADO

Ebert - DNR, Jared <jared.ebert@state.co.us>

Restoration Plan

1 message

Manuel Agripino <manny@melmanenvironmentalcorporation.com> Tue, Jul 16, 2024 at 4:08 PM
To: "Hays - DNR, Peter" <peter.hays@state.co.us>
Cc: "jared.ebert@state.co.us" <jared.ebert@state.co.us>

Here is the Restoration Plan for Two Rivers Milliken

All the Best

Manny

MELMAN
Environment Corporation

Manuel Agripino M. Ed

Vice President

manny@melmanenvironmentalcorporation.com

(720) 315-2491

Restoration and Mitigation Plan - 2 Rivers Fourth Submittal.pdf
19381K

Restoration and Mitigation Plan

Two Rivers Mine at Nature's Park
Town of Milliken, Weld County, Colorado

First Submission: November 18th, 2020
EPA Review and Comments: July 8th, 2021
Second Submission: September 3rd, 2021
EPA Review and Comments: May 25th, 2022
Third Submission: August 25th, 2023
EPA Review and Comments: January 19th, 2024
Fourth Submission: April 5th, 2024

I hereby certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine or imprisonment for knowing violations.

Prepared By:

Greg Sherman, P.G.
President
Western Environment and Ecology, Inc.
2217 West Powers Avenue,
Littleton, Colorado 80120

Brendan Calonge
Senior Staff Scientist
Western Environment and Ecology, Inc.
2217 West Powers Avenue,
Littleton, Colorado 80120

Executive Summary

- In accordance with the US Environmental Protection Agency Region 8 (EPA) Administrative Order on Consent (Consent Order) Docket Number CWA-08-2021-0003, dated November 5th, 2020, Western Environment and Ecology, Inc. (Western Environment) has prepared the following restoration and mitigation plan for the disturbed wetlands at the 2 Rivers at Nature Park property, Milliken, Colorado.

    - As detailed in this Restoration and Mitigation Plan, the disturbance totals approximately 20.0 acres of wetlands, including approximately 10.0 acres of Riparian habitat and 10.0 acres of Herbaceous habitat.

    - The proposed mitigation will include approximately 25.0 acres or 1,089,000 square feet of enhancement and establishment of new wetlands.

- This Restoration and Mitigation Plan was prepared in accordance with the U.S. Army Corps of Engineers and the Environmental Protection Agency regulations (40 CFR Part 230, and 33 CFR Parts 325 and 332) entitled, "Compensatory Mitigation for Losses of Aquatic Resources". April 10th, 2008 (Final Mitigation Rule) and the U.S. Environmental Protection Agency, Region 8 Clean Water Act § 404 Enforcement: Removal/Restoration Plans and Habitat Mitigation/Monitoring Proposals.

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Appendices

Contact Information:

Environmental Consultant:
Brendan Calonge, Senior Staff Scientist
Western Environment and Ecology, Inc.
2217 West Powers Avenue,
Littleton, Colorado 80120
Phone: 303-730-3452
Email: brendan@westernenvironment.com

Mitigation Construction :
Western Equipment and Truck, Inc.
and approved/experienced subcontractors
2055 1st Avenue
Greeley, Colorado 90631
Email: sales@wetrucks.com

Development Consultants:
Colin Geminden, P.E.
Rocky Ridge Civil Engineering
420 21st Avenue , Suite 101
Longmont, Colorado 80501
Phone: 303-651-6626
Email: colin@rockyridgecivil.com

Property Owner:
Western Equipment and Truck, Inc.
2055 1st Avenue
Greeley, Colorado 90631
Email: sales@wetrucks.com

Lead Counsel for Property Owner:
William Hughes
Winters, Hughes and Laue, LLC
5587 West 19th Street, Suite 101
Greeley, Colorado 80634
Phone: 970-352-7800
Email: whughes@wh-h.com

Applicable Reviewing Agencies:

U.S. Environmental Protection Agency, Region 8
Rebecca Little Owl
Enforcement and Compliance Assurance Division
1595 Wynkoop Street
Denver, Colorado 80202

U.S. Fish and Wildlife Service
Drue DeBerry
Ecological Services
Colorado Field Office
P.O. Box 25486, DFC (MS 65412)
Denver, Colorado 80225-0486

Town of Milliken
1101 Broad Street
Milliken, CO 80543

Colorado Department of Public Health and Environment
Joe Campbell
Water Quality Control Division
Clean Water Compliance Unit
4300 Cherry Creek Drive South
Denver, Colorado 80246

U.S. Army Corps of Engineers
Kiel Downing
Chief, Denver Regulatory Office
9307 South Wadsworth Boulevard
Littleton, Colorado 80128

Colorado Parks and Wildlife
Michael Grooms
1313 Sherman Street, 6th Floor
Denver, Colorado 80203

Colorado Division of Water Resources
Office of the State Engineer
1313 Sherman Street, Room 718
Denver, Colorado 80203

1.0 Preparation and Approval

Western Equipment and Truck, Inc., Respondent under Administrative Order on Consent, is proposing to mitigate approximately 20.00 acres of disturbed wetland on the 2 Rivers Mine at Nature Park property. The property consists of approximately 55 Acres within Section 2, Township 4 North, Range 67 West, addressed as 23344 Weld County Road 21 3/4 in the Town of Milliken, Colorado (Figure 1). The site is bisected by the Big Thompson River and bordered to the south by the Little Thompson River. The two rivers confluence in the eastern corner of the site.

On-Site Mitigation:

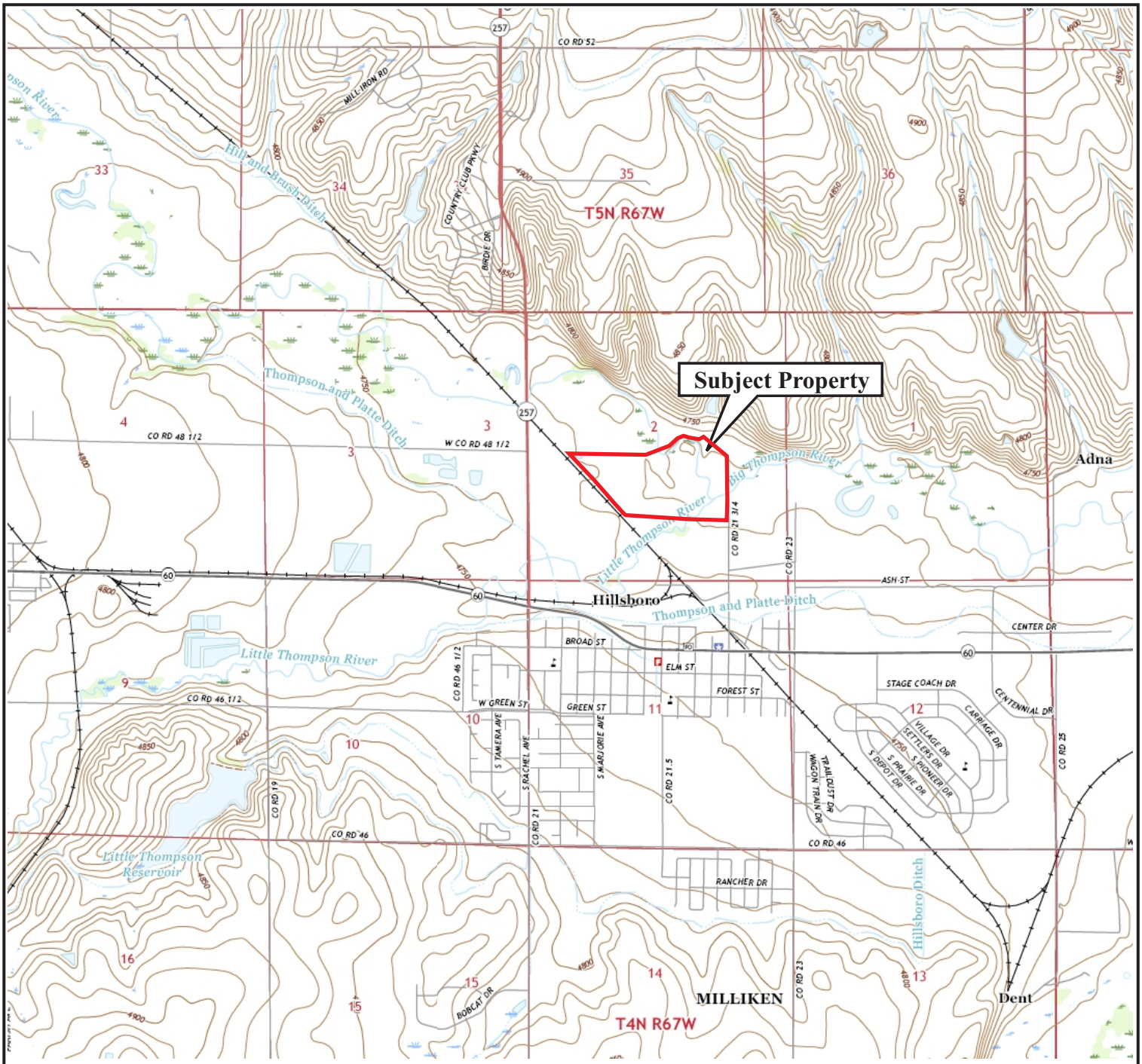
The objectives of this restoration and mitigation plan are to address compensation for prior impacts to Waters of the U.S., and detail the methods of on-site restoration, mitigation and monitoring.

Site Description:

The project area is located approximately 2,800 feet northeast of the intersection of Colorado Road 60 and Colorado Road 257 within Section 2, Township 4 North, Range 67 West (Figure 2). The project is located within the Town of Milliken, with midpoint Coordinates of approximately 40.339432° and -104.858805°.

The site occurs at an approximate elevation of 4,730 feet above sea level (USGS Milliken Quadrangle, 2019). The topography of the property is generally flat with a slight slope to the east-northeast. The National Resource Conservation Service (NRCS) classifies the site soils as predominantly Aquolls and Aquents, gravelly substratum, with Kim loam on 1 to 3 percent slopes, Dacono clay loam on 1 to 3 percent slopes, and Nunn loam on 0 to 1 percent slopes overlaying Quaternary Age Modern Alluviums including Piney Creek Alluvium and younger deposits (Green, G.N, 1992).

Site hydrology is provided by the natural path of the Big Thompson and Little Thompson Rivers. The Rivers confluence in the eastern portion of the property and connect to the South Platte River approximately 5.0 miles east.



USGS Topographic Map, Johnstown and Milliken 7.5 Minute Quadrangles, 2016

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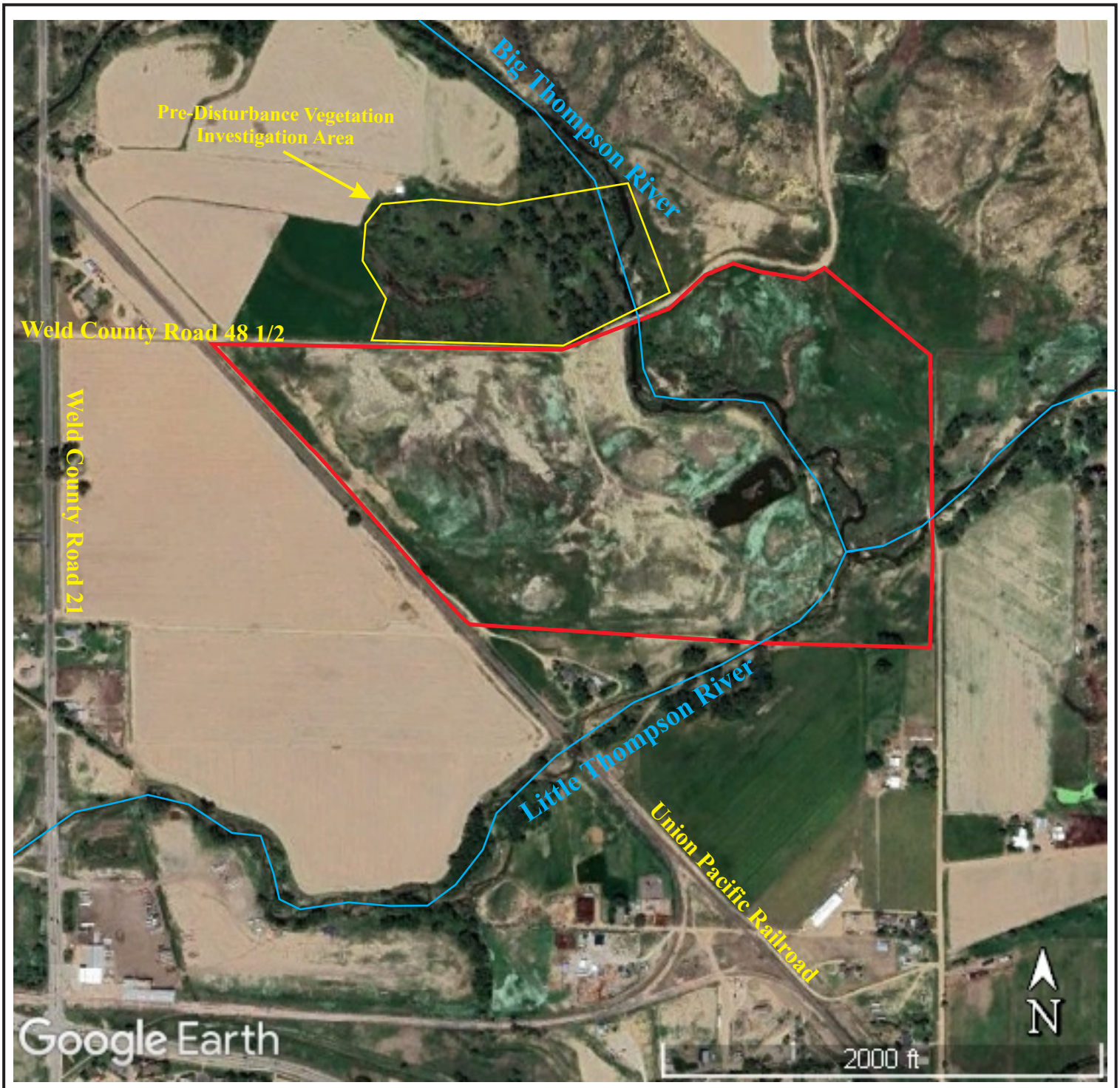
2217 West Powers Avenue
Littleton, Colorado 80120

Figure 1 - Project Location Map
23344 County Road 21 3/4
Milliken, Colorado



Google Earth Historical Aerial Photographs, 5/24/2023

Limits of Project Area

N

Approximate Scale in feet

0 500 1000

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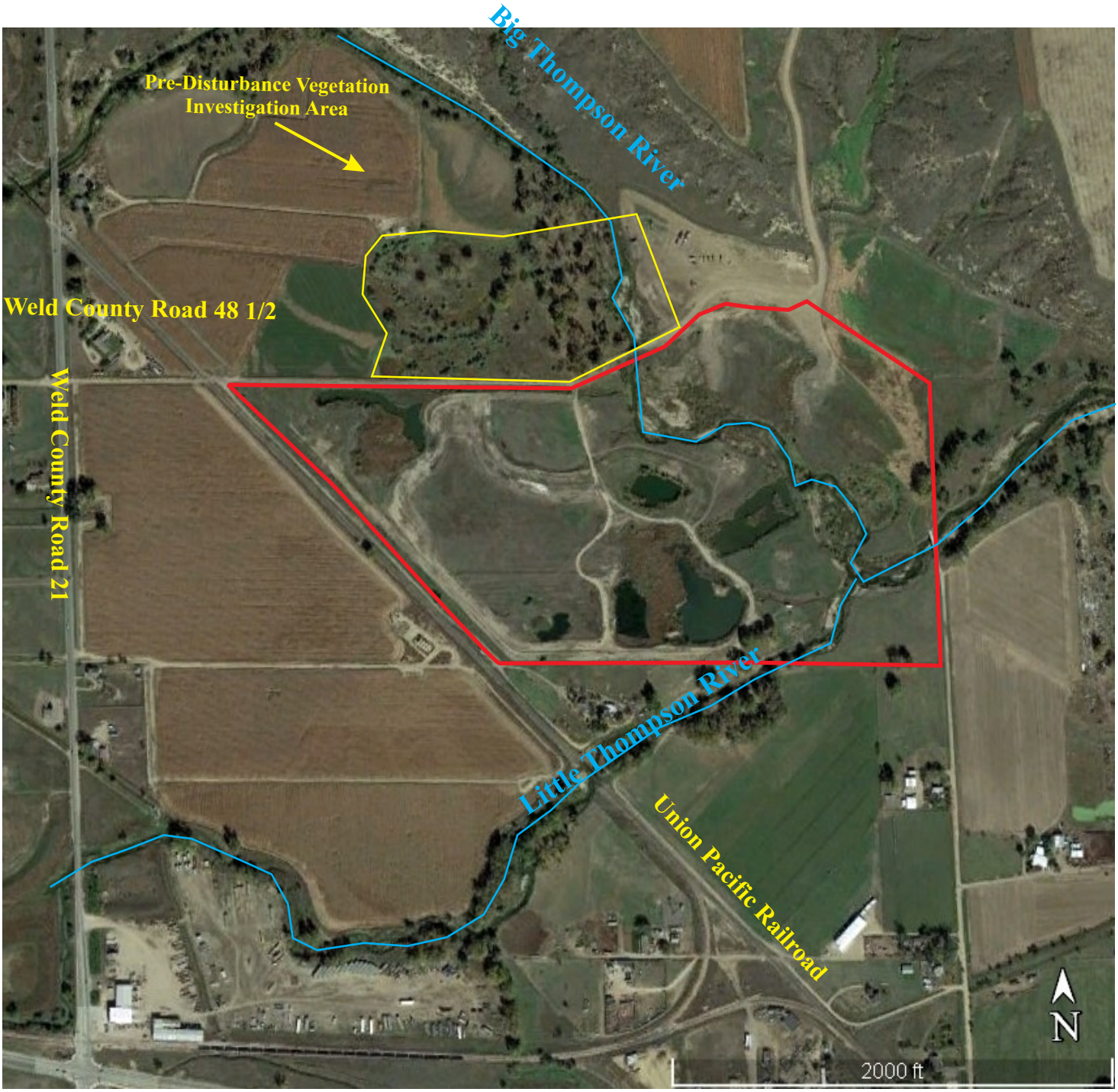
Littleton, Colorado 80120

Figure 2 - Site Map, 2023
23344 County Road 21 3/4
Milliken, Colorado



Google Earth Historical Aerial Photographs, 10/4/2017

Limits of Project Area

Approximate Scale in feet

0 500 1000

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2217 West Powers Avenue
Littleton, Colorado 80120

Figure 2A - Site Map, 2017
23344 County Road 21 3/4
Milliken, Colorado

2.0 Objectives

The following is a brief summary of impacts and proposed resource mitigation on the project site. This plan is issued as Preliminary to allow collaborative agency design input including final wetland configuration and vegetation.

Background:

Prior to the 1980s the site was used for livestock grazing and limited crop production. Additionally, it appears some minor gravel mining occurred prior to 1980. On July 18th, 1985, John Stroh, the property owner at the time, received a sand and gravel mining permit (#M1985039). Throughout the late 1980's the Stroh Gravel Mine operated producing aggregate from several small excavations. Aerial photo review indicated that mining ceased by June 1993. As a result, four small ponds were present on the site. Records maintained by the Colorado Department of Natural Resources, Mining and Safety (DMRS) show that the Stroh Mine, Permit #M1985039, was terminated indicating that reclamation was complete.

On May 20th, 2003, Western Equipment acquired full ownership of the property. Subsequently, on August 19th, 2003 Western Equipment received a mining permit (#M2002052) for the site designated The Two Rivers Rock Mine. Aerial photography confirms that active aggregate extraction from a new excavation in the southeast portion of the site had begun by May 2006. Mining continued intermittently from 2006 to late 2009. No production occurred from February 2010 to June of 2014 when a second excavation, adjacent to the west of the larger pit began. These activities ceased by late 2015 with no indication of additional extraction.

Due to lack of reporting and non-payment of fees, the Mine Land Reclamation Board requested that Western Equipment testify regarding these outstanding issues. Western Equipment chose not to testify, and therefore on July 10th, 2017, the Board revoked the Two Rivers Rock Mine, Permit #M2002052, which resulted in bond forfeiture.

On March 8th, 2018, Western Equipment submitted and requested approval of a Site Reclamation Plan for the Two Rivers Rock Mine to the DMRS. On April 30th, 2018, the Town of Milliken Certified Floodplain Manager approved a Flood Plain Development Permit (#FHDP 009) for the reclamation of the mine pit within the flood plain. Activities approved within the permit included backfill of one of the Two Rivers Rock Mine excavations with approximately 30,000 yds^3 of fill material from a borrow area northeast of the site. These permitted reclamation activities were conducted from March to August of 2018. Subsequently, an additional 35,000 yds^3 were placed, without authorization, on the site. During this un-permitted process, material was deposited within the ordinary high water mark of the Big Thompson River and within several of the small pond areas.

On December 12th, 2018, Western Equipment received a Cease and Desist Order from the Town of Milliken regarding the grading and filling activities within the floodplain. On January 10th, 2019 the Town of Milliken sent a Notice of Violation and second Cease and Desist Order, effectively revoking the #FHDP 009 permit. On August 27th, 2019, the Town of Milliken sent a second Notice of Violation and third Cease and Desist Order, which required any activity onsite would require review and approval by the US Environmental Protection Agency (EPA), US Army Corps of Engineers (ACOE), and the US Fish and Wildlife Service (FWS). On November 5th, 2020, an EPA Administrative Order on Consent (Consent Order) was executed and submitted to the EPA.

Google Earth Historical Aerial Photographs, 5/24/2023

Approximate extent of fill material

Limits of Project Area

N

Approximate Scale in feet

0 500 1000

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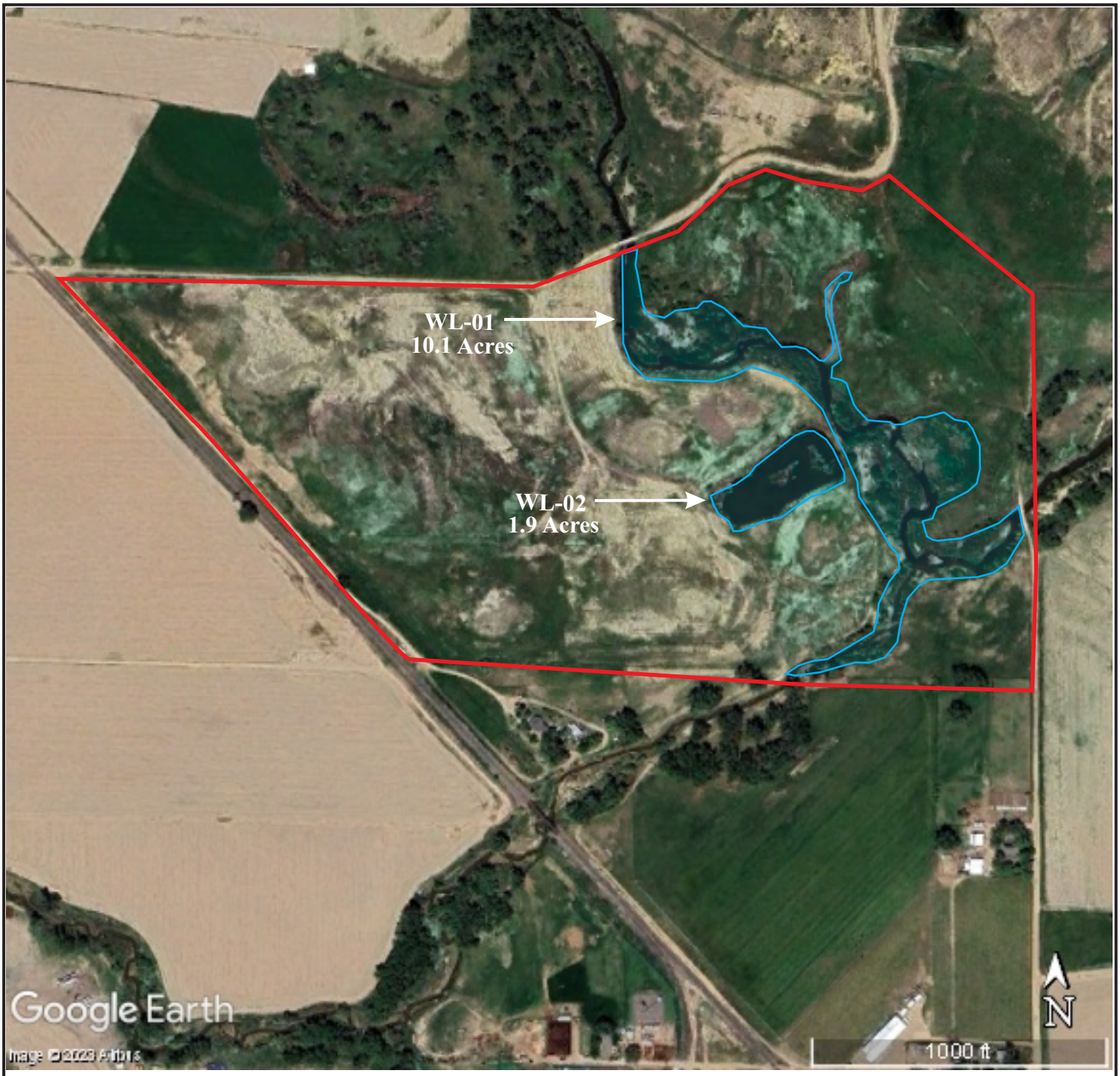
2217 West Powers Avenue
Littleton, Colorado 80120

Figure 3 - Fill Material Location Map
23344 County Road 21 3/4
Milliken, Colorado



Existing Wetland

Limits of Project Area

Google Earth Historical Aerial Photographs, 5/24/2023

N

Approximate Scale in feet

0 500 1000

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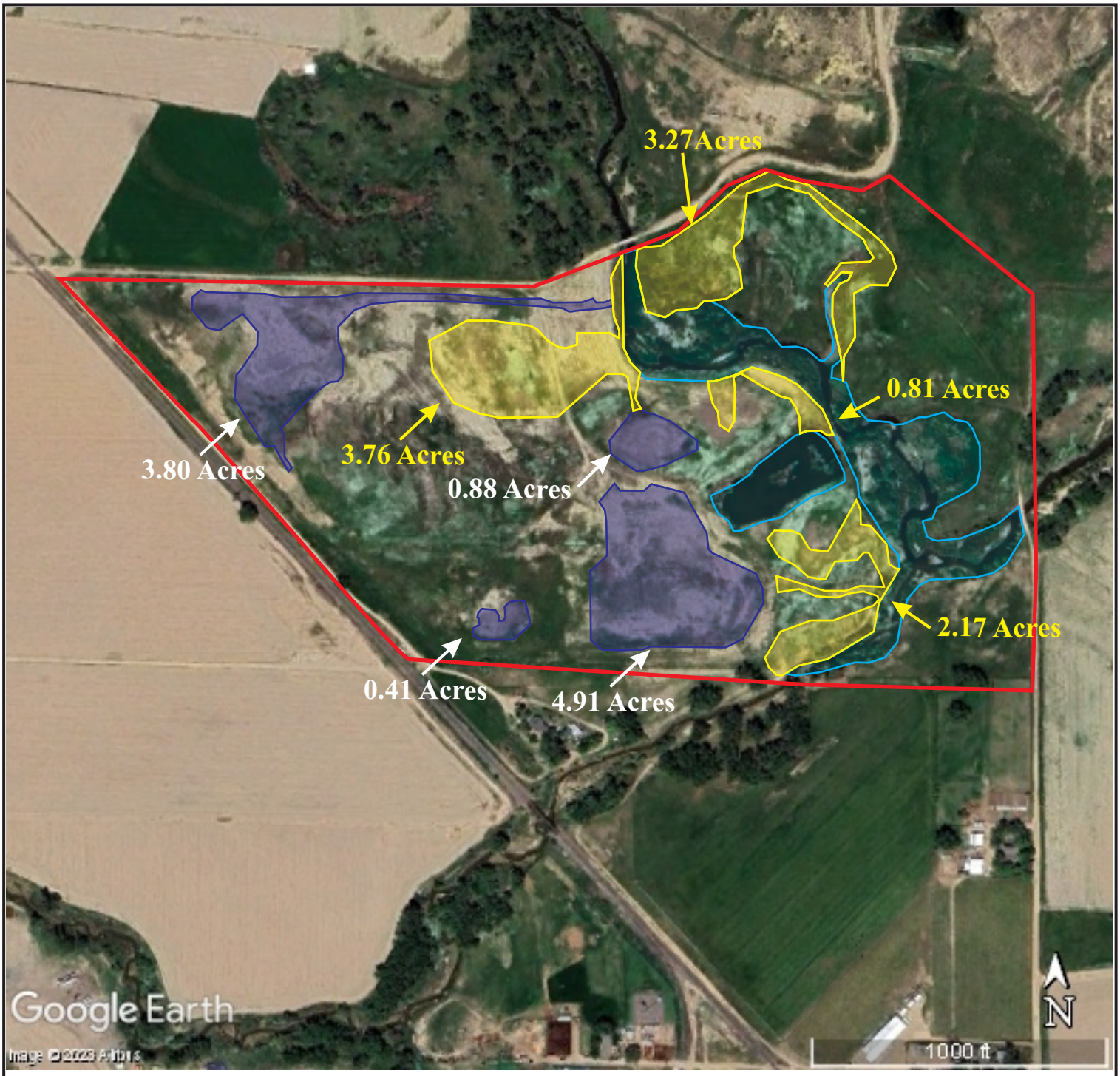
2217 West Powers Avenue
Littleton, Colorado 80120

Figure 4 - Current Site Conditions Map
23344 County Road 21 3/4
Milliken, Colorado



Existing Wetland

Disturbed Riparian Wetland

Disturbed Wetland/Open Water

Limits of Project Area

Google Earth Historical Aerial Photographs, 5/24/2023

N

Approximate Scale in feet

0 500 1000

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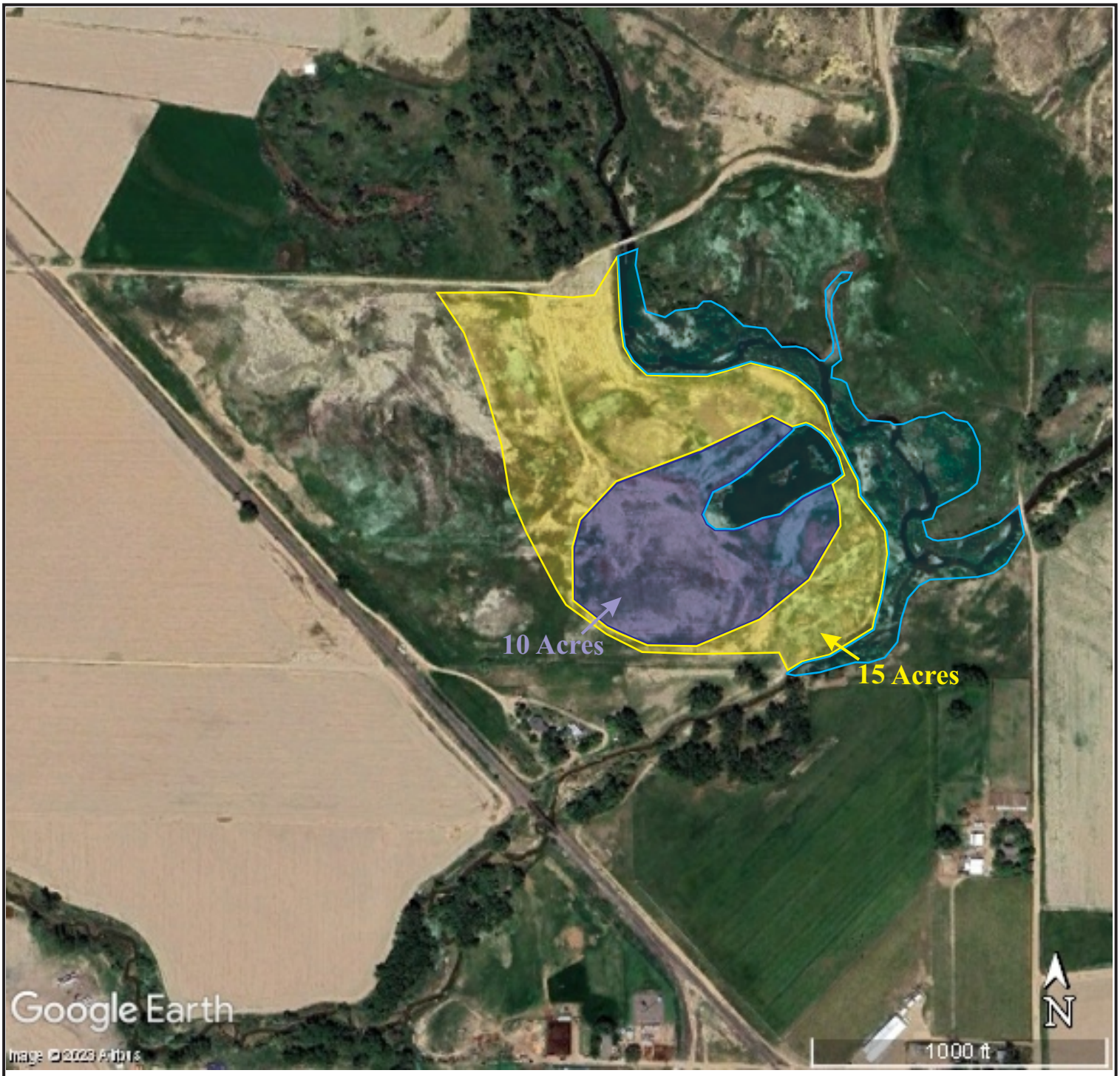
2217 West Powers Avenue
Littleton, Colorado 80120

Figure 5 - Previous Site Conditions Map
23344 County Road 21 3/4
Milliken, Colorado



Existing Wetland

Proposed Riparian Wetland

Proposed Herbaceous Wetland

Google Earth Historical Aerial Photographs, 5/24/2023

N

Approximate Scale in feet

0 500 1000

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2217 West Powers Avenue
Littleton, Colorado 80120

Figure 6 - Wetland Restoration and Mitigation Map
23344 County Road 21 3/4
Milliken, Colorado

Current Site Conditions:

Western Environment prepared a Habitat Assessment and General Ecological Survey, dated June 26th, 2020 (Appendix B) to assess current site conditions and determine impact to pre-disturbance habitat. Extensive fill was observed on the property, with the majority of the upland area graded. Fill material extended in some areas to the border of the riverbanks. The approximate extent of the fill material and grading is shown on Figure 3. Limited vegetation on the upland portion of the site was dominated by invasive weeds and volunteers, including cheatgrass, smooth brome, lambs quarters, kochia, hoary cress, curly dock, and Canada thistle. Limited populations of showy milkweed and Colorado rush were observed on the western portion of the site.

To determine the disturbance to the wetlands on the subject property, Western Environment reviewed the USFWS Wetland Mapper (Appendix E), which utilized the Cowardian System to assess wetlands, and Google Earth historical photos. Western Environment created a composite wetlands sketch of the site based upon photos dated October 3rd, 1999; October 30th, 2004; February 29th, 2008, August 18th, 2012, October 14th, 2017, Wetlands Mapper data, and from infrared imagery dated 2008. Based upon this data, Western Environment estimated an approximate total of 32 acres of wetlands occurred on the property between 1999 and 2016. Following the addition of fill, approximately 12 acres of wetlands remain onsite (Figure 4). The USFWS Wetland Mapper indicated the disturbed wetlands consisted of Forested/Shrub Riparian (Rp1FO), Freshwater Emergent (PEM1A), Riverine (R2USA), Freshwater Pond (PUBFx and PUBGx), and Freshwater Forested/Shrub (PSS1A). Western Environment concluded that "Approximately 20 acres of wetlands have been disturbed, including approximately 10.0 acres of Riparian habitat and 10.0 acres of Wetland habitat, including Upland-Wetland Transition habitat" (Habitat Assessment and General Ecological Survey, June 26th, 2020, Appendix B)

Of the approximately 12.0 acres of wetlands currently on the subject property, approximately 10.1 acres of wetlands were identified adjacent and within the Big Thompson and Little Thompson Rivers. Vegetation adjacent to the rivers was consistent with Western Great Plains Floodplain systems, dominated by grasses and forbs including western wheatgrass, saltgrass, smooth brome, prairie reed grass, cuman ragweed, and showy milkweed. Woody vegetation included plains cottonwood, peachleaf willow, and narrowleaf willow. Intermittent populations of cattails were observed along the river banks. Invasive grasses and weeds, including cheatgrass, kochia, canada thistle, curly dock, hoary cress, teasel, and lambsquarters were also observed in the riparian corridor.

An approximately 1.9 acre pond, which appeared to be a former gravel pit, was present south of the Big Thompson River. Vegetation in and adjacent to the pond included western wheatgrass, saltgrass, smooth brome, narrowleaf willow, cattail, cheatgrass, kochia, canada thistle, curly dock, hoary cress, teasel, and lambsquarters.

Approximately 20.0 acres of wetlands have been disturbed (Figure 5), including approximately 10.0 acres of Riparian habitat and 10.0 acres of Herbaceous habitat. Additionally, the property is located within the 100 year floodplain, and riparian habitat, potentially suitable for Preble's Meadow Jumping Mouse, was observed adjacent to the Big Thompson and Little Thompson Rivers. A June 2002 report, titled "Two Rivers Rock Sand and Gravel Mine, Weld County, Colorado, Preble's Meadow Jumping Mouse Survey Report" prepared by Savage and Savage, Inc. indicated that Preble's were "captured onsite along the Little Thompson, upstream of the confluence with the Big Thompson" (Savage and Savage, June 2002, Appendix F).

Proposed Impacts:

In compensation for the disturbance of wetlands, the Respondent will mitigate Herbaceous Habitat at a 1:1 ratio and Riparian Habitat at a 1.5:1 ratio, by providing 25.0 acres or 1,089,000 square feet of enhancement and establishment of new wetlands (see Figure 6, Wetland Restoration and Mitigation Map). The proposed mitigation on the property will include impact to, and creation of, Jurisdictional Wetlands. The project is expected to temporarily impact approximately 0.26 acres (11,400 square feet) of existing Preble's Meadow Jumping Mouse habitat. Following discussion with the USFWS, approximately 15.0 acres of Preble's habitat will be created within the Riparian Wetland habitat. Additionally, the existing floodplain will be modified to support and enhance the proposed wetland and habitat restoration. This action is described in the attached report titled "Preliminary Floodplain Analysis, 2 Rivers Rock Mine at Nature's Park, Milliken, Colorado" signed and stamped by Rocky Ridge Civil Engineering, dated June 19th, 2023. Stormwater flow and discharge will be minimized through the use of Best Management Practices described in the Stormwater Management Plan (SWMP) dated December 8th, 2022 (attached).

3.0 Site Selection

The areas indicated for on-site mitigation were chosen based on practicality, availability and access. Due to the topographically low position, these areas were the best suited for accomplishing ecologically self-sustaining aquatic resource restoration, establishment, and/or enhancement within the project. All construction will occur in conformance with the design requirements of the EPA, Rocky Ridge Civil Engineering and the Town of Milliken. All wetlands restored or created during the project will meet the wetland criteria for the three components of jurisdictional wetlands as defined in the AOCE Wetland Delineation Manual (1987) and the Great Plains Regional Supplement (March 2010). These components are: 1) Vegetation, 2) Soils and 3) Hydrology. The 10 acres of herbaceous wetland restoration will be located adjacent to the existing pond and will include the restoration and creation of herbaceous wetland. The 10.0 acres of herbaceous wetland will have a water table equal to or under 12 inches below surface grade (bsg) for at least 14 consecutive days during the growing season and never exceed 18 inches bsg. The 15.0 acres of riparian wetland restoration and creation will consist of expanding the bank adjacent to the Big Thompson and Little Thompson Rivers. The upland portion of the Project, at the request of Western Equipment, will be planted with native grasses suitable for grazing. No additional open water will be created. The proposed wetlands will be self-sustaining, relying upon root contact with existing shallow groundwater.

4.0 Baseline Information

The following is a brief summary of the existing wetlands on the project site. For a full description of the existing wetlands, see the attached Habitat Assessment and General Ecological Survey Report performed by Western Environment, dated June 26th, 2020 (Appendix B).

Identification and Delineation of Existing Wetlands:

In 2020, Western Environment conducted a wetland delineation of the site in accordance with the

USACE Wetland Delineation Manual (1987) and the Great Plains Regional Supplement (March 2010). The delineation identified 12.0 acres of wetlands on the subject property, including 10.1 acres adjacent and within the Big Thompson and Little Thompson Rivers and 1.9 acres within a pond, which appeared to be a former gravel pit. Large rocks placed along the bank provided stabilization. The majority of the pond consisted of open water, with limited vegetation.

Jurisdictional Determination:

The Big Thompson and Little Thompson Rivers, which connect to the South Platte River approximately 5 miles to the east, are both Jurisdictional Waters of the U.S. The majority of the property is within the 100 year floodplain, therefore, wetlands located on the property are also Jurisdictional Waters of the U.S.

5.0 Determination of Credits

As shown in the attached Wetland Restoration and Mitigation Plan Map, the impacted areas include 20.0 acres of disturbed wetlands. Western Environment is requesting a compensation option for these losses to consist of, combined Riparian (1:1) Herbaceous 1.5:1) on-site mitigation at a 1.25:1 ratio. The proposed mitigation design will provide approximately **25.0 acres or 1,089,000 ft^2** of restoration, enhancement and establishment of new wetlands (see Appendix A: Wetland Restoration and Mitigation Plan Map).

6.0 Restoration and Mitigation Work Plan

Timetable for Construction:

Timing for submittal and construction will occur in accordance with Consent Order, executed November 5th, 2020. Also in conformance with the Consent Order (Paragraph 102.c) a SWMP was submitted on November 9th, 2020, and implemented within the required 30 days of the date of execution. Following review of this draft of the restoration and mitigation plan, any modifications requested by the EPA are to be submitted within 30 days of receipt of comments. Following approval of the final restoration and mitigation plan, the necessary permits and authorization will be acquired from applicable agencies. With the approval of the permits, weather permitting, contour grading and fill/overburden removal will begin. Specialty contractor, seeding and planting, selection will occur. Proposed seeding mix and vegetation type densities are presented in Appendix A. The anticipated start date for restoration is not definable at this time. A complete timeline of construction, denoted in months following the Final Approval of the Restoration and Mitigation Plan, is presented below:

- Permitting - Seven months following approval
- Construction Bid Release and Selection - Eight months following approval
- Anticipated Restoration and Mitigation Construction Start - Three to nine months following approval (Note: Construction Start will be subject to compliance with CPW recommended

seeding specifications, criteria & protocols (Native Plant Revegetation Guide For Colorado, October, 1998): The construction will commence in line with the next available planting season. Additionally, Construction Start will be subject to compliance with USFWS Recommended Conservation Measures, Prebles Jumping Mouse (April 2021))

- As-Built Assessment Reports Completion - Eleven to fifteen months following approval

- Post Construction Monitoring - Will begin twenty-three months following approval, for a minimum of 5 years and until success criteria are met

Permitting:

Based on the impacts of the proposed on-site mitigation, the following permits and/or approval from applicable agencies will be required:

- EPA - Approval of the Final Restoration and Mitigation Plan will be required prior to permitting

- ACOE - Approval will be required for the impact to and creation of Jurisdictional Waters of the US

- FWS - Formal Section 7 Consultation for the restoration of Preble's Meadow Jumping Mouse habitat and approval of the Final Restoration and Mitigation Plan

- CDPHE - Restoration and mitigation activities must comply with the CDPHE Construction Stormwater Permit and the current Stormwater Management Plan (SMWP)

- Town of Milliken - An approved Flood Plain Development Permit will be required for construction within the floodplain

Hydrology:

Wetland creation will rely solely upon shallow groundwater, no surface water will be created or used. The groundwater depths will be evaluated twice during the growing season, using piezometers re-installed following contour grading to determine saturation and static groundwater depths (Figure 7). Performance standards in compliance, at a minimum, with the USACE Wetland Delineation Manual (1987) and the Great Plains Regional Supplement (March 2010), will be evaluated annually to determine if this water supply is sufficient and sustainable for the new wetlands, or if alternative water sources are needed. Additional water for temporary irrigation will be purchased and applied using water trucks.

Vegetation:

Herbaceous wetlands will be created using native wetland seed. After the drainage contour is established, the entire flood terrace of wetland creation site will be seeded with the proposed Herbaceous wetland seed mix (as described in Appendix A) in either spring and/or fall. Woody vegetation consisting of peach-leaf willow (*Sailx amygfaloides*) and sandbar willow (*Sailx interior*) cuttings and Woods' rose (*Rosa woodsii*) bare root plants will be located adjacent to the transition between Herbaceous and Riparian wetlands (see Wetland Restoration and Mitigation Plan Map, Appendix A). Erosion control blankets may be used to stabilize stream bank and wetland edges, and help maintain hydration levels for seed germination.

Google Earth Historical Aerial Photographs, 5/24/2023

Proposed Replacement Piezometer Well Locations

N

Approximate Scale in feet

0 500 1000

Western environment and ecology, inc.
2217 West Powers Avenue
Littleton, Colorado 80120

Figure 7 - Replacement Piezometer Well Map
23344 County Road 21 3/4
Milliken, Colorado

Woody vegetation within the Riparian wetlands will be created by first seeding the area with the Riparian wetland seed mix, and then planting nursery grown plains cottonwood (*Populus deltoides*) on a random pattern with no less that 20 foot centers. Riparian shrublands, adjacent to the herbaceous wetlands, will be created by first seeding the area with the riparian wetland seed mix, and then sprigging sandbar willow (*Sailx interior*) and peach-leaf willow (*Sailx amygfaloides*), choke cherry (*Prunus virginiana*), and Woods' rose (*Rosa woodsii*) sprigs in the designated areas (see Appendix A). Sprigs will be planted in the spring prior to leaf emergence to maximize success.

Additionally, all impacted upland areas surrounding the wetland mitigation site will be seeded with the proposed upland seed mix (Appendix A). Changes to the restoration and mitigation plan, including plantings, etc., will require consultation with the EPA.

Soil:

Due to the lack of organic material within the weathered bedrock fill, the proposed contour grading will entail excavation to native soil. Current groundwater depths and the fill/native soil contact was determined by the completion of 20 piezometers between September 5th and 6th, 2023. Following excavation, the fill will be transported to appropriate approved locations. Lithologic logs, using the USCS soil classification system and groundwater depths are presented in Appendix H.

Probability of Success:

The probability of success of the wetland creation and restoration is good because the woody and herbaceous species specified in Appendix A are appropriate for the elevation, soil conditions and expected hydrology of the mitigation site. The tree and shrub species are native to Colorado, and have been successful in similar habitat restorations.

On-Site Supervision:

Construction inspection and restoration over-sight will be performed by the project professionals. The referenced Development Consultant , Rocky Ridge Engineering, will supervise the contour grading activities. This will include grading conformation with the Restoration and Mitigation Plan. The Environmental Consultant, Western Environment and Ecology, Inc. will provide confirmation of the exposure of native soils and groundwater depths. This over-sight will be performed on an as needed basis, likely daily during the early phases of the activity.

The seeding and planting phase will begin following the completion and confirmation that final contours meet the Restoration and Mitigation Plan specifications. These activities will be performed by approved subcontractors and supervised by the Environmental Consultant. Work will begin in early Spring to provide as favorable environmental conditions as possible. Again, oversight and supervision will be on an as needed basis to ensure adherence with the plan specifications. This also will likely be daily during the early phases of the work.

Both Consultants will have STOP WORK authorization if construction activities are not meeting the plan specifications. Additionally, as built drawings for both grading and planting will be prepared, documenting compliance with the plan and identifying any approved changes.

7.0 Maintenance Plan

Once a month during the initial seeding and planting, The Environmental Consultant will visit the wetland mitigation site to ensure the project is on track and to measure the effectiveness of the restoration and mitigation plan. The visits will document the hydrological functioning, evaluate the success of the seeding and planting, and note any problems with invasive weeds, erosion or animal damage. If seed mix

has not germinated in some areas, these will be re-seeded in spring and/or fall. If planted shrubs or trees have died, they will be replaced to comply with the success criteria (see below).

During these monthly inspections, any species shown on the Colorado Noxious Weed Inventory List A shall be 100% eradicated and species shown on List B shall be no more than 10% of the total cover at the site. Weed management will comply with State of Colorado and local weed control provisions. If weeds are to be chemically managed, a certified herbicide applicator who will conduct weed treatment using herbicides registered with the EPA shall be retained. Prior to the application of any herbicides, the USFWS will be consulted to ensure any proposed herbicides and their timing of application do not have the potential to cause harm to the Preble's Meadow Jumping Mouse. The selected EPA-registered herbicides shall be used in a manner consistent with their labeling. Herbicides that are designated for aquatic use and selected to avoid harm to fish or other aquatic wildlife will be used. Application of herbicides shall comply with all applicable State of Colorado and local laws regarding the proper use of pesticides, including permitting requirements.

8.0 Performance Standards / Success Criteria

The wetland restoration and mitigation will be considered successful when:

- 25.0 acres of wetlands have been created.
- More than 50% of the dominant plant species across restoration and mitigation strata are rated OBL, FACW, or FAC.
- The presence of hydric soils and wetland hydrology is demonstrated at the site in accordance with the USACE Wetland Delineation Manual (1987) and the Great Plains Regional Supplement (March 2010).
- 80% of the original number of planted trees and shrubs are alive after five years.
- The site is dominated by plants of the wetland seed mix and desirable native colonizers.
- The site has vegetation cover of at least 80% as determined by a point-intercept quantitative cover method.
- All species on the Colorado Noxious Weed Inventory List A are 100% eliminated and the site does not have a Colorado Noxious Weed Inventory List B cover greater than 10% absolute cover, and has no areas of 25 square feet or larger dominated by weeds.
- Successful creation of riparian wetland will satisfy the restoration and creation of Preble's habitat
- Successful completion of post construction "No-Rise" certification.

9.0 Monitoring Requirements

Following the initial seeding and planting, the restoration and mitigation site will be monitored monthly during the subsequent (second) growing season. Monitoring will be performed twice per growing season for no less than the ensuing four consecutive years (third through sixth), and until a self-

sustaining community has been created and the success criteria have been achieved. Monitoring will consist of Qualitative and Quantitative data collection and reporting.

Qualitative Monitoring:

During the site visits, a list of plants growing in the restoration and mitigation area, including weeds, will be compiled and species dominance, density and extent documented. The general survivability and condition of woody sprigs/plantings will be evaluated, with suspected reasoning of any plant loss. The success of the wetland seed mix will also be evaluated by examining species diversity and growth. Using the series of piezometers, the hydrology will be monitored. Recommendations will be provided in order to ensure the site is achieving performance standards and restoration goals in a timely and effective manner.

Quantitative Monitoring:

During the site visits, vegetation will be quantified along five permanently-located line transects and two permanently-located block transects (Appendix A) within the restoration and mitigation site. Each line transect will be approximately 50 feet in length and have permanent markers at each end. Each block transect will be approximately 100 square feet and have permanent markers at each corner. To document the progress of the site, a photograph will be taken each monitoring year from the fixed points at the ends of each transect.

Herbaceous vegetation cover will be quantified using a point-intercept method. Twenty points will be sampled at 2.5 foot intervals along the 50 foot transect. For each section, the number of individuals and approximate percent cover of each species occurring within one square foot of the line will be recorded (Appendix G). The collected data will be compiled and analyzed to describe for each species within each distinct vegetation system:

Frequency: $$\frac{\text{number of sample points species occurs}}{\text{total number of sample points}}$$

Cover: $$\frac{\sum \text{estimated cover percentage for species in each sample point}}{\text{total number of sample points}}$$

Population Density: $$\frac{\text{number of individuals of a species}}{\text{total square feet sampled}}$$

Importance Value (IVI) assessment will also be conducted to determine the relative dominance of each species by calculating:

Relative frequency: $$\frac{\text{species frequency}}{\text{total number of occurances of all species}}$$

Relative Cover: $\left[\frac{\text{species cover}}{\text{sum of all species cover}}\right] \times 100$

Relative Density: $\left[\frac{\text{number of individuals of a species}}{\text{total number of individuals}}\right] \times 100$

IVI: $\sum$ Relative Frequency, Relative Cover, Relative Density

The data for all transects will be summed to describe the entire plant community.

Woody vegetation success will be determined using block transects. Total individuals of each woody species will be counted within each transect following planting. Subsequent inspections will determine the success/failure rate of the plantings with the percent of individuals remaining within each transect. The data for all transects will be summed to describe the entire plant community.

Annual Reporting and Management:

Following the creation of the new wetlands and restoration and enhancement of impacted wetlands areas, an As-Built Assessment Report will be prepared within 60 days. The report will document the details of the mitigation construction, including grading, seeding, and tree and shrub planting. Additionally, as-built HEC-RAS modeling will be completed to verify "No Rise". For the years beginning with and subsequently following the first full growing season, an Annual Monitoring Report will be prepared and submitted to the EPA, USACE, CDPHE, and Town of Milliken before December 31st of each monitoring year. The annual report will describe the progress of plant growth and measure the effectiveness of the restoration and mitigation plan. The reports will document all maintenance activities completed, including any additional seedings and/or plantings, list the on-site plant species, estimate total vegetation cover, describe developing communities, discuss weeds and weed control, and describe hydrologic functionality. The report will also include the results and an analysis of the quantitative monitoring including Wetland Determination Data Sheets (as found in the Great Plains wetland delineation supplement) and photographs for each transect. Additionally, the wetland ecologist will evaluate the effectiveness of the site at replacing aquatic resource functions and services. Annual Monitoring Reports will be completed for a minimum five consecutive years, or until the EPA determines that a self-sustaining community has been created and the success criteria have been achieved.

10.0 Adaptive Management Plan

Should it be determined that the success criteria will not be met on schedule under the proposed Restoration and Mitigation Work Plan, and/or if significant changes occur to impact the seasonal hydrology or the success of vegetation (i.e. drought, flooding, or fire), the Respondent, will consult with the EPA, the Town of Milliken, and the AOCE to develop an adaptive management plan to select and

implement effective strategies to maintain the restoration and mitigation site. Adaptive strategies will be implemented upon EPA approval. If necessary, after the scheduled five consecutive years of monitoring and maintenance, the site will continue to be monitored and maintained (ie. re-seeding and re-planting) under the guidelines indicated above with additional adaptive strategies, until the performance standards/ success criteria have been achieved.

11.0 Long-Term Management Plan

The objectives of the Long Term Management Plan are to identify appropriate measures to preserve and sustain the restored wetlands. The Respondent is evaluating transferring ownership of certain property to a third party, likely a conservation organization, through donation and is actively pursuing that option. Recent conversations with Ducks Unlimited, March 12th, 2024, indicate that a decision regarding the approval from the governing board of the organization may occur before the end of June 2024. Following completion of negotiations with the third party, an addendum to this Restoration and Mitigation Plan will be submitted to the EPA for further consideration under paragraph 4 of the AOC. However, no change in the ownership or operation of the Site or of Respondent shall alter the Respondent's responsibility under the Consent Order unless the EPA, Respondent, and transferee agree in writing to allow the transferee to assume such responsibilities.

12.0 Projected Costs

The projected costs to complete the restoration and mitigation work, including the costs of all consultations, permits, construction, and monitoring are described below:

Activity	Projected Cost
Compliance - Legal, engineering, and infrastructure	$ 125,000.00
Permitting: Restoration and Management Plan Completion	$ 68,000.00
Permitting: Habitat Conservation Plan for Preble's Jumping Mouse	$10,000.00
Clear and Grub Site	$ 90,500.00
Earthwork	$ 615,480.00
Seeding	$ 62,500.00
Planting/Staking	$ 300,000.00
Erosion Control/Maintenance	$ 80,000.00 (for 5 years)

As-Built Assessment Report Completion	$ 5,000.00
Post Construction Monitoring	$ 2,500.00 per year (minimum of 5 years)

13.0 Financial Assurance

The Respondent proposes to complete all construction, seeding, planting, and maintenance of the project until the success criteria and annual monitoring requirements have been met and the Consent Order closed. The Respondent shall have a performance bond or similar instrument established with the Town of Milliken prior to the start of any restoration or remediation work.

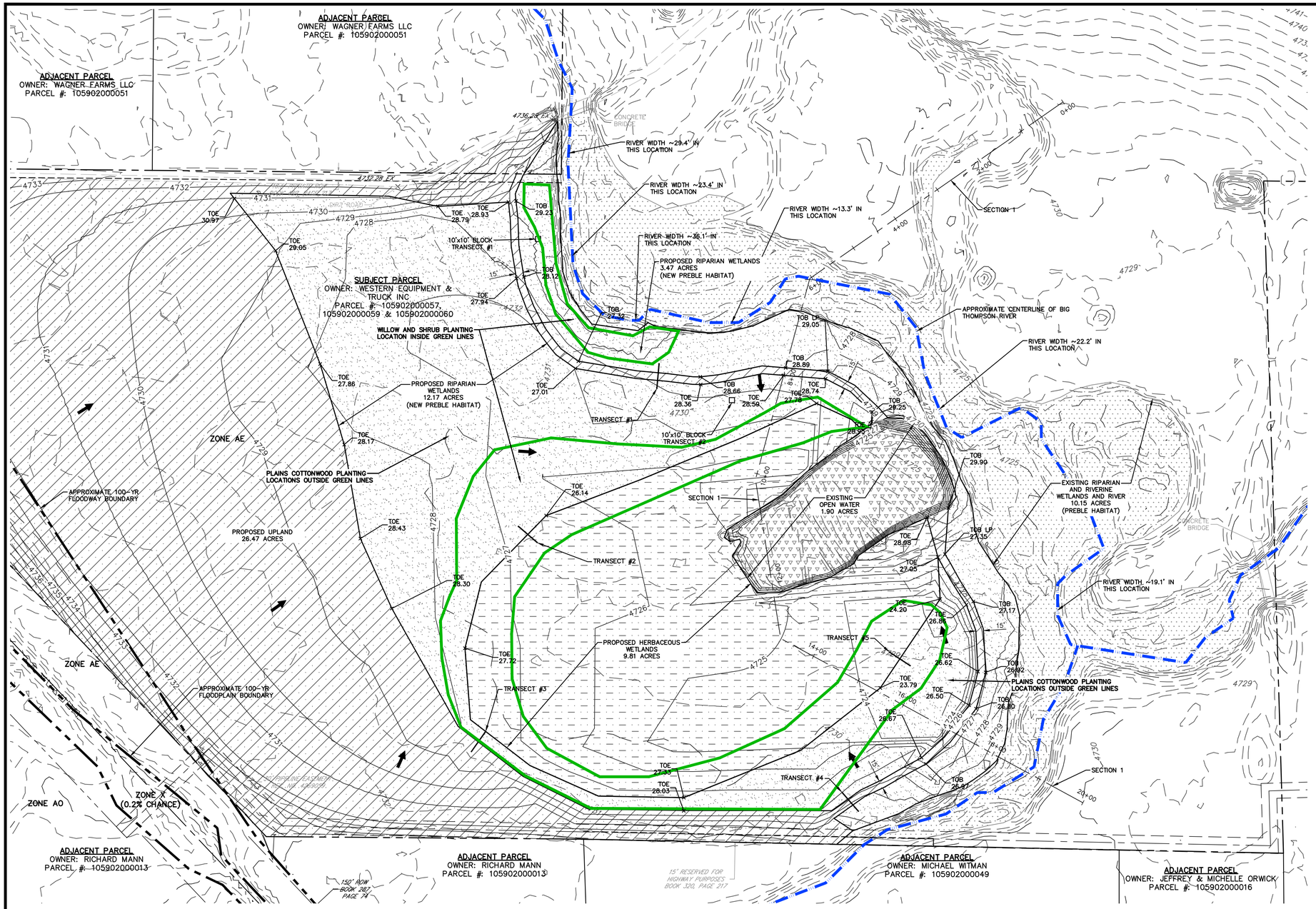
14.0 Flood Plain Development Permit/No-Rise Condition

An approved Flood Plain Development Permit will be required from the Town of Milliken for construction within the floodplain. Following the approval of this Restoration and Mitigation Plan, and the approval of all other agency permits, the application for the permit will be submitted to the Town of Milliken. The Permit will remain open until the success criteria and annual monitoring requirements have been met and the Consent Order closed. At such time the Permit can be closed and the bond released.

Rocky Ridge Civil Engineering completed the "Final Floodplain Analysis, Two Rivers Rock Mine at Natures Park, Milliken, Colorado" dated June, 2023 (Appendix D). This report detailed the effect of the disturbance and the proposed restoration and mitigation on the 100 year floodplain, as well as the results of HEC-RAS modeling for the Town of Milliken floodplain. The report concluded the proposed Restoration and Mitigation Plan will result in "no rise." The Final Floodplain Analysis report was approved by Pepper McClenahan, Connor Griffin, and Brian Campbell of the Town of Milliken on June 19th, 2023. However, based upon recent changes to the Restoration and Mitigation Plan, an updated Floodplain Analysis will be submitted to the Town of Milliken for approval.

Appendix A

Wetland Restoration and Mitigation Plan Map(s)



RESTORATION AND MITIGATION LEGEND

- PROPOSED HERBACEOUS WETLANDS (9.81 ACRES)
- PROPOSED RIPARIAN WETLANDS (15.64 ACRES)
- PROPOSED UPLAND (26.47 ACRES)
- EXISTING OPEN WATER (1.90 ACRES)
- EXISTING RIPARIAN WETLAND (10.15 ACRES)
- RIVER CENTERLINE
- PROPERTY LINE
- FLOODPLAIN BOUNDARY

N

0 100' 200'

SCALE: 1" = 100'

Herbaceous Wetland Seed Mix			
Common Name	**Scientific Name**	**NWPL - GP Classification**	**% Mix**
Colorado rush	*Juncus confusus*	FACW	15%
switchgrass	*Panicum virgatum*	FAC	15%
prairie cordgrass	*Spartina pectinata*	FACW	15%
arctic rush	*Juncus arcticus*	OBL	10%
foxtail barley	*Hordeum jubatum*	FACW	10%
Nebraska sedge	*Carex nebrascensis*	OBL	9%
common spike-rush	*Eleocharis palustris*	OBL	7%
shortawn foxtail	*Alopecurus aequalis*	OBL	7%
Canada goldenrod	*Solidago lepida*	FACU	5%
western wheatgrass	*Pascopyrum smithii*	FACU	5%
Nuttall's sunflower	*Helianthus nuttelii*	FACW	2%
Herbaceos Wetland Shrubs			
Sandbar Willow	*Salix interior*	FACW	-
Woods' Rose	*Rosa woodsii*	FACU	-

Riparian Wetland Seed Mix			
Common Name	**Scientific Name**	**NWPL - GP Classification**	**% Mix**
switchgrass	*Panicum virgatum*	FAC	15%
prairie cordgrass	*Spartina pectinata*	FACW	15%
sand dropseed	*Sporobolus cryptandrus*	FACU	15%
western wheatgrass	*Pascopyrum smithii*	FACU	15%
Colorado rush	*Juncus confusus*	FACW	10%
foxtail barley	*Hordeum jubatum*	FACW	10%
arctic rush	*Juncus arcticus*	OBL	5%
sideoats grama	*Bouteloua curtipendula*	UPL	5%
Canada goldenrod	*Solidago lepida*	FACU	5%
Nebraska sedge	*Carex nebrascensis*	OBL	2%
Nuttall's sunflower	*Helianthus nuttelii*	FACW	2%
Riparian Wetland Shrubs/Trees			
sandbar willow	*Salix interior*	FACW	-
peach-leaf willow	*Salix amygdaloides*	FACW	-
plains cottonwood	*Populus deltoides*	FAC	-
choke cherry	*Prunus virginiana*	FACU	-
Woods' Rose	*Rosa woodsii*	FACU	-

Upland Seed Mix			
Common Name	**Scientific Name**	**NWPL - GP Classification**	**% Mix**
western wheatgrass	*Pascopyrum smithii*	FACU	15%
switchgrass	*Panicum virgatum*	FAC	15%
Canada wildrye	*Elymus canadensis*	FACU	15%
sideoats grama	*Bouteloua curtipendula*	UPL	12%
green needlegrass	*Nassella viridula*	NL	12%
slender wheatgrass	*Elymus trachycaulus*	FACU	10%
indiangrass	*Sorghastrum nutans*	FACU	10%
big bluestem	*Andropogon gerardii*	FACU	5%
little bluestem	*Schizachyrium scoparium*	FACU	5%

PLANTING TABLE

FOR PREBLE HABITAT

PLAINS COTTONWOOD SPACING – 20FT

PEACH-LEAF & SANDBAR WILLOW SPACING IN RIPARIAN WETLANDS – 9FT

PEACH-LEAF & SANDBAR WILLOW SPACING IN HERBACEOUS WETLANDS – 3FT

100 – PLAINS COTTONWOOD TREES (1"–2")

100 – BARE ROOT CHOKE CHERRY

100 – BARE ROOT WOOD'S ROSE

10,000 – PEACH-LEAF & SANDBAR WILLOW (0.5"–1" CUTTINGS)

GRADING LEGEND

- 5075 — EXISTING 5' CONTOUR
- 5074 — EXISTING 1' CONTOUR
- 5075 — PROPOSED 5' CONTOUR
- 5074 — PROPOSED 1' CONTOUR

NOTES:

1. SPECIAL SPOT ELEVATION NOTATIONS ARE AS FOLLOWS:
   - 1.1. TOE – TOE OF BANK
   - 1.2. TOB – TOP OF BANK
   - 1.3. EX – EXISTING GRADE
2. EXISTING CONTOURS (DASHED) SHOWN AT 1' INTERVALS.
3. PROPOSED CONTOURS (SOLID) SHOWN AT 1' INTERVALS.
4. ALL SPOT ELEVATIONS HAVE BEEN REDUCED FOR CLARITY. ADD 4700 FOR ACTUAL ELEVATIONS.

BASIS OF BEARINGS:

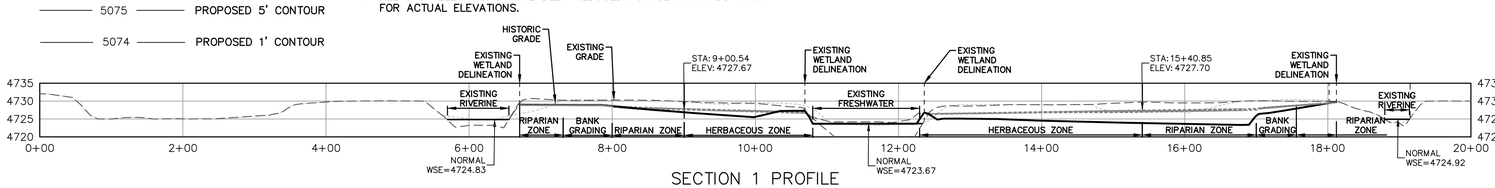
ASSUMING THE NORTH LINE OF THE NORTHWEST QUARTER OF SECTION 35, TOWNSHIP 5 NORTH, RANGE 67 WEST OF THE 6TH P.M. MONUMENTED AS SHOWN ON THE ISP AS BEARING SOUTH 89°35'56" EAST, BEING A GRID BEARING OF THE COLORADO STATE PLANE, NORTH ZONE, NORTH AMERICAN DATUM 1982/2011, A DISTANCE OF 2620.92 FEET AND WITH AL OTHER BEARINGS CONTAINED HERIN RELATIVE THERETO.

FLOODPLAIN STATEMENT:

THE SUBJECT PROPERTY LIES MOSTLY WITHIN ZONE AE, AS SHOWN ON F.I.R.M. PANEL #08123C1703F, WITH AN EFFECTIVE DATE OF NOVEMBER 30, 2023.

BENCHMARK:

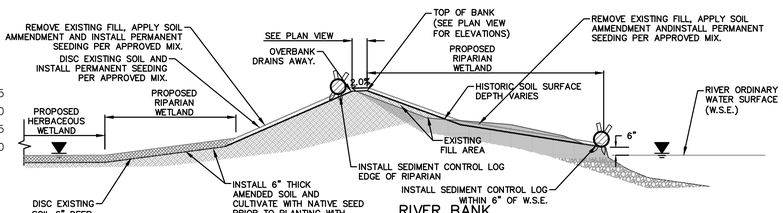
NGS VERMILYEA NAVD88 DATUM, ELEVATION 5025.80 (PUBLISHED ELEVATION–5026).



SECTION 1 PROFILE

SCALE: (H) 1" = 100.00' (V) 1" = 20.00'

START STA: 0+00.00, END STA: 20+00.00



RIVER BANK TYPICAL SECTION

NO.	DATE	DESCRIPTION	BY

Rocky Ridge Civil Engineering
420 21st Ave, Suite 101
Longmont, CO 80501
303.651.6626
www.rockyridgecivil.com

TWO RIVERS ROCK MINE AT NATURE'S PARK

WETLAND RESTORATION & MITIGATION PLAN MAP

JOB NO 780-1

CAD NO 7801BASE

DATE 04/01/24

SHEET NO 1

Appendix B

Habitat Assessment and General Ecological Survey

WESTERN ENVIRONMENT AND ECOLOGY, INC

June 26, 2020

Joel Seamons
Rocky Ridge Civil Engineering
420 21st Avenue , Suite 101
Longmont, Colorado 80501

William Hughes
Winters, Hellerich & Hughes, LLC
5587 West 19th Street, Suite 101
Greeley, Colorado 80634

Subject: Habitat Assessment and General Ecological Survey - Two Rivers Mine at Nature's Park. Approximately 48.5 Acres within Section 2, Township 4 North, Range 67 West, Milliken, Colorado. Western Environment and Ecology, Inc Project Number 814-001-02.

Dear Mr. Seamons and Mr. Hughes,

At your request, Western Environment and Ecology, Inc(Western Environment) has prepared this "Habitat Assessment and General Ecological Survey" of the natural resources including threatened and endangered species, wetlands, and other significant habitats for the above referenced property. This survey was performed in accordance with Phase I of the "Wetland Restoration/Remediation Plan" dated June 9th, 2020 to describe wildlife habitat on and directly adjacent to the project.

Methods

Species that are federally or state listed as threatened or endangered, including federally proposed and candidate species, occurring or having historically occurred in Weld County were considered for this study (Table 1). The Weld County classification was determined by following the Colorado Field Office of the U.S. Fish and Wildlife Service's county checklist (USFWS, 2018). The list was narrowed based on habitat requirements of the species relative to existing habitats on the project.

To assess current site conditions, the property was surveyed on foot on April 29th, June 17th, and June 18th, 2020. Information was collected on topography, ecosystems, and species of flora and fauna found on the property. Photographs were taken, and emphasis was placed on potential habitat of threatened and endangered species, species of special concern, and the presence of wetlands. Existing wetlands on the property were delineated in accordance with the 1987 "Corps of Engineers Wetland Delineation Manual" and the Great Plains Region regional supplement.

Through comparison of historic aerial photographs, the parcel located adjacent to the north (Weld County Parcel #105902000051) appeared to be congruent with the pre-disturbance vegetation on the subject property. Therefore, Western Environment chose the parcel to assess pre-disturbance habitat. On June 15th, 2020, Western Environment contacted Ms. Carolyn Kerls of Wagner Farms, LLC, the owner of the parcel adjacent to the north, to request permission to access the property. Mr. Kerls granted access, and the property was surveyed on foot on June 17th and 18th, 2020. Information was collected on topography, ecosystems, and species of flora and fauna found on the property. Line and point-intercept quadrat transect sampling was conducted to determine composition, population density, total coverage, and frequency of the pre-disturbance vegetation.

2217 WEST POWERS AVENUE · LITTLETON, COLORADO 80120
PHONE (303)730-3452 · FAX (303)730-3461
WWW.WESTERNENVIRONMENT.COM

Landscape Setting

The project area is located approximately 2,800 feet northeast of the intersection of Colorado Road 60 and Colorado Road 257 within Section 2, Township 4 North, Range 67 West (Figure 2). The project is located within the City of Milliken, with midpoint Coordinates of approximately 40.339432° and -104.858805°.

The site occurs at an approximate elevation of 4,730 feet above sea level (USGS Milliken Quadrangle, 2019). The topography of the property is generally flat with a slight slope to the east-northeast. The National Resource Conservation Service (NRCS) classifies the site soils as predominantly Aquolls and Aquents, gravelly substratum, with Kim loam on 1 to 3 percent slopes, Dacono clay loam on 1 to 3 percent slopes, and Nunn loam on 0 to 1 percent slopes overlaying Quaternary Age Modern Alluviums including Piney Creek Alluvium and younger deposits (Green, G.N, 1992).

Site hydrology is provided by the natural path of the Big Thompson and Little Thompson Rivers. The Rivers confluence in the eastern portion of the property and connect to the South Platte River approximately 5.0 miles east.

Threatened and Endangered Species

Western Environment reviewed data maintained by the Colorado Division of Parks and Wildlife (CPW) to establish presence/absence and potential habitat of any Federal or State threatened and endangered species on the property.

Bald Eagle (*Haliaeetus leucocephalus*)
State Threatened

National Diversity Information Source (NDIS) data maintained by CPW (2017) identified 4 active bald eagle nests, located 1.9 and 2.0 miles to the northwest, 2.4 miles to the east, and 2.8 miles to the southeast. The US Fish and Wildlife Service (FWS) recommends adhering to a buffer from active bald eagles sites, including a year round no surface occupancy within 660 feet. Additionally, CPW recommends no development within 0.5 miles.

Preble's Meadow Jumping Mouse (*Zapus hudsonius preblei*)
Federally Threatened, State Threatened

Typical Preble's habitat has been described as "well-developed plains riparian vegetation with relatively undisturbed grassland and a water source in close proximity," and "dense herbaceous vegetation consisting of a variety of grasses, forbs and thick shrubs" (Armstrong et al., 1997). Although any vegetation could offer cover and hibernacula for Preble's, the species is mostly known from habitat containing shrub cover, such as willow or narrow-leaf cottonwood. Preble's are known to regularly range outward into adjacent uplands to feed and hibernate. For this reason, the U.S. Fish and Wildlife Service generally requires a 300 foot development buffer from the edge of the 100 year flood plain.

The subject property is located within the 100 year floodplain, and riparian habitat, potentially suitable for Preble's, was observed adjacent to the Big Thompson and Little Thompson Rivers. However, habitat fragmentation, as a result of residential development, gravel mining, and private agricultural use adjacent to the rivers, has occurred along the rivers. As a result, no designated Critical Habitat occurs in proximity to the subject property.

No other habitat for threatened and endangered species was identified in proximity to the subject property.

Current Site Conditions

At the time of the inspections, the majority of the property was graded. Vegetation on the site was dominated by native and invasive grasses and weeds, including cheatgrass, smooth brome, lambs quarters, kochia, hoary cress, curly dock, and Canada thistle. Limited populations of showy milkweed and Colorado rush were observed on the western portion of the site.

The property was bisected by the Big Thompson River and bordered to the south by the Little Thompson River. The two rivers confluenced in the eastern corner of the site. Vegetation adjacent to the rivers was consistent with Western Great Plains Floodplain systems, dominated by grasses and forbs including western wheatgrass, saltgrass, smooth brome, prairie reed grass, cuman ragweed, and showy milkweed. Woody vegetation included plains cottonwood, peachleaf willow, and narrowleaf willow. Intermittent populations of cattails were observed along the river banks. Invasive grasses and weeds, including cheatgrass, kochia, canada thistle, curly dock, hoary cress, teasel, and lambsquarters were also observed in the riparian corridor.

A large pond, which appeared to be a reclaimed gravel pit, was present south of the Big Thompson River. Vegetation in and adjacent to the pond included western wheatgrass, saltgrass, smooth brome, narrowleaf willow, cattail, cheatgrass, kochia, canada thistle, curly dock, hoary cress, teasel, and lambsquarters.

Wildlife observed on the property included Canada goose, mallard, red wing blackbird, red tail hawk, and great blue heron. These species, as are all migratory birds, area federally protected under the Migratory Bird Species Act. No large nests were observed in the plains cottonwoods or peachleaf willow trees on the subject property; however, this habitat provides migration routes, and potential nesting and foraging resources for the species observed on the site, as well as other migratory birds, reptiles, amphibians, and mammals.

Aquatic Resources

Two distinct areas on the subject property, thought to contain aquatic resources, were delineated. The attached Aquatic Resources Delineation Maps depict the location and the extent of the surveys.

- Wetland-01 (WL-01) was delineated along the Big Thompson and Little Thompson Rivers. The Big Thompson River bisected the property from northwest to east, and continued to the South Platte River approximately 5 miles east. The Little Thompson River bisected the property from the south, and confluenced with the Big Thompson River in the eastern portion of the site. Both Rivers contained wetland components of Ordinary High Water Mark (OHWM), vegetation, hydric soil, and hydrology. No wetland vegetation was observed above OHWM. The Rivers appeared to be mostly unmodified, with a natural meander and bank with no stabilization. WL-01 consists of approximately 10.1 acres.

- Wetland-02 (WL-02) was delineated along a pond south of the Big Thompson River. The pond appeared to be a reclaimed gravel pit. Large rocks placed along the bank provided stabilization. The majority of the pond consisted of open water, with limited vegetation. No wetland vegetation was observed above the banks. WL-01 consists of approximately 1.9 acres.

Pre-Disturbance Vegetation Assessment

Western Environment conducted a vegetation survey on an approximately 300,000 square foot (6.88 acre) macrogrid of undisturbed habitat. Several distinct vegetation systems occurred within the macrogrid, including uplands, riparian, wetland, and upland-wetland transition. A combination of sampling techniques were used to collect data for each system.

Line Transect

Three (3) 100 foot Line Transects were established, incorporating each of the major vegetation systems. The starting locations were staked with rebar and photographs and GPS data were recorded. Measuring tape was used to mark 100 feet, and the end points were staked with rebar and photographs and GPS data were recorded. The measuring tape was then secured around the stakes. The transect was divided into 21 sampling sections, occurring at five foot intervals. For each section, the number of individuals of each species occurring within one square foot of the line was recorded (see attached data sheets).

Point Quadrat Transect

A nine square foot quadrat was utilized to estimate vegetation and bare ground cover. The three line transects had been divided into 21 sampling sections. At every other section, the quadrat was placed in a random direction (dropped behind the back). The estimated percent cover of each species, and bare ground, was recorded (see attached data sheets) for the sample area. The quadrat was then flipped in a random direction and an additional sample area was recorded. To compensate for species not located within the line transects, a cross section was established for each line, and additional 5 sample areas were recorded at approximately 20 foot intervals.

Soil Borings and Piezometers

Soil borings were advanced in each system using a hand auger to a maximum depth of 5 feet. Soil core samples were obtained and photographed for each boring. Two inch slotted PVC pipe was then installed in the borings. The next day, a water level indicator was used to determine depth to water table.

Analysis

The collected data was compiled and analyzed to describe the frequency, cover, and population density of each species within each distinct vegetation system. Importance Value (IVI) assessment was also conducted to determine the relative dominance of each species. The attached Tables describe the results of the analysis.

- Upland - The upland community consisted of sub-irrigated grasses and forbs. Western wheatgrass was the dominant species, with sparse populations of showy milkweed, field horsetail, and western snowberry. Woody vegetation consisted of plains cottonwood. Non-

native species, including lambsquarters, curly dock, and smooth brome were also identified. Cheatgrass, a State List C Noxious Weed, and Canada thistle, Russian olive, hoary cress, and leafy spurge, all State List B Noxious Weeds, were present throughout the site. These non-native and invasive weeds represented approximately 31 percent of the vegetative cover. Bare ground consisted of approximately 35 percent of total cover. The soil boring identified sandy clay from the surface to approximately 2 feet below grade surface (bgs), where gravel was encountered. The gravel was penetrated from 2 to 2.5 feet, where silty sand was observed to the total depth of 5 feet. No water was encountered.

- Riparian - the riparian community consisted of cottonwood galleries, shrubs, and wetland and non-wetland herbaceous species on deposits of sand, silt, and gravel adjacent to the Big Thompson River. Dominant species included narrowleaf willow, the introduced reed canary grass, and western wheatgrass. Populations of saltgrass, cuman ragweed, showy milkweed, and foxtail barley were also identified. Woody vegetation consisted of plains cottonwood and peachleaf willow. Non-native species included curly dock, lambsquarters, broadleaf pepperweed, State List B Noxious Weed bull thistle, and State List C Noxious Weed cheatgrass. Non-native species and invasive weeds comprised approximately 58 percent of total vegetation cover. Bare ground represented approximately 56 percent of total cover. The soil boring identified sand, silt and gravel from the surface to 2 feet bgs, where refusal occurred. No water was identified in the boring. The topography of the riparian area occurred between 2-4 feet of the River surface.

- Wetland - the wetland community consisted of wetland type vegetation located within a depressional basin. Dominant species included broad leaf cattails, Colorado rush, Nebraska sedge, and non-native spotted lady's thumb and field pennycress. Other non-native species consisted of lambsquarters and herb sophia. The non-native species represented approximately 55 percent of total vegetative cover. Bare ground comprised approximately 22 percent of total cover. The soil boring identified dark sandy clay surface to approximately 0.1 feet bgs, where a glayed matrix with organic material and depletion was present to a depth of 0.5 feet. Saturated sandy clay was present from 0.5 feet to the total depth of 3 feet. Static water was measured at 2.1 feet.

- Upland-Wetland Transition - the transition community is comprised of wetland and non-wetland species situated on the slope between a depressional basin and the sub-irrigated grassland. The general length of the transition zone was measured between 25 and 35 feet. Dominant vegetation consisted of Colorado rush, western wheatgrass, showy milkweed, and non-native species field pennycress, reed canary grass, and broadleaf pepperweed. Populations of Nebraska sedge were also identified, along with non-native populations of spotted lady's thumb, lambsquarters, and State List B Noxious Weed Canada thistle. Woody vegetation consisted of plains cottonwood and State List B Noxious Weed Russian olive. The non-native species represented approximately 21 percent of total vegetative cover. Bare ground comprised approximately 19 percent of total cover. The water table in this zone is estimated to be between 2 and 5 feet. Based upon the presence of wetland vegetation, hydric soils, and hydrology, it is the opinion of Western Environment that the transition zone would be considered a wetland.

Wildlife observed on the adjacent parcel included wild turkey, great blue heron, red tail hawk, and white tailed deer.

Wetland Disturbance Assessment

To determine the disturbance to the wetlands on the subject property, Western Environment reviewed the USFWS Wetland Mapper (attached), which utilized the Cowardian System to assess wetlands, and Google Earth historic photos. Western Environment created a composite wetlands sketch of the site based upon photos dated October 3rd, 1999; October 30th, 2004; February 29th, 2008, August 18th, 2012, October 14th, 2017, and the Wetlands Mapper data, from infrared imagery dated 2008. Based upon this data, Western Environment estimated an approximate total of 32 acres of wetlands occurred on the property between 1999 and 2016. Following the addition of fill, approximately 12 acres of wetlands remain onsite.

Conclusions and Recommendations

- The subject property is located within the 100 year floodplain, and riparian habitat, potentially suitable for Preble's Meadow Jumping Mouse, was observed adjacent to the Big Thompson and Little Thompson Rivers. However, habitat fragmentation, as a result of residential development, gravel mining, and private agricultural use adjacent to the rivers, has occurred along the rivers. As a result, no designated Critical Habitat occurs in proximity to the subject property. Western Environment recommends submitting a request for a Finding of No Significant Impact from the USFWS confirming that no Preble's habitat occurs on the site.

- Currently, approximately 12.0 acres of wetlands occur on the subject property, including 10.1 acres within WL-01 and 1.9 acres within WL-02.

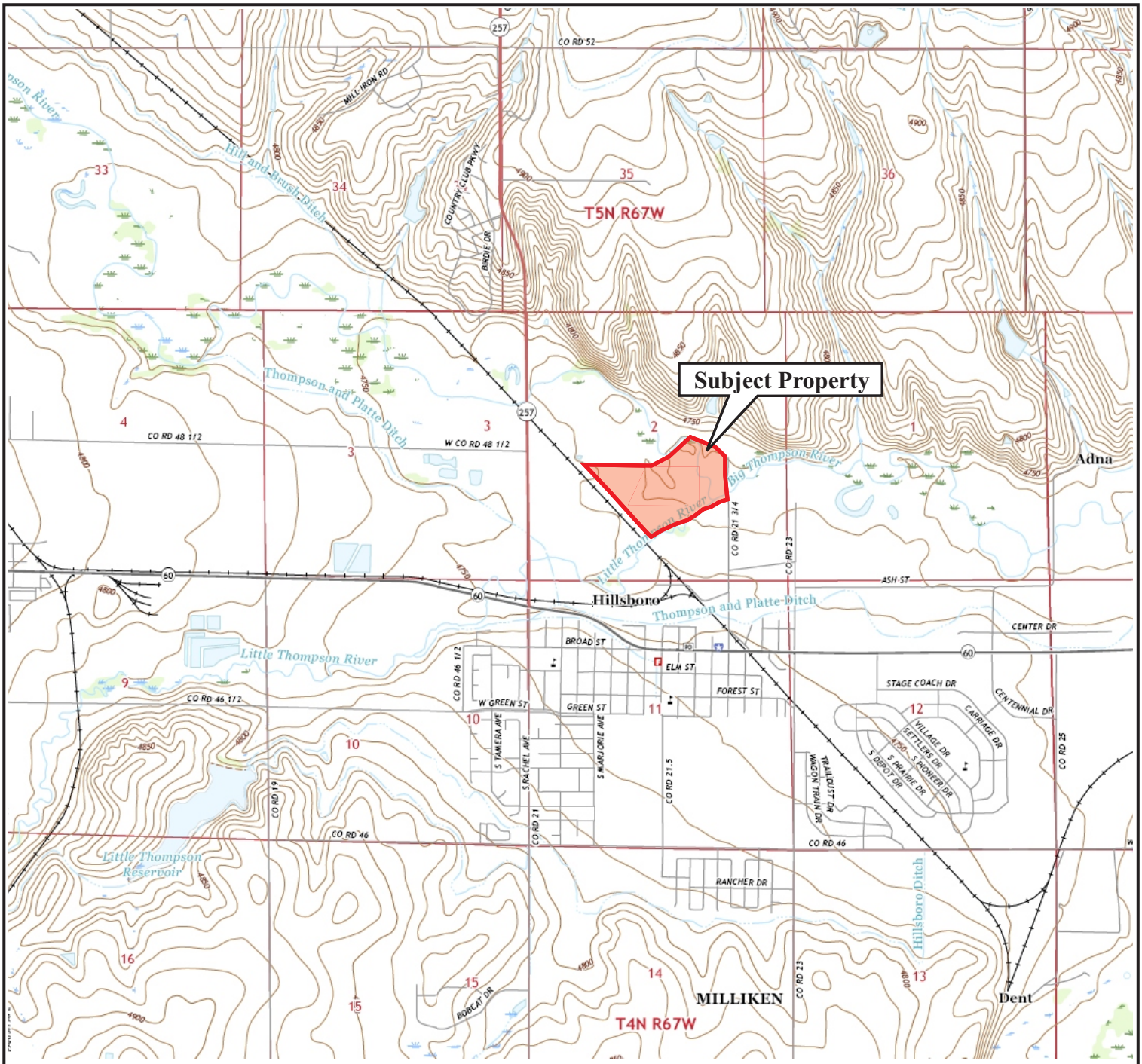
- Approximately 20 acres of wetlands have been disturbed, including approximately 10.0 acres of Riparian habitat and 10.0 acres of Wetland habitat, including Upland-Wetland Transition habitat.

If you have any questions, please don't hesitate to contact me.

Sincerely,

WESTERN ENVIRONMENT AND ECOLOGY, INC.

Brendan Calonge
Wildlife Biologist



USGS Topographic Map, Johnstown and Milliken 7.5 Minute Quadrangles, 2016

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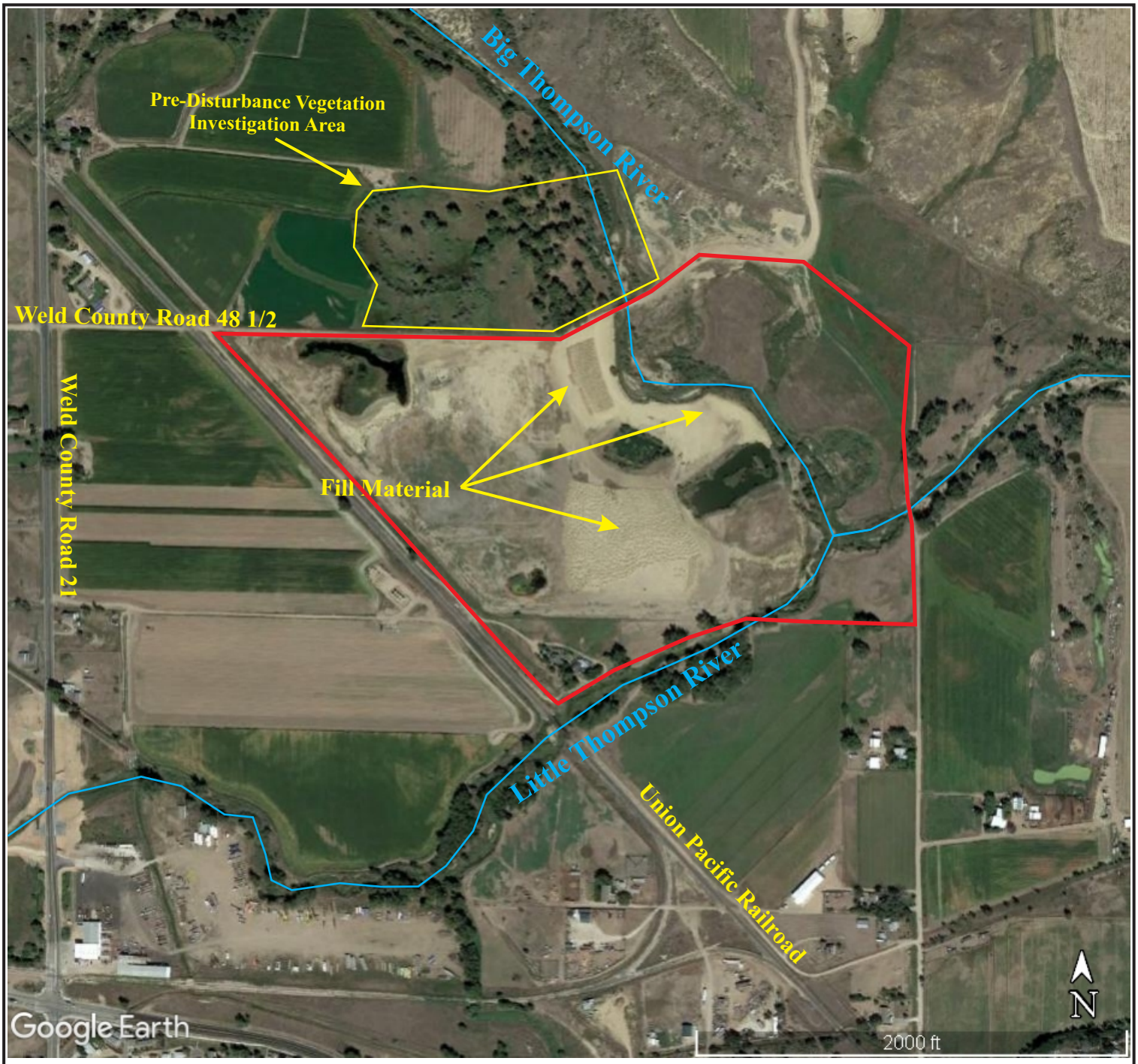
Figure 1 - Project Location Map
23344 County Road 21 3/4
Milliken, Colorado



Approximate Scale in feet

0 500 1000

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and ecology, inc.
2217 West Powers Avenue
Littleton, Colorado 80120

Figure 2 - Site Map
23344 County Road 21 3/4
Milliken, Colorado

Existing Wetland

N

Approximate Scale in feet

0 500 1000

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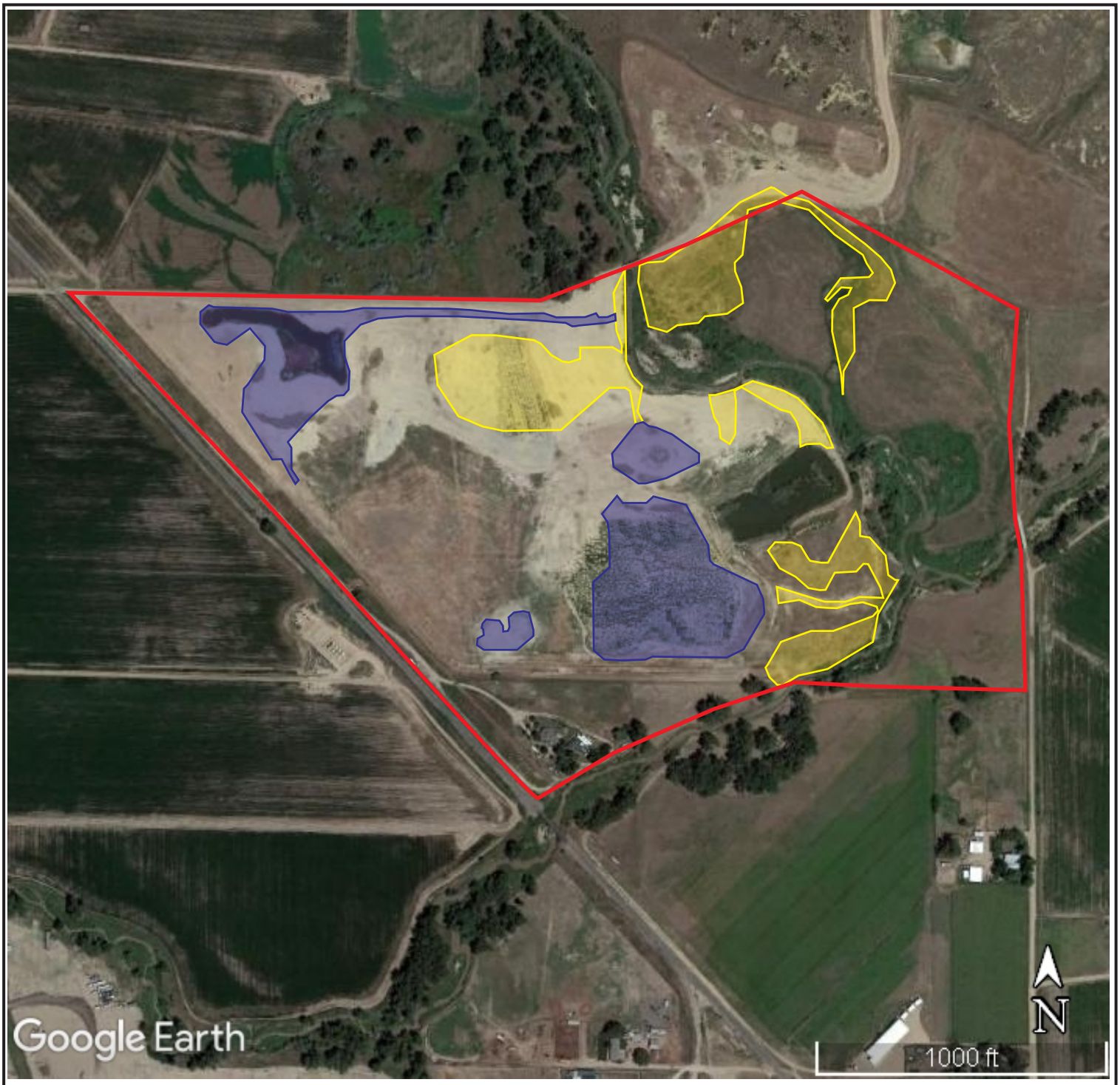
Figure 3 - Existing Wetland Map
23344 County Road 21 3/4
Milliken, Colorado



Disturbed Riparian Wetland

Disturbed Wetland/Open Water

Approximate Scale in feet

0 500 1000

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Figure 4 - Disturbed Wetland Map
23344 County Road 21 3/4
Milliken, Colorado

Transect 1
Transect 2
Transect 3
Cross Transect 1
Cross Transect 2
Cross Transect 3

N

Approximate Scale in feet

0 400

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Figure 5 - Transect Location Map
23344 County Road 21 3/4
Milliken, Colorado

Table 1. Common name, scientific name, and status of federal and state threatened and endangered species that could occur or historically occurred in the Colorado Piedmont (CDOW, 2018; USFWS, 2018).

Common Name	Scientific Name	Status[1]
Birds		
Bald eagle	*Haliaeetus leucocephalus*	SC
Whooping crane	*Grus americana tabida*	FE, SE
Least Tern	*Sterna antillarum*	FE, SE
Mountain plover	*Charadrius montanus*	SC
Mexican spotted owl	*Strix occidentalis lucida*	FT, ST
Piping plover	*Charadrius melodus*	FT, ST
Plains Sharp-Tailed Grouse	*Tympanuchus phasianellus jamesii*	SE
Western burrowing owl	*Athene cunicularia*	ST
Lesser Prairie Chicken	*Tympanuchus pallidicinctus*	ST
Ferruginous Hawk	*Buteo regalis*	SC
Mammals		
Black-footed ferret	*Mustela nigripes*	FE, SE
Preble's meadow jumping mouse	*Zapus hudsonius preblei*	FT, ST
Black-tailed prairie dog	*Cynomys ludovicianus*	SC
Plants		
Ute ladies'-tresses	*Spiranthes diluvialis*	FT
Western prairie fringed orchid	*Platanthera praeclara*	FT

[1]**Status Codes:** FE = Federally Endangered, FT = Federally Threatened, FPT = Federally Proposed as Threatened, FC = Federal Candidate, SE = State Endangered, ST = State Threatened, SC = State Concerned

Table 2. Species Data Table for Upland Habitat

Species						
Common Name	Scientific Name	NWPL Status	Native Status	Cover (%)	Frequency	Population Density (ind/sqft)
Western Wheatgrass	*Pascopyrum smithii*	FACU	Native	40.97	1.00	19.83
Canada Thistle	*Cirsium arvense*	FAC	List B Noxious	2.34	0.25	0.49
Lambsquarters	*Chenopodium album*	FACU	Non-Native	0.64	0.15	0.15
Showy Milkweed	*Asclepias speciosa*	FAC	Native	1.08	0.13	0.11
Field Horsetail	*Equisetum arvense*	FAC	Native	0.25	0.02	0.92
Hoary Cress	*Lepidium draba*	FACU	List B Noxious	14.82	0.56	3.51
Western Snowberry	*Symphoricarpos occidentalis*	UPL	Native	0.43	0.05	0.01
Curly Dock	*Rumex crispus*	FAC	Non-Native	0.02	0.02	0.01
Leafy Spurge	*Euphorbia esula*	FACU	List B Noxious	0.64	0.02	0.11
Cheatgrass	*Bromus tectorum*	FACU	List C Noxious	0.77	0.02	0.35
Smooth Brome	*Bromus inermis*	UPL	Non-Native	1.02	0.02	0.47
Plains Cottonwood	*Populus Tremuloides*	FAC	Native	2.05	0.02	0.02
Bare Ground	-	-	-	34.92	-	-

Table 3. Importance Value (Dominance) Table for Upland Habitat Species

Species				
Common Name	Relative Cover	Relative Frequency	Relative Density	Importance Value (IVI)
Western Wheatgrass	62.96296296	43.33333333	78.8042746	185.1005709
Canada Thistle	3.605200946	43.33333333	1.957580038	16.67389209
Lambsquarters	0.985027581	11.11111111	0.61126621	8.262960458
Showy Milkweed	1.674546887	6.666666667	0.467618651	7.697721094
Field Horsetail	0.394011032	5.555555556	0.366759726	1.871881869
Hoary Cress	22.77383767	1.111111111	13.94652116	61.16480327
Western Snowberry	0.669818755	24.44444444	0.038968221	2.931009198
Curly Dock	0.039401103	2.222222222	0.009168993	1.159681207
Leafy Spurge	0.985027581	1.111111111	0.458449658	2.554588349
Cheatgrass	1.182033097	1.111111111	1.399731768	3.692875976
Smooth Brome	1.576044129	1.111111111	1.866309024	4.553464265
Plains Cottonwood	3.152088258	1.111111111	0.073351945	4.336551315

Table 4. Species Data Table for Riparian Habitat

Species						
Common Name	Scientific Name	NWPL Status	Native Status	Cover (%)	Frequency	Population Density (ind/sqft)
Reed Canary Grass	*Phalaris arundinacea*	FACW	Non-Native	19.11	0.82	5.76
Narrowleaf Willow	*Salix exigua*	FACW	Native	11.15	0.60	0.24
Curly Dock	*Rumex crispus*	FAC	Non-Native	2.48	0.14	0.21
Salt grass	*Distichlis spicata*	FACW	Native	1.78	0.21	0.23
Bull Thistle	*Cirsium vulgare*	UPL	List B Noxious	1.56	0.21	0.13
Showy Milkweed	*Asclepias speciosa*	FAC	Native	0.47	0.07	0.04
Western Wheatgrass	*Pascopyrum smithii*	FACU	Native	2.29	0.18	1.07
Cuman Ragweed	*Ambrosia psilostachya*	FAC	Non-Native	1.09	0.14	0.28
Cheatgrass	*Bromus tectorum*	FACU	List C Noxious	0.93	0.10	0.40
Plains Cottonwood	*Populus tremuloides*	FAC	Native	0.81	0.07	0.01
Lambsquarters	*Chenopodium album*	FACU	Non-Native	0.04	0.03	0.01
Peachleaf Willow	*Salix amygdaloides*	FACW	Native	1.67	0.07	0.01
Broadleaf Pepperweed	*Lepidium latifolium*	FACW	Non-Native	0.18	0.03	0.02
Foxtail Barley	*Hordeum jubatum*	FACW	Native	0.37	0.03	0.16
Bare Ground	-	-	-	56.07	-	-

Table 5. Importance Value (Dominance) Table for Riparian Habitat Species

Species				
Common Name	Relative Cover	Relative Frequency	Relative Density	Importance Value (IVI)
Reed Canary Grass	43.50759	29.87012987	66.91359	140.2913044
Narrowleaf Willow	25.37943	22.07792208	2.807162	50.26451115
Curly Dock	5.649241	5.194805195	2.4994	13.34344678
Salt grass	4.047218	7.792207792	2.685923	14.52534818
Bull Thistle	3.541315	7.792207792	1.566788	12.90031147
Showy Milkweed	1.053963	2.597402597	0.559567	4.210932759
Western Wheatgrass	5.227656	6.493506494	12.43953	24.16069558
Cuman Ragweed	2.487352	5.194805195	3.301447	10.98360448
Cheatgrass	2.107926	3.896103896	4.745729	10.74975901
Plains Cottonwood	1.854975	2.597402597	0.08207	4.534447167
Lambsquarters	0.084317	1.298701299	0.099479	1.482496955
Peachleaf Willow	3.794266	2.597402597	0.16787	6.559539218
Broadleaf Pepperweed	0.421585	1.298701299	0.233153	1.953439484
Foxtail Barley	0.84317	1.298701299	1.898292	4.040163344

Table 6. Species Data Table for Wetland Habitat

Species						
Common Name	Scientific Name	NWPL Status	Native Status	Cover (%)	Frequency	Population Density (ind/sqft)
Broad-Leaf Cat-Tail	*Typha latifolia*	OBL	Native	16.00	0.57	5.01
Spotted Lady's-Thumb	*Persicaria maculosa*	FACW	Non-Native	28.14	0.71	12.15
Field Pennycress	*Thlaspi arvense*	FACU	Non-Native	13.57	0.86	7.94
Colorado Rush	*Juncus confusus*	FACW	Native	5.00	0.14	3.37
Lamb's Quarters	*Chenopodium album*	FACU	Non-Native	0.43	0.29	0.10
Herb Sophia	*Descurainia sophia*	-	Non-Native	0.71	0.14	0.06
Nebraska Sedge	*Carex nebrascensis*	OBL	Native	14.28	0.14	5.14
Bare Ground	-	-	-	21.86	-	-

Table 7. Importance Value (Dominance) Table for Wetland Habitat Species

Species				
Common Name	Relative Cover	Relative Frequency	Relative Density	Importance Value (IVI)
Broad-Leaf Cat-Tail	20.47531993	20.0	14.83679525	55.31211518
Spotted Lady's-Thumb	36.01462523	25.0	35.97352203	96.98814726
Field Pennycress	17.36745887	30.0	23.49159248	70.85905135
Colorado Rush	6.398537477	5.0	9.986304497	21.38484197
Lamb's Quarters	0.548446069	10.0	0.304344518	10.85279059
Herb Sophia	0.914076782	5.0	0.190215324	6.104292106
Nebraska Sedge	18.28153565	5.0	15.2172259	38.49876155

Table 8. Species Data Table for Wetland-Upland Transition Habitat

Species						
Common Name	Scientific Name	NWPL Status	Native Status	Cover (%)	Frequency	Population Density (ind/sqft)
Field Pennycress	*Thlaspi arvense*	FACU	Non-Native	6.25	0.37	3.65
Spotted Lady's-Thumb	*Persicaria maculosa*	FACW	Non-Native	3.12	0.25	1.35
Lambsquarters	*Chenopodium album*	FACU	Non-Native	0.12	0.12	0.03
Colorado Rush	*Juncus confusus*	FACW	Native	20.00	0.37	13.50
Reed Canary Grass	*Phalaris arundinacea*	FACW	Native	11.25	0.50	3.52
Nebraska Sedge	*Carex nebrascensis*	OBL	Native	5.00	0.12	1.80
Western Wheatgrass	*Pascopyrum smithii*	FACU	Native	23.75	0.50	11.50
Broadleaf Pepperweed	*Lepidium latifolium*	FACW	Non-Native	5.12	0.50	0.58
Canada Thistle	*Cirsium arvense*	FAC	List B Noxious	1.37	0.37	0.29
Russian Olive	*Elaeagnus Angustifolia*	FACU	List B Noxious	0.75	0.25	0.01
Showy Milkweed	*Asclepias speciosa*	FAC	Native	4.25	0.37	0.46
Bare Ground	-	-	-	19.00	-	-

Table 9. Importance Value (Dominance) Table for Wetland-Upland Transition Habitat Species

Species				
Common Name	Relative Cover	Relative Frequency	Relative Density	Importance Value (IVI)
Field Pennycress	7.716049383	10	9.96708602	27.6831354
Spotted Lady's-Thumb	3.858024691	6.666666667	3.680154838	14.2048462
Lambsquarters	0.154320988	3.33333333	0.081781219	3.56943554
Colorado Rush	24.69135802	10	36.80154838	71.49290641
Reed Canary Grass	13.88888889	13.33333333	9.594689399	36.81691162
Nebraska Sedge	6.172839506	3.33333333	4.906873117	14.41304596
Western Wheatgrass	29.32098765	13.33333333	31.33933658	73.99365757
Broadleaf Pepperweed	6.327160494	13.33333333	1.571732795	21.23222662
Canada Thistle	1.697530864	10	0.787144229	12.48467509
Russian Olive	0.925925926	6.666666667	0.018400774	7.610993367
Showy Milkweed	5.24691358	10	1.251252645	16.49816623

Line Transect Data Sheet

WP 1 WP 2

Date:	Transect #:	Start Lat/Long:	End Lat/Long:
6/17/20	1	40.341769°, -104.860722	40.341668°, -104.860385°

Species	NWPL Status	Section: 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
broadleaf cattails	OBL	3																				
unknown 1	FACW	4	6	3	9		2															
field pennycress	FACU	0 ~~7~~ 10	7	2	9	8																
lambsquarters	FACU				1											6						
bulrush	OBL					10	5															
reed canarygrass	FAC					3																
western wheatgrass	FACU						2	10	11	10	12	10	7	5	2	5	8	8	7	8	5	10
showy milkweed	FAC								1	2		1	1	1								
guadeloupe cucumber	FAC						1															
broadleaf pepperweed	FACW							1		1			1									
canada thistle	FAC										1		2	4					2			
field horsetail	FAC																					4

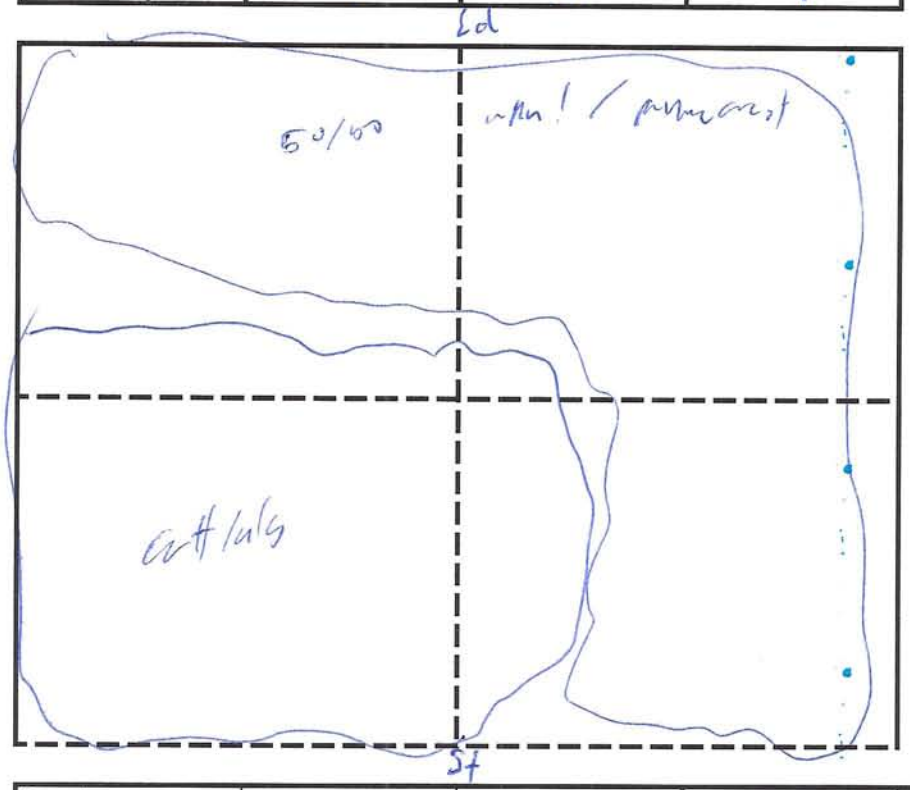
unknown 1 = Spotted ladys thumb
bulrush = Schoenoplectus actus
broadleaf pepperweed = Lepidium latifolium

Tree Prevalence Data Sheet

Date: 6/17/20	Transect #: 1	Start Lat/Long: 40.341769°, -104.860722°	End Lat/Long: 40.341668°, -104.860385
Species	Distance	Height (est.)	Diameter (est.)
plains cottonwood	6-34'	40'	40'
russian olive	23-30'	20'	15'
F.O.	32-38	10'	6'
	41-45	8'	4'
	47-48	6'	3'

Line Point Transect Data Sheet

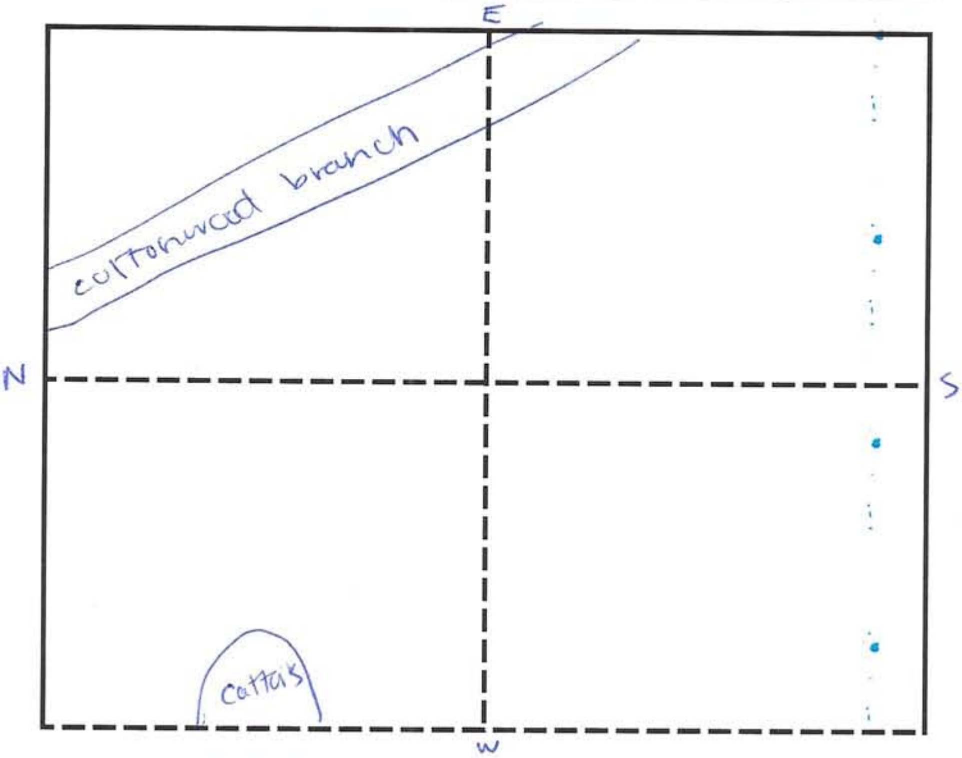
Date:	Transect #:	Section #:	Quad #:
6/17/20	1	1	1



Species	NWPL Status	%	Species	NWPL Status	%
cattails	OBL	40			
unknown 1	FACW	20			
Field pennycress	FACU	15			
bare ground	-	25			

Line Point Transect Data Sheet

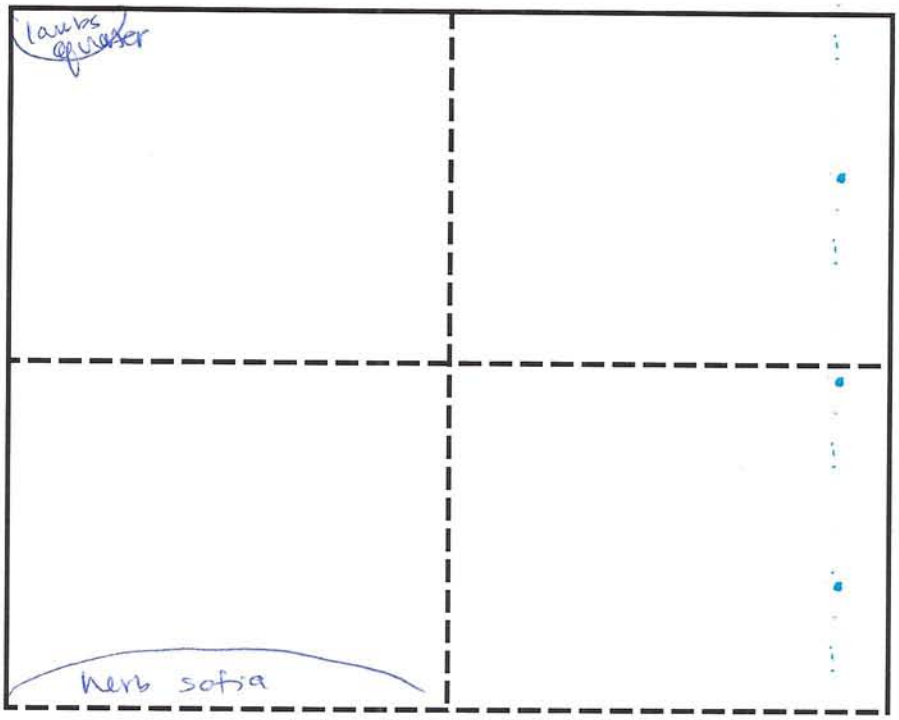
Date:	Transect #:	Section #:	Quad #:
6/17/20	1	1	2



Species	NWPL Status	%	Species	NWPL Status	%
cattails	OBL	2			
pennycress	FACU	15			
unknown 1	FACW	~~60~~ 70			
cottonwood branch	FAC	~~4~~ 3			
bareground	–	10			

Line Point Transect Data Sheet

Date:	Transect #:	Section #:	Quad #:
6/17/20	1	3	1



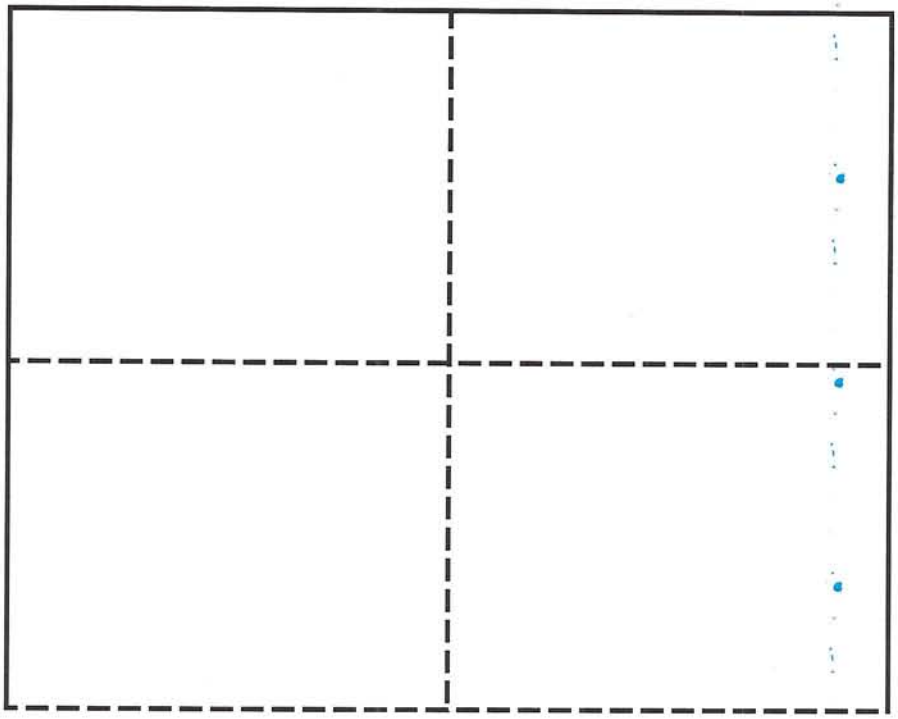
40% overhead coverage of cottonwood

Species	NWPL Status	%	Species	NWPL Status	%
pennycress	FACU	25			
unknown 1	FACW	285			
lambs quarters	FACU	2			
herb sophia	? –	5			
bareground	–	40			
woody debris	–	3			

4
$13
25
28

Line Point Transect Data Sheet

Date:	Transect #:	Section #:	Quad #:
6/17/20	1	3	2



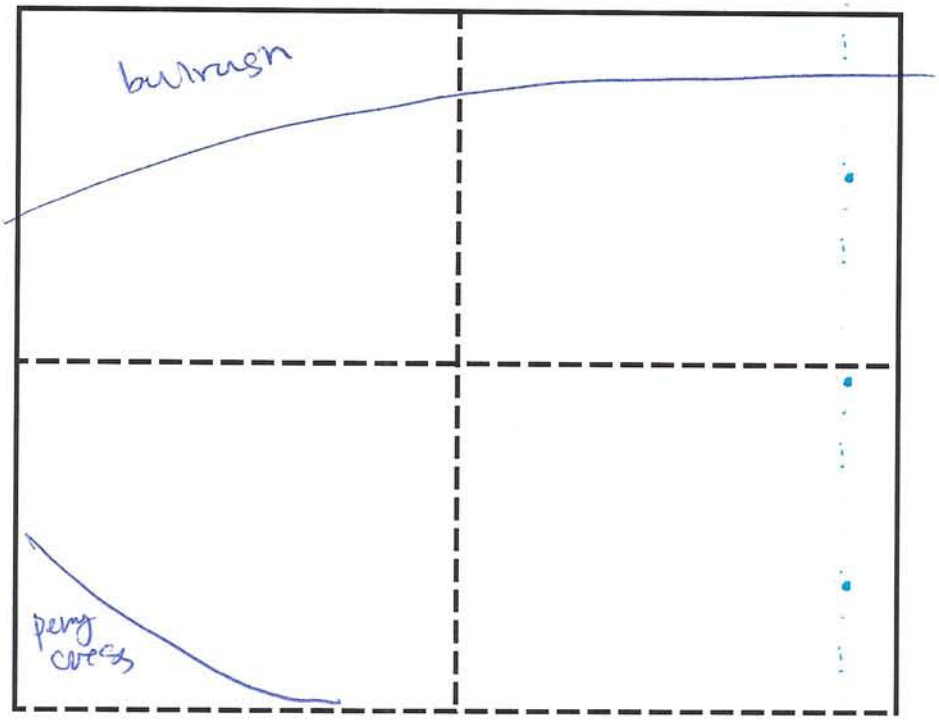
40% overhead coverage of cutter weed

Species	NWPL Status	%	Species	NWPL Status	%
pennycress	FACW/UV	~~100~~ ~~27~~ 30			
unknown 1	FACW	~~15~~ 27			
lambs quarters	FACU	1			
bareground	–	40			
woody debris	–	2			

6/10
4/3

Line Point Transect Data Sheet

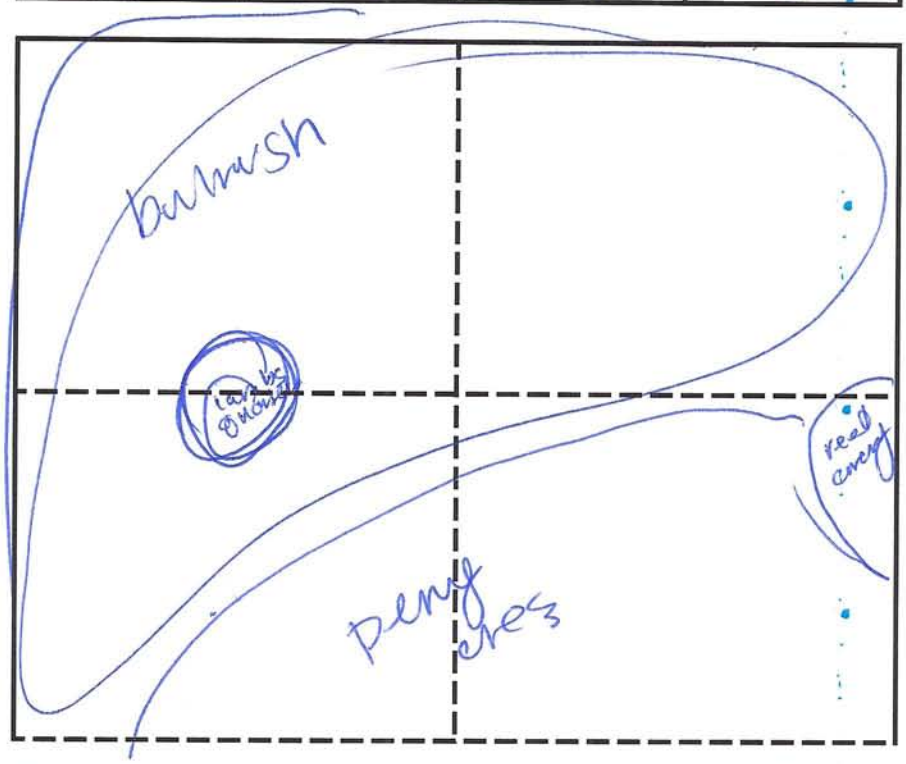
Date:	Transect #:	Section #:	Quad #:
6/17/20	1	5	1



Species	NWPL Status	%	Species	NWPL Status	%
bulrush	OBL	30			
reed canary grass	FAC	40			
unknown 1	FACW	10			
pennycress	FACU	10			
bareground	-	10			

Line Point Transect Data Sheet

Date:	Transect #:	Section #:	Quad #:
6/17/20	1	5	2

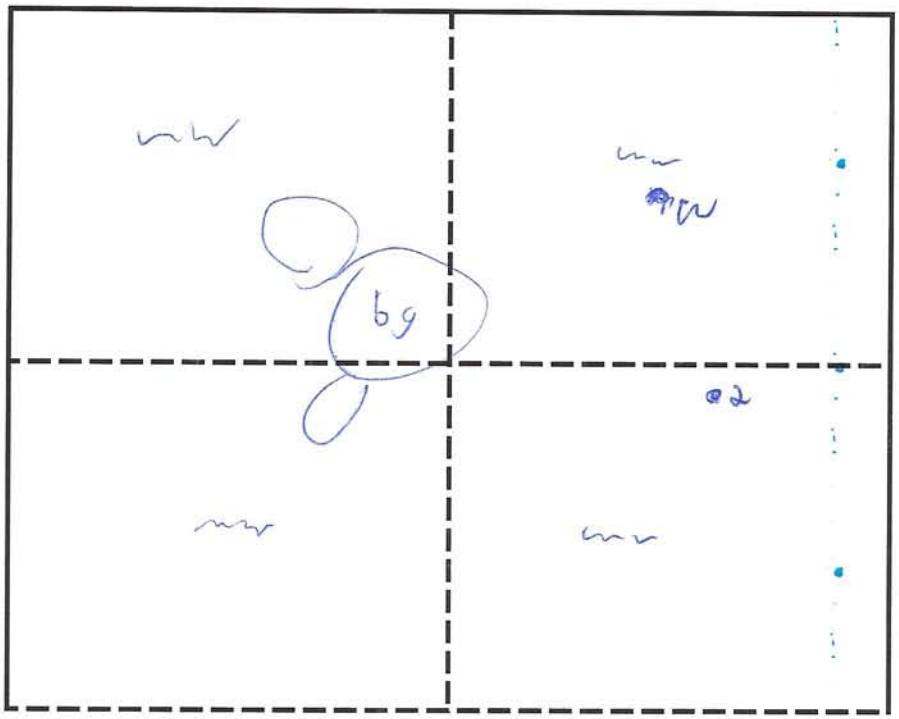


20% overhead coolforward cover

Species	NWPL Status	%	Species	NWPL Status	%
bulrush	OBL	60			
reed canary	FAC	10			
penny cress	FACU	25			
lambs quarters	FACU	1			
bare ground	–	14			

Line Point Transect Data Sheet

Date:	Transect #:	Section #:	Quad #:
6/17/20	1	7	1

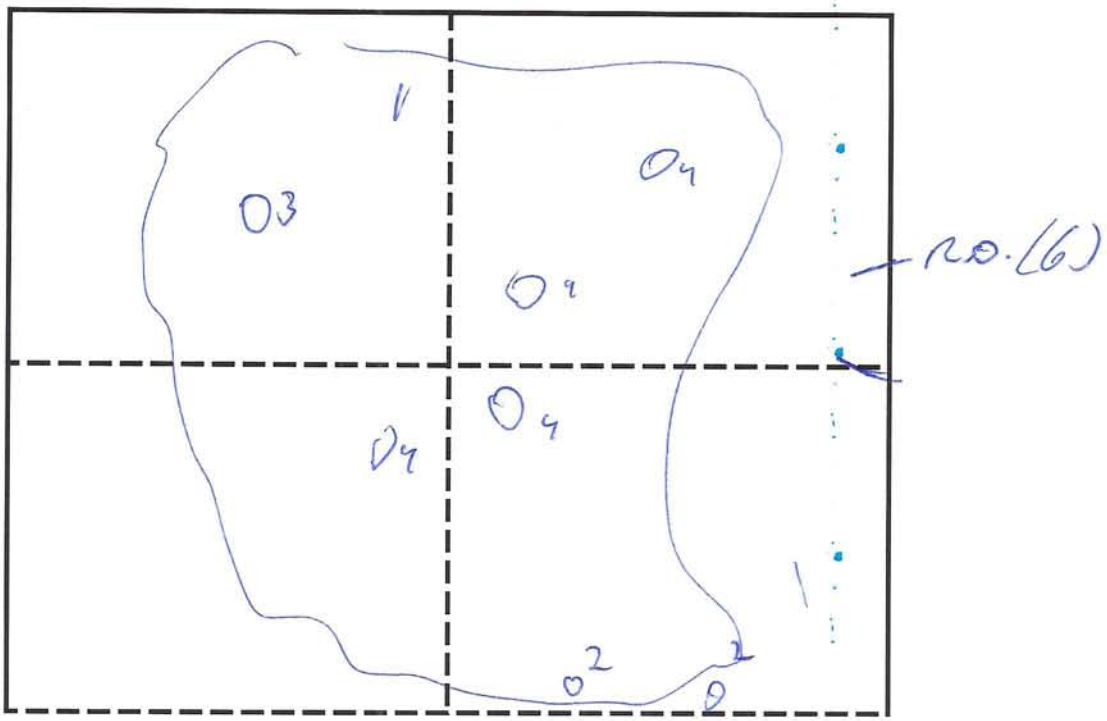


5% ombrd sm

Species	NWPL Status	%	Species	NWPL Status	%
western wheat	FACU	60			
peppermint	FACW	15			
bare ground	-	~~25~~			
woody debris	-	5			

Line Point Transect Data Sheet

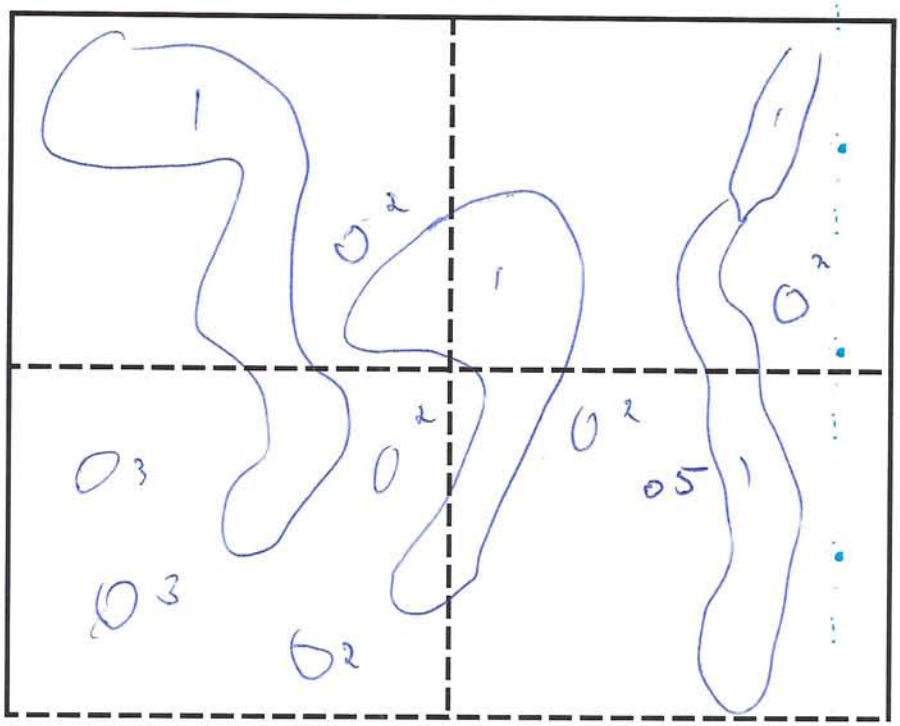
Date: 6/17/20	Transect #: 1	Section #: 7	Quad #: 2



Species	NWPL Status	%	Species	NWPL Status	%
ww	FACU	55			
canada thistle	FAC	5			
milkweed	FAC	5			
perennial	FACW	15			
bare ground	—	20			
russian olive	FACU	1			

Line Point Transect Data Sheet

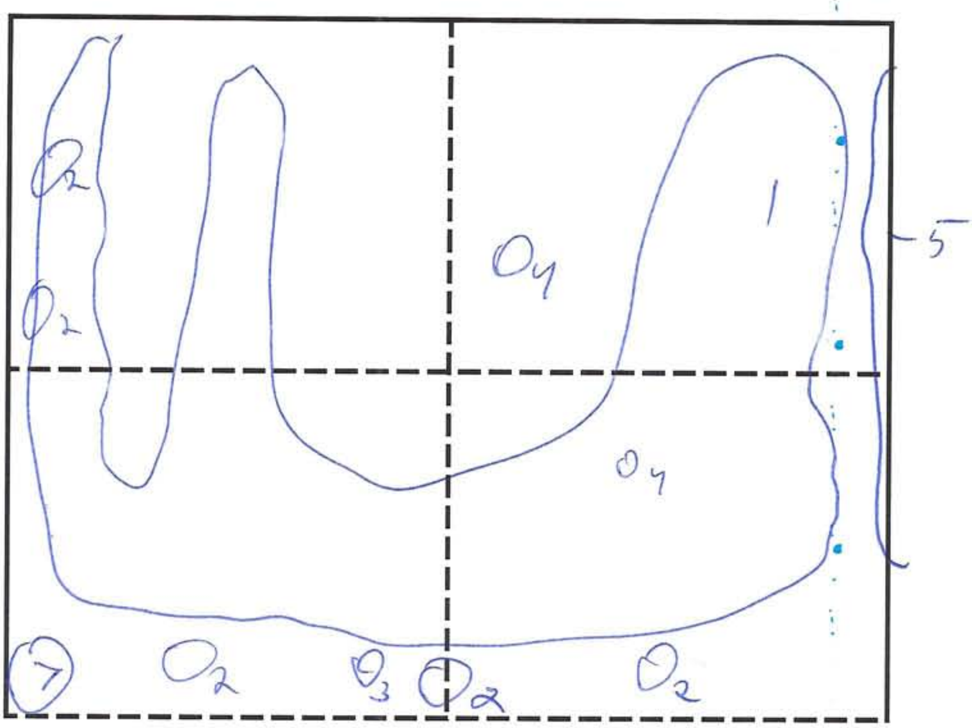
Date:	Transect #:	Section #:	Quad #:
6/17	1	9	1



Species	NWPL Status	%	Species	NWPL Status	%
W. w.	FACW	30			
Milkweed	FAC	20			
perennial	FACW	10			
b.g.	–	40			
Canada	FAC	1			

Line Point Transect Data Sheet

Date:	Transect #:	Section #:	Quad #:
6/17/20	1	9	2

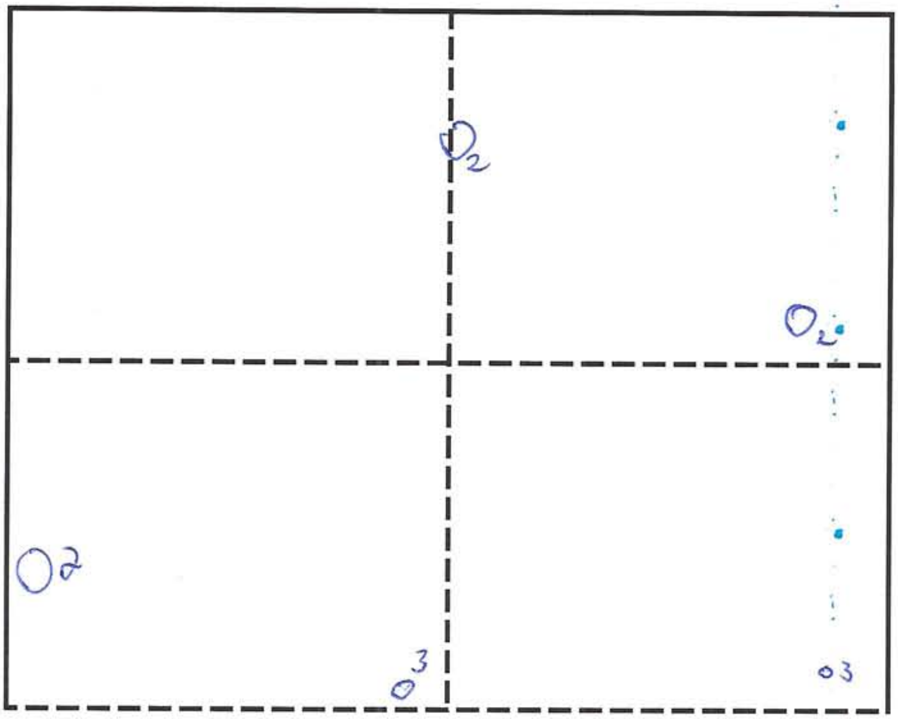


Species	NWPL Status	%	Species	NWPL Status	%
w. w.	FACU	40			
milkweed	FAC	9			
peppermint	FACW	1			
canada thistle	FAC	5			
[illegible]	FACU	5			
b.g.	–	40			
teasel	FACU	1			

Fullers teasel* (Dipsacus fullonum)

Line Point Transect Data Sheet

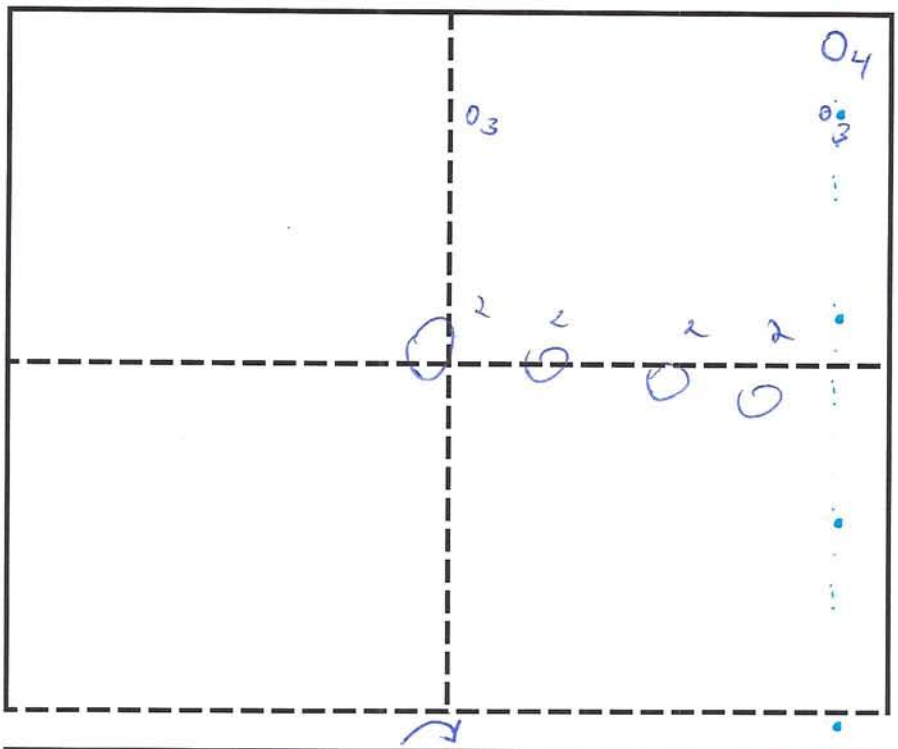
Date:	Transect #:	Section #:	Quad #:
6/17/20	1	11	1



Species	NWPL Status	%	Species	NWPL Status	%
W-W.	FACU	60			
Milkweed	FAC	15			
Canada thistle	FAC	5			
b.g.	—	20			

Line Point Transect Data Sheet

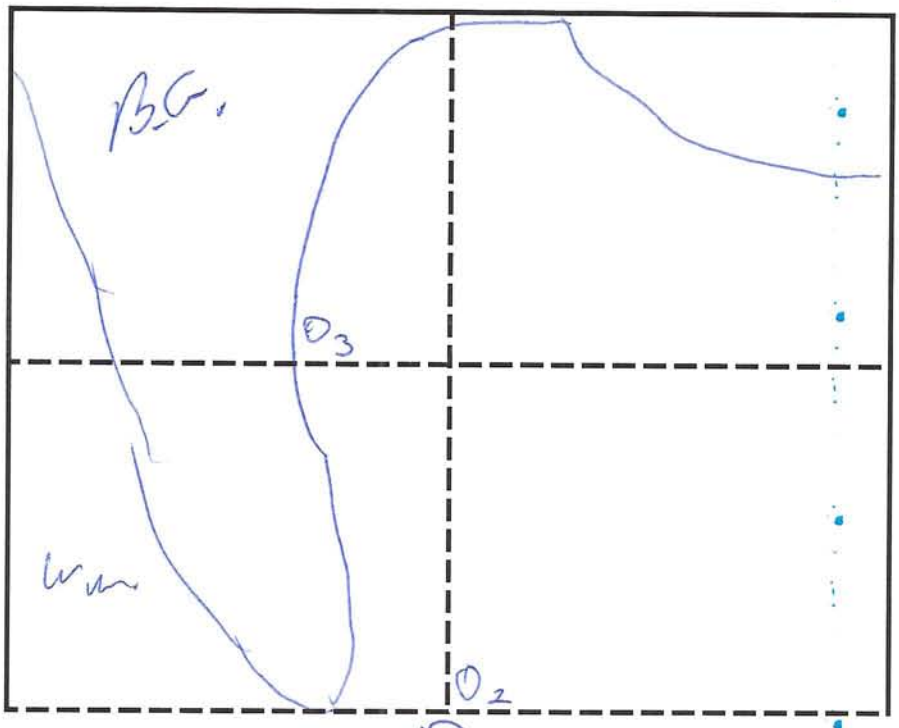
Date:	Transect #:	Section #:	Quad #:
6/17/20	1	11	2



Species	NWPL Status	%	Species	NWPL Status	%
w.w	50	FACU			
milkweed	15	FAC			
thistle	3	FAC			
lambs quarters	2	FACU			
bg	30				

Line Point Transect Data Sheet

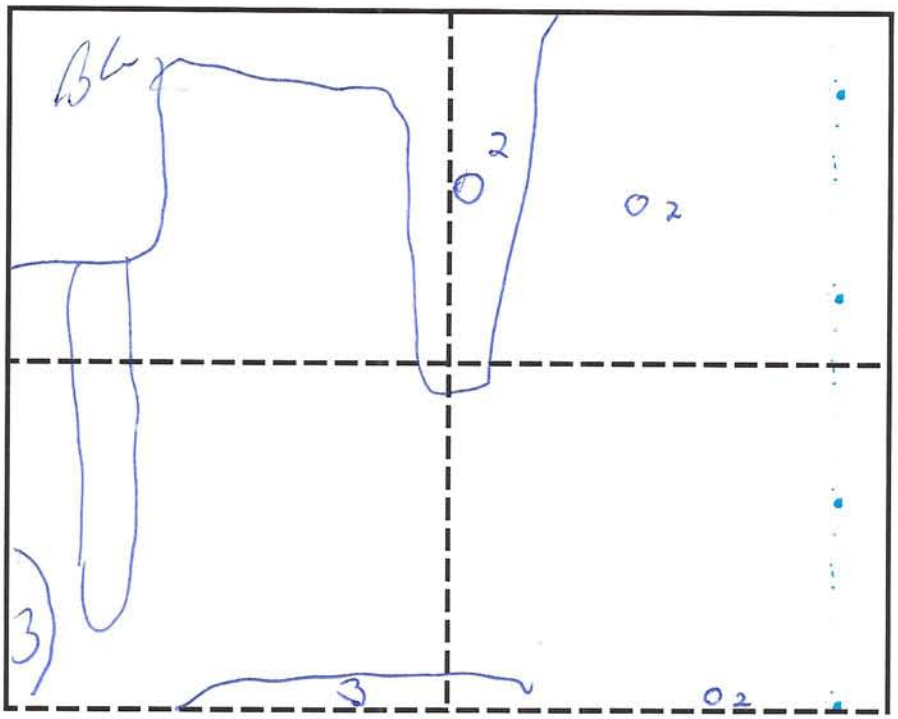
Date:	Transect #:	Section #:	Quad #:
6/17/20	1	13	1



Species	NWPL Status	%	Species	NWPL Status	%
W.M.	45	FACU			
M.W.	2.5	FAC			
C.T.	2.5	FAC			
B.G.	50	–			

Line Point Transect Data Sheet

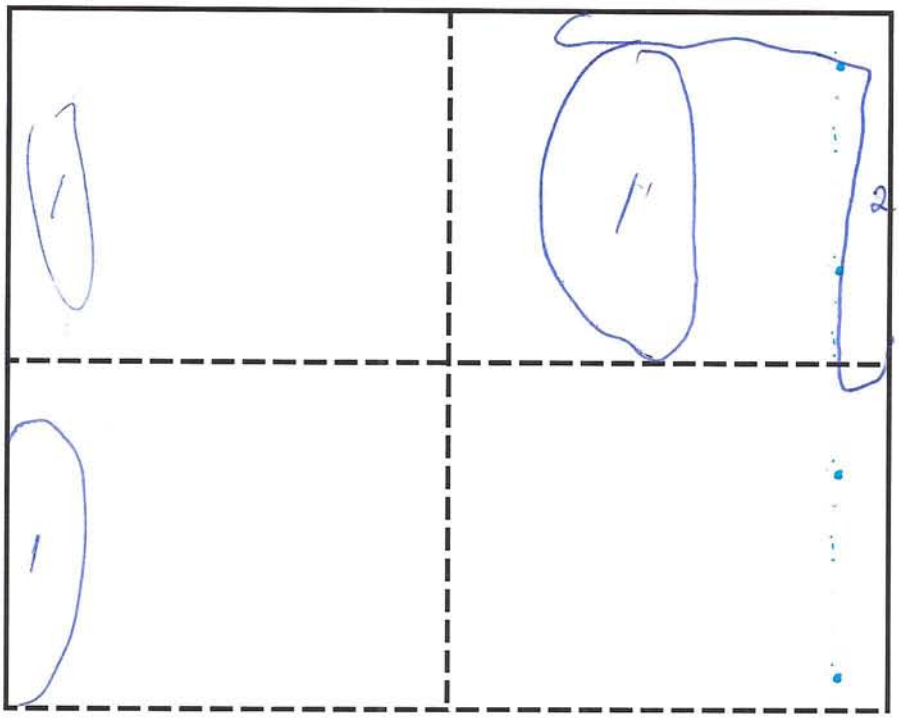
Date:	Transect #:	Section #:	Quad #:
6/17/20	1	13	2



Species	NWPL Status	%	Species	NWPL Status	%
WCW:	FACU	~~50~~ 50			
Milk weed	FAC	5			
Canada thistle	FAC	15			
B.G.	–	~~50~~ 30			

Line Point Transect Data Sheet

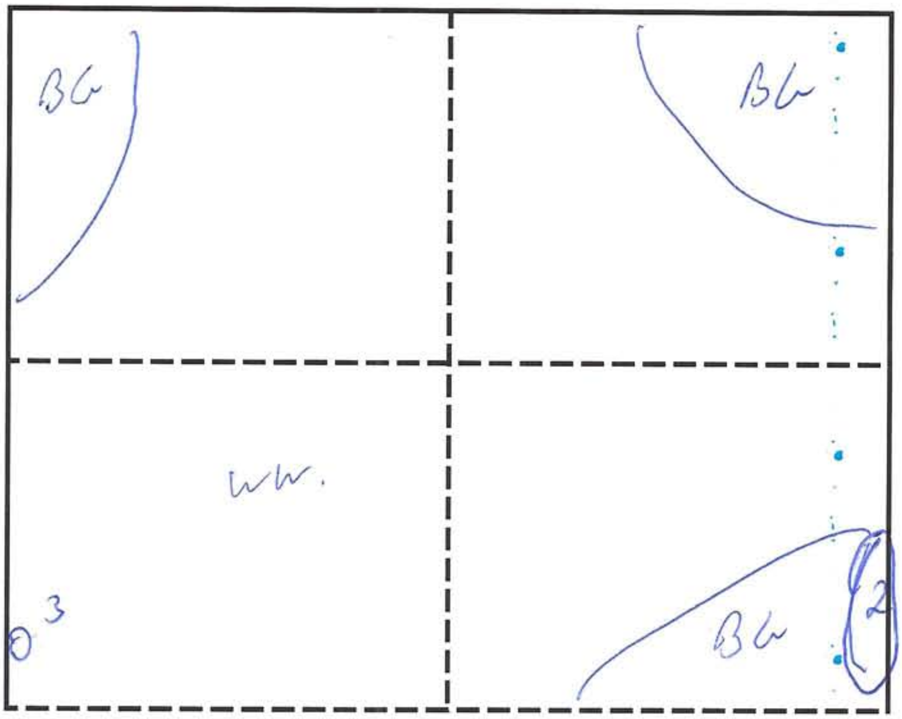
Date:	Transect #:	Section #:	Quad #:
6/17/20	1	15	1



Species	NWPL Status	%	Species	NWPL Status	%
W.w.	FACU	20			
Lamb's Q	FACU	10			
B.G	~~-~~	70			

Line Point Transect Data Sheet

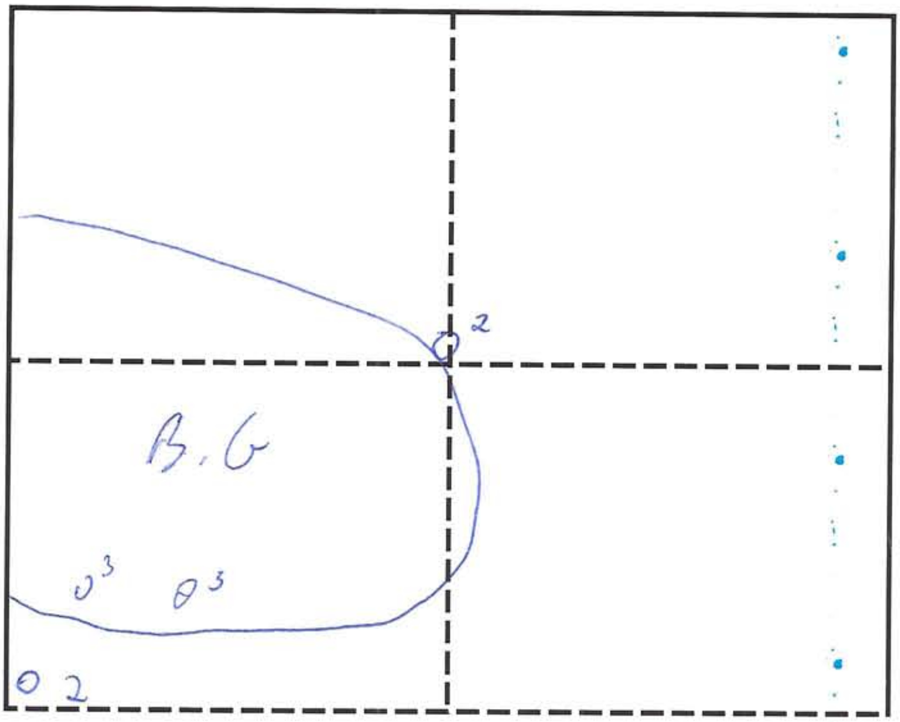
Date: 6/17/20	Transect #: 1	Section #: 15	Quad #: 2



Species	NWPL Status	%	Species	NWPL Status	%
W.W	FACU	50			
Canada thistle	FAC	10			
Lambs'q	FACU	2			
B.G	—	38			

Line Point Transect Data Sheet

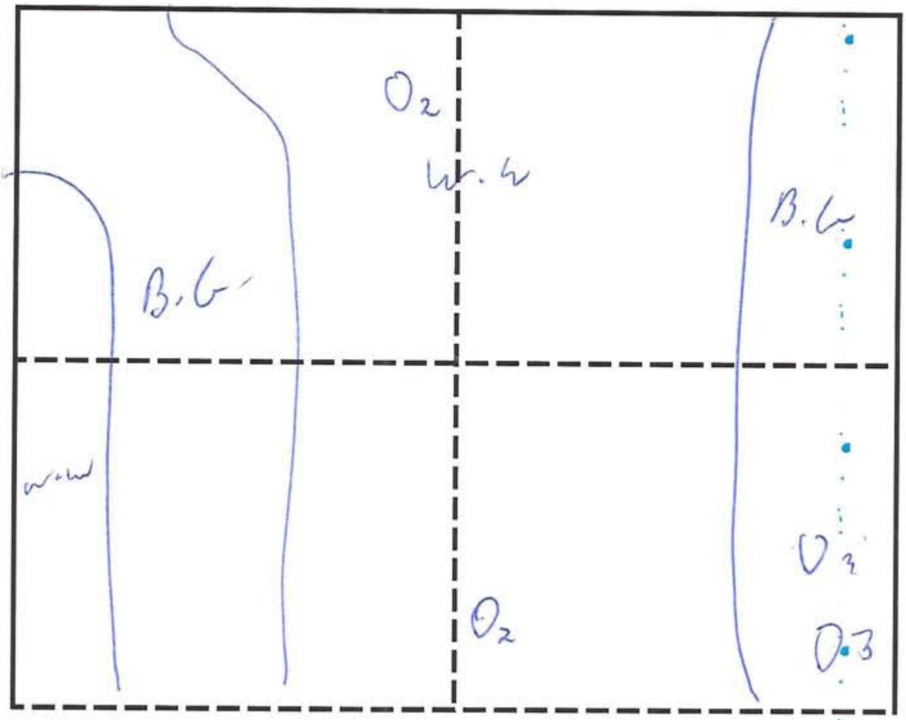
Date:	Transect #:	Section #:	Quad #:
6/17/20	1	17	1



Species	NWPL Status	%	Species	NWPL Status	%
W.h	FACU	60			
Thistle (C.)	FAC	30			
Lambs q	FACU	5			
B.G	—	5			

Line Point Transect Data Sheet

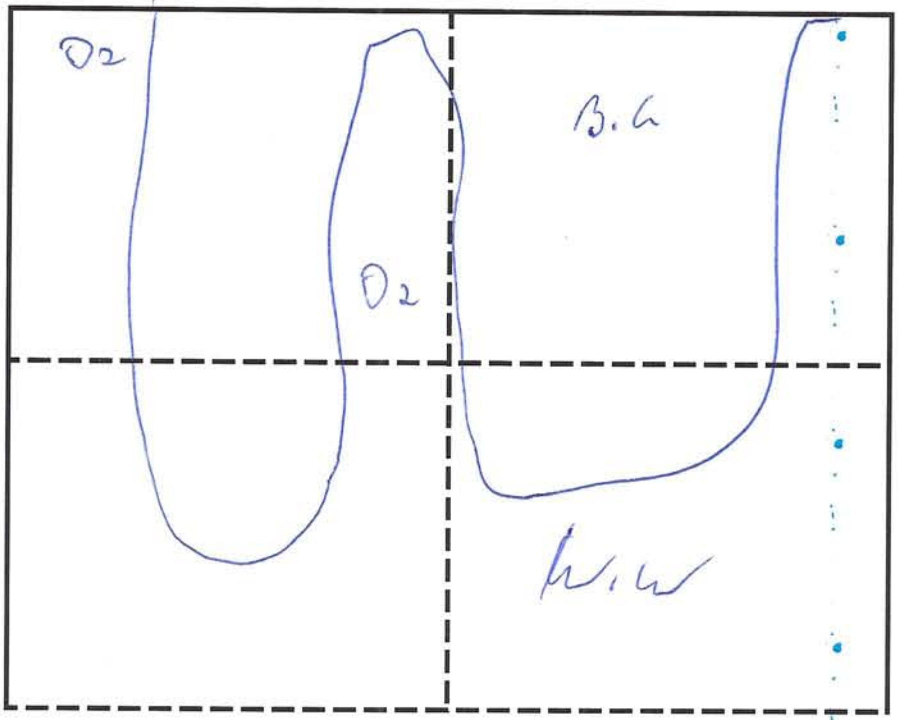
Date:	Transect #:	Section #:	Quad #:
6/17/20	1	17	2



Species	NWPL Status	%	Species	NWPL Status	%
W. W.	FACU	50			
C thistle	FAC	5			
Lambs 1/4	FACU	5			
B. G.	–	40			

Line Point Transect Data Sheet

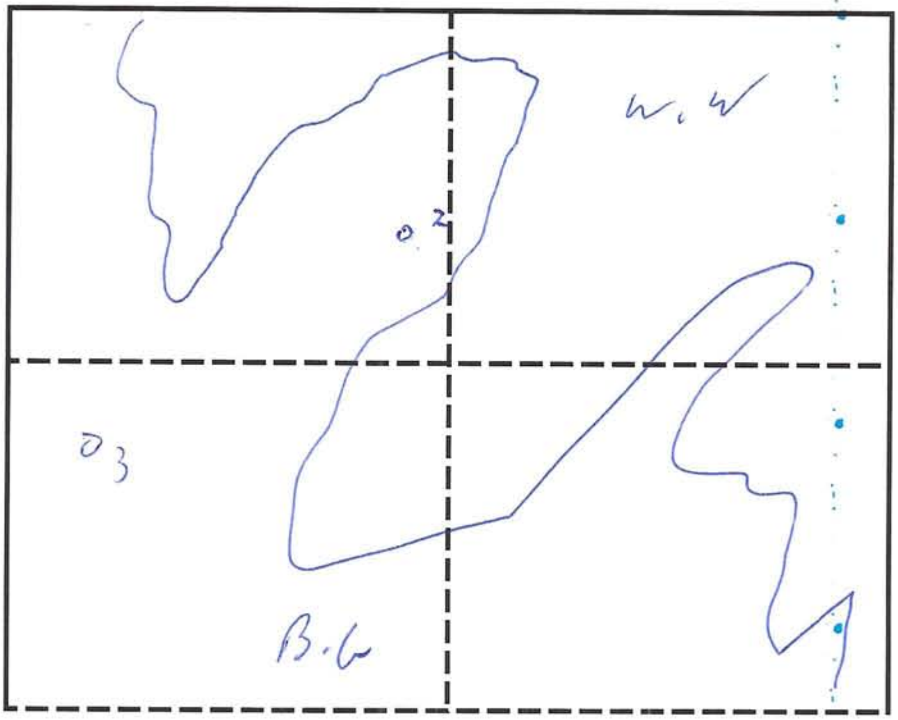
Date:	Transect #:	Section #:	Quad #:
6/17/20	1	19	1



Species	NWPL Status	%	Species	NWPL Status	%
W.W	FACU	55			
Canda thistle	FAC	5			
B.G	—	40			

Line Point Transect Data Sheet

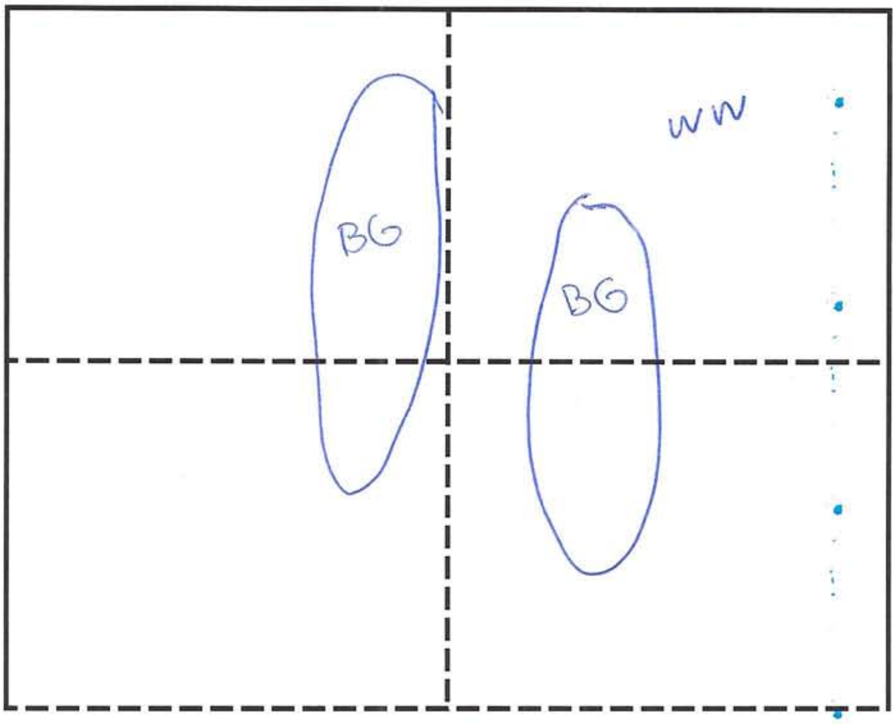
Date:	Transect #:	Section #:	Quad #:
6/17/20	1	19	2



Species	NWPL Status	%	Species	NWPL Status	%
W.W	FACU	49			
Lambs Qu	FACU	1			
C. Thistle	FAC	1			
B.G	—	49			

Line Point Transect Data Sheet

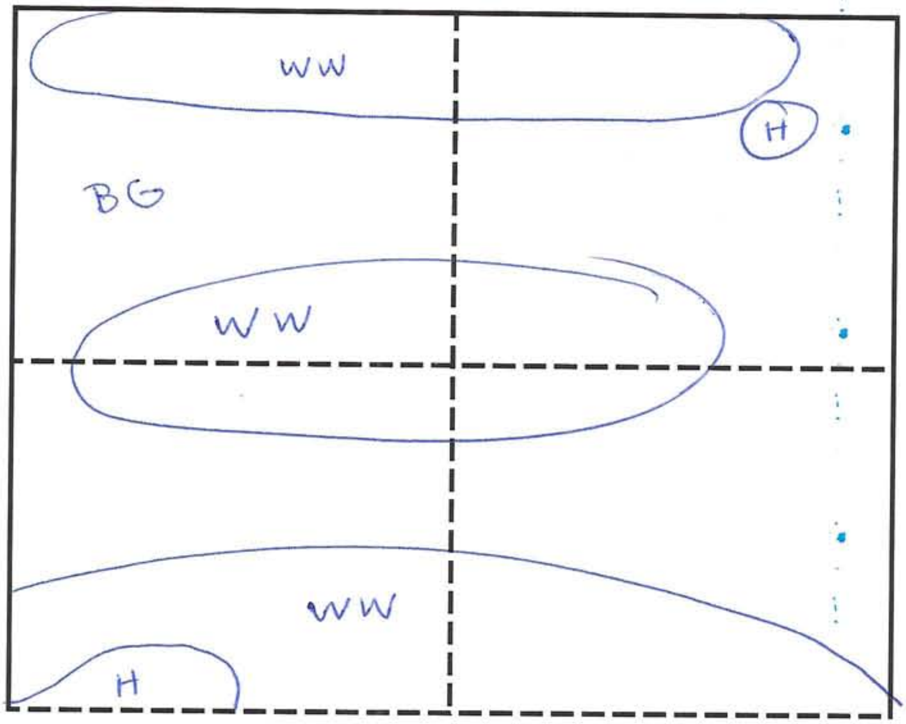
Date:	Transect #:	Section #:	Quad #:
6/17/20	1	21	1



Species	NWPL Status	%	Species	NWPL Status	%
W. W. grass	FACU	60			
B. G.	—	40			

Line Point Transect Data Sheet

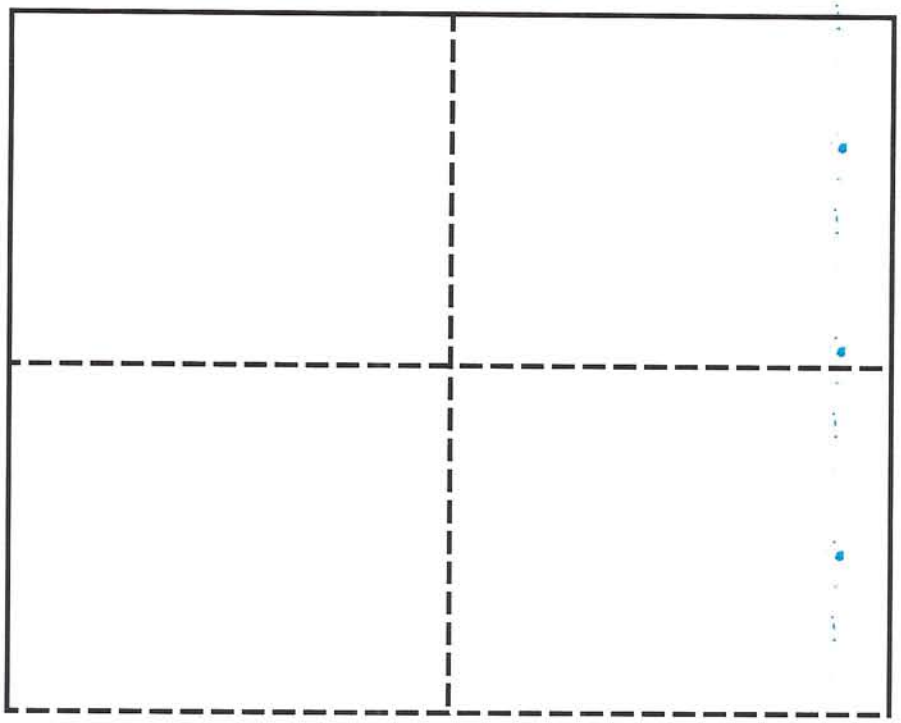
Date: 6/17/20	Transect #: 1	Section #: 21	Quad #: 2



Species	NWPL Status	%	Species	NWPL Status	%
WW grass	FACU	30			
horsetail	FAC	10			

Line Point Transect Data Sheet

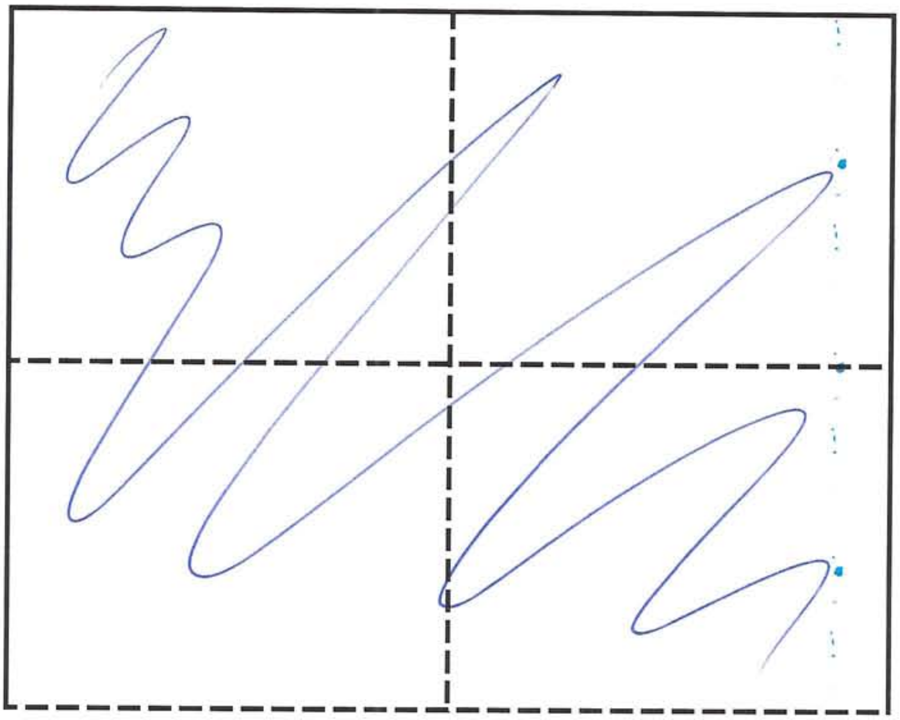
Date:	Transect #:	Section #:	Quad #:
6/18/20	C1	6 –	1



Species	NWPL Status	%	Species	NWPL Status	%
Nebraska sedge	OBL	40			
Reed canary grass	FAC	20			
unknown 1	FACW	15			
Field pennycress	FACU	15			

Line Point Transect Data Sheet

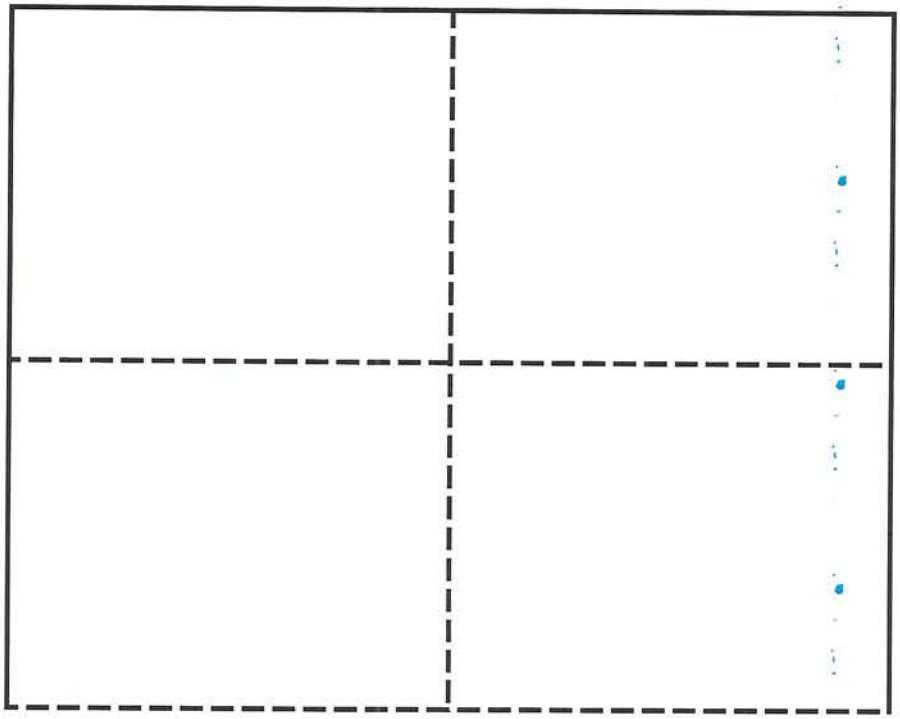
Date:	Transect #:	Section #:	Quad #:
6/18/20	C1	—	2



Species	NWPL Status	%	Species	NWPL Status	%
Nebraska S.	OBL	100			

Line Point Transect Data Sheet

Date:	Transect #:	Section #:	Quad #:
6/18/20	C3 1	–	3



Species	NWPL Status	%	Species	NWPL Status	%
bulrush	OBL	35			
cattails	OBL	40			
field penny	FACU	5			
Bare ground	–	20			

Line Point Transect Data Sheet

Date:	Transect #:	Section #:	Quad #:
6/18/20	C1	–	4

Species	NWPL Status	%	Species	NWPL Status	%
cattails	OBL	30			
unknown 1	FACW	55			
B. G.	–	10			
Field penny	FACU	5			

Line Point Transect Data Sheet

Date:	Transect #:	Section #:	Quad #:
6/18/20	C1	—	5

Species	NWPL Status	%	Species	NWPL Status	%
reed canary	FAC	20			
bulrush	OBL	70			
B. G.	—	10			

Line Transect Data Sheet

WP3 WP4

Date:	Transect #:	Start Lat/Long:	End Lat/Long:
6/17/20	2	40.341908 -104.859339	40.341633 -104.859423

Species	NWPL Status	Section: 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
W. wheatgrass	FACU	5	5	3	2	5	3	4	1	3	3	5	2	8	4	3	3	3	5	4	2	6
shepards purse (?)	NA		1	1	5	2	1	2	2	1	2	4	8	2	2		1	1	1	2	8	4
snowberry	UPL			1																		
rambs quarters	FACU									1												

shepards purse => hoary cress

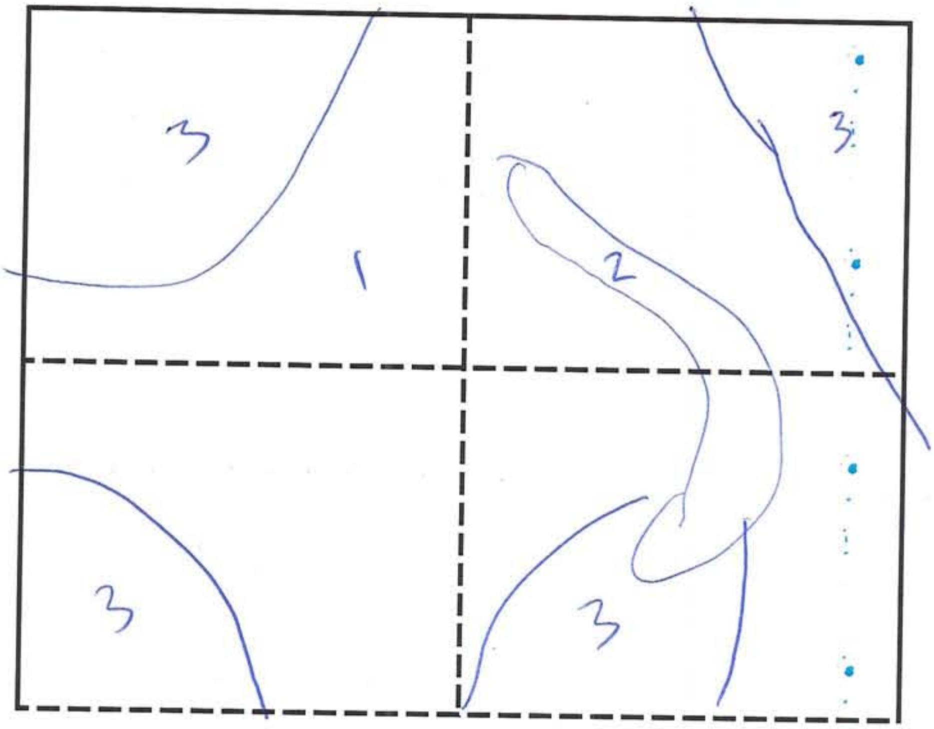
Tree Prevalence Data Sheet

WP 3 WP 4

Date: 6/18/20	Transect #: 2	Start Lat/Long: 40.341908, -104.859339	End Lat/Long: 40.341633 -104.859423
Species	Distance	Height (est.)	Diameter (est.)
cottonwood	0-33	60	35
cottonwood	5-17	30	20
cottonwood	33-48	40	15
" "	34-69	60	30
" "	61-100	60	45
" "	72-100	60	

Line Point Transect Data Sheet

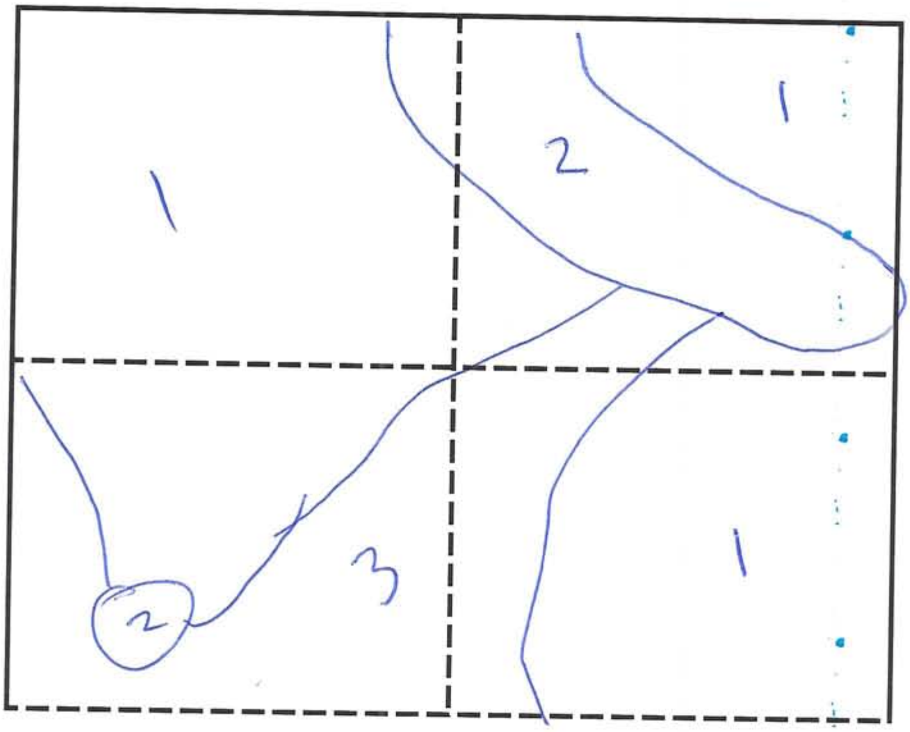
Date:	Transect #:	Section #:	Quad #:
6/18/20	2	1	1



Species	NWPL Status	%	Species	NWPL Status	%
western wheat	FACU	55			
shep purse	–	15			
bare ground	–	30			

Line Point Transect Data Sheet

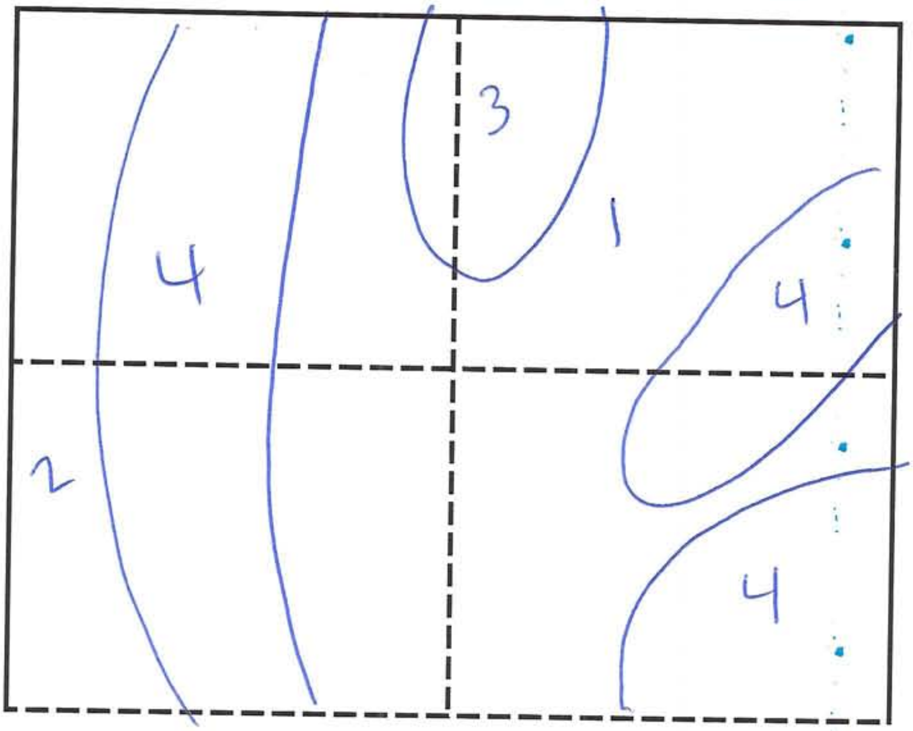
Date: 6/18	Transect #: 2	Section #: 1	Quad #: 2



Species	NWPL Status	%	Species	NWPL Status	%
w. w. grass	FACU	50			
Shep. purse	–	20			
bareground	–	30			

Line Point Transect Data Sheet

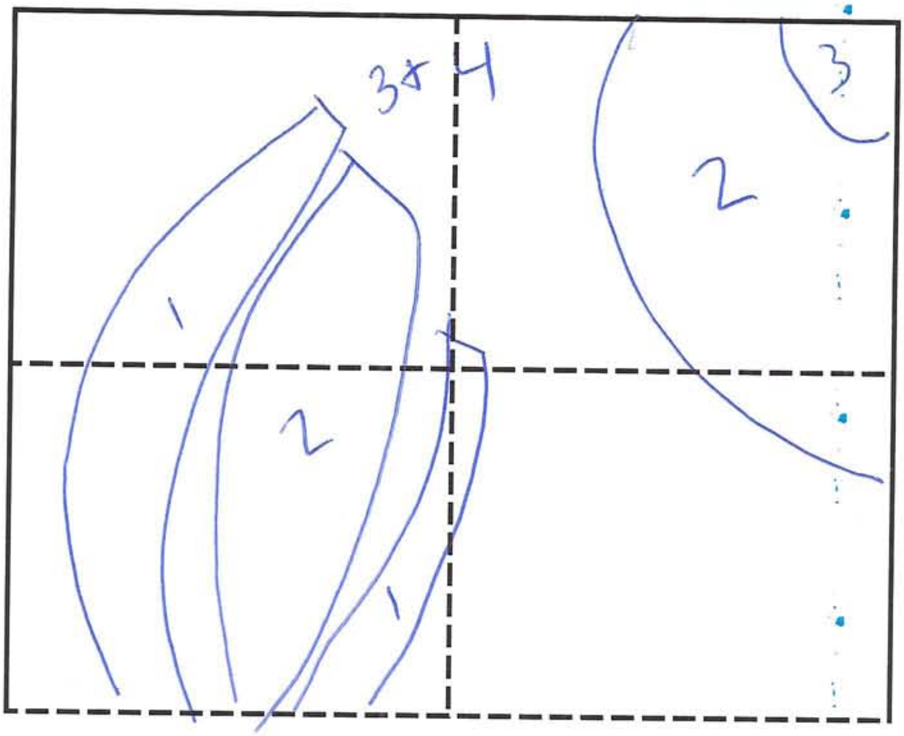
Date:	Transect #:	Section #:	Quad #:
6/18/20	2	3	1



Species	NWPL Status	%	Species	NWPL Status	%
w. w. grass	FACU	30			
Shep purse	–	15			
snowberry	UPL	15			
bare ground	–	50			

Line Point Transect Data Sheet

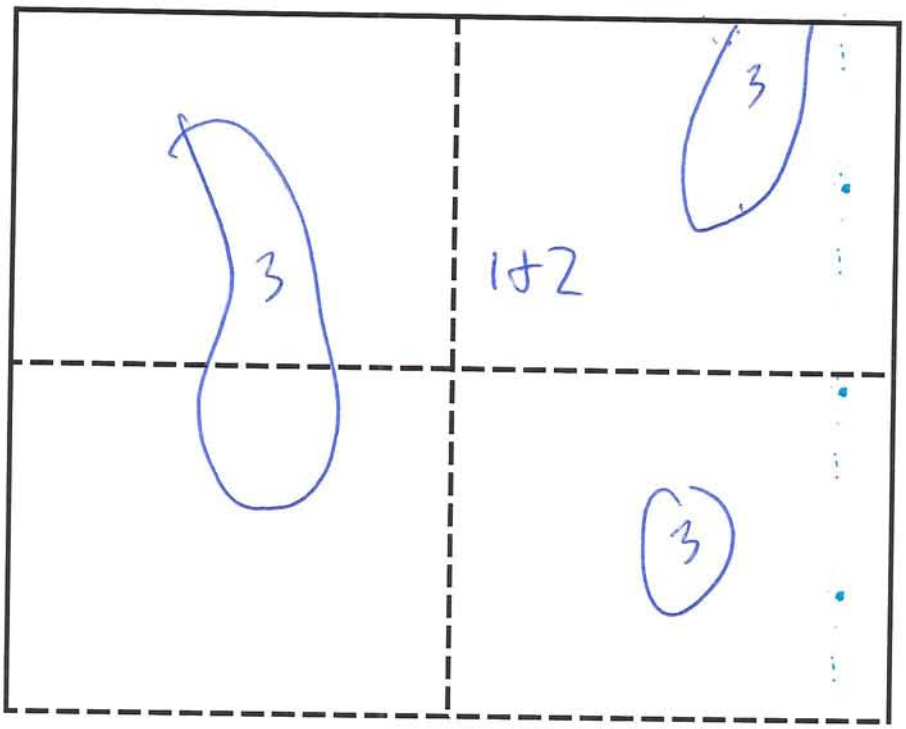
Date:	Transect #:	Section #:	Quad #:
6/18/20	2	3	2



Species	NWPL Status	%	Species	NWPL Status	%
woody debris	-	15			
bareground	-	15			
strawberry	UPL	2			
w.w grass	FACU				
sheep purs	-				

Line Point Transect Data Sheet

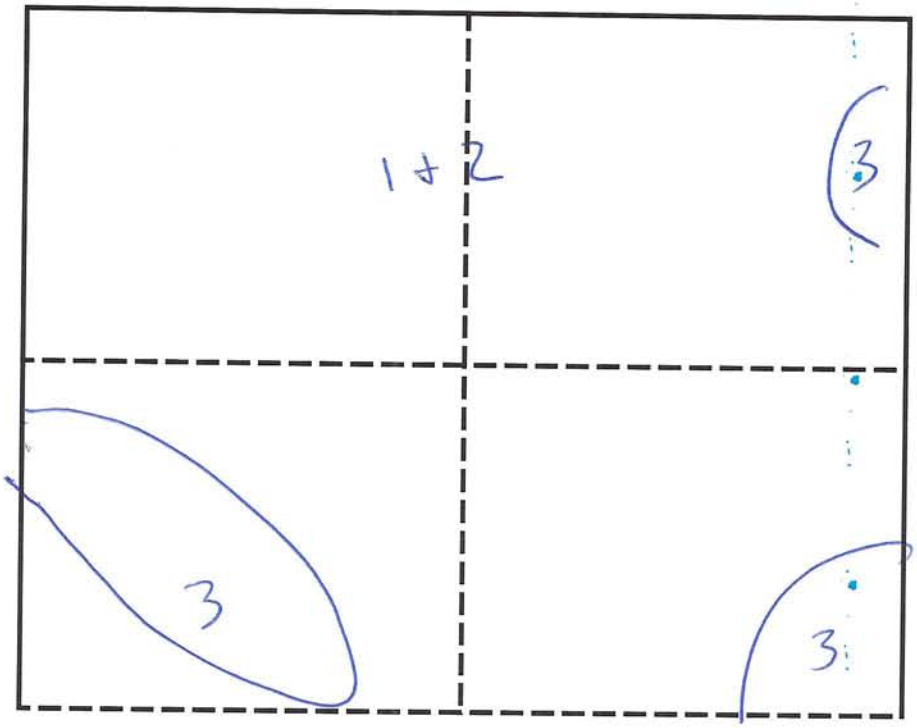
Date:	Transect #:	Section #:	Quad #:
6/18/20	2	5	1



Species	NWPL Status	%	Species	NWPL Status	%
W. W grass	FACU	55			
Shep. purse	~~OBL~~ -	30			
bare ground	–	15			

Line Point Transect Data Sheet

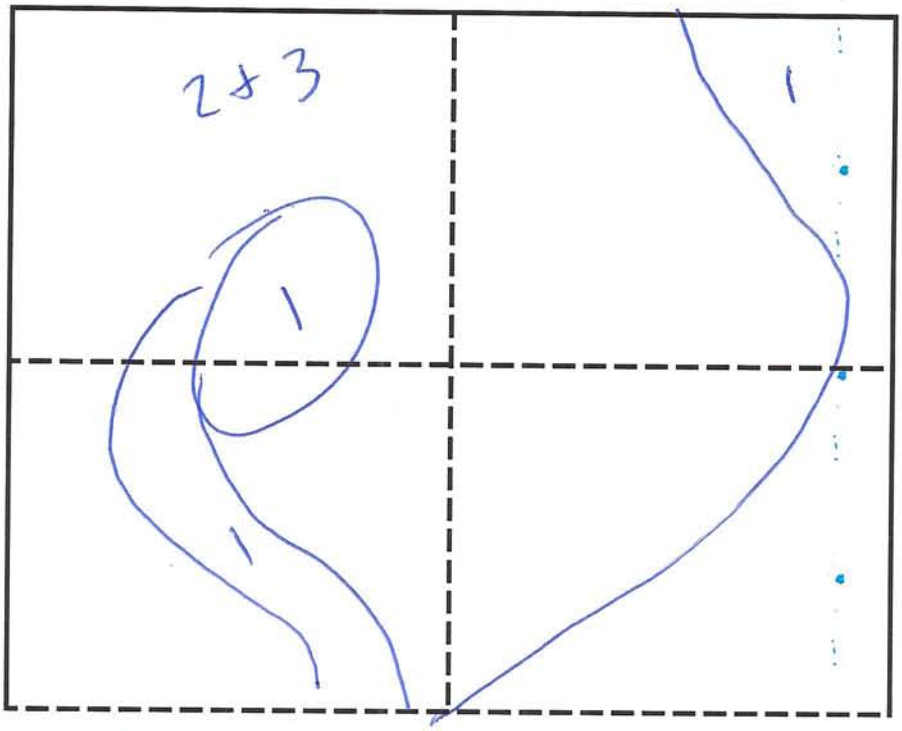
Date:	Transect #:	Section #:	Quad #:
6/18	2	5	2



Species	NWPL Status	%	Species	NWPL Status	%
W.W. grass	FACU	70			
Sheep fescue	-	15			
bareground	-	15			

Line Point Transect Data Sheet

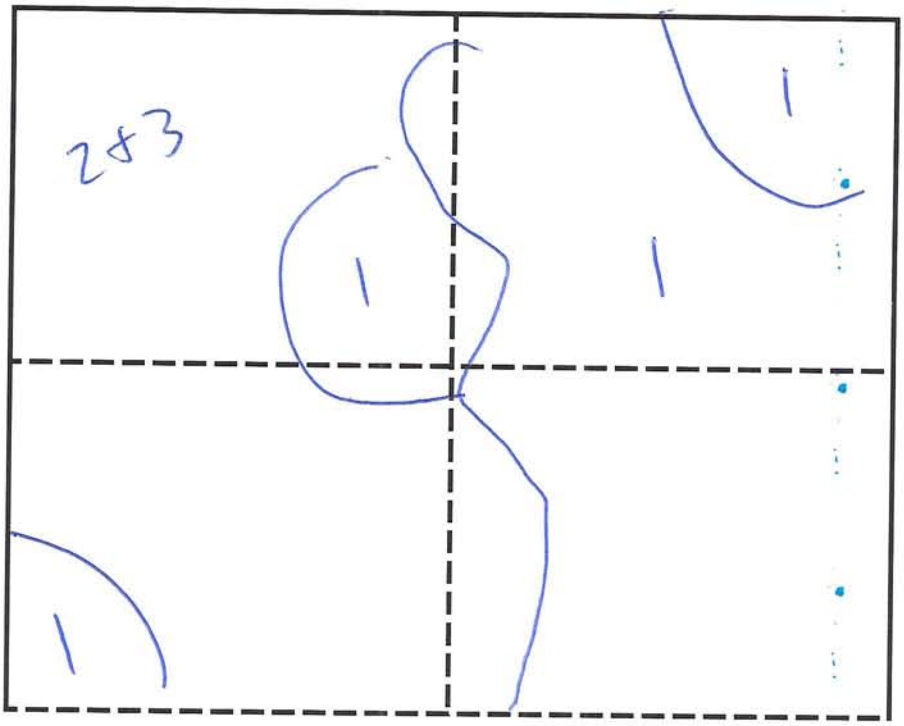
Date:	Transect #:	Section #:	Quad #:
6/18/20	2	7	1



Species	NWPL Status	%	Species	NWPL Status	%
bareground	–	50			
shep purse	–	35			
w. w grass	FALU	15			

Line Point Transect Data Sheet

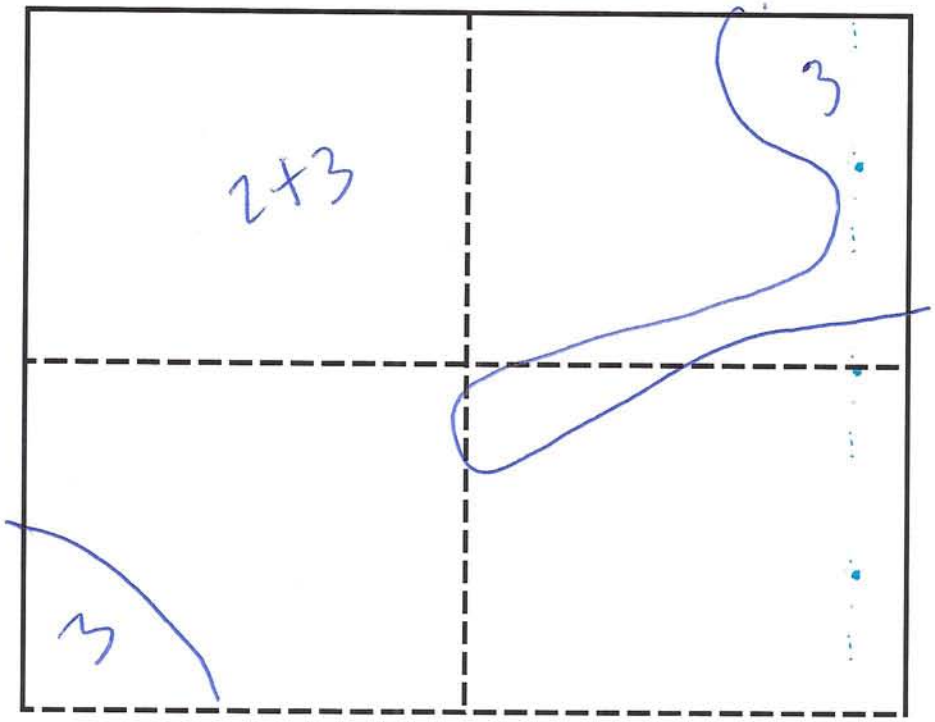
Date:	Transect #:	Section #:	Quad #:
6/18/20	2	7	2



Species	NWPL Status	%	Species	NWPL Status	%
bareground	–	70			
Shep purse	–	20			
w.w grass	FACU	10			

Line Point Transect Data Sheet

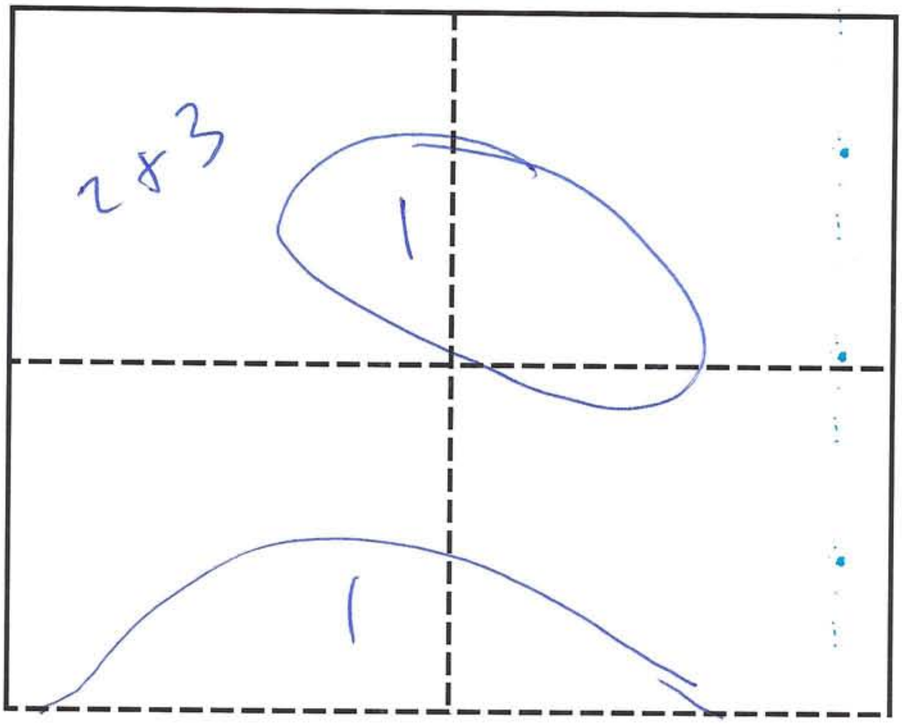
Date:	Transect #:	Section #:	Quad #:
6/18/20	2	9	1



Species	NWPL Status	%	Species	NWPL Status	%
w.w. grass	FALU	35			
shep. purse	-	35			
bareground	-	30			

Line Point Transect Data Sheet

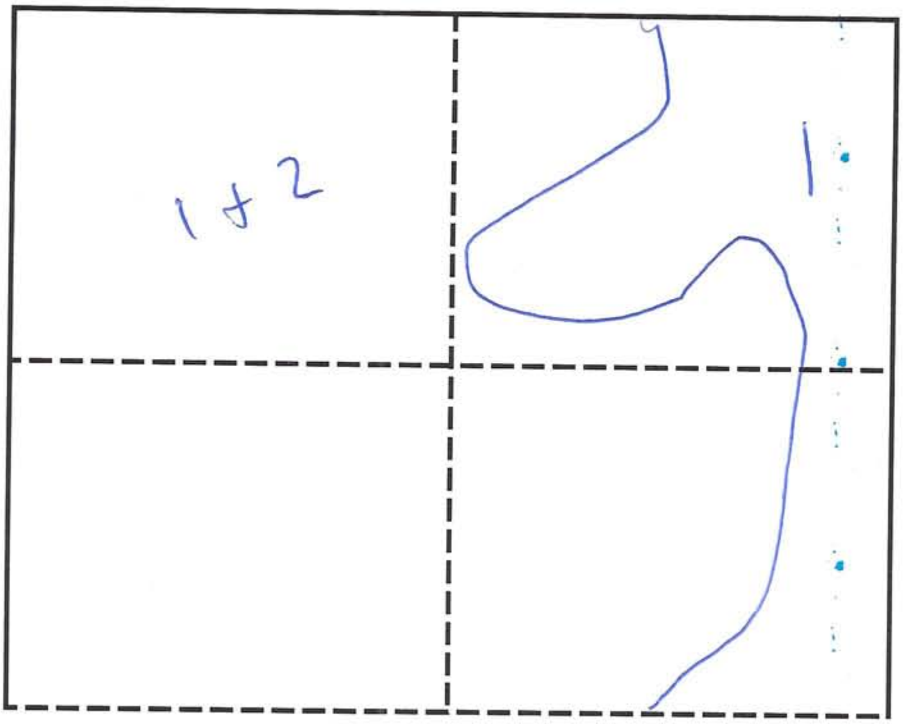
Date:	Transect #:	Section #:	Quad #:
4/18	2	9	2



Species	NWPL Status	%	Species	NWPL Status	%
bareground	–	60			
w.w. grass	FACU	20			
shep purse	-	20			

Line Point Transect Data Sheet

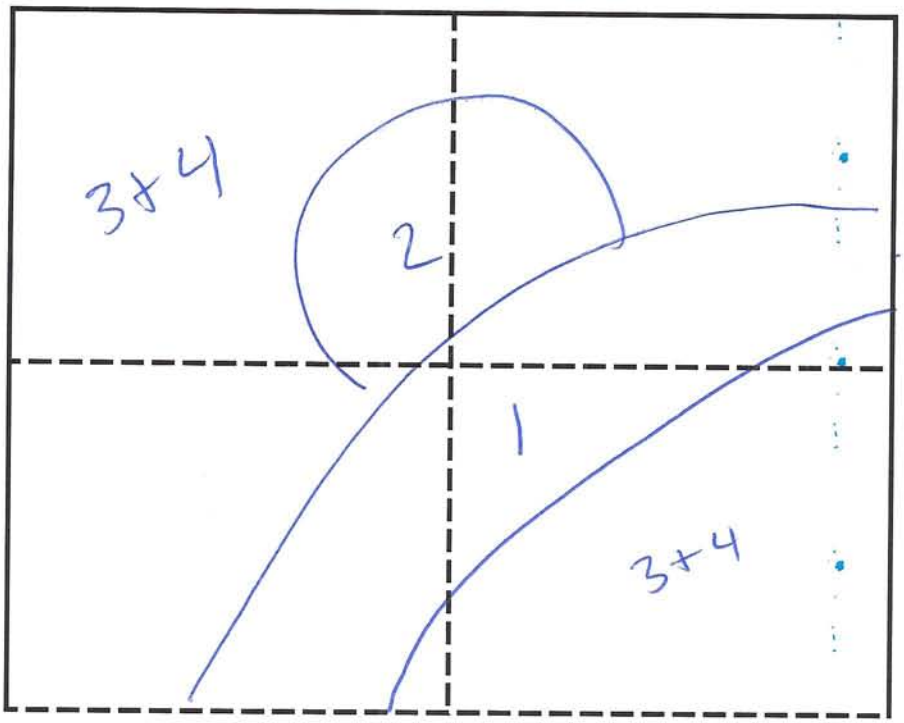
Date:	Transect #:	Section #:	Quad #:
6/18	2	11	1



Species	NWPL Status	%	Species	NWPL Status	%
w. wgrass	FACU	45			
shep. purse	–	30			
bareground	–	25			

Line Point Transect Data Sheet

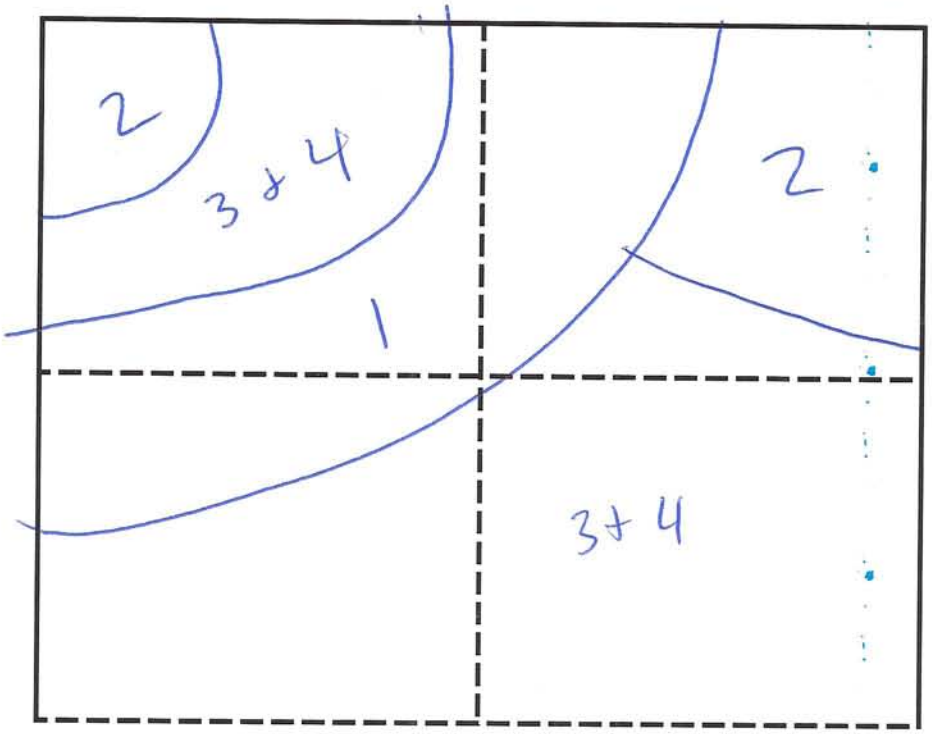
Date:	Transect #:	Section #:	Quad #:
6/18	2	11	2



Species	NWPL Status	%	Species	NWPL Status	%
woody debris	–	15			
bare ground	–	25			
W. wheatgrass	FACU	35			
shepherdsc	–	25			

Line Point Transect Data Sheet

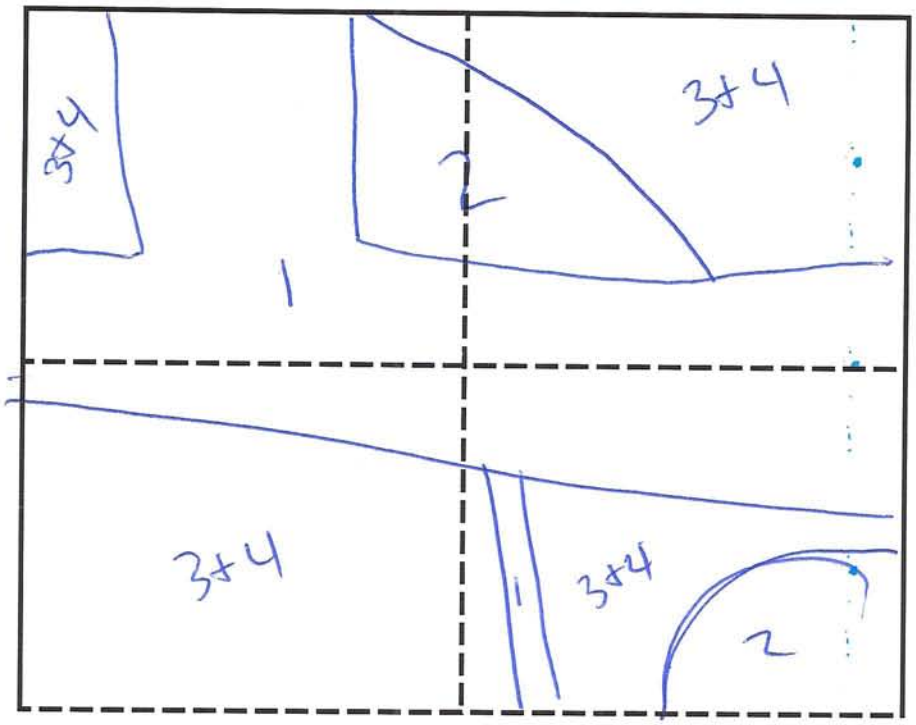
Date:	Transect #:	Section #:	Quad #:
6/18	2	13	1



Species	NWPL Status	%	Species	NWPL Status	%
woody debris	-	25			
bare ground	-	25			
shep purse	-	20			
w w grass	FACU	30			

Line Point Transect Data Sheet

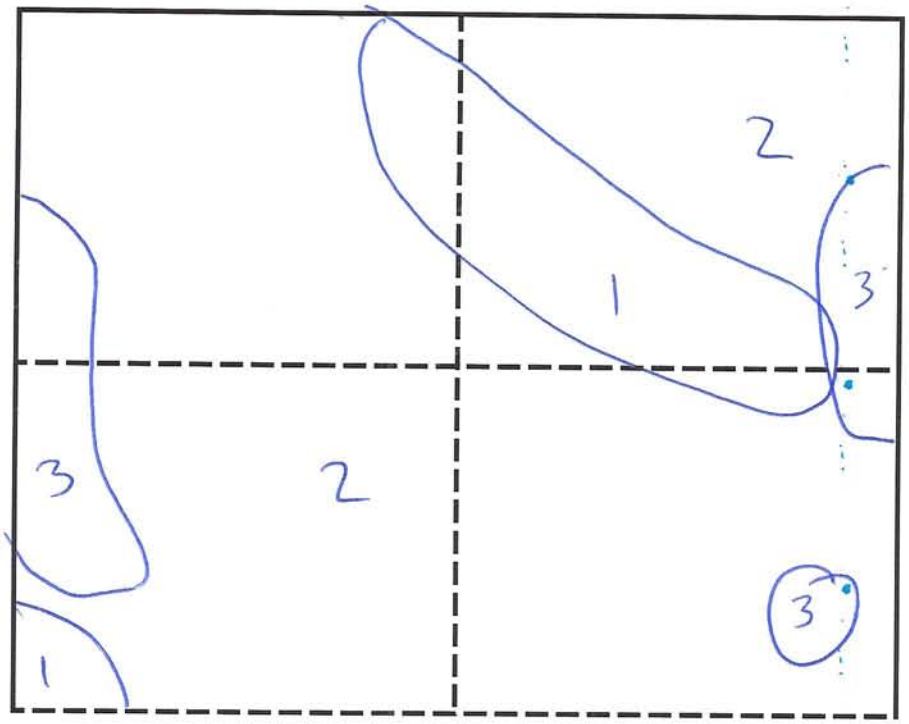
Date:	Transect #:	Section #:	Quad #:
6/18/20	2	13	2



Species	NWPL Status	%	Species	NWPL Status	%
woody debris	-	50			
bare ground	-	20			
W. W. grass	FACU	15			
shep purse	-	15			

Line Point Transect Data Sheet

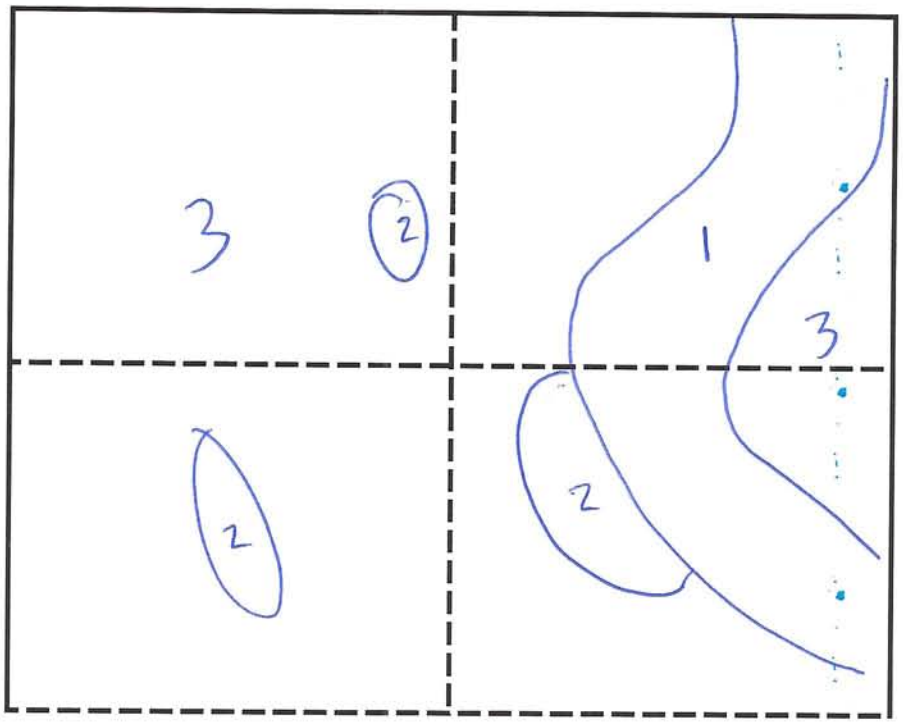
Date:	Transect #:	Section #:	Quad #:
6/18	2	15	1



Species	NWPL Status	%	Species	NWPL Status	%
bareground	–	10			
w w	FACU	80			
shep purse	–	10			

Line Point Transect Data Sheet

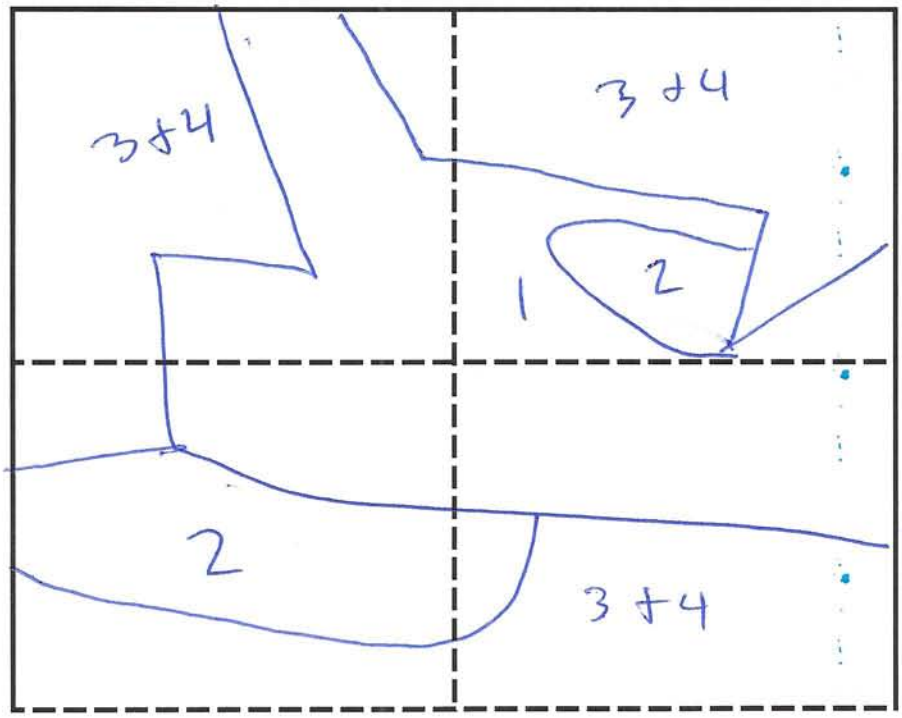
Date:	Transect #:	Section #:	Quad #:
6/18/20	2	15	2



Species	NWPL Status	%	Species	NWPL Status	%
bare ground	–	15			
Shep purse	–	15			
w. w. grass	FALV	70			

Line Point Transect Data Sheet

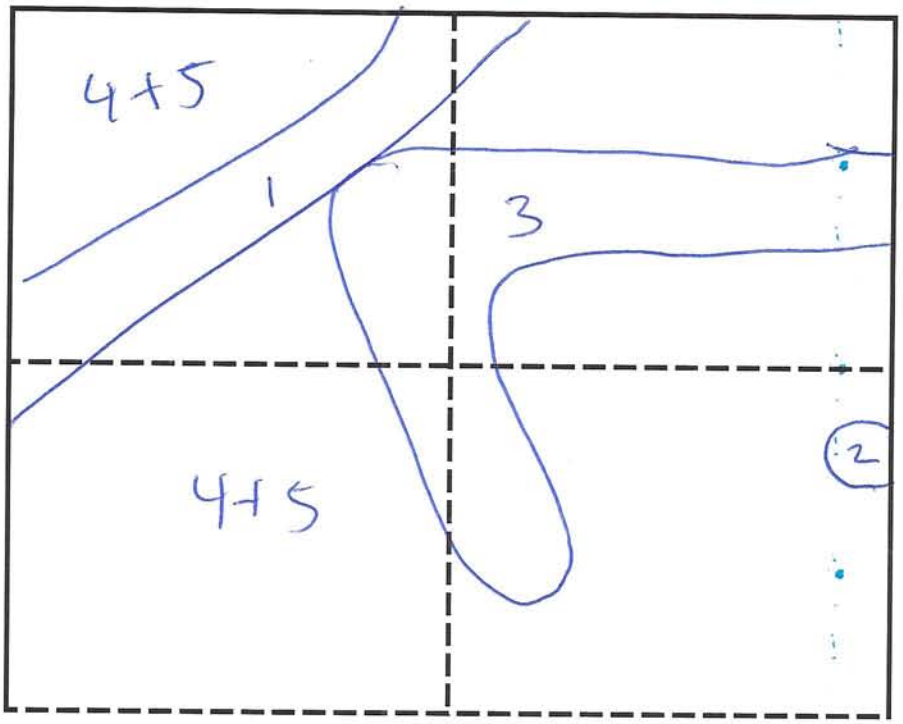
Date:	Transect #:	Section #:	Quad #:
6/18/20	2	17	1



Species	NWPL Status	%	Species	NWPL Status	%
woody d.	—	35			
bare ground	—	25			
shep p.	—	20			
W.W. gras	FACW	20			

Line Point Transect Data Sheet

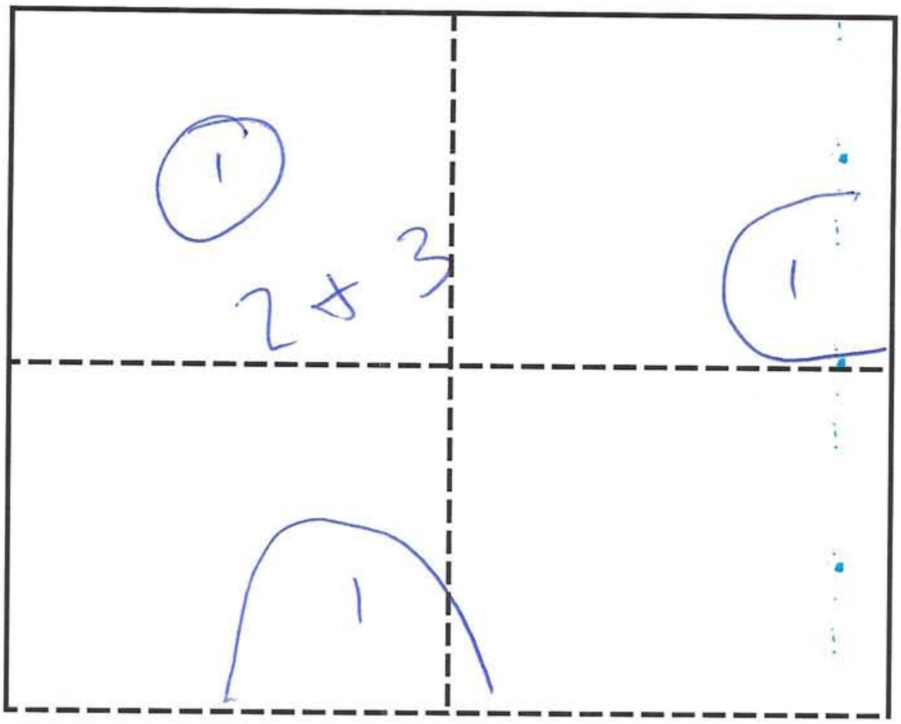
Date:	Transect #:	Section #:	Quad #:
6/18	2	17	2



Species	NWPL Status	%	Species	NWPL Status	%
woody d	—	15			
curly dock	FAC	1			
bare ground	—	15			
w.w grass	FACU	35			
shep. purse	-	34			

Line Point Transect Data Sheet

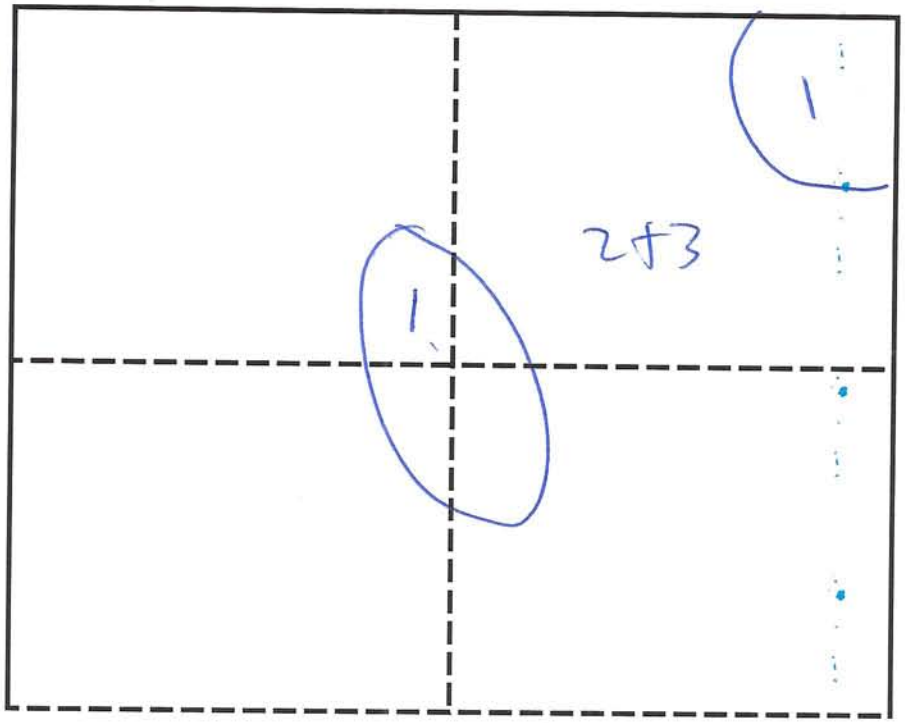
Date:	Transect #:	Section #:	Quad #:
6/18	2	19	1



Species	NWPL Status	%	Species	NWPL Status	%
bareground	-	~~25~~ 30			
w w g	FACU	35			
shep purse	-	35			

Line Point Transect Data Sheet

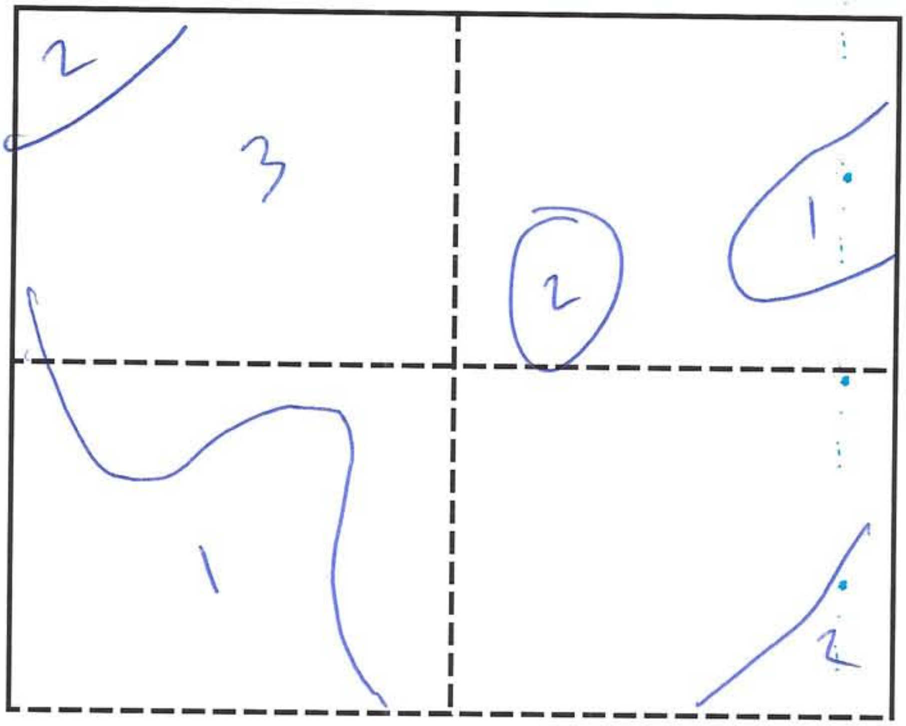
Date:	Transect #:	Section #:	Quad #:
6/18	2	19	2



Species	NWPL Status	%	Species	NWPL Status	%
bareground	-	20			
Shep purse	-	40			
WWG	FACU	40			

Line Point Transect Data Sheet

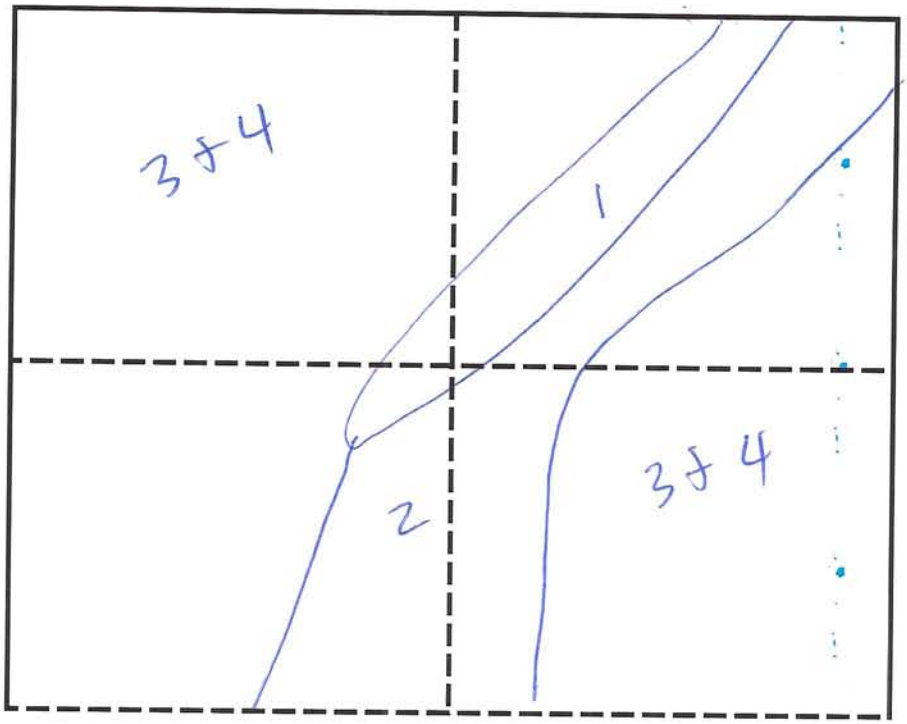
Date:	Transect #:	Section #:	Quad #:
6/18	2	21	1



Species	NWPL Status	%	Species	NWPL Status	%
bareground	—	25			
w w g	FACU	15			
shepards	—	60			

Line Point Transect Data Sheet

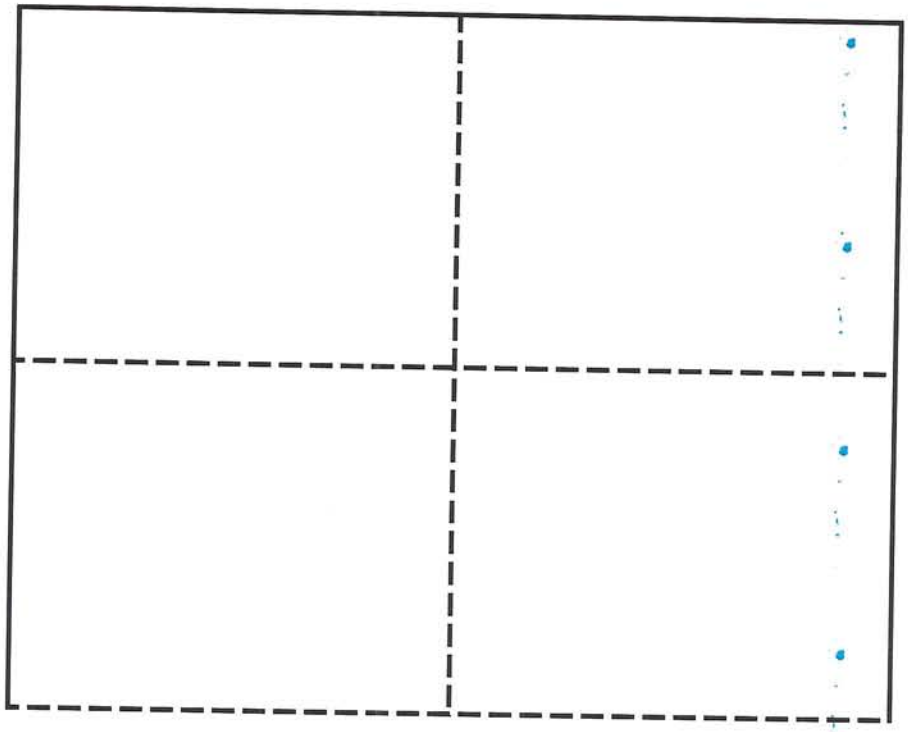
Date:	Transect #:	Section #:	Quad #:
6/18	2	21	2



Species	NWPL Status	%	Species	NWPL Status	%
woody deb	–	10			
bareground	–	25			
sheep purse	–	~~30~~ 35			
w. w. grass	FACU	~~35~~ 30			

Line Point Transect Data Sheet

Date:	Transect #:	Section #:	Quad #:
6/18/20	C 2	–	1



Species	NWPL Status	%	Species	NWPL Status	%
WW grass	FACU	20			
leafy spurge	–	25			
cheatgrass	–	30			
B. g.	–	25			

Line Point Transect Data Sheet

Date:	Transect #:	Section #:	Quad #:
6/18/20	C2	–	2

Species	NWPL Status	%	Species	NWPL Status	%
WW grass	FACU	60			
B.G.	–	40			

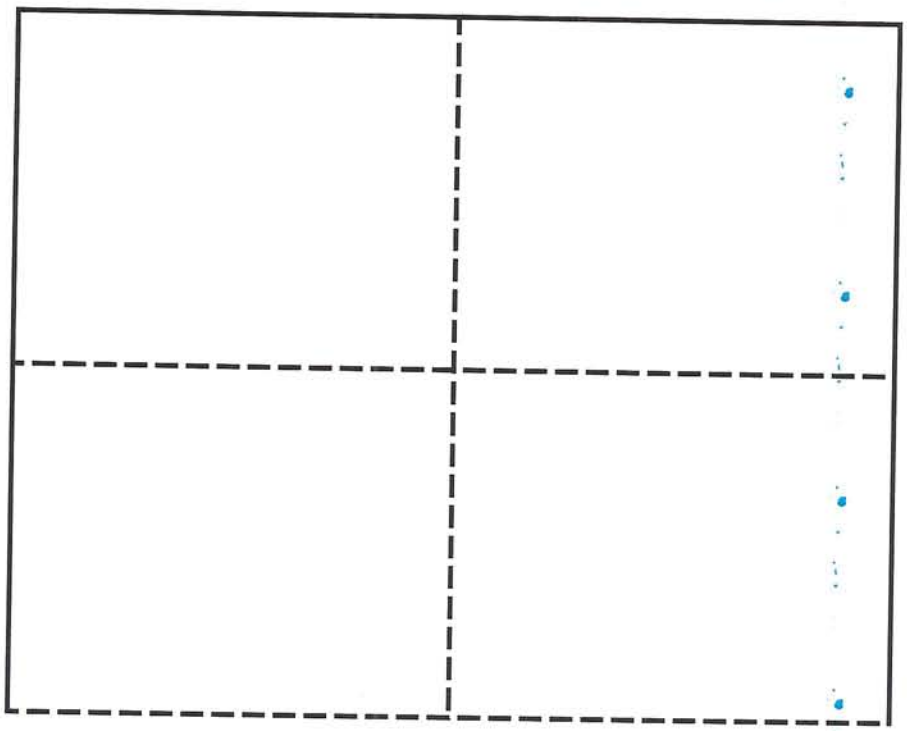
Line Point Transect Data Sheet

Date:	Transect #:	Section #:	Quad #:
6/18/20	C2	—	3

Species	NWPL Status	%	Species	NWPL Status	%
WW grass	FACU	40			
smooth brome	UPL	40			
woody debris	—	5			
B.G	—	15			

Line Point Transect Data Sheet

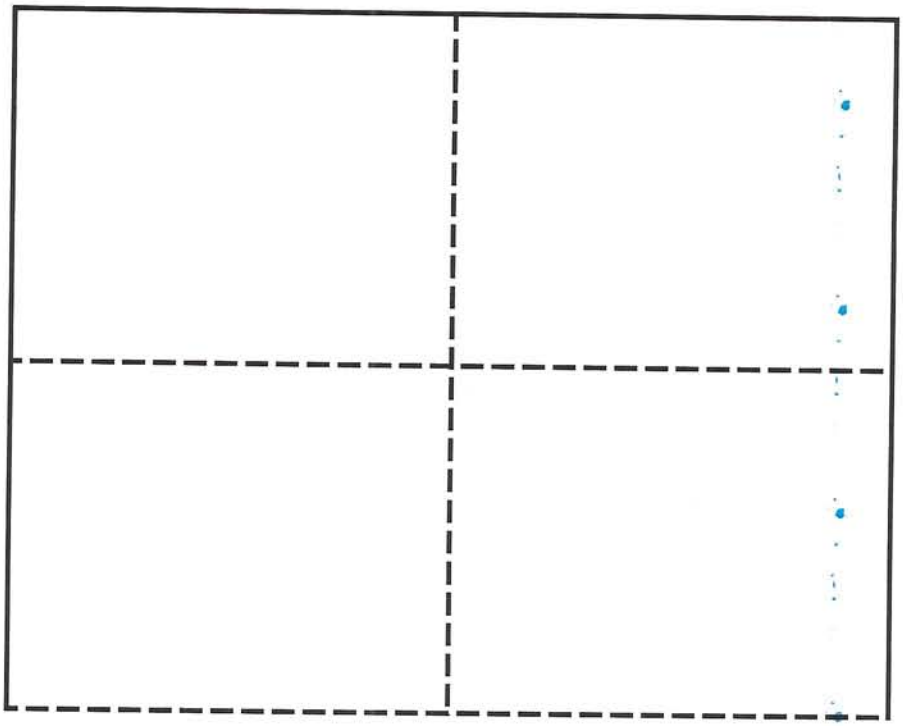
Date:	Transect #:	Section #:	Quad #:
6/18/20	C2	—	4



Species	NWPL Status	%	Species	NWPL Status	%
cottonwood	FAC	80			
BG	—	10			
WW grass	FACU	10			

Line Point Transect Data Sheet

Date:	Transect #:	Section #:	Quad #:
6/18/20	C 2	–	5



Species	NWPL Status	%	Species	NWPL Status	%
Canada thistle	FAC	15			
showy milkweed	FAC	5			
WW grass	FACU	65			
BG	–	15			

Start: 40.342520°, -104.858569°
End: 40.342787°, -104.858588°

Line Transect Data Sheet

Date: 6/15/2020	Transect #: 3	Start Lat/Long: W.P. 5			End Lat/Long: W.P. 6																		
Species	NWPL Status	Section: 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
reed canary grass	FAC	3	3	2	4	3	2	3		3	6	2	4	4	2	2	3	2	3	10	5	4
Curly dock	FAC	1																				
narrow leaf willow	FACW	1	3	4	1	2	1		2			1			1							1
Salt grass	FACW	1			1			2										2				
prairie cucumber	FAC	1																				
Bull thistle	UPL						1															
western wheatgrass	FACU						1	1	8			2										
ragweed	FACU									3	2											
plains cottonwood	FAC														1				1			
~~Green ash~~ peachtree willow (FACW)																					2	1
nebraska sedge	OBL																					4

Tree Prevalence Data Sheet

Date: 6/18/20	Transect #: 3	Start Lat/Long: 40.342520 -104.858569	End Lat/Long: 40.342787, -104.858588
Species	Distance	Height (est.)	Diameter (est.)
N	1	3	2
N	4	3	2
N	4	3	2
N	5	5	2
N	5	3	2
N	10	5	5
N	10	10	5
C	10	50	10
N	12	3	1
N	14	6	6
N	17	6	5
N	17	3	1
N	22	4	1
N	22	4	2
N	25	5	1
N	26	3	1
N	30	2	2
N	32	6	1
C	32	50	10
N	38	5	5
N	38	6	1
N	38	5	1
P	41-51	20	10
N	44	6	1
N	50	8	2
N	55	5	3
N	60	8	2
CX8	60	40-50	10
CX3	75	40	10-20
CX7	86	50	15
PX3	84	10-30	10
C	91	50	10
P	100	35	10
N	100	0	1

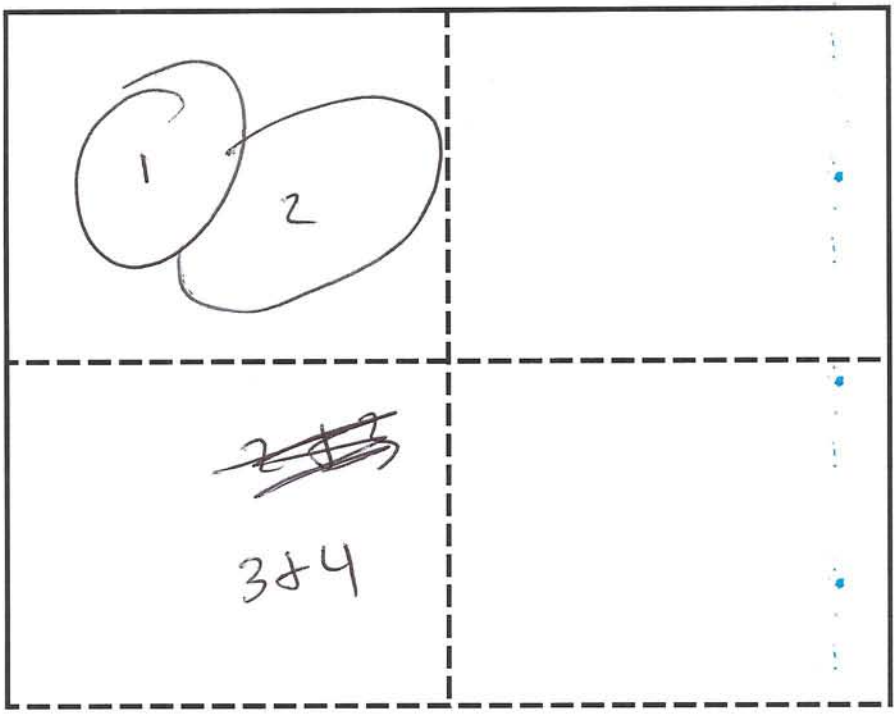
NLW = N

PLW = P

Cottonwood = C

Line Point Transect Data Sheet

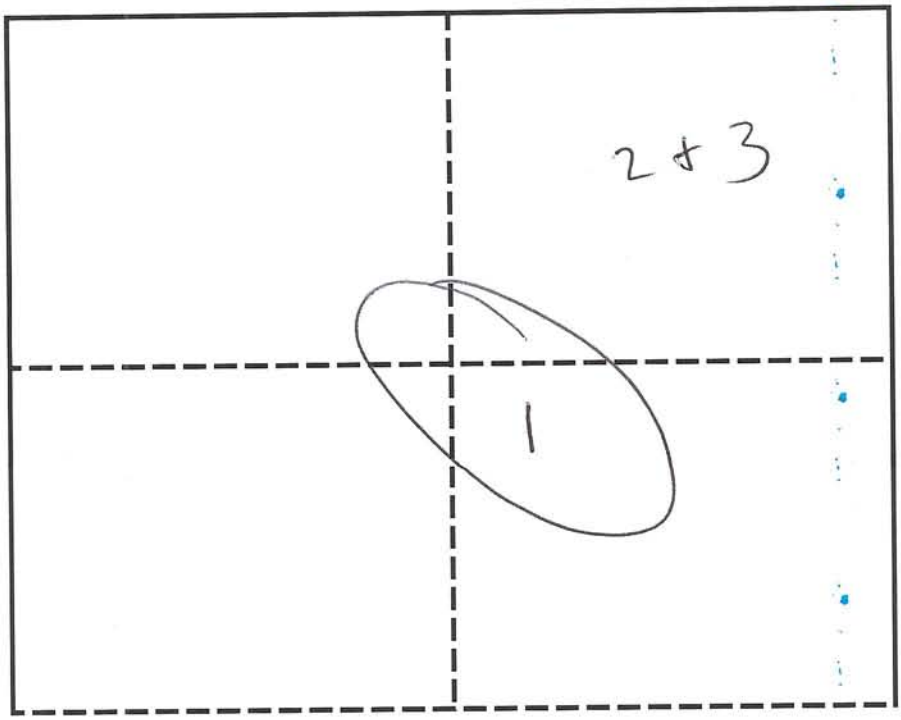
Date:	Transect #:	Section #:	Quad #:
6/18	3	1	1



Species	NWPL Status	%	Species	NWPL Status	%
curly dock	FAC	15			
narrowleaf w.	FACW	15			
crg ~~prune~~ c. g.	FAC	10			
bare ground	–	60			

Line Point Transect Data Sheet

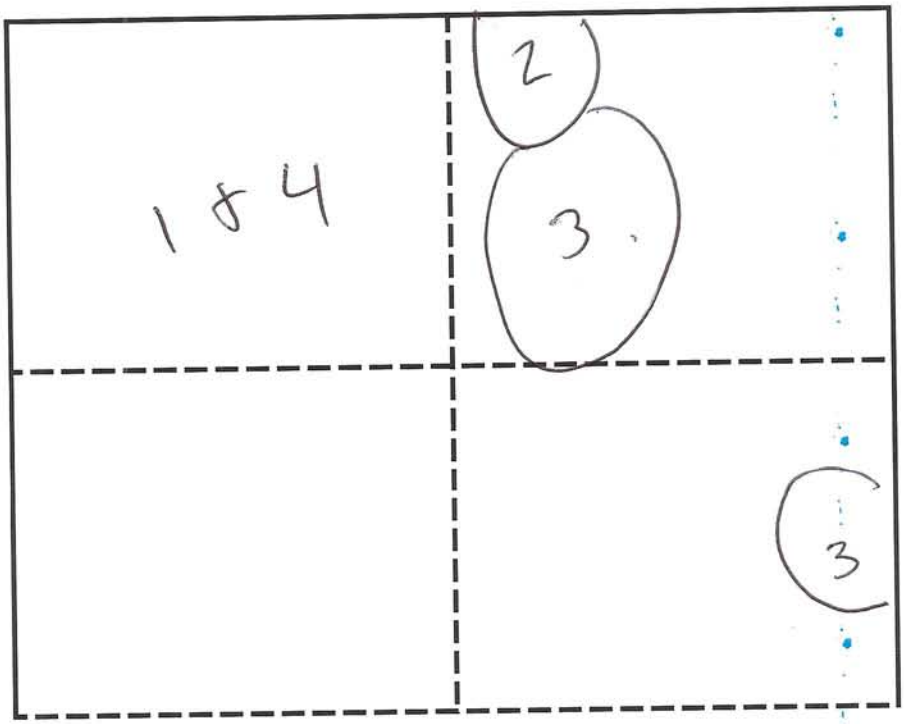
Date:	Transect #:	Section #:	Quad #:
6/18/20	3	1	2



Species	NWPL Status	%	Species	NWPL Status	%
n R. willow	FACW	20			
bare gd	—	60			
c rg	FAC	20			

Line Point Transect Data Sheet

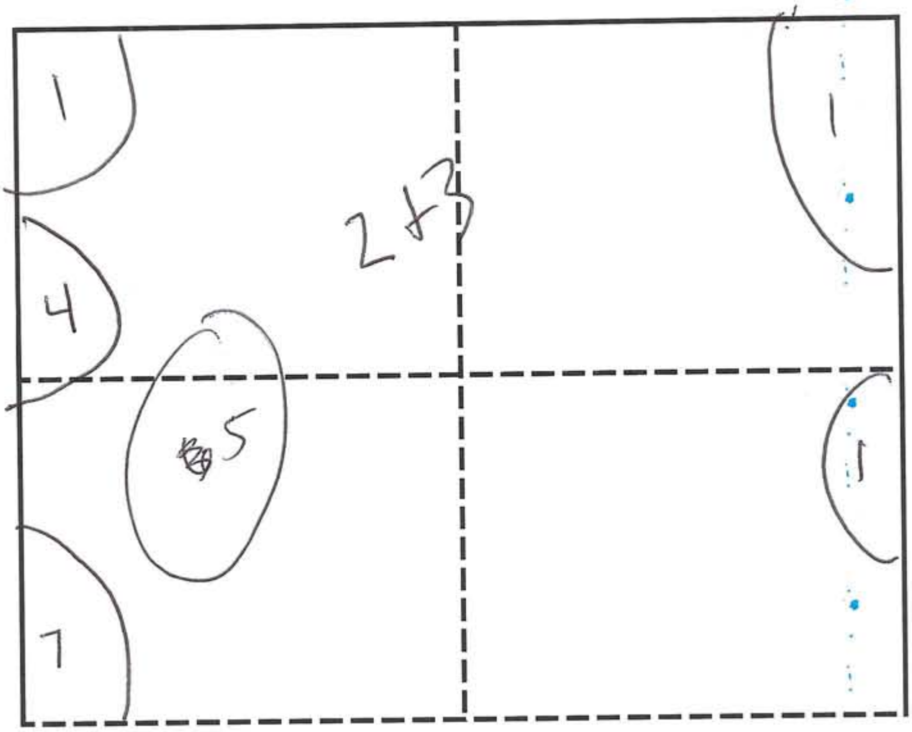
Date:	Transect #: 3	Section #: 3	Quad #: 1



Species	NWPL Status	%	Species	NWPL Status	%
bare g.d.	–	39			
salt grass	FACW	1			
n l willow	FACW	30			
r.c.grass	FAC	30			

Line Point Transect Data Sheet

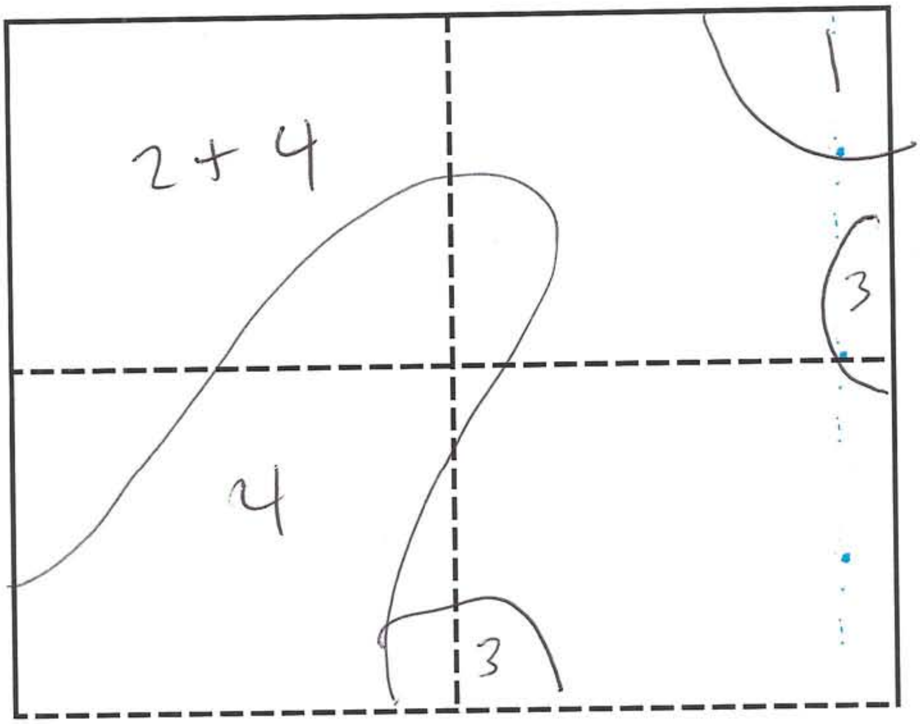
Date:	Transect #:	Section #:	Quad #:
6/18	3	3	2



	Species	NWPL Status	%	Species	NWPL Status	%
1	ml willow	FACW	20			
2	salt grass	FACW	2			
3	rcg	FAC	8			
4	Showy milk	FAC	5			
5	bull thistle	UPL	5			
6	bareground	—	40			
7	moss	—	10			

Line Point Transect Data Sheet

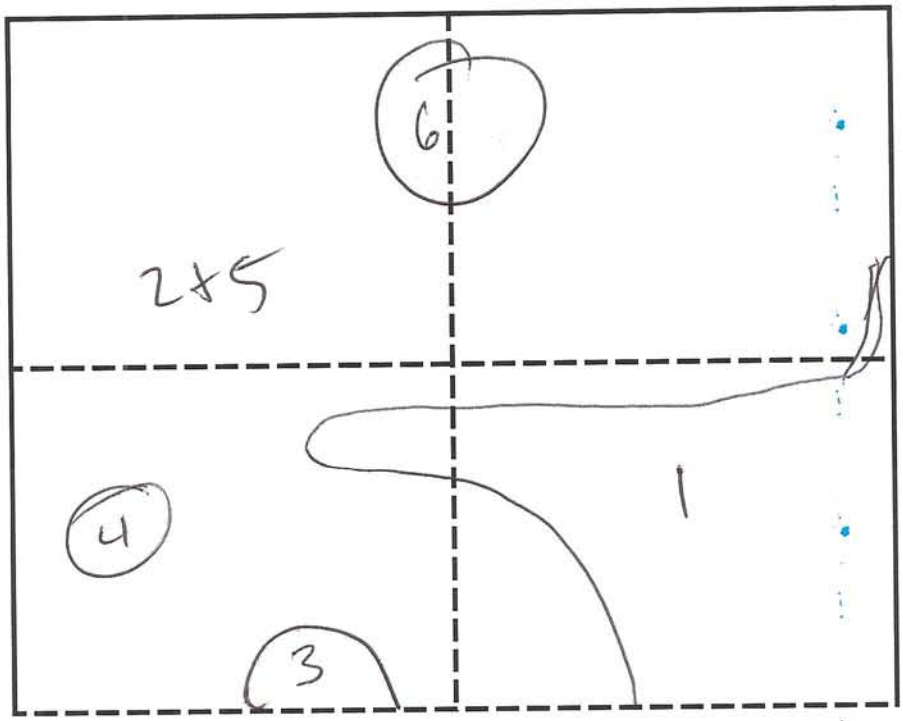
Date: 6/18	Transect #: 3	Section #: 5	Quad #: 1



Species	NWPL Status	%	Species	NWPL Status	%
bull thistle	UPL	5			
crg	FAC	10			
narrow will	FACW	15			
bargound	—	70			

Line Point Transect Data Sheet

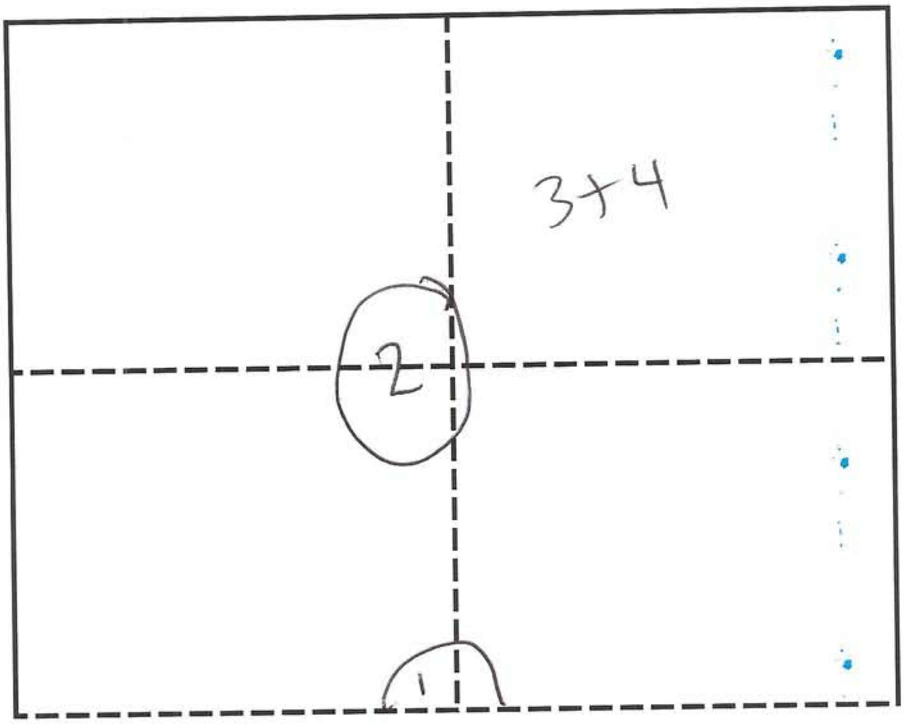
Date:	Transect #:	Section #:	Quad #:
6/18	3	5	2



	Species	NWPL Status	%	Species	NWPL Status	%
1	woody	–	25			
2	bare g.d.	–	30			
3	n. l. willow	FACW	5			
4	bull thistle	UPL	5			
5	rcg	FAC	30			
6	salt grass	FACW	5			

Line Point Transect Data Sheet

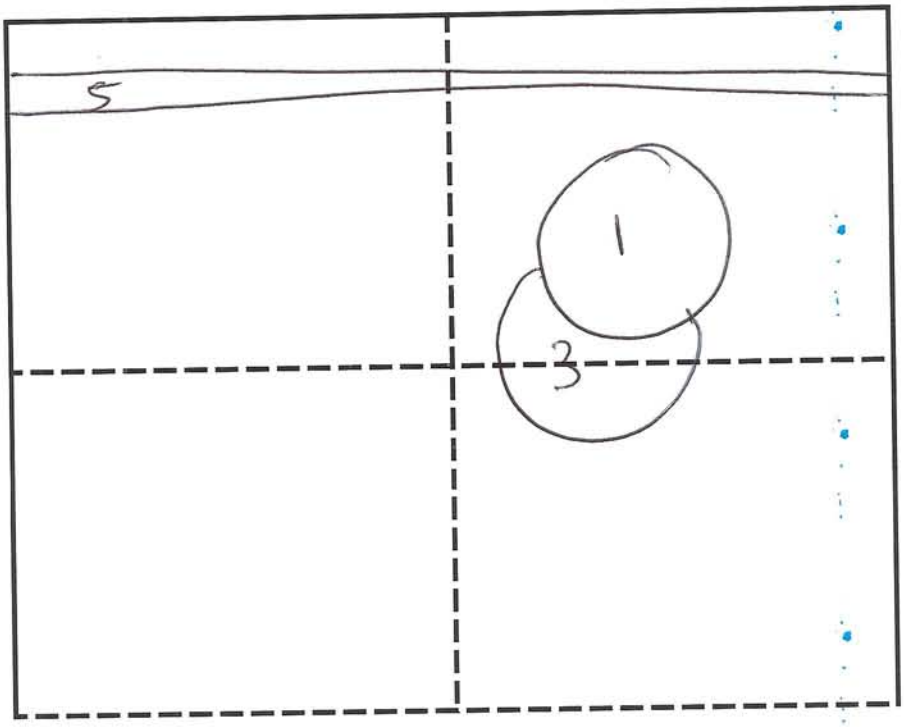
Date: 6/18	Transect #: 3	Section #: 7	Quad #: 1



Species	NWPL Status	%	Species	NWPL Status	%
bull thistle	UPL	2			
NL willow	FACW	15			
R.C. grass	FAC	3			
baregund	—	80			

Line Point Transect Data Sheet

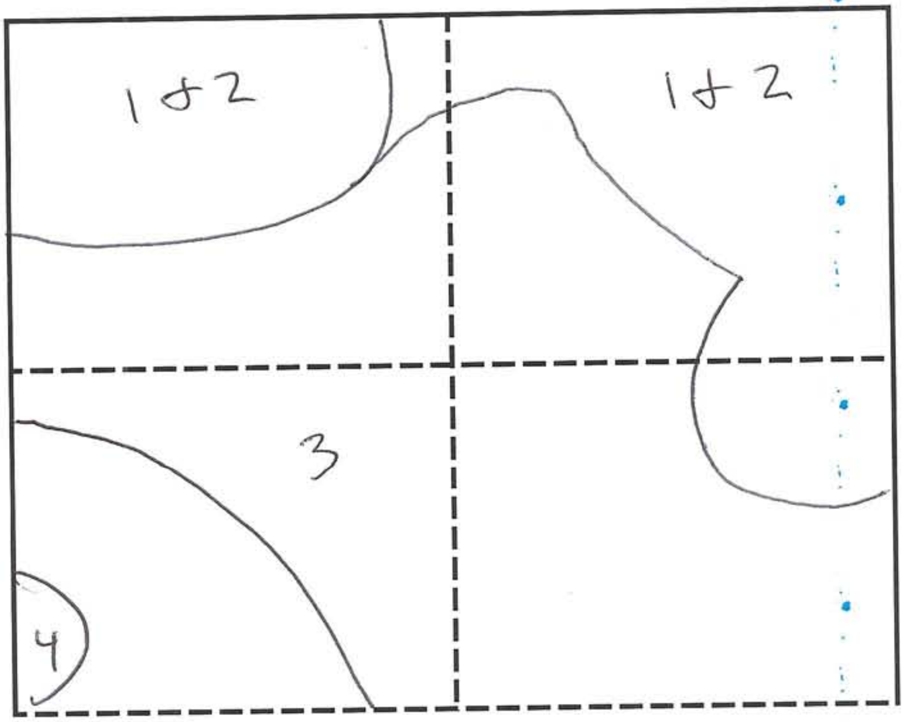
Date:	Transect #:	Section #:	Quad #:
6/18	3	7	2



	Species	NWPL Status	%	Species	NWPL Status	%
1	bull thistle	UPL	5			
2	salt grass	FACW	25			
3	canary grass	FAC	35			
4	bare ground	–	30			
5	woody d.	–	5			

Line Point Transect Data Sheet

Date:	Transect #:	Section #:	Quad #:
6/18/20	3	9	1

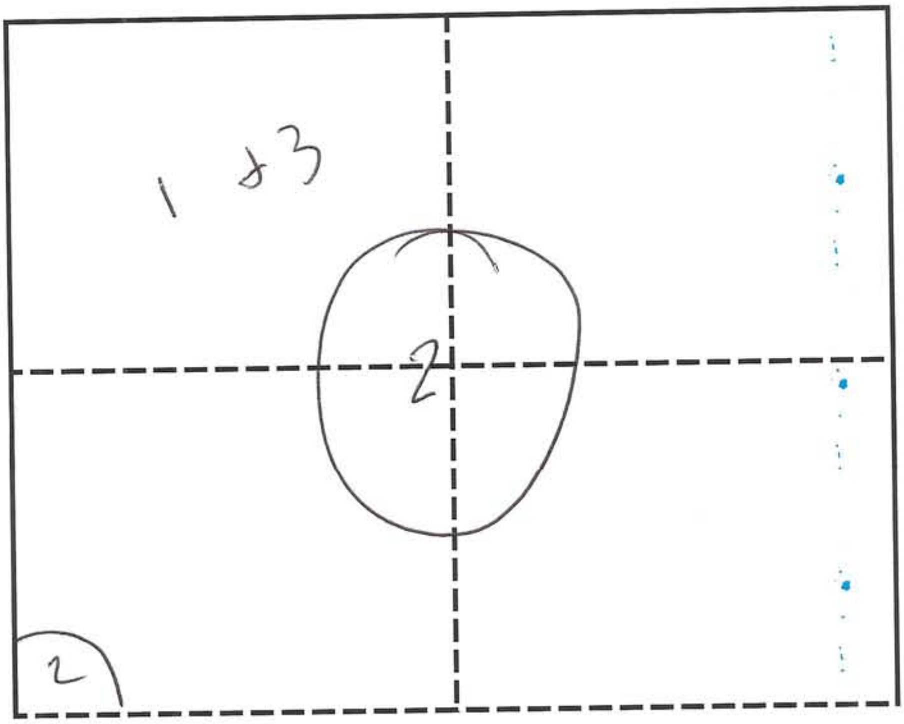


25% canopy peach leaf willow overhead

	Species	NWPL Status	%	Species	NWPL Status	%
1	reed canary	FAC	8			
2	western wheat	FACU	20			
3	bareground	–	10			
4	moss	–	2			

Line Point Transect Data Sheet

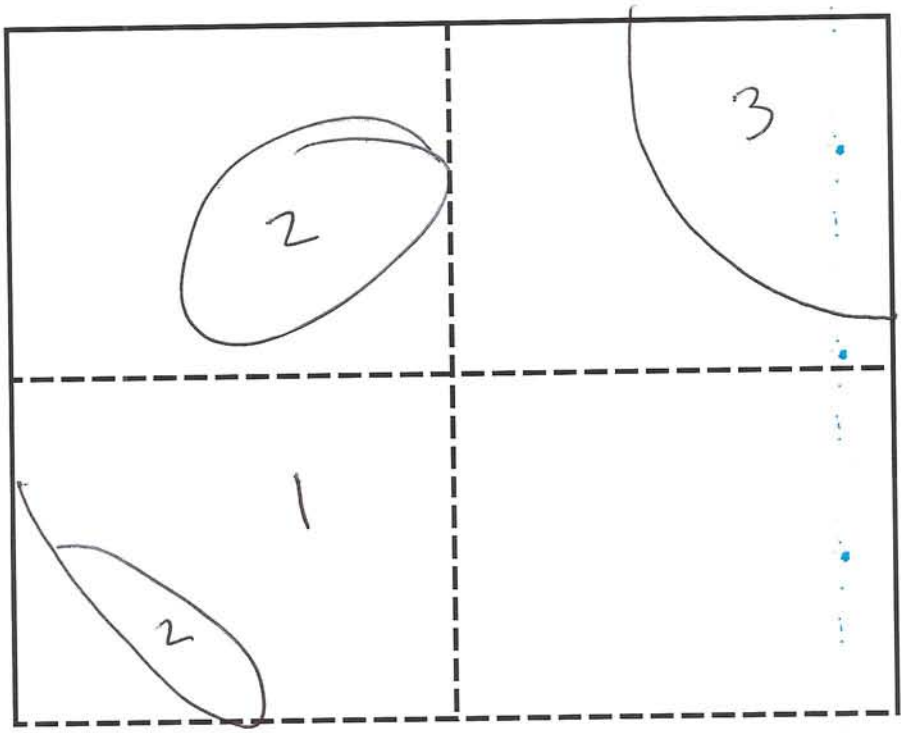
Date:	Transect #:	Section #:	Quad #:
6/18/20	3	9	2



Species	NWPL Status	%	Species	NWPL Status	%
b. g	–	80			
NL willow	FACW	20			
RC grass	FAC	2			

Line Point Transect Data Sheet

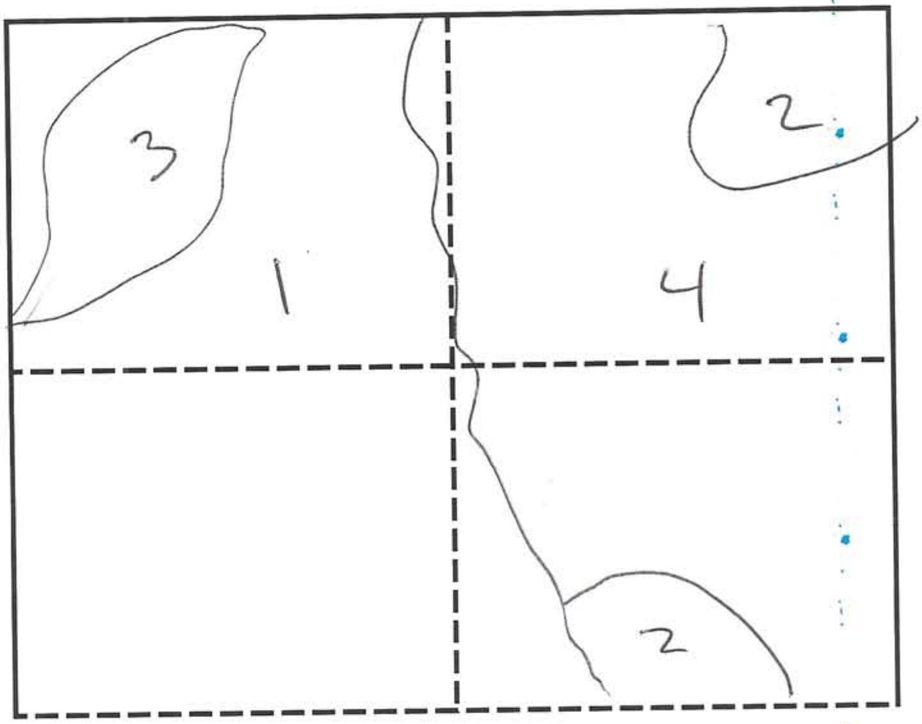
Date:	Transect #:	Section #:	Quad #:
6/18/20	3	11	1



Species	NWPL Status	%	Species	NWPL Status	%
borgrond	—	75			
ww grass	FACU	5			
CR grass	FAC	5			
NL willow	FACW	15			

Line Point Transect Data Sheet

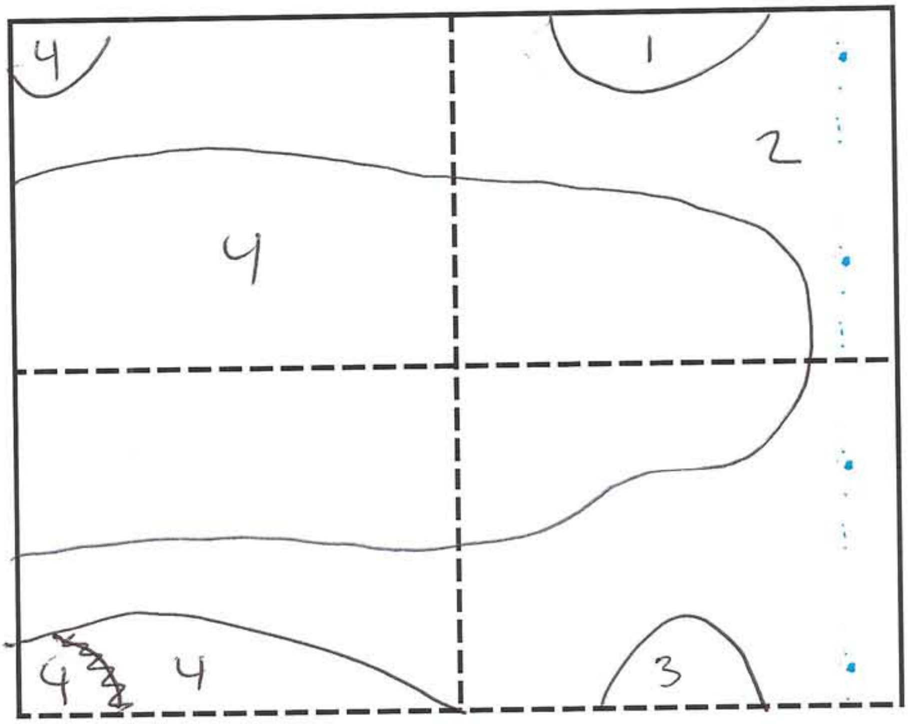
Date:	Transect #:	Section #:	Quad #:
6/18/20	3	11	2



	Species	NWPL Status	%	Species	NWPL Status	%
1	river rocks	–	~~40~~ 45			
2	ragweed	FACU	5			
3	cheatgrass	–	5			
4	bareground	–	~~40~~ 45			

Line Point Transect Data Sheet

Date:	Transect #: 3	Section #: 13	Quad #: 1



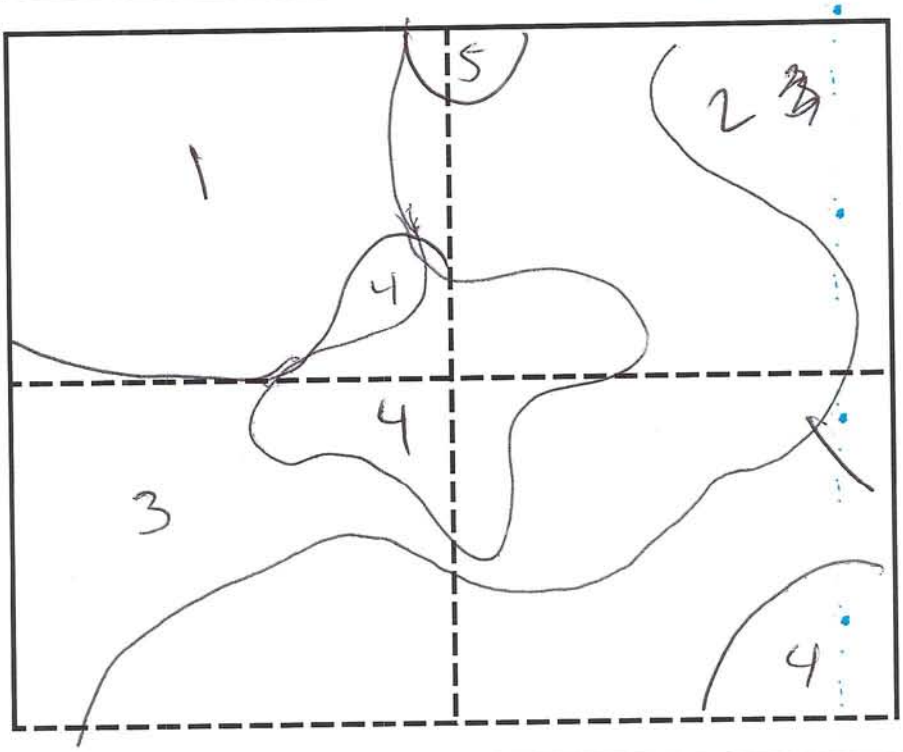
100% overhead canopy cottonwood

	Species	NWPL Status	%	Species	NWPL Status	%
1	cottonwood	FAC	2			
2	bareground	—	65			
3	curly dock	FAC	2			
4	CR grass	FAC	31			

Line Point Transect Data Sheet

Date:	Transect #:	Section #:	Quad #:
6/18	3	13	2

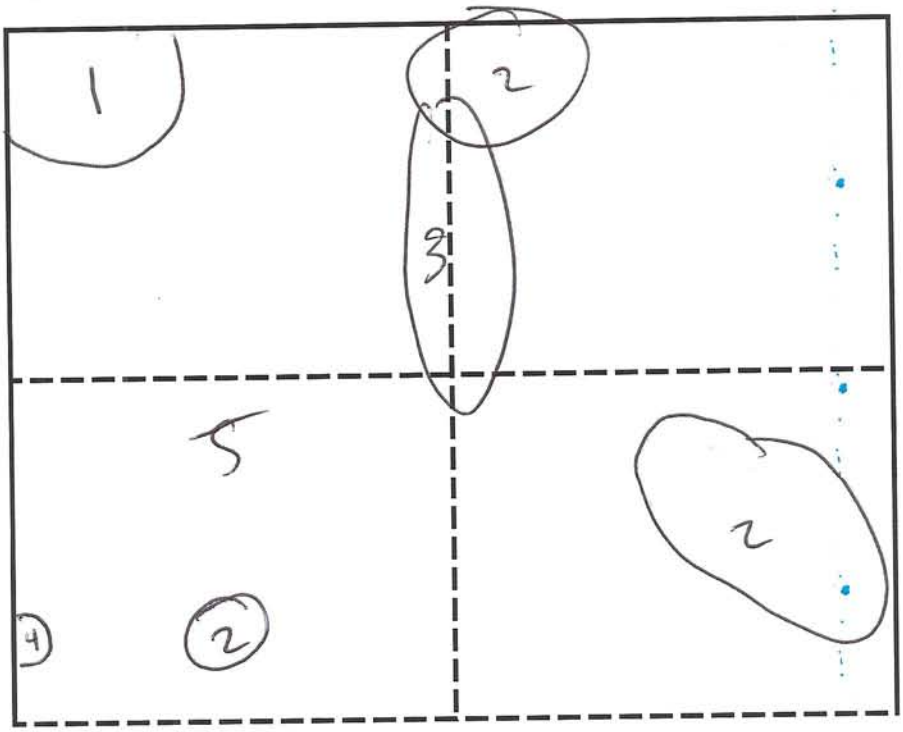
100 cm
covered
covered



	Species	NWPL Status	%	Species	NWPL Status	%
1	curly dock	FAC	25			
2	WW. grass	FACU	15			
3	Canary R grass	FAC	20			
4	bare ground	~~FAC~~ —	40			
5	NL willow	FACW	1			

Line Point Transect Data Sheet

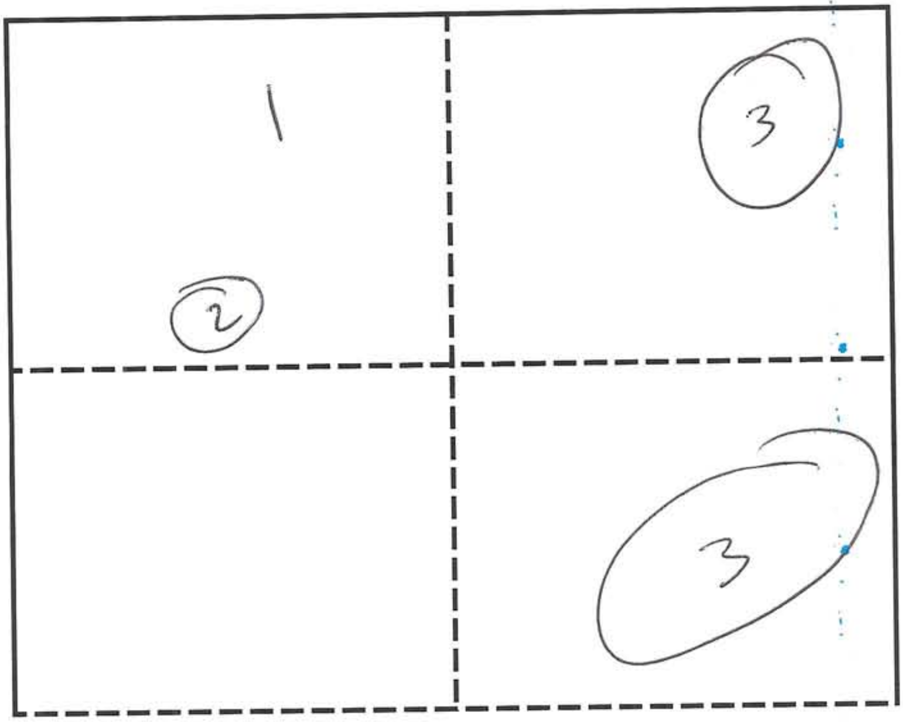
Date:	Transect #:	Section #:	Quad #:
6/18	3	15	1



Species	NWPL Status	%	Species	NWPL Status	%
NC Cotton	FACW	10			
RC grass	FAC	4			
woody debris	–	10			
lambs quarters	FACU	1			
bare ground	–	~~80~~ 75			

Line Point Transect Data Sheet

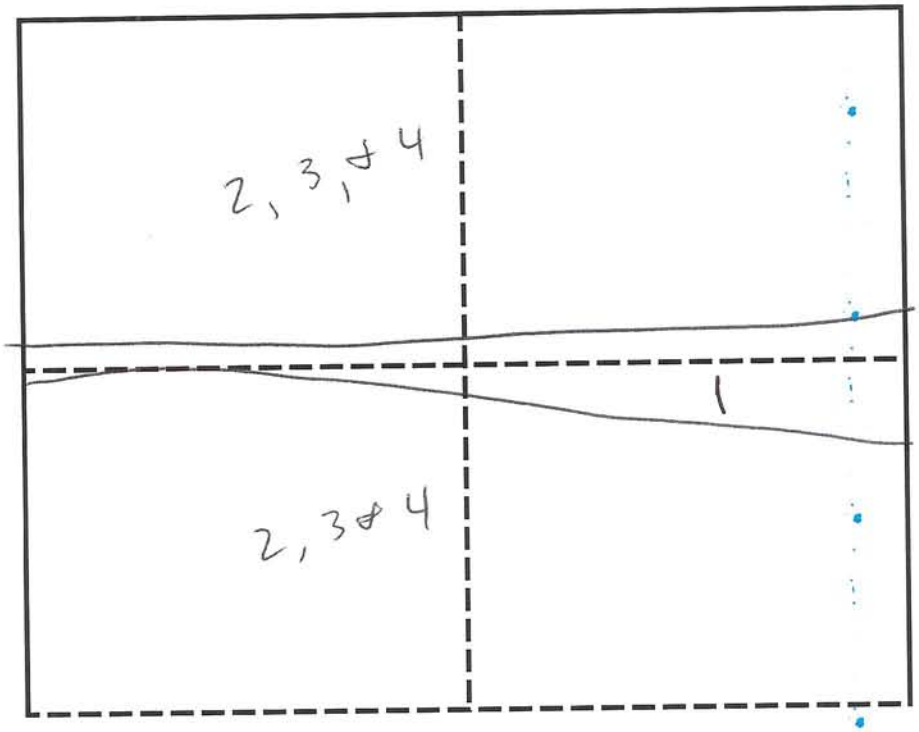
Date: 6/18/20	Transect #: 3	Section #: 15	Quad #: 2



Species	NWPL Status	%	Species	NWPL Status	%
bareground	—	80			
NL willow	FACW	10			
CR grass	FAC	10			

Line Point Transect Data Sheet

Date:	Transect #:	Section #:	Quad #:
6/18/20	3	17	1

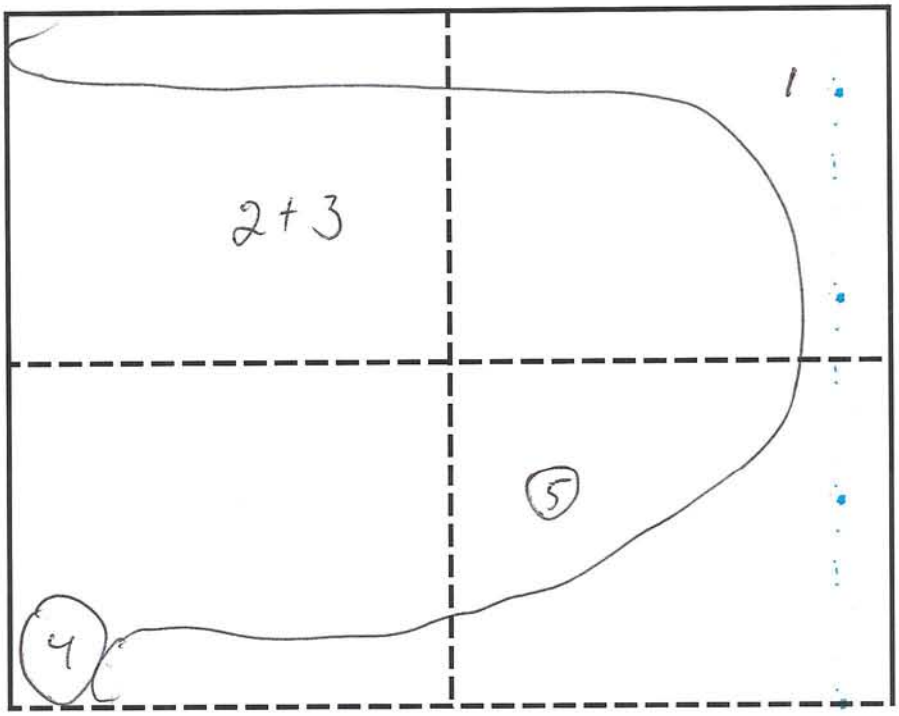


100% cotton coverage

Species	NWPL Status	%	Species	NWPL Status	%
woody d.	–	10			
bare ground	–	50			
WW grass	FACU	20			
CR grass	FAC	20			

Line Point Transect Data Sheet

Date:	Transect #:	Section #:	Quad #:
6/18/20	3	17	2



100% cotton coverage

	Species	NWPL Status	%	Species	NWPL Status	%
1	B. G.	—	30			
2	Saltgrass	FACW	10			
3	prairie red g.	FAC	10			
4	cotton wood	FAC	20			
5	peachleaf willow	FACW	30			

Line Point Transect Data Sheet

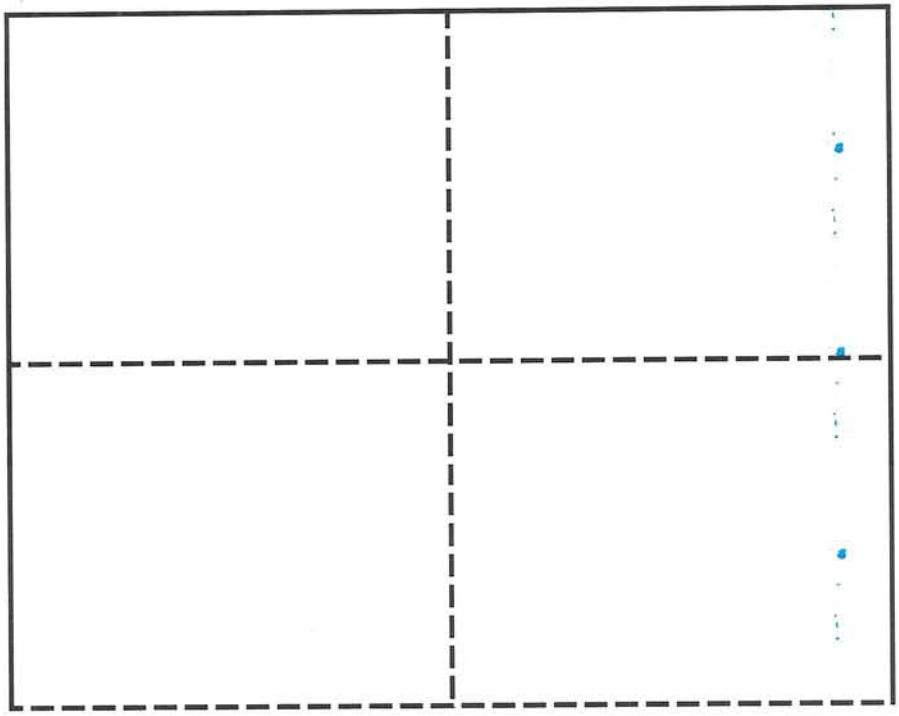
Date: 6/18/20	Transect #: 3	Section #: 19	Quad #: 1

100 %
overhead
cottonwood /
peachleaf
willow

Species	NWPL Status	%	Species	NWPL Status	%
W. d.	–	5			
B.G.	–	25			
canary reedgrass	FAC	70			

Line Point Transect Data Sheet

Date:	Transect #:	Section #:	Quad #:
6/18	3	19	2



overhead coverage: 100% cottonwood + p. l. willow

Species	NWPL Status	%	Species	NWPL Status	%
peach l willow	FACW	15			
t. R. Grass	FAC	65			
woody d.	–	5			
b. g.	–	15			

Line Point Transect Data Sheet

Date:	Transect #:	Section #:	Quad #:
6/18/20	3	21	1

Species	NWPL Status	%	Species	NWPL Status	%
N. L. willow	FACW	25			
R.C. grass	FAC	60			
bareground	—	20			

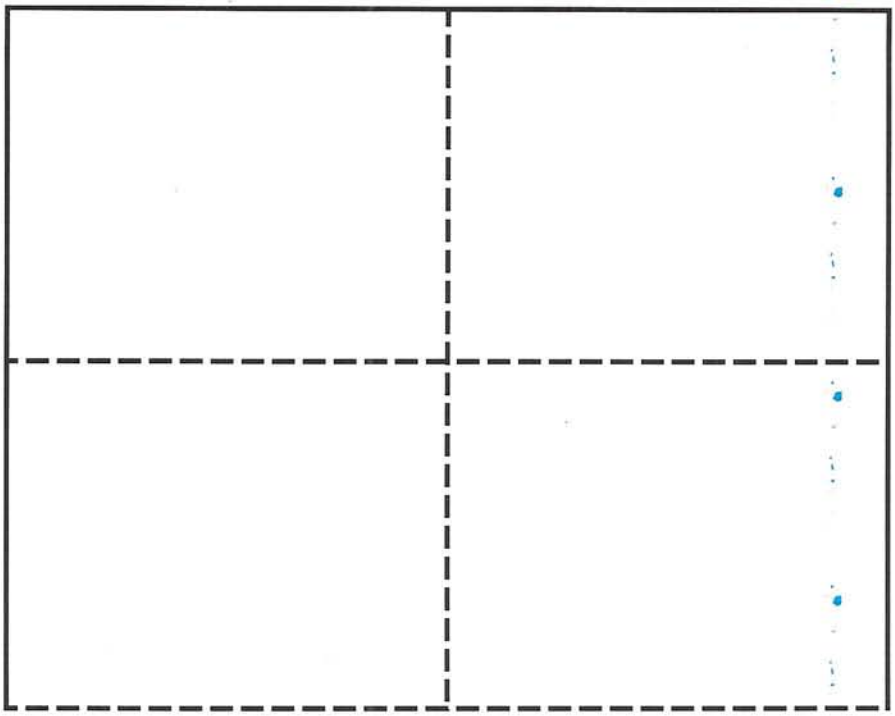
Line Point Transect Data Sheet

Date:	Transect #:	Section #:	Quad #:
6/18/20	3	21	2

Species	NWPL Status	%	Species	NWPL Status	%
bareground	—	60			
C.R. grass	FAC	40			

Line Point Transect Data Sheet

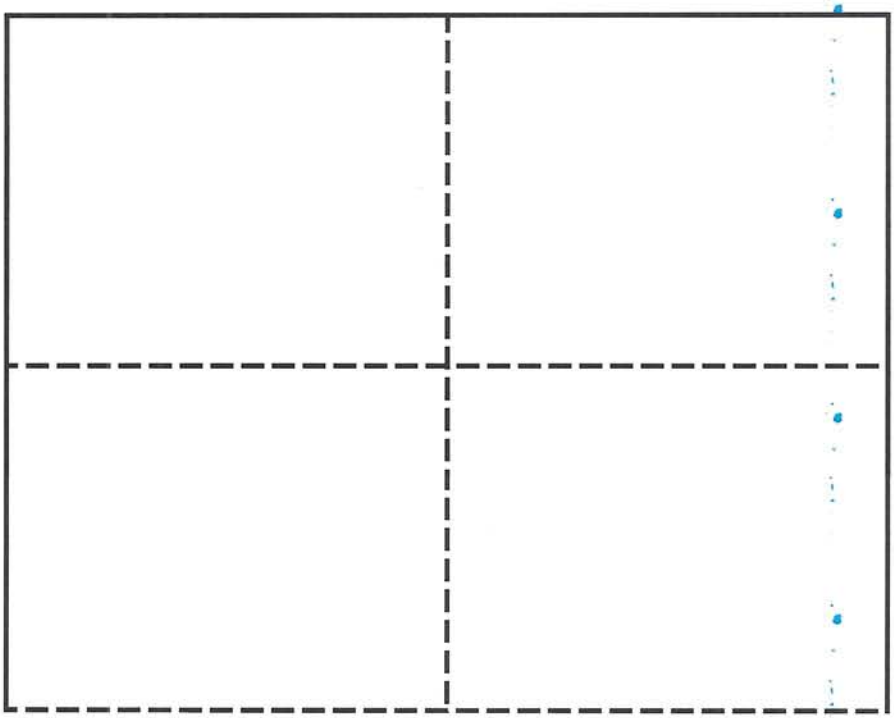
Date:	Transect #:	Section #:	Quad #:
6/18/20	C3	—	1



Species	NWPL Status	%	Species	NWPL Status	%
peppenweed	FACW	5			
ragweed	FACU	2			
ww grass	FACU	2			
B.G.	—	70			
woody d.	—	10			
foxtail barley	FACW	10			
cheatgrass	—	5			

Line Point Transect Data Sheet

Date:	Transect #:	Section #:	Quad #:
6/18/20	C3	–	2



Species	NWPL Status	%	Species	NWPL Status	%
B.G.	–	25			
river rocks	–	10			
N.L. willow	FACW	5			
cheatgrass	–	15			
bull thistle	UPL	20			
curly dock	FAC	25			

Line Point Transect Data Sheet

Date: 6/18/20	Transect #: C3	Section #: —	Quad #: 3

Species	NWPL Status	%	Species	NWPL Status	%
showy milkweed	FAC	5			
N.L. cottonwood	FACW	20			
ragweed	FACU	5			
saltgrass	FACW	5			
B.G. - silt deposit	—	60			

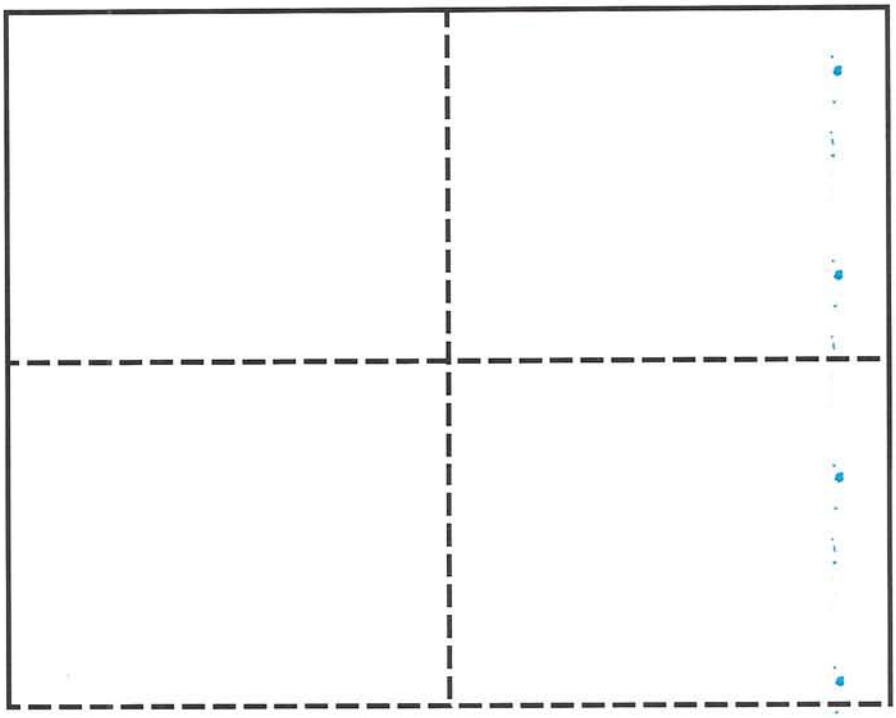
Line Point Transect Data Sheet

Date: 6/18/20	Transect #: C3	Section #: —	Quad #: 4

Species	NWPL Status	%	Species	NWPL Status	%
N.L. cottonwood	FACW	25			
CR grass	FAC	20			
ragweed	FACU	15			
B.G.	—	40			

Line Point Transect Data Sheet

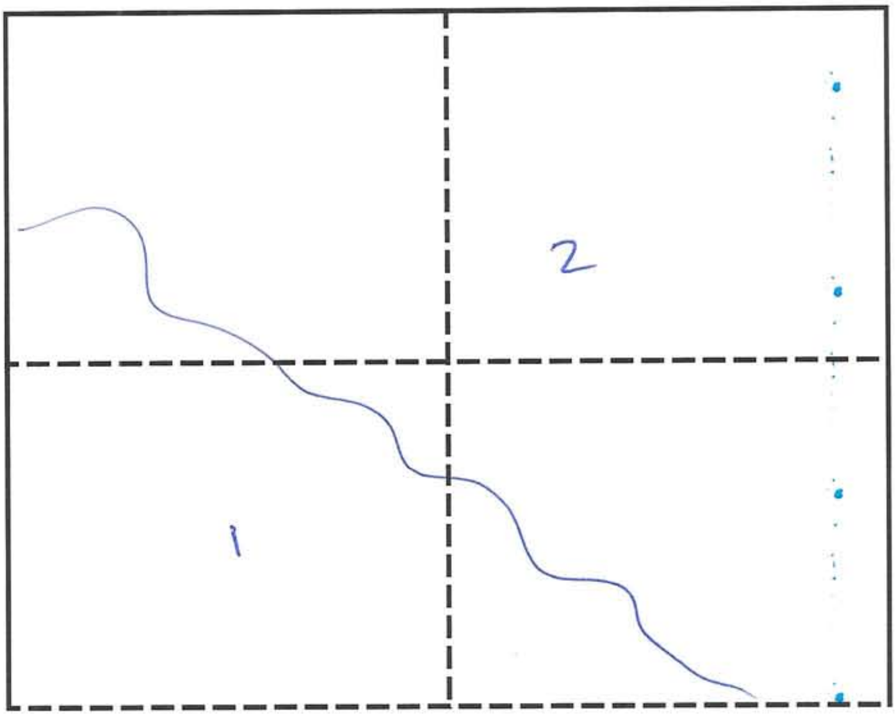
Date:	Transect #:	Section #:	Quad #:
10/18/20	C3	—	5



Species	NWPL Status	%	Species	NWPL Status	%
RC grass	FAC	10			
N/L willow	FACW	40			
B. G.	—	50			

Line Point Transect Data Sheet

Date:	Transect #:	Section #:	Quad #:
6/18/20	C3	—	6



Species	NWPL Status	%	Species	NWPL Status	%
B. G.		30			
River rocks		70			

View of disturbed riparian vegetation along Big Thompson River

View of pre-disturbance property (left) and disturbed property (right)

Aerial view of subject property

View of Quadrat Sampling

View of Upland Transect

View of Wetland Habitat

View of Upland-Wetland Transition Habitat

View of Riparian Habitat