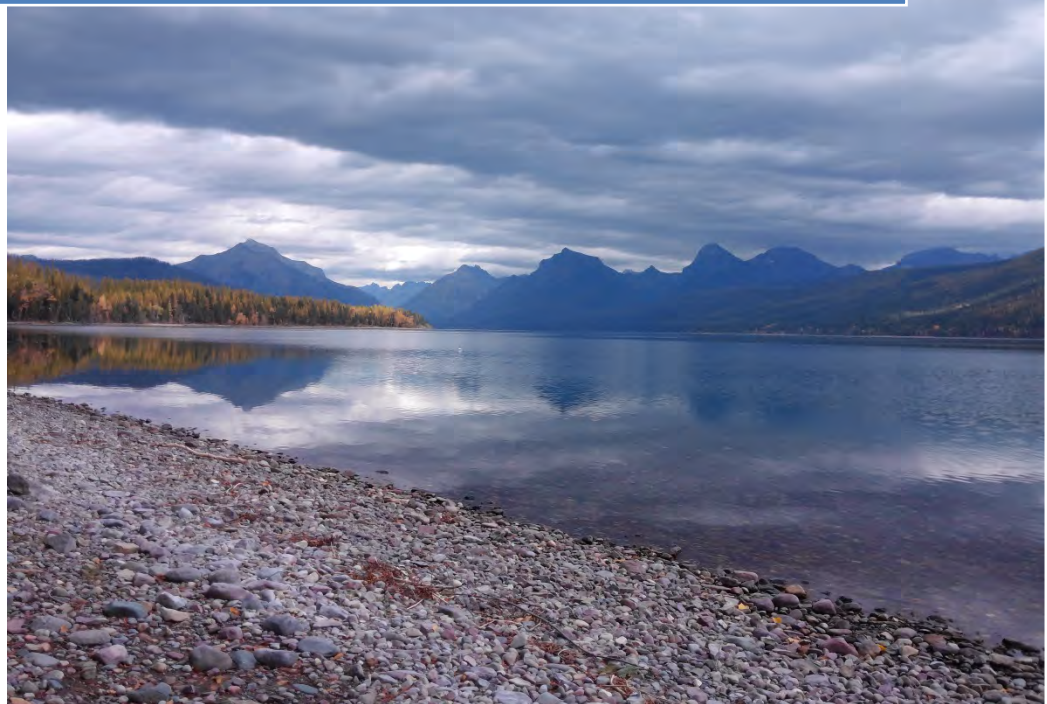


Lake McDonald Historical Inholdings: Wetland Delineation Report



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1.0 INTRODUCTION

Three historical inholdings acquired by Glacier National Park are under review for future activities. The purpose of this report is to describe existing wetland characteristics at the project sites and quantify the location and extent of wetlands within the vicinity of all properties.

The project location is near the town of Apgar, within Glacier National Park, in Flathead County, Montana. The project areas where wetlands are located are along the southwest and northeast shorelines of Lake McDonald (Figure 1).

Wetland delineations on three historic inholding properties are included within this report. All properties include structures that were constructed prior to the inception of Glacier as a National Park, and all properties have been recently acquired by the Park since the termination of the inholding agreements.

The historic Greve property is located along the northeast shore of Lake McDonald, approximately 9.3 miles north along the Going-to-the-Sun Road from Apgar. It lies within Section 14 of Township 33N, Range 18W. The Moberly and Fox properties are located along the southwest shore of Lake McDonald, approximately 0.5 miles from the town of Apgar. The Moberly property is located approximately 0.56 miles north on Grist Road. The Fox property is approximately 0.11 miles north of the Moberly property along the shoreline, or approximately 0.67 miles north along Grist Road. Both properties are located within Section 14 of Township 32N, Range 19W. All sites are located on slight slopes from upland areas to shoreline. Elevations range from 3,215 to 3,250 feet in elevation in the project areas.

This report describes existing wetland conditions at all three sites. Included are methods employed during the October 13, 2015 wetland delineations, delineation results, and preliminary determinations as to the jurisdictional status of project area wetlands. Future plans for all of these properties are uncertain, but may include renovation of the cabins under the historical lease program or removal of structures on one or more properties.

2.0 REGULATORY SETTING

Placement of dredged or fill material into wetlands or other “waters of the United States” is regulated by the Army Corps of Engineers (ACOE) and the Environmental Protection Agency (EPA) under Section 404 of the federal Clean Water Act (CWA).

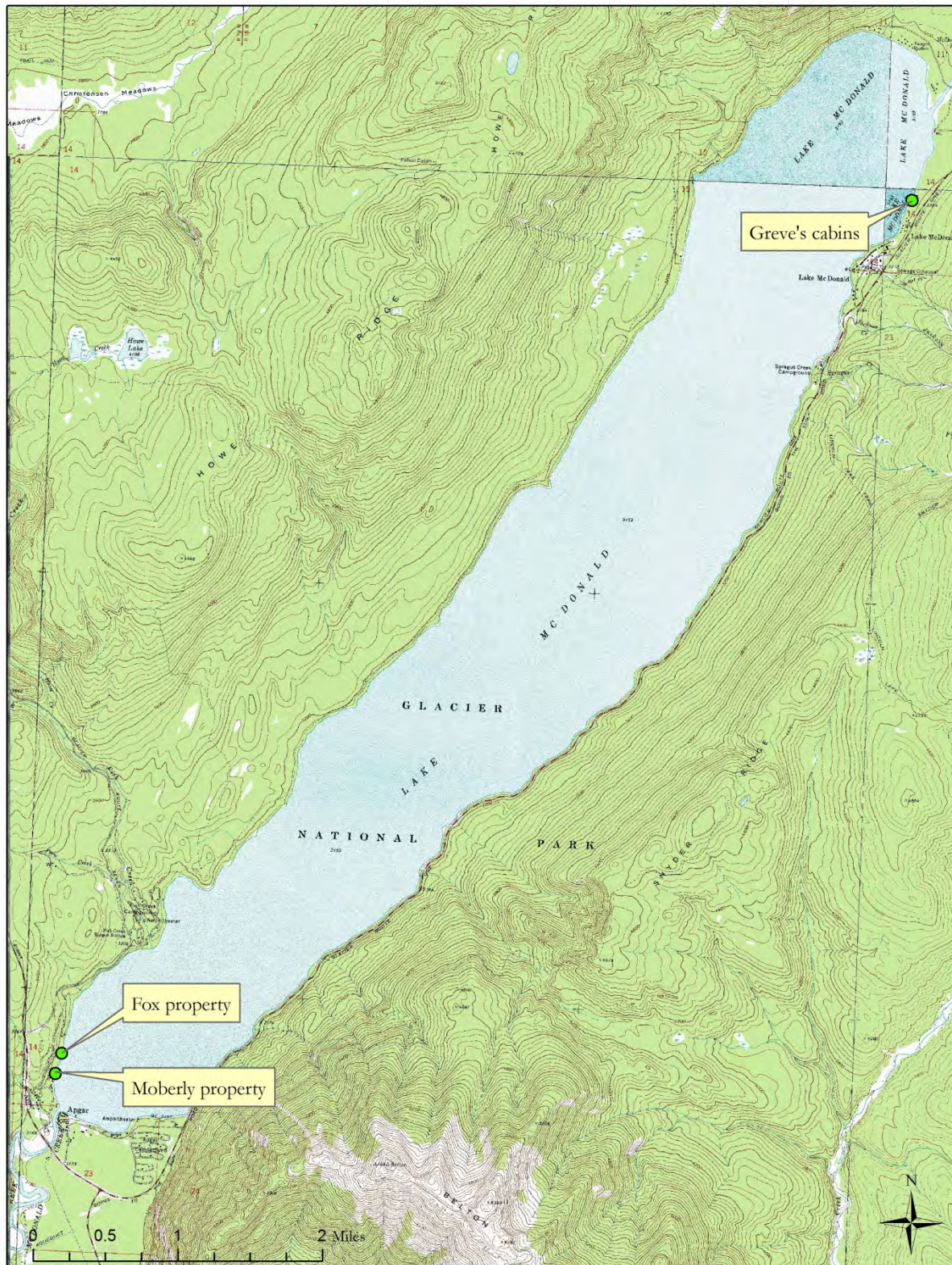
2.1 Wetland definition

For delineation purposes, wetlands are defined as:

Those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions (33 CFR 328.3, 40 CFR 230.3).

The interaction of wetland hydrology, hydrophytic vegetation, and hydric soil results in the development of site characteristics unique to wetlands. Consequently, except under certain

Figure 1. Location of Subject Lake McDonald Inholding Properties, Glacier National Park, MT



circumstances, the ACOE Wetlands Delineation Manual (Environmental Laboratory 1987) requires that a minimum of one positive indicator from each of these three parameters be documented to positively delineate an area as a wetland. Unvegetated stream channels, open water areas, and similar areas are not wetlands, but may be regulated by the ACOE and EPA as waters of the United States.

2.2 Waters of the U.S. definition

According to the ACOE rules, waters of the United States generally include: waters which were or could be used for interstate or foreign commerce; all interstate waters including interstate wetlands; all other waters including intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use or degradation of which could affect interstate or foreign commerce; all impoundments of waters otherwise defined as waters of the U.S.; tributaries of aforementioned waters; territorial seas; and wetlands adjacent to aforementioned waters (other than wetlands).

2.3 Regulatory Jurisdiction

According to 33 CFR 328.4c, the limits of jurisdiction in non-tidal waters are as follows: (1) in the absence of adjacent wetlands, the jurisdiction extends to the ordinary high water mark, or; (2) when adjacent wetlands are present, the jurisdiction extends beyond the ordinary high water mark to the limit of the adjacent wetlands; and (3) when the water of the United States consists only of wetlands the jurisdiction extends to the limit of this wetland.

Non-jurisdictional or isolated wetlands are identified using the same criteria but these wetlands do not have a connection to waters of the United States consisting of continuous wetland area or a stream with identifiable bed and banks. Currently, there are federal legal uncertainties concerning the jurisdiction of isolated wetlands making preliminary jurisdictional determinations difficult. Final jurisdictional determination should be made by ACOE personnel.

3.0 METHODS

Topographic maps and aerial photographs were obtained and reviewed prior to conducting the wetland delineation. Wetlands were then delineated in the field on October 13, 2015. All wetlands on the property were delineated.

Routine methodology protocols were used as outlined in the 1987 ACOE Wetland Delineation Manual (US-ACOE, 1987) and as clarified in a March 1992 memo (US-ACOE, 1992). In 2010, the US-ACOE released final Regional Supplements that are now the required forms to use in wetland delineation. This area of Montana falls within the Western Mountains, Valleys, and Coast Region Regional Supplement area. Western Mountains, Valleys, and Coast Region wetland determination data forms were completed at four locations at the three wetland sites. At the Greve and Moberly properties, one set of upland-wetland companion plots were completed to define the wetland boundary for a total of two wetland delineation plots at each property. At the Fox property, two sets of upland-wetland companion plots were completed to define the wetland boundary for a total of four wetland delineation plots at that property. The locations of these wetland observation points are marked on the field map (Appendix A). Wetland boundaries were marked with a handheld GPS

unit. The wetland boundaries and proposed impact area to wetlands are indicated on three attached maps in Appendix A. It is important to remember that these boundaries have not been formally surveyed and may not be completely accurate in location. Representative photographs of the site are provided in Appendix B and ACOE wetland determination forms are included in Appendix C.

3.1 Hydrology Methods

Surface and subsurface hydrology observations were made in the field. Generally, continuous inundation or saturation for greater than 12.5 percent of the growing season is clear evidence of active wetland hydrology, whereas inundation or saturation for periods less than 5 percent of the growing season is clear evidence of non-wetland conditions. Systems with continuous inundation or saturation between 5 and 12.5 percent of the growing season may or may not be jurisdictional wetlands based on other criteria.

Growing season for this project is defined as the number of days where there is a 50% probability that the minimum daily temperature is greater than or equal to 28° F (Environmental Laboratory, 1987). The average frost-free period (growing season) for this area is reported as approximately 100 days in a local soil survey report for the Flathead Valley (USDA 1960), starting approximately in May and ending in September. Therefore, to qualify as wetland hydrology, inundation or saturation needs to be present for at least 5 days (5 percent) during the growing season. Inundation or saturation that is present for 12.5 days (12.5 percent) during the growing season is clear evidence of wetland hydrology. Field observations took place just at the end of the growing season.

Either direct observations of inundation or well data showing a free water surface in the major portion of the root zone (generally depths of 12 inches or less) continuously for more than 5 percent of the growing season have been used to distinguish active wetland hydrology. Lacking long-term well and surface-water monitoring data, primary and secondary field indicators were used to determine current wetland hydrology. Field indicators are divided into two categories: primary and secondary. Primary indicators include visual observation of inundation or saturation within 12 inches of the surface, watermarks on woody vegetation, drift lines, sediment deposits, the presence of oxidized rhizospheres (rust coloration around living roots), water-stained vegetation, algal mats or crusts, salt crust, surface soil cracks, inundation visible on aerial imagery, a hydrogen sulfide odor, the presence of iron deposits or reduced iron, evidence of aquatic invertebrates, stunted or stressed plants, and a sparsely vegetated concave surface. Secondary field indicators include water-stained vegetation, drainage patterns, dry-season water table, saturation visible on aerial imagery, the presence of a shallow aquitard, vegetation passing the FAC-neutral test, and the presence of raised ant mounds or frost-heaved hummocks. Presence or absence of these indicators was noted for the investigative plots.

3.2 Soils Methods

Each wetland delineation plot was examined for the presence of hydric soils. Hydric soils are soils which are saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions in the upper horizons (Environmental Laboratory 1987). Characteristic field indicators of hydric conditions include organic soils, thick organic layers (histic epipedons), a sulfidic odor, depleted soil below a dark surface, a depleted dark surface, a depleted matrix, a loamy gleyed matrix, loamy mucky material, a thick dark surface or redox dark surface, sandy mucky material, a

sandy gleyed matrix, sandy soil with redoximorphic features (mottles), and redox depressions. Typically, low soil chroma and mottles provide evidence of reduced soil conditions that develop under wet, anaerobic conditions. Mottles can also indicate a fluctuating water table. Local NRCS offices have published complete lists of hydric soil series. Wetland soils can be assumed to be present in any plant community in which all dominant species have an indicator status of OBL, or where all dominant species have an indicator status of OBL or FACW, and the wetland boundary is abrupt (Environmental Laboratory 1987).

Soil pits were dug to a depth of at least 16 inches at each sample location. Soil was analyzed for texture and color using the Munsell Soil Color Chart (Munsell Color 1990). Soil color is based on hue, value, and chroma. A soil color denoted by “10YR 3/2” has a hue to 10 yellow-red, a value of 3, and a chroma of 2. Prescribed methods require a colorimetric determination immediately below the “A” horizon, or 10 inches, whichever is less.

3.3 Vegetation Methods

Vegetation protocols followed new regional standards (US-ACOE 2010). This protocol states that in order to meet the hydrophytic vegetation criteria, vegetation must meet Apply Indicator 1 or Apply Indicator 2, or in the case that hydric soil and wetland hydrology are present, hydrophytic vegetation may meet Apply Indicator 3. Vegetation was assessed using the following step system:

1. Apply Indicator 1 (Rapid Test for Hydrophytic Vegetation).
 - a. If the plant community passes the rapid test for hydrophytic vegetation (all dominant species cross all strata are OBL or FACW), then the vegetation is hydrophytic and no further vegetation analysis is required.
 - b. If the rapid test for hydrophytic vegetation is not met, then proceed to step 2.
2. Apply Indicator 2 (Dominance Test).
 - a. If the plant community passes the dominance test, then the vegetation is hydrophytic and no further vegetation analysis is required.
 - b. If the plant community fails the dominance test, and indicators of hydric soil and/or wetland hydrology are absent, then hydrophytic vegetation is absent unless the site meets requirements for a problematic wetland situation.
 - c. If the plant community fails the dominance test, but indicators of hydric soil and wetland hydrology are both present, proceed to step 3.
3. Apply Indicator 3 (Prevalence Index). This and the following step assume that at least one indicator of hydric soil and one primary or two secondary indicators of wetland hydrology are present.
 - a. If the plant community satisfies the prevalence index, then the vegetation is hydrophytic. No further vegetation analysis is required.
 - b. If the plant community fails the prevalence index, hydrophytic vegetation is not present

The U.S. Fish and Wildlife Service (USFWS) has classified vegetation according to its frequency of occurrence in wetlands (Table 1, Reed 1988). The wetland indicator represents the estimated probability (likelihood) of a species occurring in wetlands versus non-wetlands in the region.

Indicator status was derived from the northwest (Region 9) national list of plant species that occur in wetlands (1988) and the 1994 update. All dominant species were identifiable to species.

Table 1. Plant Indicators Used to Determine Wetland Status (Reed 1988).

Indicator Symbol	Indicator Status	Definition
OBL	Obligate	Species that occur almost always (probability >99%) in wetlands under natural conditions
FACW	Facultative wetland	Species that usually occur in wetlands (probability 67 to 99%), but occasionally are found in non-wetlands
FAC	Facultative	Species that is equally likely to occur in wetlands or non-wetlands (probability 34-66%)
FACU	Facultative upland	Species that usually occur in non-wetlands (probability 67-99%), but occasionally are found in wetlands
UPL	Upland	Species that occur almost always in non-wetlands under normal circumstances (probability >99%)
NI	No indicator	Species for which insufficient information was available to determine

3.4 Determination of Wetland Boundaries

Field work was performed on October 13, 2015 by NPS biological technicians who are trained in wetland delineation methodology. Wetland boundaries were determined based on the presence of all three wetland parameters: hydrophytic vegetation, wetland hydrology and hydric soils. Distinct topographic changes and vegetation breaks also assisted in wetland boundary establishment.

4.0 DELINEATION RESULTS

4.1 Site Conditions

All project areas are located along the shores of Lake McDonald. The Greve property, along the northwest shore of Lake McDonald, is a historic resort containing 5 cabins and 3 outbuildings (2 sheds and an outhouse), that are all currently uninhabited and unused. The wetland within the property is confined to the high water mark along the shoreline and none of the existing structures are located within the wetland boundaries. The upland area surrounding the cabins supports a western redcedar/western hemlock forest with a relatively denuded understory from past foot traffic. No evidence of hydrology was found in the upland area surrounding the cabins. It is possible that runoff provides surface water flow in areas of the upland during the spring, but no evidence of this was present at the time of field work.

The Moberly and Fox properties are located along the southwestern shoreline of Lake McDonald. Each property contains a historic cabin. Wetlands exist throughout the parcels and are fed by numerous springs along the hillside of the area, creating a mosaic of emergent and forested wetlands and wetland channels that eventually feed Lake McDonald (Appendix A). Wetlands along the shores of Lake McDonald are also impacted from the high water mark of the lake. The current cabin at the Moberly property exists partially within the wetland boundary. The wetland line runs through large cement pilings of the foundation (photo 6). The Fox Cabin lies entirely within a wetland (photos 17 and 18). A stream flows underneath the foundation of the cabin, surrounded by

emergent wetland. A mosaic of wetlands is present throughout the property. Upland areas adjacent to the wetlands contain western redcedar/western hemlock forests.

4.2 Hydrology

At the Greve property, where the only delineated wetland exists as lakeshore fringe, hydrology supporting the wetland is primarily provided by the fluctuating water levels of Lake McDonald. Surface water runoff, rainfall and groundwater interaction may provide subordinate influences. Primary wetland hydrology indicators in the wetland, indicated by plot W-1, include a high water table at 9 inches and saturation 2 inches below the soil surface, as well as visible saturation on aerial photography. Secondary hydrology indicators within this wetland include geomorphic position that supports wetlands, as well as vegetation passing the FAC-neutral test at 3:0. The wetland on this property abuts Lake McDonald, included in waters of the United States, and is therefore identified as jurisdictional.

The Moberly and Fox properties contain both lakeshore fringe wetlands as well as emergent wetlands interspersed among the slope. The rise and fall of lake levels provide hydrology for the fringe wetlands, along with surface flow from springs and streams on the vegetated slope (photos 7 and 16). Emergent and forested wetlands located on the slope above the lake are primarily fed by numerous underground springs and flowing groundwater that is prevalent in this area. Both wetlands are likely also secondarily influenced by rainfall and spring runoff. Numerous pipes and culverts have been historically installed on and near these properties, attempting to divert and control water flow throughout the area (photos 8, 15 and 19), which appears to be continuous throughout the growing season and beyond.

At the Moberly site, the wetland within the property boundary primarily exists as lakeshore fringe (Appendix A). Surrounding spring-fed emergent and forested wetlands were also delineated to depict the overall hydrology of the influencing area. Plot W-2 falls within the fringe wetland, adjacent to the cabin. Primary wetland hydrology indicators in the wetland include saturation at 6 inches below the soil surface and visible saturation on aerial photography. Portions of the foundation of the cabin are located within this lacustrine fringe wetland, depicted by water marks on the pilings, an additional primary indicator. Secondary hydrology indicators within this wetland include geomorphic position that supports wetlands, as well as vegetation passing the FAC-neutral test at 1:0. Wetlands on this property are adjacent to, or directly feed into Lake McDonald, a water of the United States, and are therefore identified as jurisdictional wetlands.

At the Fox site, both lacustrine fringe wetlands and spring-fed emergent and forested wetlands exist throughout the majority of the property. Plot W-3 is located within a slopeside forested wetland and showed clear evidence of primary hydrological support. The plot was located upslope from the cabin in an area characterized by a mosaic of streams, saturated wetlands, and small upland patches. The water table was at 5 inches at this location and saturation occurred at the surface. Plot W-4 is located within another slopeside forested wetland below the woodshed. Primary hydrology indicators here include a high water table at 6 inches below the surface and saturation at the soil surface. Wetlands on this property either consist of continuous wetland area, are streams with identifiable bed and banks that connect to the lake, or are directly adjacent to Lake McDonald, a jurisdictional water of the United States.

Plots U-1, U-2, U-3 and U-4 showed no evidence of wetland hydrology indicators and were not included in the wetland boundary.

4.3 Soils

The soils of Glacier National Park were mapped in five stages between 1994 and 1999 as part of an on-going effort to complete a park-wide soil inventory. Generally, the soil inventory follows an Order 3 Soil Survey according to the U.S. Department of Agriculture National Cooperative Soil Survey Program standards.

All upslope soils on all three properties, as well as the lakeshore soils at the Greve property, have been mapped as Silty Clay Loam Glacial Till Soils. Lakeshore soils at the Moberly and Fox properties are mapped as Lakeside Beach Soils.

Soil pit data taken at the time of field work revealed wetland soils within all wetland delineated boundaries. On the Greve property, wetland soils within plot W-1 consisted of a two-inch surface layer of sand overlying thick layer of clay. The sandy surface color was 10YR 3/1 with no mottling. The underlying clay layer had a matrix color of 10YR 6/2, 15% of which was embedded with depletions of 10YR 5/2, which qualifies this soil as depleted below a dark surface.

Wetland soils at the Moberly property were comprised of sandy clay with organic streaking and constituents. Soils at plot W-2 consisted of a single layer with a dark matrix color of 10YR 3/1 and a high amount of dark organic streaking, classifying these soils as sandy mucky mineral hydric soils.

Soils within the wetlands at the Fox property consisted of organic muck. These soils were identified in plots W-3 and W-4 as histosols.

Soils at all upland sites did meet any hydric soil criteria. Soils at these sites, sampled in plots U-1, U-2, U-3 and U-4, consisted of loamy soils and only contained a single layer with a matrix color of 10YR 3/2 without mottling.

4.4 Vegetation

Field work was conducted outside of the active growing season, but all plant species were identifiable. Areas within the inholding property boundaries that were delineated as wetlands were typically lacustrine fringe wetlands along the lake shore, as well as forested wetlands with small emergent wetland patches on the Moberly and Fox properties (Cowardin et al 1979). Lakeshore fringe vegetation on the Greve property, documented in plot W-1, can be classified as a *Deschampsia cespitosa* (tufted hairgrass) habitat type (Hansen et. al, 1995), an emergent wetland type. Lakeshore vegetation on the Moberly property, documented in plot W-2, can be classified as a *Carex utriculata* (beaked sedge) habitat type (Hansen et. al., 1996), another emergent wetland type. Finally wetland vegetation at the Fox property, documented by plots W-3 and W-4, can be classified a *Thuja plicata*/*Athyrium filix-femina* (western red cedar/lady fern) habitat type (Hansen et. al., 1996), a forested wetland type (Cowardin et al 1979).

Lakeshore wetland fringe vegetation at the Greve property (plot W-1) was dominated by tufted hairgrass (*Deschampsia cespitosa*) and lentil-fruit sedge (*Carex lenticularis*). Lakeshore wetland fringe vegetation at the Moberly property (plot W-2) was dominated by redtop (*Agrostis stolonifera*) and

beaked sedge (*Carex utriculata*). Vegetation in both plots passed the dominance test with 100% hydrophytic vegetation and both plots passed the prevalence index test for hydrophytic vegetation.

Forested wetland vegetation on the Fox property (plots W-3 and W-4) was dominated by western redcedar (*Thuja plicata*) and western hemlock (*Tsuga heterophylla*) in the overstory. Wetland understory vegetation on plot W-3 was dominated by facultative species lady fern (*Athyrium filix-femina*), woodland forget-me-not (*Myosotis sylvatica*), and mat muhly (*Muhlenbergia richardsonis*). Wetland understory vegetation on plot W-4 was dominated by facultative species lady fern and foamflower (*Tiarella trifoliata*). Each plot, however, had the presence of other obligate or facultative wetland species with lower cover. Both plots had 100% hydrophytic vegetation, passing both the dominance test and prevalence index for wetland vegetation. This area also had a fringe lakeshore wetland along Lake McDonald that was similar to the wetland described above on the Moberly property.

Vegetation within plots U-1, U-2, U-3, and U-4 did not pass the dominance or prevalence index tests for hydrophytic vegetation. These areas were dominated by a western redcedar/queencup beadlily habitat type (Pfister et. al. 1977), an upland forest type. In addition to western redcedar and western hemlock in the overstory, the understory was dominated by snowberry, Wood's rose, queencup beadlily, western fescue, and non-native species.

5.0 CONCLUSION

The wetland hydrology, vegetation, and soils of the three wetland areas are summarized below. Photos of the wetland features and survey areas are included in Appendix B. Routine Wetland Determination forms are included in Appendix C. Wetlands on all of these properties either consist of a continuous wetland area, are streams with identifiable bed and banks that connect to Lake McDonald, or are directly adjacent to the lake, a jurisdictional water of the United States. These wetlands should be recognized as jurisdictional using these criteria, however, the Army Corps of Engineers will make the final determination of jurisdictional status for these wetland areas.

As wetlands delineated on each of these properties connect to much larger wetlands, area or acreage was not calculated for wetlands on each property. No fill is currently being proposed for these wetlands at this date, so there was also no impact to wetlands to quantify. Please refer to the attached maps for the extent of the wetland boundaries, although please remember that these boundaries were mapped using handheld GPS units and were not officially surveyed.

W1 – Emergent Wetland

Wetland W1 on the Greve property is a fringe lakeshore wetland. It is located along the shore of Lake McDonald with wetland hydrology that is primarily provided by the fluctuating water levels of Lake McDonald. Surface water runoff, rainfall and groundwater interaction may provide subordinate influences. This wetland hydrology was evident during the site visit as a high water table and saturation within 12 inches of the surface, as well as visible saturation on aerial photography, a geomorphic position that supports wetlands, and vegetation that passes the FAC-neutral test. As it is adjacent to Lake McDonald, this wetland is connected to navigable waters of the U.S. This wetland is dominated by herbaceous emergent wetland vegetation. Indicators of hydric soil include a narrow dark surface with lighter chroma soils in the subsurface embedded with depletions. This characterizes this hydric soil as depleted below a dark surface.

W2 – Emergent Wetland

Wetland W2 on the Moberly property is another fringe lakeshore wetland. It is also located along the shore of Lake McDonald with wetland hydrology that is primarily provided by the fluctuating water levels of Lake McDonald. Nearby springs, surface water runoff, rainfall and groundwater interaction may provide subordinate influences. This wetland hydrology was evident during the site visit as a high water table and saturation within 12 inches of the surface, as well as visible saturation on aerial photography, a geomorphic position that supports wetlands, and vegetation that passes the FAC-neutral test. As it is adjacent to Lake McDonald, this wetland is connected to navigable waters of the U.S. This wetland is dominated by herbaceous emergent wetland vegetation. Indicators of hydric soil include a dark sandy clay with a high amount of organic streaking and constituents. This characterizes this soil as a sandy mucky mineral hydric soil. The current cabin at the Moberly property exists partially within the wetland boundary. The wetland line runs through large cement pilings of the foundation.

W3 – Forested and Emergent Wetland

Wetland W3 on the Fox property is comprised of both lacustrine fringe wetlands and spring-fed emergent and forested wetlands that exist throughout the property. The forested wetland is at an upslope from the cabin and has a mosaic of spring-fed streams, saturated wetlands fed by springs, and small upland patches. Wetland hydrology, evident as a high water table and saturation at the soil surface, is provided in these forested wetlands by several springs on the steep slope, surface water runoff, and rainfall. The lakeshore wetland fringe below the cabin, similar to W2, receives wetland hydrology from the fluctuating water levels of adjacent Lake McDonald. Wetland hydrology was also evident as a high water table and saturation within 12 inches of the surface. As these wetlands are adjacent to Lake McDonald or along spring-fed areas that flow into Lake McDonald, they are connected to navigable waters of the U.S. The forested wetland is dominated by woody and herbaceous forested wetland vegetation while the lakeshore wetland is dominated by herbaceous emergent vegetation. Indicators of hydric soil include mucky soil throughout the forested wetlands, characterizing these soils as histosols. Indicators of hydric soils along the shore are similar to W2, characterizing these soils as a sandy mucky mineral hydric soil.

The Fox Cabin lies entirely within the delineated wetland. A stream flows underneath the foundation of the cabin, surrounded by emergent and forested wetland vegetation.

6.0 REFERENCES

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Appendix A. Lake McDonald Inholdings Wetland Delineations

- **Maps of wetland boundaries and delineation plots**

Figure 2. Wetland boundaries on the Greve property.



Figure 3. Wetland boundaries on the Moberly property.



Figure 4. Wetland boundaries on the Fox property.



Appendix B. Photographs of Lake McDonald Inholdings wetland delineations.



Photo 1. Upland plot at Greve's Cabins.



Photo 2. Wetland plots at Greve's Cabins.



Photo 3. Upland surrounding Greve's Cabins.



Photo 4. Upland plot at Moberly Cabin



Photo 5. Wetland plot at Moberly Cabin.



Photo 6. Moberly Cabin; wetland line is through pilings of foundation.



Photo 7. Side Channel northeast of Moberly Cabin.



Photo 8. Pipe above slope from Moberly Cabin diverting spring water



Photo 9. Upland Plot (U-3) at Fox Cabin.



Photo 10. Wetland Plot (W-3) at Fox Cabin.



Photo 11. Upland Plot (U-4) at Fox Cabin.



Photo 12. Wetland Plot (W-4) at Fox Cabin.



Photo 13. Stream running through wetland behind Fox Cabin.



Photo 14. Spring coming out of the ground behind Fox Cabin.



Photo 15. Pipe diverting water from springs behind Fox Cabin.



Photo 16. Flowing water from wetland meeting lakefront at Fox Cabin.



Photo 17. Creek flowing under boardwalk to Fox Cabin.



Photo 19. Pipe diverting water on slope above Fox Cabin.



Photo 18. Foundation of Fox Cabin; stream flows underneath

Appendix C. Lake McDonald Inholdings Wetland Delineations

- **Wetland Delineation forms**

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project Site: Greve Property City/County: Flathead Sampling Date: 10/13/2015
 Applicant/Owner: Glacier National Park State: MT Sampling Point: U-1
 Investigator(s): J. Asebrook, J. Hintz Section, Township, Range: S14, T33N, R18W
 Landform (hillslope, terrace, etc.): Lakeshore Local relief (concave, convex, none): none Slope (%): 2
 Subregion (LRR): Rocky Mtn Forests & Rangeland (E) Lat: 48.623628 Long: -113.872028 Datum: NAD83
 Soil Map Unit Name: Silty Clay Loam Glacial Till Soils NWI classification: upland

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

Are Vegetation ☐, Soil ☐, Or Hydrology ☐, significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

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

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

Hydrophytic Vegetation Present?	Yes	☐	No	☒	Is the Sampling Area within a Wetland? Yes ☐ No ☒
Hydric Soil Present?	Yes	☐	No	☒	
Wetland Hydrology Present?	Yes	☐	No	☒	

REMARKS:

VEGETATION – Use scientific names of plants

Tree Stratum (Plot Size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A) Total Number of Dominant Species Across All Strata: <u>7</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>14%</u> (A/B)																					
1. <u>Thuja plicata</u>	<u>25</u>	<u>yes</u>	<u>FAC</u>																						
2. <u>Picea engelmannii</u>	<u>5</u>	<u>no</u>	<u>FAC</u>																						
3. <u>Tsuga heterophylla</u>	<u>5</u>	<u>no</u>	<u>FACU</u>																						
4. _____	_____	_____	_____																						
50% = <u>17.5</u> , 20% = <u>7</u>	<u>35</u>	= Total Cover																							
Sapling/Shrub Stratum (Plot Size: _____)																									
1. <u>Symphoricarpos albus</u>	<u>15</u>	<u>yes</u>	<u>FACU</u>	Prevalence Index worksheet: <table border="0"> <tr> <td></td> <td>Total % Cover of:</td> <td>Multiply by:</td> </tr> <tr> <td>OBL species</td> <td><u>0</u></td> <td>x1 = <u>0</u></td> </tr> <tr> <td>FACW species</td> <td><u>0</u></td> <td>x2 = <u>0</u></td> </tr> <tr> <td>FAC species</td> <td><u>35</u></td> <td>x3 = <u>105</u></td> </tr> <tr> <td>FACU species</td> <td><u>42</u></td> <td>x4 = <u>168</u></td> </tr> <tr> <td>UPL species</td> <td><u>3</u></td> <td>x5 = <u>15</u></td> </tr> <tr> <td>Column Totals:</td> <td>(A)80</td> <td>(B)288</td> </tr> </table> Prevalence Index = B/A = 3.6		Total % Cover of:	Multiply by:	OBL species	<u>0</u>	x1 = <u>0</u>	FACW species	<u>0</u>	x2 = <u>0</u>	FAC species	<u>35</u>	x3 = <u>105</u>	FACU species	<u>42</u>	x4 = <u>168</u>	UPL species	<u>3</u>	x5 = <u>15</u>	Column Totals:	(A)80	(B)288
	Total % Cover of:	Multiply by:																							
OBL species	<u>0</u>	x1 = <u>0</u>																							
FACW species	<u>0</u>	x2 = <u>0</u>																							
FAC species	<u>35</u>	x3 = <u>105</u>																							
FACU species	<u>42</u>	x4 = <u>168</u>																							
UPL species	<u>3</u>	x5 = <u>15</u>																							
Column Totals:	(A)80	(B)288																							
2. <u>Rosa woodsii</u>	<u>10</u>	<u>yes</u>	<u>FACU</u>																						
3. <u>Cornus canadensis</u>	<u>5</u>	<u>no</u>	<u>FAC</u>																						
4. <u>Spiraea betulifolia</u>	<u>3</u>	<u>no</u>	<u>FACU</u>																						
5. <u>Mahonia repens</u>	<u>2</u>	<u>no</u>	<u>UPL</u>																						
50% = <u>17.5</u> , 20% = <u>7</u>	<u>35</u>	= Total Cover																							
Herb Stratum (Plot Size: _____)																									
1. <u>Leucanthemum vulgare</u>	<u>5</u>	<u>yes</u>	<u>FACU</u>	Hydrophytic Vegetation Indicators: ☐ Dominance Test is >50% ☐ Prevalence Index is ≤3.0 ¹ ☐ Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) ☐ Wetland Non-Vascular Plants ¹ ☐ Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.																					
2. <u>Poa compressa</u>	<u>3</u>	<u>yes</u>	<u>FACU</u>																						
3. <u>Clintonia uniflora</u>	<u>1</u>	<u>yes</u>	<u>UPL</u>																						
4. <u>Linnaea borealis</u>	<u>1</u>	<u>yes</u>	<u>FACU</u>																						
5. <u>Fragaria vesca</u>	<u>1</u>	<u>no</u>	<u>FACU</u>																						
6. <u>Equisetum arvense</u>	<u>1</u>	<u>no</u>	<u>FAC</u>																						
7. _____	_____	_____	_____																						
8. _____	_____	_____	_____																						
9. _____	_____	_____	_____																						
10. _____	_____	_____	_____																						
11. _____	_____	_____	_____																						
50% = <u>5</u> , 20% = <u>1</u>	<u>10</u>	= Total Cover																							
Woody Vine Stratum (Plot Size: _____)																									
1. _____	_____	_____	_____	Hydrophytic Vegetation Present? Yes ☐ No ☒																					
2. _____	_____	_____	_____																						
50% = _____, 20% = _____	_____	= Total Cover																							
% Bare Ground in Herb Stratum _____																									
REMARKS : Hydrophytic vegetation is not present. Vegetation does not pass any hydrophytic vegetation indicators. Also present with trace covers: <i>Sorbus sitchensis</i> and <i>Arctostaphylos uva-ursi</i> .																									

SOILSampling Point: U-1**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (Moist)	%	Type ¹	Loc ²		
0-16+	10YR3/2	100	n/a	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____

¹Type: C= Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)**

- | | |
|--|--|
| ☐ Histosol (A1) | ☐ Sandy Redox (S5) |
| ☐ Histic Epipedon (A2) | ☐ Stripped Matrix (S6) |
| ☐ Black Histic (A3) | ☐ Loamy Mucky Mineral (F1) (except MLRA 1) |
| ☐ Hydrogen Sulfide (A4) | ☐ Loamy Gleyed Matrix (F2) |
| ☐ Depleted Below Dark Surface (A11) | ☐ Depleted Matrix (F3) |
| ☐ Thick Dark Surface (A12) | ☐ Redox Dark Surface (F6) |
| ☐ Sandy Mucky Mineral (S1) | ☐ Depleted Dark Surface (F7) |
| ☐ Sandy Gleyed Matrix (S4) | ☐ Redox Depressions (F8) |

Indicators for Problematic Hydric Soils³:

- | |
|---|
| ☐ 2 cm Muck (A10) |
| ☐ Red Parent Material (TF2) |
| ☐ Other (Explain in Remarks) |

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.**Restrictive Layer (if present):**

Type: _____

Depth (Inches): _____

Hydric Soils Present?

Yes

☐

No

☒

Remarks: No hydric soil indicators are present.

HYDROLOGY**Wetland Hydrology Indicators:**

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

- | | |
|--|---|
| ☐ Surface Water (A1) | ☐ Water-Stained Leaves (B9) |
| ☐ High Water Table (A2) | (except MLRA 1, 2, 4A, and 4B) |
| ☐ Saturation (A3) | ☐ Salt Crust (B11) |
| ☐ Water Marks (B1) | ☐ Aquatic Invertebrates (B13) |
| ☐ Sediment Deposits (B2) | ☐ Hydrogen Sulfide Odor (C1) |
| ☐ Drift Deposits (B3) | ☐ Oxidized Rhizospheres along Living Roots (C3) |
| ☐ Algal Mat or Crust (B4) | ☐ Presence of Reduced Iron (C4) |
| ☐ Iron Deposits (B5) | ☐ Recent Iron Reduction in Tilled Soils (C6) |
| ☐ Surface Soil Cracks (B6) | ☐ Stunted or Stresses Plants (D1) (LRR A) |
| ☐ Inundation Visible on Aerial Imagery (B7) | ☐ Other (Explain in Remarks) |
| ☐ Sparsely Vegetated Concave Surface (B8) | |

Secondary Indicators (2 or more required)

- | |
|--|
| ☐ Water-Stained Leaves (B9) |
| (MLRA 1, 2, 4A, and 4B) |
| ☐ Drainage Patterns (B10) |
| ☐ Dry-Season Water Table (C2) |
| ☐ Saturation Visible on Aerial Imagery (C9) |
| ☐ Geomorphic Position (D2) |
| ☐ Shallow Aquitard (D3) |
| ☐ FAC-Neutral Test (D5) |
| ☐ Raised Ant Mounds (D6) (LRR A) |
| ☐ Frost-Heave Hummocks (D7) |

Field Observations:Surface Water Present? Yes ☐ No ☒ Depth (inches): _____Water Table Present? Yes ☐ No ☒ Depth (inches): _____Saturation Present?
(includes capillary fringe) Yes ☐ No ☒ Depth (inches): _____**Wetland Hydrology Present?**

Yes

☐

No

☒

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

Remarks: No wetland hydrology indicators are present.

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project Site: Greve Property City/County: Flathead Sampling Date: 10/13/2015
 Applicant/Owner: Glacier National Park State: MT Sampling Point: W-1
 Investigator(s): J. Asebrook, J. Hintz Section, Township, Range: S14, T33N, R18W
 Landform (hillslope, terrace, etc.): Lakeshore Local relief (concave, convex, none): none Slope (%): 0
 Subregion (LRR): Rocky Mtn Forests & Rangeland Lat: 48.623671 Long: -113.872123 Datum: NAD83
 Soil Map Unit Name: Silty Clay Loam Glacial Till Soils NWI classification: Lacustrine Littoral Aquatic Bed, Intermittently Exposed

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)
 Are Vegetation ☐, Soil ☐, Or Hydrology ☐, significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐
 Are Vegetation ☐, Soil ☐, Or Hydrology ☐, naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes	☒	No	☐	Is the Sampling Area within a Wetland?	Yes	☒	No	☐
Hydric Soil Present?	Yes	☒	No	☐					
Wetland Hydrology Present?	Yes	☒	No	☐					

REMARKS:

VEGETATION – Use scientific names of plants

Tree Stratum (Plot Size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)																								
1. _____	_____	_____	_____																									
2. _____	_____	_____	_____																									
3. _____	_____	_____	_____																									
4. _____	_____	_____	_____																									
50% = _____, 20% = _____	_____	= Total Cover																										
Sapling/Shrub Stratum (Plot Size: _____)																												
1. <u>Salix bebbiana</u>	<u>5</u>	<u>yes</u>	<u>FACW</u>	Prevalence Index worksheet: <table border="0"> <tr> <td></td> <td><u>Total % Cover of:</u></td> <td><u>Multiply by:</u></td> </tr> <tr> <td>OBL species</td> <td><u>15</u></td> <td>x1 = <u>15</u></td> </tr> <tr> <td>FACW species</td> <td><u>26</u></td> <td>x2 = <u>52</u></td> </tr> <tr> <td>FAC species</td> <td><u>5</u></td> <td>x3 = <u>15</u></td> </tr> <tr> <td>FACU species</td> <td><u>1</u></td> <td>x4 = <u>4</u></td> </tr> <tr> <td>UPL species</td> <td><u>0</u></td> <td>x5 = <u>0</u></td> </tr> <tr> <td>Column Totals:</td> <td>47(A)</td> <td>86(B)</td> </tr> <tr> <td colspan="3">Prevalence Index = B/A = 1.83</td> </tr> </table>		<u>Total % Cover of:</u>	<u>Multiply by:</u>	OBL species	<u>15</u>	x1 = <u>15</u>	FACW species	<u>26</u>	x2 = <u>52</u>	FAC species	<u>5</u>	x3 = <u>15</u>	FACU species	<u>1</u>	x4 = <u>4</u>	UPL species	<u>0</u>	x5 = <u>0</u>	Column Totals:	47(A)	86(B)	Prevalence Index = B/A = 1.83		
	<u>Total % Cover of:</u>	<u>Multiply by:</u>																										
OBL species	<u>15</u>	x1 = <u>15</u>																										
FACW species	<u>26</u>	x2 = <u>52</u>																										
FAC species	<u>5</u>	x3 = <u>15</u>																										
FACU species	<u>1</u>	x4 = <u>4</u>																										
UPL species	<u>0</u>	x5 = <u>0</u>																										
Column Totals:	47(A)	86(B)																										
Prevalence Index = B/A = 1.83																												
2. _____	_____	_____	_____																									
3. _____	_____	_____	_____																									
4. _____	_____	_____	_____																									
5. _____	_____	_____	_____																									
50% = <u>2.5</u> , 20% = <u>1</u>	<u>5</u>	= Total Cover																										
Herb Stratum (Plot Size: _____)																												
1. <u>Deschampsia caespitosa</u>	<u>15</u>	<u>yes</u>	<u>FACW</u>	Hydrophytic Vegetation Indicators: ☒ Dominance Test is >50% ☒ Prevalence Index is ≤3.0 ¹ ☐ Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) ☐ Wetland Non-Vascular Plants ¹ ☐ Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.																								
2. <u>Carex lenticularis</u>	<u>15</u>	<u>yes</u>	<u>OBL</u>																									
3. <u>Mentha arvensis</u>	<u>5</u>	<u>no</u>	<u>FACW</u>																									
4. <u>Equisetum arvense</u>	<u>5</u>	<u>no</u>	<u>FAC</u>																									
5. <u>Symphotrichum laeve</u>	<u>1</u>	<u>no</u>	<u>FACU</u>																									
6. <u>Viola glabella</u>	<u>1</u>	<u>no</u>	<u>FACW</u>																									
7. _____	_____	_____	_____																									
8. _____	_____	_____	_____																									
9. _____	_____	_____	_____																									
10. _____	_____	_____	_____																									
11. _____	_____	_____	_____																									
50% = <u>21</u> , 20% = <u>8.4</u>	<u>42</u>	= Total Cover																										
Woody Vine Stratum (Plot Size: _____)																												
1. _____	_____	_____	_____	Hydrophytic Vegetation Present? Yes ☒ No ☐																								
2. _____	_____	_____	_____																									
50% = _____, 20% = _____	_____	= Total Cover																										
% Bare Ground in Herb Stratum _____																												

REMARKS:
:

While vegetation is primarily facultative, vegetation does pass dominance test for hydrophytic vegetation.

SOIL

Sampling Point: W-1

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (Moist)	%	Type ¹	Loc ²		
0-2"	10YR3/1	100	_____	_____	_____	_____	Sand	_____
2 – 16+"	10YR 6/2	85	10YR 5/2	15	D	M	Clay	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____

¹Type: C= Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)**

- | | |
|---|--|
| ☐ Histosol (A1) | ☐ Sandy Redox (S5) |
| ☐ Histic Epipedon (A2) | ☐ Stripped Matrix (S6) |
| ☐ Black Histic (A3) | ☐ Loamy Mucky Mineral (F1) (except MLRA 1) |
| ☐ Hydrogen Sulfide (A4) | ☐ Loamy Gleyed Matrix (F2) |
| ☒ Depleted Below Dark Surface (A11) | ☐ Depleted Matrix (F3) |
| ☐ Thick Dark Surface (A12) | ☐ Redox Dark Surface (F6) |
| ☐ Sandy Mucky Mineral (S1) | ☐ Depleted Dark Surface (F7) |
| ☐ Sandy Gleyed Matrix (S4) | ☐ Redox Depressions (F8) |

Indicators for Problematic Hydric Soils³:

- | |
|---|
| ☐ 2 cm Muck (A10) |
| ☐ Red Parent Material (TF2) |
| ☐ Other (Explain in Remarks) |

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.**Restrictive Layer (if present):**

Type: _____

Depth (Inches): _____

Hydric Soils Present?

Yes

☒

No

☐

Remarks: Meets hydric soil criteria.

HYDROLOGY**Wetland Hydrology Indicators:**

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

- | | |
|---|---|
| ☐ Surface Water (A1) | ☐ Water-Stained Leaves (B9) |
| ☒ High Water Table (A2) | (except MLRA 1, 2, 4A, and 4B) |
| ☒ Saturation (A3) | ☐ Salt Crust (B11) |
| ☐ Water Marks (B1) | ☐ Aquatic Invertebrates (B13) |
| ☐ Sediment Deposits (B2) | ☐ Hydrogen Sulfide Odor (C1) |
| ☐ Drift Deposits (B3) | ☐ Oxidized Rhizospheres along Living Roots (C3) |
| ☐ Algal Mat or Crust (B4) | ☐ Presence of Reduced Iron (C4) |
| ☐ Iron Deposits (B5) | ☐ Recent Iron Reduction in Tilled Soils (C6) |
| ☐ Surface Soil Cracks (B6) | ☐ Stunted or Stresses Plants (D1) (LRR A) |
| ☒ Inundation Visible on Aerial Imagery (B7) | ☐ Other (Explain in Remarks) |
| ☐ Sparsely Vegetated Concave Surface (B8) | |

Secondary Indicators (2 or more required)

- | |
|--|
| ☐ Water-Stained Leaves (B9) |
| (MLRA 1, 2, 4A, and 4B) |
| ☐ Drainage Patterns (B10) |
| ☐ Dry-Season Water Table (C2) |
| ☐ Saturation Visible on Aerial Imagery (C9) |
| ☒ Geomorphic Position (D2) |
| ☐ Shallow Aquitard (D3) |
| ☒ FAC-Neutral Test (D5) |
| ☐ Raised Ant Mounds (D6) (LRR A) |
| ☐ Frost-Heave Hummocks (D7) |

Field Observations:Surface Water Present? Yes ☐ No ☒ Depth (inches): _____Water Table Present? Yes ☒ No ☐ Depth (inches): 9"Saturation Present? (includes capillary fringe) Yes ☒ No ☐ Depth (inches): 2"**Wetland Hydrology Present?**

Yes

☒

No

☐

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

Remarks: Meets wetland hydrology with a high water table and saturation.

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project Site: Moberly City/County: Flathead Sampling Date: 10/13/2015
 Applicant/Owner: Glacier National Park State: MT Sampling Point: U-2
 Investigator(s): J. Asebrook, J. Hintz Section, Township, Range: S14, T32N, R19W
 Landform (hillslope, terrace, etc.): Lakeshore Local relief (concave, convex, none): none Slope (%): 2
 Subregion (LRR): Rocky Mtn Forests & Rangeland (E) Lat: 48.533511 Long: -113.996221 Datum: NAD83
 Soil Map Unit Name: Silty Clay Loam Glacial Till Soils NWI classification: upland

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

Are Vegetation ☐, Soil ☐, Or Hydrology ☐, significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

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

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

Hydrophytic Vegetation Present?	Yes	☐	No	☒	Is the Sampling Area within a Wetland? Yes ☐ No ☒
Hydric Soil Present?	Yes	☐	No	☒	
Wetland Hydrology Present?	Yes	☐	No	☒	

REMARKS:

VEGETATION – Use scientific names of plants

Tree Stratum (Plot Size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>5</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>40%</u> (A/B)																								
1. <u>Thuja plicata</u>	<u>30</u>	<u>yes</u>	<u>FAC</u>																									
2. _____	_____	_____	_____																									
3. _____	_____	_____	_____																									
4. _____	_____	_____	_____																									
50% = <u>15</u> , 20% = <u>6</u>	<u>30</u>	= Total Cover																										
Sapling/Shrub Stratum (Plot Size: _____)																												
1. <u>Symphoricarpos albus</u>	<u>5</u>	<u>yes</u>	<u>FACU</u>	Prevalence Index worksheet: <table border="0"> <tr> <td></td> <td><u>Total % Cover of:</u></td> <td><u>Multiply by:</u></td> </tr> <tr> <td>OBL species</td> <td><u>0</u></td> <td>x1 = <u>0</u></td> </tr> <tr> <td>FACW species</td> <td><u>0</u></td> <td>x2 = <u>0</u></td> </tr> <tr> <td>FAC species</td> <td><u>58</u></td> <td>x3 = <u>174</u></td> </tr> <tr> <td>FACU species</td> <td><u>10</u></td> <td>x4 = <u>40</u></td> </tr> <tr> <td>UPL species</td> <td><u>42</u></td> <td>x5 = <u>210</u></td> </tr> <tr> <td>Column Totals:</td> <td>(A)110</td> <td>(B)424</td> </tr> <tr> <td colspan="3">Prevalence Index = B/A = 3.85</td> </tr> </table>		<u>Total % Cover of:</u>	<u>Multiply by:</u>	OBL species	<u>0</u>	x1 = <u>0</u>	FACW species	<u>0</u>	x2 = <u>0</u>	FAC species	<u>58</u>	x3 = <u>174</u>	FACU species	<u>10</u>	x4 = <u>40</u>	UPL species	<u>42</u>	x5 = <u>210</u>	Column Totals:	(A)110	(B)424	Prevalence Index = B/A = 3.85		
	<u>Total % Cover of:</u>	<u>Multiply by:</u>																										
OBL species	<u>0</u>	x1 = <u>0</u>																										
FACW species	<u>0</u>	x2 = <u>0</u>																										
FAC species	<u>58</u>	x3 = <u>174</u>																										
FACU species	<u>10</u>	x4 = <u>40</u>																										
UPL species	<u>42</u>	x5 = <u>210</u>																										
Column Totals:	(A)110	(B)424																										
Prevalence Index = B/A = 3.85																												
2. <u>Picea engelmanni</u>	<u>5</u>	<u>yes</u>	<u>FAC</u>																									
3. <u>Pseudotsuga menziesii</u>	<u>2</u>	<u>no</u>	<u>FACU</u>																									
4. <u>Larix occidentalis</u>	<u>2</u>	<u>no</u>	<u>FACU</u>																									
5. <u>Shepherdia canadensis</u>	<u>2</u>	<u>no</u>	<u>UPL</u>																									
50% = <u>8</u> , 20% = <u>3.2</u>	<u>16</u>	= Total Cover																										
Herb Stratum (Plot Size: _____)																												
1. <u>Festuca occidentalis</u>	<u>40</u>	<u>yes</u>	<u>UPL</u>																									
2. <u>Equisetum arvense</u>	<u>20</u>	<u>yes</u>	<u>FAC</u>																									
3. <u>Poa pratensis</u>	<u>2</u>	<u>no</u>	<u>FAC</u>																									
4. <u>Trifolium pratensis</u>	<u>1</u>	<u>no</u>	<u>FAC</u>																									
5. <u>Leucanthemum vulgare</u>	<u>1</u>	<u>no</u>	<u>FACU</u>																									
6. _____	_____	_____	_____																									
7. _____	_____	_____	_____																									
8. _____	_____	_____	_____																									
9. _____	_____	_____	_____																									
10. _____	_____	_____	_____																									
11. _____	_____	_____	_____																									
50% = <u>32</u> , 20% = <u>12.8</u>	<u>64</u>	= Total Cover																										
Woody Vine Stratum (Plot Size: _____)																												
1. _____	_____	_____	_____	Hydrophytic Vegetation Present? Yes ☐ No ☒																								
2. _____	_____	_____	_____																									
50% = _____, 20% = _____	_____	= Total Cover																										
% Bare Ground in Herb Stratum _____																												
REMARKS : Hydrophytic vegetation is not present. Vegetation does not pass any hydrophytic vegetation indicators. Also present with trace covers: <i>Sorbus sitchensis</i> and <i>Arctostaphylos uva-ursi</i> .																												

SOILSampling Point: U-2**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (Moist)	%	Type ¹	Loc ²		
0-16+	10YR3/2	100	n/a	_____	_____	_____	loam	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____

¹Type: C= Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)**

- | | |
|--|--|
| ☐ Histosol (A1) | ☐ Sandy Redox (S5) |
| ☐ Histic Epipedon (A2) | ☐ Stripped Matrix (S6) |
| ☐ Black Histic (A3) | ☐ Loamy Mucky Mineral (F1) (except MLRA 1) |
| ☐ Hydrogen Sulfide (A4) | ☐ Loamy Gleyed Matrix (F2) |
| ☐ Depleted Below Dark Surface (A11) | ☐ Depleted Matrix (F3) |
| ☐ Thick Dark Surface (A12) | ☐ Redox Dark Surface (F6) |
| ☐ Sandy Mucky Mineral (S1) | ☐ Depleted Dark Surface (F7) |
| ☐ Sandy Gleyed Matrix (S4) | ☐ Redox Depressions (F8) |

Indicators for Problematic Hydric Soils³:

- | |
|---|
| ☐ 2 cm Muck (A10) |
| ☐ Red Parent Material (TF2) |
| ☐ Other (Explain in Remarks) |

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.**Restrictive Layer (if present):**

Type: _____

Depth (Inches): _____

Hydric Soils Present?

Yes

☐

No

☒

Remarks: No hydric soil indicators are present.

HYDROLOGY**Wetland Hydrology Indicators:**

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

- | | |
|--|---|
| ☐ Surface Water (A1) | ☐ Water-Stained Leaves (B9) |
| ☐ High Water Table (A2) | (except MLRA 1, 2, 4A, and 4B) |
| ☐ Saturation (A3) | ☐ Salt Crust (B11) |
| ☐ Water Marks (B1) | ☐ Aquatic Invertebrates (B13) |
| ☐ Sediment Deposits (B2) | ☐ Hydrogen Sulfide Odor (C1) |
| ☐ Drift Deposits (B3) | ☐ Oxidized Rhizospheres along Living Roots (C3) |
| ☐ Algal Mat or Crust (B4) | ☐ Presence of Reduced Iron (C4) |
| ☐ Iron Deposits (B5) | ☐ Recent Iron Reduction in Tilled Soils (C6) |
| ☐ Surface Soil Cracks (B6) | ☐ Stunted or Stresses Plants (D1) (LRR A) |
| ☐ Inundation Visible on Aerial Imagery (B7) | ☐ Other (Explain in Remarks) |
| ☐ Sparsely Vegetated Concave Surface (B8) | |

Secondary Indicators (2 or more required)

- | |
|--|
| ☐ Water-Stained Leaves (B9) |
| (MLRA 1, 2, 4A, and 4B) |
| ☐ Drainage Patterns (B10) |
| ☐ Dry-Season Water Table (C2) |
| ☐ Saturation Visible on Aerial Imagery (C9) |
| ☐ Geomorphic Position (D2) |
| ☐ Shallow Aquitard (D3) |
| ☐ FAC-Neutral Test (D5) |
| ☐ Raised Ant Mounds (D6) (LRR A) |
| ☐ Frost-Heave Hummocks (D7) |

Field Observations:Surface Water Present? Yes ☐ No ☒ Depth (inches): _____Water Table Present? Yes ☐ No ☒ Depth (inches): _____Saturation Present?
(includes capillary fringe) Yes ☐ No ☒ Depth (inches): _____**Wetland Hydrology Present?**

Yes

☐

No

☒

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

Remarks: No wetland hydrology indicators are present.

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project Site: Moberly City/County: Flathead Sampling Date: 10/13/2015
 Applicant/Owner: Glacier National Park State: MT Sampling Point: W-2
 Investigator(s): J. Asebrook, J. Hintz Section, Township, Range: S14, T32N, R19W
 Landform (hillslope, terrace, etc.): Lakeshore Local relief (concave, convex, none): none Slope (%): 2
 Subregion (LRR): Rocky Mtn Forests & Rangeland Lat: 48.533544 Long: -113.996184 Datum: NAD83
 Soil Map Unit Name: Lakeside Beach Soils NWI classification: upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)
 Are Vegetation ☐, Soil ☐, Or Hydrology ☐, significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐
 Are Vegetation ☐, Soil ☐, Or Hydrology ☐, naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes	☒	No	☐	Is the Sampling Area within a Wetland?	Yes	☒	No	☐
Hydric Soil Present?	Yes	☒	No	☐					
Wetland Hydrology Present?	Yes	☒	No	☐					

REMARKS:

VEGETATION – Use scientific names of plants

Tree Stratum (Plot Size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)																								
1. _____	_____	_____	_____																									
2. _____	_____	_____	_____																									
3. _____	_____	_____	_____																									
4. _____	_____	_____	_____																									
50% = _____, 20% = _____	_____	= Total Cover																										
Sapling/Shrub Stratum (Plot Size: _____)				Prevalence Index worksheet: <table border="0"> <tr> <td></td> <td><u>Total % Cover of:</u></td> <td><u>Multiply by:</u></td> </tr> <tr> <td>OBL species</td> <td><u>20</u></td> <td>x1 = <u>20</u></td> </tr> <tr> <td>FACW species</td> <td><u>0</u></td> <td>x2 = <u>0</u></td> </tr> <tr> <td>FAC species</td> <td><u>84</u></td> <td>x3 = <u>252</u></td> </tr> <tr> <td>FACU species</td> <td><u>1</u></td> <td>x4 = <u>4</u></td> </tr> <tr> <td>UPL species</td> <td><u>0</u></td> <td>x5 = <u>0</u></td> </tr> <tr> <td>Column Totals:</td> <td>105(A)</td> <td>276(B)</td> </tr> <tr> <td colspan="3">Prevalence Index = B/A = 2.62</td> </tr> </table>		<u>Total % Cover of:</u>	<u>Multiply by:</u>	OBL species	<u>20</u>	x1 = <u>20</u>	FACW species	<u>0</u>	x2 = <u>0</u>	FAC species	<u>84</u>	x3 = <u>252</u>	FACU species	<u>1</u>	x4 = <u>4</u>	UPL species	<u>0</u>	x5 = <u>0</u>	Column Totals:	105(A)	276(B)	Prevalence Index = B/A = 2.62		
	<u>Total % Cover of:</u>	<u>Multiply by:</u>																										
OBL species	<u>20</u>	x1 = <u>20</u>																										
FACW species	<u>0</u>	x2 = <u>0</u>																										
FAC species	<u>84</u>	x3 = <u>252</u>																										
FACU species	<u>1</u>	x4 = <u>4</u>																										
UPL species	<u>0</u>	x5 = <u>0</u>																										
Column Totals:	105(A)	276(B)																										
Prevalence Index = B/A = 2.62																												
1. <u>Populus balsamifera ss. trichocarpa</u>	<u>2</u>	<u>yes</u>	<u>FAC</u>																									
2. _____	_____	_____	_____																									
3. _____	_____	_____	_____																									
4. _____	_____	_____	_____																									
5. _____	_____	_____	_____																									
50% = <u>1</u> , 20% = <u>0.2</u>	<u>2</u>	= Total Cover																										
Herb Stratum (Plot Size: _____)				Hydrophytic Vegetation Indicators: ☒ Dominance Test is >50% ☒ Prevalence Index is ≤3.0 ¹ ☐ Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) ☐ Wetland Non-Vascular Plants ¹ ☐ Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.																								
1. <u>Agrostis stolonifera</u>	<u>70</u>	<u>yes</u>	<u>FAC</u>																									
2. <u>Carex utriculata</u>	<u>20</u>	<u>yes</u>	<u>OBL</u>																									
3. <u>Equisetum arvense</u>	<u>10</u>	<u>no</u>	<u>FAC</u>																									
4. <u>Mimulus guttatus</u>	<u>2</u>	<u>no</u>	<u>OBL</u>																									
5. <u>Rumex crispus</u>	<u>1</u>	<u>no</u>	<u>FAC</u>																									
6. <u>Ranunculus acris</u>	<u>1</u>	<u>no</u>	<u>FAC</u>																									
7. <u>Festuca pratensis</u>	<u>1</u>	<u>no</u>	<u>FACU</u>																									
8. <u>Allium schoenoprasum</u>	<u>1</u>	<u>no</u>	<u>FACW</u>																									
9. <u>Symphotrichum laeve</u>	<u>1</u>	<u>no</u>	<u>FACU</u>																									
10. _____	_____	_____	_____																									
11. _____	_____	_____	_____																									
50% = <u>52.5</u> , 20% = <u>21</u>	<u>105</u>	= Total Cover																										
Woody Vine Stratum (Plot Size: _____)				Hydrophytic Vegetation Present? Yes ☒ No ☐																								
1. _____	_____	_____	_____																									
2. _____	_____	_____	_____																									
50% = _____, 20% = _____	_____	= Total Cover																										
% Bare Ground in Herb Stratum _____																												

REMARKS: Vegetation passes dominance test and prevalence index for hydrophytic vegetation.

SOILSampling Point: W-2**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (Moist)	%	Type ¹	Loc ²		
0-16+"	10YR3/1	100	_____	_____	_____	_____	Sandy clay	organic
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____

¹Type: C= Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)**

- | | |
|--|--|
| ☐ Histosol (A1) | ☐ Sandy Redox (S5) |
| ☐ Histic Epipedon (A2) | ☐ Stripped Matrix (S6) |
| ☐ Black Histic (A3) | ☐ Loamy Mucky Mineral (F1) (except MLRA 1) |
| ☐ Hydrogen Sulfide (A4) | ☐ Loamy Gleyed Matrix (F2) |
| ☐ Depleted Below Dark Surface (A11) | ☐ Depleted Matrix (F3) |
| ☐ Thick Dark Surface (A12) | ☐ Redox Dark Surface (F6) |
| ☒ Sandy Mucky Mineral (S1) | ☐ Depleted Dark Surface (F7) |
| ☐ Sandy Gleyed Matrix (S4) | ☐ Redox Depressions (F8) |

Indicators for Problematic Hydric Soils³:

- | |
|---|
| ☐ 2 cm Muck (A10) |
| ☐ Red Parent Material (TF2) |
| ☐ Other (Explain in Remarks) |

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.**Restrictive Layer (if present):**

Type: _____

Depth (Inches): _____

Hydric Soils Present?

Yes

☒

No

☐

Remarks: Meets hydric soil criteria.

HYDROLOGY**Wetland Hydrology Indicators:**

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

- | | |
|---|---|
| ☐ Surface Water (A1) | ☐ Water-Stained Leaves (B9) |
| ☐ High Water Table (A2) | (except MLRA 1, 2, 4A, and 4B) |
| ☒ Saturation (A3) | ☐ Salt Crust (B11) |
| ☒ Water Marks (B1) | ☐ Aquatic Invertebrates (B13) |
| ☐ Sediment Deposits (B2) | ☐ Hydrogen Sulfide Odor (C1) |
| ☐ Drift Deposits (B3) | ☐ Oxidized Rhizospheres along Living Roots (C3) |
| ☐ Algal Mat or Crust (B4) | ☐ Presence of Reduced Iron (C4) |
| ☐ Iron Deposits (B5) | ☐ Recent Iron Reduction in Tilled Soils (C6) |
| ☐ Surface Soil Cracks (B6) | ☐ Stunted or Stresses Plants (D1) (LRR A) |
| ☒ Inundation Visible on Aerial Imagery (B7) | ☐ Other (Explain in Remarks) |
| ☐ Sparsely Vegetated Concave Surface (B8) | |

Secondary Indicators (2 or more required)

- | |
|--|
| ☐ Water-Stained Leaves (B9) |
| (MLRA 1, 2, 4A, and 4B) |
| ☐ Drainage Patterns (B10) |
| ☐ Dry-Season Water Table (C2) |
| ☐ Saturation Visible on Aerial Imagery (C9) |
| ☒ Geomorphic Position (D2) |
| ☐ Shallow Aquitard (D3) |
| ☒ FAC-Neutral Test (D5) |
| ☐ Raised Ant Mounds (D6) (LRR A) |
| ☐ Frost-Heave Hummocks (D7) |

Field Observations:Surface Water Present? Yes ☐ No ☒ Depth (inches): _____Water Table Present? Yes ☐ No ☒ Depth (inches): _____Saturation Present? (includes capillary fringe) Yes ☒ No ☐ Depth (inches): 6"**Wetland Hydrology Present?**

Yes

☒

No

☐

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

Remarks: Meets primary wetland hydrology criteria with saturation, water marks on pilings and drainage patterns. Secondary criteria include geomorphic position.

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project Site: Fox City/County: Flathead Sampling Date: 10/13/2015
 Applicant/Owner: Glacier National Park State: MT Sampling Point: U-3
 Investigator(s): J. Asebrook, J. Hintz Section, Township, Range: S14, T32N, R19W
 Landform (hillslope, terrace, etc.): Toeslope Local relief (concave, convex, none): none Slope (%): 3
 Subregion (LRR): Rocky Mtn Forests & Rangeland (E) Lat: 48.535215 Long: -113.995525 Datum: NAD83
 Soil Map Unit Name: Silty Clay Loam Glacial Till Soils NWI classification: upland

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

Are Vegetation ☐, Soil ☐, Or Hydrology ☐, significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

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

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

Hydrophytic Vegetation Present?	Yes	☐	No	☒	Is the Sampling Area within a Wetland?	Yes	☐	No	☒
Hydric Soil Present?	Yes	☐	No	☒					
Wetland Hydrology Present?	Yes	☐	No	☒					

REMARKS:

VEGETATION – Use scientific names of plants

Tree Stratum (Plot Size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:																					
1. <u><i>Tsuga heterophylla</i></u>	<u>50</u>	<u>yes</u>	<u>FACU</u>		Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>5</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>40%</u> (A/B)																				
2. <u><i>Thuja plicata</i></u>	<u>15</u>	<u>yes</u>	<u>FAC</u>																						
3. _____	_____	_____	_____																						
4. _____	_____	_____	_____																						
50% = <u>32.5</u> , 20% = <u>13</u>	<u>65</u>	= Total Cover		Prevalence Index worksheet: <table border="0"> <tr> <td colspan="2">Total % Cover of:</td> <td>Multiply by:</td> </tr> <tr> <td>OBL species</td> <td><u>0</u></td> <td>x1 = <u>0</u></td> </tr> <tr> <td>FACW species</td> <td><u>0</u></td> <td>x2 = <u>0</u></td> </tr> <tr> <td>FAC species</td> <td><u>16</u></td> <td>x3 = <u>48</u></td> </tr> <tr> <td>FACU species</td> <td><u>55</u></td> <td>x4 = <u>220</u></td> </tr> <tr> <td>UPL species</td> <td><u>1</u></td> <td>x5 = <u>5</u></td> </tr> <tr> <td>Column Totals:</td> <td><u>72(A)</u></td> <td><u>273(B)</u></td> </tr> </table> Prevalence Index = B/A = 3.79	Total % Cover of:		Multiply by:	OBL species	<u>0</u>	x1 = <u>0</u>	FACW species	<u>0</u>	x2 = <u>0</u>	FAC species	<u>16</u>	x3 = <u>48</u>	FACU species	<u>55</u>	x4 = <u>220</u>	UPL species	<u>1</u>	x5 = <u>5</u>	Column Totals:	<u>72(A)</u>	<u>273(B)</u>
Total % Cover of:		Multiply by:																							
OBL species	<u>0</u>	x1 = <u>0</u>																							
FACW species	<u>0</u>	x2 = <u>0</u>																							
FAC species	<u>16</u>	x3 = <u>48</u>																							
FACU species	<u>55</u>	x4 = <u>220</u>																							
UPL species	<u>1</u>	x5 = <u>5</u>																							
Column Totals:	<u>72(A)</u>	<u>273(B)</u>																							
Sapling/Shrub Stratum (Plot Size: _____)																									
1. <u><i>Tsuga heterophylla</i></u>	<u>5</u>	<u>yes</u>	<u>FACU</u>																						
2. _____	_____	_____	_____																						
3. _____	_____	_____	_____																						
4. _____	_____	_____	_____																						
5. _____	_____	_____	_____																						
50% = <u>2.5</u> , 20% = <u>1</u>	<u>5</u>	= Total Cover																							
Herb Stratum (Plot Size: _____)																									
1. <u><i>Clintonia uniflora</i></u>	<u>1</u>	<u>yes</u>	<u>UPL</u>	Hydrophytic Vegetation Indicators: ☐ Dominance Test is >50% ☐ Prevalence Index is ≤3.0 ¹ ☐ Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) ☐ Wetland Non-Vascular Plants ¹ ☐ Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.																					
2. <u><i>Tiarella trifoliata</i></u>	<u>1</u>	<u>yes</u>	<u>FAC</u>																						
3. _____	_____	_____	_____																						
4. _____	_____	_____	_____																						
5. _____	_____	_____	_____																						
6. _____	_____	_____	_____																						
7. _____	_____	_____	_____																						
8. _____	_____	_____	_____																						
9. _____	_____	_____	_____																						
10. _____	_____	_____	_____																						
11. _____	_____	_____	_____																						
50% = <u>1</u> , 20% = <u>0.4</u>	<u>2</u>	= Total Cover																							
Woody Vine Stratum (Plot Size: _____)																									
1. _____	_____	_____	_____	Hydrophytic Vegetation Present? Yes ☐ No ☒																					
2. _____	_____	_____	_____																						
50% = _____, 20% = _____	_____	= Total Cover																							
% Bare Ground in Herb Stratum _____																									
REMARKS: Hydrophytic vegetation is not present. Vegetation does not pass any hydrophytic vegetation indicators. Also present with trace covers: <i>Sorbus sitchensis</i> and <i>Arctostaphylos uva-ursi</i> .																									

SOILSampling Point: U-3**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (Moist)	%	Type ¹	Loc ²		
0-16+	10YR3/2	100	n/a	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____

¹Type: C= Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)**

- | | |
|--|--|
| ☐ Histosol (A1) | ☐ Sandy Redox (S5) |
| ☐ Histic Epipedon (A2) | ☐ Stripped Matrix (S6) |
| ☐ Black Histic (A3) | ☐ Loamy Mucky Mineral (F1) (except MLRA 1) |
| ☐ Hydrogen Sulfide (A4) | ☐ Loamy Gleyed Matrix (F2) |
| ☐ Depleted Below Dark Surface (A11) | ☐ Depleted Matrix (F3) |
| ☐ Thick Dark Surface (A12) | ☐ Redox Dark Surface (F6) |
| ☐ Sandy Mucky Mineral (S1) | ☐ Depleted Dark Surface (F7) |
| ☐ Sandy Gleyed Matrix (S4) | ☐ Redox Depressions (F8) |

Indicators for Problematic Hydric Soils³:

- | |
|---|
| ☐ 2 cm Muck (A10) |
| ☐ Red Parent Material (TF2) |
| ☐ Other (Explain in Remarks) |

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.**Restrictive Layer (if present):**

Type: _____

Depth (Inches): _____

Hydric Soils Present?

Yes

☐

No

☒

Remarks: No hydric soil indicators are present.

HYDROLOGY**Wetland Hydrology Indicators:**

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

- | | |
|--|---|
| ☐ Surface Water (A1) | ☐ Water-Stained Leaves (B9) |
| ☐ High Water Table (A2) | (except MLRA 1, 2, 4A, and 4B) |
| ☐ Saturation (A3) | ☐ Salt Crust (B11) |
| ☐ Water Marks (B1) | ☐ Aquatic Invertebrates (B13) |
| ☐ Sediment Deposits (B2) | ☐ Hydrogen Sulfide Odor (C1) |
| ☐ Drift Deposits (B3) | ☐ Oxidized Rhizospheres along Living Roots (C3) |
| ☐ Algal Mat or Crust (B4) | ☐ Presence of Reduced Iron (C4) |
| ☐ Iron Deposits (B5) | ☐ Recent Iron Reduction in Tilled Soils (C6) |
| ☐ Surface Soil Cracks (B6) | ☐ Stunted or Stresses Plants (D1) (LRR A) |
| ☐ Inundation Visible on Aerial Imagery (B7) | ☐ Other (Explain in Remarks) |
| ☐ Sparsely Vegetated Concave Surface (B8) | |

Secondary Indicators (2 or more required)

- | |
|--|
| ☐ Water-Stained Leaves (B9) |
| (MLRA 1, 2, 4A, and 4B) |
| ☐ Drainage Patterns (B10) |
| ☐ Dry-Season Water Table (C2) |
| ☐ Saturation Visible on Aerial Imagery (C9) |
| ☐ Geomorphic Position (D2) |
| ☐ Shallow Aquitard (D3) |
| ☐ FAC-Neutral Test (D5) |
| ☐ Raised Ant Mounds (D6) (LRR A) |
| ☐ Frost-Heave Hummocks (D7) |

Field Observations:Surface Water Present? Yes ☐ No ☒ Depth (inches): _____Water Table Present? Yes ☐ No ☒ Depth (inches): _____Saturation Present?
(includes capillary fringe) Yes ☐ No ☒ Depth (inches): _____**Wetland Hydrology Present?**

Yes

☐

No

☒

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

Remarks: No wetland hydrology indicators are present.

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project Site: Fox City/County: Flathead Sampling Date: 10/13/2015
 Applicant/Owner: Glacier National Park State: MT Sampling Point: W-3
 Investigator(s): J. Asebrook, J. Hintz Section, Township, Range: S14, T32N, R19W
 Landform (hillslope, terrace, etc.): Toeslope Local relief (concave, convex, none): none Slope (%): 2
 Subregion (LRR): Rocky Mtn Forests & Rangeland Lat: 48.535354 Long: -113.995675 Datum: NAD83
 Soil Map Unit Name: Silty Clay Loam Glacial Till Soils NWI classification: upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)
 Are Vegetation ☐, Soil ☐, Or Hydrology ☐, significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐
 Are Vegetation ☐, Soil ☐, Or Hydrology ☐, naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes	☒	No	☐	Is the Sampling Area within a Wetland?	Yes	☒	No	☐
Hydric Soil Present?	Yes	☒	No	☐					
Wetland Hydrology Present?	Yes	☒	No	☐					

REMARKS:

VEGETATION – Use scientific names of plants

Tree Stratum (Plot Size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:																								
1. <u>Thuja plicata</u>	<u>10</u>	<u>yes</u>	<u>FAC</u>		Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A) Total Number of Dominant Species Across All Strata: <u>4</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)																							
2. <u>Tsuga heterophylla</u>	<u>1</u>	<u>no</u>	<u>FACU</u>																									
3. _____	_____	_____	_____																									
4. _____	_____	_____	_____																									
50% = <u>5.5</u> , 20% = <u>2.2</u>	<u>11</u>	= Total Cover		Prevalence Index worksheet: <table border="0"> <tr> <td></td> <td><u>Total % Cover of:</u></td> <td><u>Multiply by:</u></td> </tr> <tr> <td>OBL species</td> <td><u>0</u></td> <td>x1 = <u>0</u></td> </tr> <tr> <td>FACW species</td> <td><u>5</u></td> <td>x2 = <u>10</u></td> </tr> <tr> <td>FAC species</td> <td><u>80</u></td> <td>x3 = <u>240</u></td> </tr> <tr> <td>FACU species</td> <td><u>1</u></td> <td>x4 = <u>4</u></td> </tr> <tr> <td>UPL species</td> <td><u>0</u></td> <td>x5 = <u>0</u></td> </tr> <tr> <td>Column Totals:</td> <td><u>86(A)</u></td> <td><u>254(B)</u></td> </tr> <tr> <td colspan="3">Prevalence Index = B/A = 2.95</td> </tr> </table>		<u>Total % Cover of:</u>	<u>Multiply by:</u>	OBL species	<u>0</u>	x1 = <u>0</u>	FACW species	<u>5</u>	x2 = <u>10</u>	FAC species	<u>80</u>	x3 = <u>240</u>	FACU species	<u>1</u>	x4 = <u>4</u>	UPL species	<u>0</u>	x5 = <u>0</u>	Column Totals:	<u>86(A)</u>	<u>254(B)</u>	Prevalence Index = B/A = 2.95		
	<u>Total % Cover of:</u>	<u>Multiply by:</u>																										
OBL species	<u>0</u>	x1 = <u>0</u>																										
FACW species	<u>5</u>	x2 = <u>10</u>																										
FAC species	<u>80</u>	x3 = <u>240</u>																										
FACU species	<u>1</u>	x4 = <u>4</u>																										
UPL species	<u>0</u>	x5 = <u>0</u>																										
Column Totals:	<u>86(A)</u>	<u>254(B)</u>																										
Prevalence Index = B/A = 2.95																												
Sapling/Shrub Stratum (Plot Size: _____) 1. <u>Ribes lacustre</u> <u>5</u> <u>yes</u> <u>FAC</u> 2. <u>Rubus parviflorus</u> <u>1</u> <u>no</u> <u>FACU</u> 3. _____ 4. _____ 5. _____ 50% = <u>2.5</u> , 20% = <u>1</u> <u>5</u> = Total Cover																												
Herb Stratum (Plot Size: _____) 1. <u>Athyrium filix-femina</u> <u>40</u> <u>yes</u> <u>FAC</u> 2. <u>Myosotis sylvatica</u> <u>15</u> <u>yes</u> <u>FAC</u> 3. <u>Muhlenbergia richardsonis</u> <u>10</u> <u>no</u> <u>FAC</u> 4. <u>Glyceria elata</u> <u>5</u> <u>no</u> <u>FACW</u> 5. <u>Pyrola asarifolia</u> <u>1</u> <u>no</u> <u>FACU</u> 6. <u>Tiarella trifoliata</u> <u>1</u> <u>no</u> <u>FAC</u> 7. <u>Clintonia uniflora</u> <u>1</u> <u>no</u> <u>UPL</u> 8. <u>Adenocaulon bicolor</u> <u>1</u> <u>no</u> <u>UPL</u> 9. <u>Goodyera oblongifolia</u> <u>1</u> <u>no</u> <u>FACU</u> 10. _____ 11. _____ 50% = <u>35</u> , 20% = <u>14</u> <u>70</u> = Total Cover																												
Woody Vine Stratum (Plot Size: _____) 1. _____ 2. _____ 50% = _____, 20% = _____ % Bare Ground in Herb Stratum _____																												
Hydrophytic Vegetation Indicators: ☒ Dominance Test is >50% ☒ Prevalence Index is ≤3.0 ¹ ☐ Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) ☐ Wetland Non-Vascular Plants ¹ ☐ Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.																												
Hydrophytic Vegetation Present? Yes ☒ No ☐																												

REMARKS: Vegetation passes dominance test and prevalence index for hydrophytic vegetation.

SOILSampling Point: W-3**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (Moist)	%	Type ¹	Loc ²		
0-16+"	10YR2/1	100	_____	_____	_____	_____	muck	organic
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____

¹Type: C= Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)**

- | | |
|--|--|
| ☒ Histosol (A1) | ☐ Sandy Redox (S5) |
| ☐ Histic Epipedon (A2) | ☐ Stripped Matrix (S6) |
| ☐ Black Histic (A3) | ☐ Loamy Mucky Mineral (F1) (except MLRA 1) |
| ☐ Hydrogen Sulfide (A4) | ☐ Loamy Gleyed Matrix (F2) |
| ☐ Depleted Below Dark Surface (A11) | ☐ Depleted Matrix (F3) |
| ☐ Thick Dark Surface (A12) | ☐ Redox Dark Surface (F6) |
| ☐ Sandy Mucky Mineral (S1) | ☐ Depleted Dark Surface (F7) |
| ☐ Sandy Gleyed Matrix (S4) | ☐ Redox Depressions (F8) |

Indicators for Problematic Hydric Soils³:

- | |
|---|
| ☐ 2 cm Muck (A10) |
| ☐ Red Parent Material (TF2) |
| ☐ Other (Explain in Remarks) |

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.**Restrictive Layer (if present):**

Type: _____

Depth (Inches): _____

Hydric Soils Present?

Yes

☒

No

☐

Remarks: Meets hydric soil criteria.

HYDROLOGY**Wetland Hydrology Indicators:**

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

- | | |
|--|---|
| ☐ Surface Water (A1) | ☐ Water-Stained Leaves (B9) |
| ☒ High Water Table (A2) | (except MLRA 1, 2, 4A, and 4B) |
| ☒ Saturation (A3) | ☐ Salt Crust (B11) |
| ☐ Water Marks (B1) | ☐ Aquatic Invertebrates (B13) |
| ☐ Sediment Deposits (B2) | ☐ Hydrogen Sulfide Odor (C1) |
| ☐ Drift Deposits (B3) | ☐ Oxidized Rhizospheres along Living Roots (C3) |
| ☐ Algal Mat or Crust (B4) | ☐ Presence of Reduced Iron (C4) |
| ☐ Iron Deposits (B5) | ☐ Recent Iron Reduction in Tilled Soils (C6) |
| ☐ Surface Soil Cracks (B6) | ☐ Stunted or Stresses Plants (D1) (LRR A) |
| ☐ Inundation Visible on Aerial Imagery (B7) | ☐ Other (Explain in Remarks) |
| ☐ Sparsely Vegetated Concave Surface (B8) | |

Secondary Indicators (2 or more required)

- | |
|--|
| ☐ Water-Stained Leaves (B9) |
| (MLRA 1, 2, 4A, and 4B) |
| ☐ Drainage Patterns (B10) |
| ☐ Dry-Season Water Table (C2) |
| ☐ Saturation Visible on Aerial Imagery (C9) |
| ☐ Geomorphic Position (D2) |
| ☐ Shallow Aquitard (D3) |
| ☐ FAC-Neutral Test (D5) |
| ☐ Raised Ant Mounds (D6) (LRR A) |
| ☐ Frost-Heave Hummocks (D7) |

Field Observations:Surface Water Present? Yes ☐ No ☒ Depth (inches): _____Water Table Present? Yes ☒ No ☐ Depth (inches): 5"Saturation Present? (includes capillary fringe) Yes ☒ No ☐ Depth (inches): surface**Wetland Hydrology Present?**

Yes

☒

No

☐

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

Remarks: Meets primary wetland hydrology criteria with saturation at the surface and water table present at 5". Rivulets of running streams through the area.

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project Site: Fox City/County: Flathead Sampling Date: 10/13/2015
 Applicant/Owner: Glacier National Park State: MT Sampling Point: U-4
 Investigator(s): J. Asebrook, J. Hintz Section, Township, Range: S14, T32N, R19W
 Landform (hillslope, terrace, etc.): Toeslope Local relief (concave, convex, none): none Slope (%): 2
 Subregion (LRR): Rocky Mtn Forests & Rangeland (E) Lat: 48.535073 Long: -113.995698 Datum: NAD83
 Soil Map Unit Name: Silty Clay Loam Glacial Till Soils NWI classification: upland

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

Are Vegetation ☐, Soil ☐, Or Hydrology ☐, significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

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

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

Hydrophytic Vegetation Present?	Yes	☐	No	☒	Is the Sampling Area within a Wetland?	Yes	☐	No	☒
Hydric Soil Present?	Yes	☐	No	☒					
Wetland Hydrology Present?	Yes	☐	No	☒					

REMARKS:

VEGETATION – Use scientific names of plants

Tree Stratum (Plot Size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u>Thuja plicata</u>	<u>40</u>	<u>yes</u>	<u>FAC</u>	
2. <u>Tsuga heterophylla</u>	<u>10</u>	<u>yes</u>	<u>FACU</u>	Total Number of Dominant Species Across All Strata: <u>4</u> (B)
3. _____	_____	_____	_____	Percent of Dominant Species That Are OBL, FACW, or FAC: <u>50%</u> (A/B)
4. _____	_____	_____	_____	
50% = <u>25</u> , 20% = <u>10</u>	<u>50</u>	= Total Cover		
Sapling/Shrub Stratum (Plot Size: _____)				Prevalence Index worksheet:
1. <u>Tsuga heterophylla</u>	<u>3</u>	<u>yes</u>	<u>FACU</u>	
2. _____	_____	_____	_____	Total % Cover of: _____ Multiply by: _____
3. _____	_____	_____	_____	OBL species <u>0</u> x1 = <u>0</u>
4. _____	_____	_____	_____	FACW species <u>0</u> x2 = <u>0</u>
5. _____	_____	_____	_____	FAC species <u>43</u> x3 = <u>129</u>
50% = <u>1.5</u> , 20% = <u>0.6</u>	<u>3</u>	= Total Cover		FACU species <u>13</u> x4 = <u>52</u>
Herb Stratum (Plot Size: _____)				UPL species <u>1</u> x5 = <u>1</u>
1. <u>Tiarella trifoliata</u>	<u>3</u>	<u>yes</u>	<u>FAC</u>	Column Totals: (A)57 (B)182
2. <u>Clintonia uniflora</u>	<u>1</u>	<u>yes</u>	<u>UPL</u>	Prevalence Index = B/A = 3.19
3. <u>Equisetum arvense</u>	<u>1</u>	<u>no</u>	<u>FAC</u>	Hydrophytic Vegetation Indicators: ☐ Dominance Test is >50% ☐ Prevalence Index is ≤3.0 ¹ ☐ Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) ☐ Wetland Non-Vascular Plants ¹ ☐ Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
50% = <u>2</u> , 20% = <u>0.8</u>	<u>4</u>	= Total Cover		
Woody Vine Stratum (Plot Size: _____)				Hydrophytic Vegetation Present? Yes ☐ No ☒
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
50% = _____, 20% = _____	_____	= Total Cover		
% Bare Ground in Herb Stratum _____				
REMARKS: Hydrophytic vegetation is not present. Vegetation does not pass any hydrophytic vegetation indicators.				

SOILSampling Point: U-4**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (Moist)	%	Type ¹	Loc ²		
0-16+	10YR3/2	100	n/a	_____	_____	_____	loam	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____

¹Type: C= Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)**

- | | |
|--|--|
| ☐ Histosol (A1) | ☐ Sandy Redox (S5) |
| ☐ Histic Epipedon (A2) | ☐ Stripped Matrix (S6) |
| ☐ Black Histic (A3) | ☐ Loamy Mucky Mineral (F1) (except MLRA 1) |
| ☐ Hydrogen Sulfide (A4) | ☐ Loamy Gleyed Matrix (F2) |
| ☐ Depleted Below Dark Surface (A11) | ☐ Depleted Matrix (F3) |
| ☐ Thick Dark Surface (A12) | ☐ Redox Dark Surface (F6) |
| ☐ Sandy Mucky Mineral (S1) | ☐ Depleted Dark Surface (F7) |
| ☐ Sandy Gleyed Matrix (S4) | ☐ Redox Depressions (F8) |

Indicators for Problematic Hydric Soils³:

- | |
|---|
| ☐ 2 cm Muck (A10) |
| ☐ Red Parent Material (TF2) |
| ☐ Other (Explain in Remarks) |

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.**Restrictive Layer (if present):**

Type: _____

Depth (Inches): _____

Hydric Soils Present?

Yes

☐

No

☒

Remarks: No hydric soil indicators are present.

HYDROLOGY**Wetland Hydrology Indicators:**

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

- | | |
|--|---|
| ☐ Surface Water (A1) | ☐ Water-Stained Leaves (B9) |
| ☐ High Water Table (A2) | (except MLRA 1, 2, 4A, and 4B) |
| ☐ Saturation (A3) | ☐ Salt Crust (B11) |
| ☐ Water Marks (B1) | ☐ Aquatic Invertebrates (B13) |
| ☐ Sediment Deposits (B2) | ☐ Hydrogen Sulfide Odor (C1) |
| ☐ Drift Deposits (B3) | ☐ Oxidized Rhizospheres along Living Roots (C3) |
| ☐ Algal Mat or Crust (B4) | ☐ Presence of Reduced Iron (C4) |
| ☐ Iron Deposits (B5) | ☐ Recent Iron Reduction in Tilled Soils (C6) |
| ☐ Surface Soil Cracks (B6) | ☐ Stunted or Stresses Plants (D1) (LRR A) |
| ☐ Inundation Visible on Aerial Imagery (B7) | ☐ Other (Explain in Remarks) |
| ☐ Sparsely Vegetated Concave Surface (B8) | |

Secondary Indicators (2 or more required)

- | |
|--|
| ☐ Water-Stained Leaves (B9) |
| (MLRA 1, 2, 4A, and 4B) |
| ☐ Drainage Patterns (B10) |
| ☐ Dry-Season Water Table (C2) |
| ☐ Saturation Visible on Aerial Imagery (C9) |
| ☐ Geomorphic Position (D2) |
| ☐ Shallow Aquitard (D3) |
| ☐ FAC-Neutral Test (D5) |
| ☐ Raised Ant Mounds (D6) (LRR A) |
| ☐ Frost-Heave Hummocks (D7) |

Field Observations:Surface Water Present? Yes ☐ No ☒ Depth (inches): _____Water Table Present? Yes ☐ No ☒ Depth (inches): _____Saturation Present?
(includes capillary fringe) Yes ☐ No ☒ Depth (inches): _____**Wetland Hydrology Present?**

Yes

☐

No

☒

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

Remarks: No wetland hydrology indicators are present.

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project Site: Fox City/County: Flathead Sampling Date: 10/13/2015
 Applicant/Owner: Glacier National Park State: MT Sampling Point: W-4
 Investigator(s): J. Asebrook, J. Hintz Section, Township, Range: S14, T32N, R19W
 Landform (hillslope, terrace, etc.): Toeslope Local relief (concave, convex, none): none Slope (%): 2
 Subregion (LRR): Rocky Mtn Forests & Rangeland Lat: 48.535064 Long: -113.995653 Datum: NAD83
 Soil Map Unit Name: Silty Clay Loam Glacial Till Soils NWI classification: upland

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

Are Vegetation ☐, Soil ☐, Or Hydrology ☐, significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

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

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

Hydrophytic Vegetation Present?	Yes	☒	No	☐	Is the Sampling Area within a Wetland?	Yes	☒	No	☐
Hydric Soil Present?	Yes	☒	No	☐					
Wetland Hydrology Present?	Yes	☒	No	☐					

REMARKS:

VEGETATION – Use scientific names of plants

Tree Stratum (Plot Size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>2</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)																								
1. <u>Thuja plicata</u>	<u>5</u>	<u>yes</u>	<u>FAC</u>																									
2. _____	_____	_____	_____																									
3. _____	_____	_____	_____																									
4. _____	_____	_____	_____																									
50% = <u>2.5</u> , 20% = <u>2</u>	<u>5</u>	= Total Cover																										
Sapling/Shrub Stratum (Plot Size: _____)				Prevalence Index worksheet: <table border="0"> <tr> <td></td> <td><u>Total % Cover of:</u></td> <td><u>Multiply by:</u></td> </tr> <tr> <td>OBL species</td> <td><u>10</u></td> <td>x1 = <u>10</u></td> </tr> <tr> <td>FACW species</td> <td><u>1</u></td> <td>x2 = <u>2</u></td> </tr> <tr> <td>FAC species</td> <td><u>79</u></td> <td>x3 = <u>237</u></td> </tr> <tr> <td>FACU species</td> <td><u>1</u></td> <td>x4 = <u>4</u></td> </tr> <tr> <td>UPL species</td> <td><u>0</u></td> <td>x5 = <u>0</u></td> </tr> <tr> <td>Column Totals:</td> <td>(A) 91</td> <td>(B) 253</td> </tr> <tr> <td colspan="3">Prevalence Index = B/A = 2.78</td> </tr> </table>		<u>Total % Cover of:</u>	<u>Multiply by:</u>	OBL species	<u>10</u>	x1 = <u>10</u>	FACW species	<u>1</u>	x2 = <u>2</u>	FAC species	<u>79</u>	x3 = <u>237</u>	FACU species	<u>1</u>	x4 = <u>4</u>	UPL species	<u>0</u>	x5 = <u>0</u>	Column Totals:	(A) 91	(B) 253	Prevalence Index = B/A = 2.78		
	<u>Total % Cover of:</u>	<u>Multiply by:</u>																										
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1. _____	_____	_____	_____																									
2. _____	_____	_____	_____																									
3. _____	_____	_____	_____																									
4. _____	_____	_____	_____																									
5. _____	_____	_____	_____																									
50% = , 20% =		= Total Cover																										
Herb Stratum (Plot Size: _____)				Hydrophytic Vegetation Indicators: ☒ Dominance Test is >50% ☒ Prevalence Index is ≤3.0 ¹ ☐ Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) ☐ Wetland Non-Vascular Plants ¹ ☐ Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.																								
1. <u>Athyrium filix-femina</u>	<u>40</u>	<u>yes</u>	<u>FAC</u>																									
2. <u>Tiarella trifoliata</u>	<u>30</u>	<u>yes</u>	<u>FAC</u>																									
3. <u>Glyceria striata</u>	<u>10</u>	<u>no</u>	<u>OBL</u>																									
4. <u>Carex deweyana</u>	<u>5</u>	<u>no</u>	<u>FAC</u>																									
5. <u>Myosotis sylvatica</u>	<u>3</u>	<u>no</u>	<u>FAC</u>																									
6. <u>Glyceria elata</u>	<u>1</u>	<u>no</u>	<u>FACW</u>																									
7. <u>Equisetum arvense</u>	<u>1</u>	<u>no</u>	<u>FAC</u>																									
8. <u>Goodyera oblongifolia</u>	<u>1</u>	<u>no</u>	<u>FACU</u>																									
9. <u>Pyrola asarifolia</u>	<u>1</u>	<u>no</u>	<u>FACU</u>																									
10. _____	_____	_____	_____																									
11. _____	_____	_____	_____																									
50% = <u>45</u> , 20% = <u>18</u>	<u>90</u>	= Total Cover																										
Woody Vine Stratum (Plot Size: _____)				Hydrophytic Vegetation Present? Yes ☒ No ☐																								
1. _____	_____	_____	_____																									
2. _____	_____	_____	_____																									
50% = _____, 20% = _____	_____	= Total Cover																										
% Bare Ground in Herb Stratum _____																												

REMARKS: Vegetation passes dominance test and prevalence index for hydrophytic vegetation.

SOILSampling Point: W-4**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (Moist)	%	Type ¹	Loc ²		
0-16+"	10YR2/1	100	_____	_____	_____	_____	muck	organic
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____

¹Type: C= Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)**

- | | |
|--|--|
| ☐ Histosol (A1) | ☐ Sandy Redox (S5) |
| ☐ Histic Epipedon (A2) | ☐ Stripped Matrix (S6) |
| ☐ Black Histic (A3) | ☐ Loamy Mucky Mineral (F1) (except MLRA 1) |
| ☐ Hydrogen Sulfide (A4) | ☐ Loamy Gleyed Matrix (F2) |
| ☐ Depleted Below Dark Surface (A11) | ☒ Depleted Matrix (F3) |
| ☐ Thick Dark Surface (A12) | ☐ Redox Dark Surface (F6) |
| ☐ Sandy Mucky Mineral (S1) | ☐ Depleted Dark Surface (F7) |
| ☐ Sandy Gleyed Matrix (S4) | ☐ Redox Depressions (F8) |

Indicators for Problematic Hydric Soils³:

- | |
|---|
| ☐ 2 cm Muck (A10) |
| ☐ Red Parent Material (TF2) |
| ☐ Other (Explain in Remarks) |

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.**Restrictive Layer (if present):**

Type: _____

Depth (Inches): _____

Hydric Soils Present?

Yes

☒

No

☐

Remarks: Meets hydric soil criteria.

HYDROLOGY**Wetland Hydrology Indicators:**

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

- | | |
|--|---|
| ☐ Surface Water (A1) | ☐ Water-Stained Leaves (B9) |
| ☒ High Water Table (A2) | (except MLRA 1, 2, 4A, and 4B) |
| ☒ Saturation (A3) | ☐ Salt Crust (B11) |
| ☐ Water Marks (B1) | ☐ Aquatic Invertebrates (B13) |
| ☐ Sediment Deposits (B2) | ☐ Hydrogen Sulfide Odor (C1) |
| ☐ Drift Deposits (B3) | ☐ Oxidized Rhizospheres along Living Roots (C3) |
| ☐ Algal Mat or Crust (B4) | ☐ Presence of Reduced Iron (C4) |
| ☐ Iron Deposits (B5) | ☐ Recent Iron Reduction in Tilled Soils (C6) |
| ☐ Surface Soil Cracks (B6) | ☐ Stunted or Stresses Plants (D1) (LRR A) |
| ☐ Inundation Visible on Aerial Imagery (B7) | ☐ Other (Explain in Remarks) |
| ☐ Sparsely Vegetated Concave Surface (B8) | |

Secondary Indicators (2 or more required)

- | |
|--|
| ☐ Water-Stained Leaves (B9) |
| (MLRA 1, 2, 4A, and 4B) |
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| ☐ Geomorphic Position (D2) |
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| ☐ FAC-Neutral Test (D5) |
| ☐ Raised Ant Mounds (D6) (LRR A) |
| ☐ Frost-Heave Hummocks (D7) |

Field Observations:Surface Water Present? Yes ☐ No ☒ Depth (inches): _____Water Table Present? Yes ☒ No ☐ Depth (inches): 6"Saturation Present? (includes capillary fringe) Yes ☒ No ☐ Depth (inches): surface**Wetland Hydrology Present?**

Yes

☒

No

☐

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

Remarks: Meets primary wetland hydrology criteria with saturation at the surface and water table at 6". Rivulets of running water run throughout the area.